



Pneumatic Clean Series

3rd edition

## Pneumatic Clean Series

3rd edition

Actuator, Rotary actuator, Air gripper, Directional control valve,  
Air line equipment, Air preparation equipment, Pressure switch,  
Clean regulator, Clean gas filter

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# SMC clean series is

a pneumatic system that



● Within SMC clean series, the user can choose equipment that provides the required level of cleanliness (Class 10 to Class 1000).

## Class10

## Class100

## Class1000

**Air cylinder  
Series 11-**



**Air gripper  
Series 11-**



**Pressure control  
equipment  
Series 10-**



**Rotary actuator  
Series 11-**



**Air preparation equipment  
Series 10-**



**Air cylinder  
Series 10-**



**Cylinder with guide  
Series 13-**



**Directional control valve  
Series 10-**



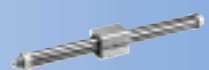
**Fitting  
Series 10-**



**Cylinder with guide  
Series 12-**



**Rodless cylinder  
Series 12-**



can be selected according to the cleanliness (Class 10 to 1000)\* of the clean room.

\* Classification of cleanliness classes according to Fed. Std. 209D

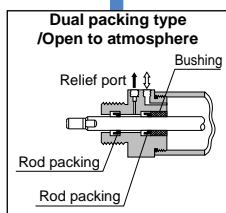
● Dust is kept off from the clean room.

- After inspection, the product is blown with high purity air (of Class 100 clean bench) in a clean environment.
- Products are sealed and shipped in anti-static double bags.



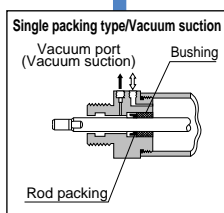
● Four series of actuators are lined up, among which the customer can select the most suitable product according to the required clean level.

SMC actuator (Clean Series)



Cylinder with guide

Rodless cylinder



Cylinder with guide

"Special treatment"

Ball bush guide  
Linear guide

"Special treatment"

Cylinder tube

"Special treatment"

Ball bush guide  
Linear guide



Series  
10-

Series  
12-

Series  
11-

Series  
13-





# Clean Series Index Guide

Basic Series		Cylinder with Guide		Air Slide Table		Rodless Cylinder		Low Speed Cylinder			
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10-11- <b>CG1</b>	Air Cylinder Series CG1 P.36	10- <b>CBM2</b>	End Lock Cylinder Series CBM2 P.72	12-13- <b>MGPL</b>	Compact Type Cylinder with Guide Series MGPL P.98	13- <b>MXS</b>	Air Slide Table Series 13-MXS P.144	12- <b>CY1R</b>	Magnetically Coupled Rodless Cylinder Series 12-CY1R P.176	10-11- <b>CM2X</b>	Low Speed Cylinder Series CM2X P.184
10-11- <b>CUJ</b>	Mini Free Mount Cylinder Series CUJ P.48	10-11- <b>REC</b>	Sine Cylinder Series REC P.78	10- <b>MGF</b>	Guide Cylinder Table Series MGF P.102			12- <b>REA</b>	Sine Rodless Cylinder Series REA P.178		
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10- <b>CRB1</b>	Vane Type Series CRB1 P.192	11- <b>CRA1</b>	Rack Pinion Type Series CRA1 P.204	11- <b>MSQ</b>	Rotary Table/Rack and Pinion Type Series MSQ P.210						
11- <b>MHZ2</b>	Parallel Type Series MHZ2 P.216	11- <b>MHR2</b>	Rotary Actuated Series MHR2 P.220	11- <b>MHR3</b>	Rotary Actuated Series MHR3 P.226	11- <b>MHL2</b>	Wide Opening Parallel Type Series MHL2 P.230				
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10- <b>SQ</b>	5 Port SQ1000/2000 P.254	10- <b>SYJ</b>	4/5 Port SYJ3000/5000 P.310	10- <b>SYJ</b>	3 Port SYJ300/500 P.352	10- <b>VQ</b>	3 Port VQ100 P.418				
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10- <b>AS</b>	Speed Controller Series AS P.438	10- <b>AR</b>	Regulator Series AR P.482	10- <b>IR</b>	Precision Regulator Series IR P.506						
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10- <b>SF</b>	Clean Gas Filter Series SFA,SFB,SFC P.650										

Actuator  
Rotary Actuator  
Air Gripper  
Directional Control Valve  
Air Line Equipment  
Air Preparation Equipment  
Pressure Switch  
Clean Regulator  
Clean Gas Filter

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# How to Search

Three types of search methods are available so that the desired product can be found quickly as well as easily.

## 1 How to Search from Clean Series Total Index (Product Name)

### Clean Series Total Index

**Clean Series Total Index**

**Prior to Use** ..... Front matter 1/Supplement 1

**Index Guide** ..... Front matter 1

**Clean Series Total Index** ..... Front matter 2/3

**How to Search** ..... Front matter 4/5

**Safety Instructions** ..... Front matter 7

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Front matter 2

### Main Text

**Series 10-11-CM2** Air Cylinder/20, ø25, ø32, ø40

**How to Order**

**Clean series**

10 - Clean series  
11 - Industrial standard type

**Build to request**

10 - No  
D - 100 mm (4 in) length

**Measuring**

10 - Stroke  
11 - Front range  
12 - Rear range  
13 - Stroke of rod  
14 - Stroke of rod  
15 - Stroke of rod  
16 - Stroke of rod

**Stroke size (mm)**

10 - C D M 2 L 40 - 150 A - C73

**Cylinder stroke (mm)**

10 - Stroke  
A - Air cushion

**Number of auto switches**

0 - 0  
1 - 1  
2 - 2  
3 - 3

**Model**

Model	Stroke size (mm)	Port	Label	Action	Standard stroke (mm)	Auto switch memory	Control
10-CM2-20	20						
10-CM2-25	25						
10-CM2-32	32						
10-CM2-40	40						
11-CM2-20	20		10-18	Double-acting	25, 50, 75, 100, 125, 150, 175, 200, 250, 300	Available	Available/Available
11-CM2-25	25		10-18	Double-acting			
11-CM2-32	32		10-18	Double-acting			
11-CM2-40	40		10-18	Double-acting			

**Specifications**

Item	Stroke size (mm)	Value
Stroke	20, 25, 32, 40	
Port pressure	1.2 MPa	
Min. operating pressure	0.2 MPa	
Max. operating pressure	0.52 MPa	
Response and hold performance	Minimum: 10 ms (stroke 25 mm to 100 mm) Maximum: 100 ms (stroke 100 mm to 300 mm)	
Filtering speed	30 to 60 g/min	
Cylinder length tolerance	±0.1 mm	
Mounting	Basic: Anvil base / Front range: Anvil range	

Air Cylinder Series 10-11-CM2/CM2W/CM2R

## 2 How to Search From Index Guide

### Index Guide

#### Clean Series Index Guide

The index guide is a multi-column table listing various SMC components. A blue circle highlights the 'Mist Separator' section, which includes models like 10-AM150 to 850. The table is organized into sections: Main Series, Cylinders with Solenoid, Air Blade Valve, Product Cylinder, and Line Speed Cylinder. Each section contains a grid of model numbers and their corresponding page numbers.

### Middle Cover

#### Clean Series Actuator

The middle cover page features a large image of a Clean Series Actuator. Below the image, there is a table of contents for the actuator section, mirroring the layout of the index guide. A blue circle highlights the 'Mist Separator' section in this table as well.

## 3 How to Search by Type and Model (in Alphabetical Order)

### INDEX in the Alphabetical Order

This page shows an alphabetical index of product series. The 'M' section is highlighted with a blue circle, and a specific entry '10-AM150 to 850' is circled in blue. A blue arrow points from this entry to the page number '592' in a separate circle. The index lists various models and their corresponding page numbers.

### Main Text

#### Series 10-AM Mist Separator

The main text page provides detailed information for the Series 10-AM Mist Separator. It includes a 'How to Order' section with a diagram showing the model number breakdown: 10 - AM 250 - 03 B - J. A diagram of the mist separator is shown with labels for body size, port size, and options. Below this is a 'Model' table with columns for different body sizes and their corresponding part numbers. The 'Specifications' section lists technical details such as non-generating pressure, filtration, and material. The 'Replacement Parts' table lists the material and quantity for various components.


10-AM150 to 850 ..... 592







# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard by labeling "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO4414 <sup>Note 1)</sup>, JIS B 8370 <sup>Note 2)</sup> and other safety practices.

 **Caution:** Operator error could result in injury or equipment damage.

 **Warning:** Operator error could result in serious injury or loss of life.

 **Danger:** In extreme conditions, there is a possibility of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power-General rules relating to systems.

Note 2) JIS B 8370: Pneumatic system axiom.

## Warning

**① The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.**

Since the products specified here are used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

**② Only trained personnel should operate pneumatically operated machinery and equipment.**

Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

**③ Do not service machinery/equipment or attempt to remove components until safety is confirmed.**

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for the equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is re-started, take measures to prevent quick extensions of the cylinder piston rod etc.

**④ Contact SMC if the product is to be used in any of the following conditions:**

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, recreation equipment, emergency stop circuits, press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



# Clean Series/Common Precautions 1

Be sure to read before handling.

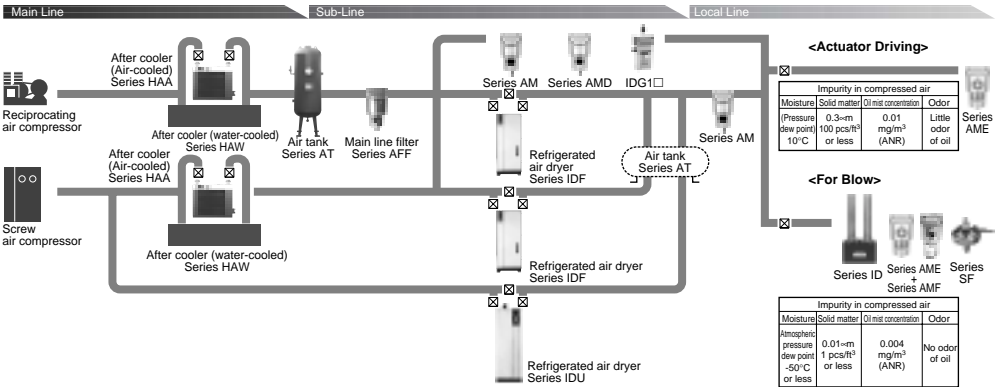
Refer to the main text for precautions for each series.

## Air Supply

### ⚠ Caution

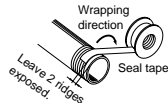
#### ① System configuration

Refer to Compressed Air Clean System below for the quality of compressed air to configure the system.



#### ② Piping

- ① Provide an inclination of 1cm per meter in the direction of the air flow to the main piping.
- ② If there is a line branching from the main piping, provide an outlet of compressed air on top using a tee so that drainage accumulated in the piping will not flow out.
- ③ Provide a drainage mechanism at every recessed point or dead end to prevent drain accumulation.
- ④ For future extension of piping, plug the end of the piping with a tee.
- ⑤ Preparation before connecting the piping  
Use an air blower to thoroughly flush the piping or wash the piping to remove any cutting chips, cutting oil, or debris from inside the piping before connecting them.
- ⑥ Wrapping the seal tape  
When screwing in the pipes or fittings, be sure to prevent cutting chips or sealing material on the threaded portion of the pipe from entering the piping.



#### ③ Maintenance

If the heatless air dryer Series ID is left unused for a long period, the absorbent may be moistened. Prior to use, stop the valve on the secondary side of the dryer for regeneration and drying.

#### ④ Blow system

Even a small amount of dust can cause problems in a blow system. Install a clean gas filter series SF at the end of the blow line.

#### ⑤ Precautions on design

Adopt a safety design to prevent occurrence of unexpected accidents as listed below.

### ⚠ Warning

- ① Design a layout so that high pressure compressed air will not flow over to the secondary side.  
If the coolant water of a water-cooled after cooler or the fan motor of an air-cooled after cooler stops, high temperature compressed air will flow over to the secondary side, which may cause the secondary side equipment (AFF, AM, AD, IDF, etc.) to malfunction or be damaged.
- ② Consider possible failure in supply of compressed air when designing the system.  
Freezing in a refrigerated air dryer or malfunction of a switching valve (In case of a heatless dryer) may hinder flow of compressed air.

### ⚠ Caution

- ① Design a layout in consideration of possible leakage of coolant water or water dripping due to condensation.  
Water leakage may be caused by freezing on a water-cooled after cooler using coolant water while condensation and consequent water dripping may be caused by overcooling depending on the operating conditions in case of a refrigerated air dryer and its downstream piping.
- ② Design a layout which will prevent occurrence of reverse pressure and reverse flow.  
Reverse pressure or reverse flow will cause malfunction or damage to equipment. Implement safety measures including those for handling procedures.





# Clean Series/Common Precautions 2

Be sure to read before handling.

Refer to the main text for precautions for each series.

## Piping Inside Clean Room

### ⚠ Caution

- 1 Do not make the piping for the air cylinder relief port and regulator breathing vent piping common with solenoid valve exhaust piping.

It can cause malfunction of air cylinder or regulator pressure change.

- 2 Arrange the piping to allow exhaust air of the solenoid valve to be exhausted outside the clean room.

- 3 Air filter drain piping

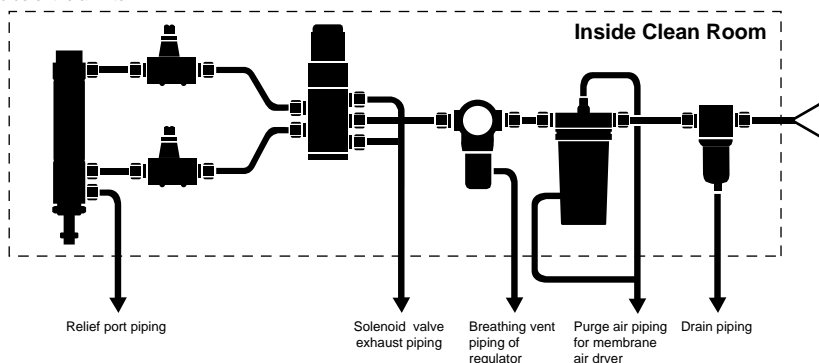
Exhaust drainage outside the clean room through piping from the drain guide of the air filter.

- 4 Arrange membrane dryer air purge piping to exhaust air outside the clean room using a standard size tubing.

- 5 Take precautions so that the threaded portion of piping connection or tubing connection will not be loosened.

Take enough precautions if the piping is shaking along with the vibration of the equipment.

- 6 Use polyurethane tubing containing no plasticizer.



### Handling

### ⚠ Caution

- 1 The inner bag of a double packed clean series package should be opened in a clean room or clean environment.
- 2 When standard pneumatic equipment is brought into a clean room, spray high purity air upon it and clear dust thoroughly by wiping the external surfaces of cylinder tubing, solenoid valves and air line equipment with alcohol.
- 3 To replace parts or disassemble the product in a clean room, first exhaust compressed air inside the piping to outside of the clean room before the work.
- 4 Do not use rotation type mounting brackets such as clevis and trunnion. They will generate a considerable amount of particles due to sliding friction between metal parts.

### Lubrication/Actuator

### ⚠ Warning

Be sure to wash your hands after handling fluoro resin grease.

The grease is not hazardous but it can produce hazardous gas under a temperature exceeding 260°C.

### ⚠ Caution

- 1 Do not use grease except for those specified by SMC. Use of grease not in the specification will cause malfunction or particle generation.

- 2 Do not lubricate since the product is of a non lubricant type.

As the clean series actuator is lubricated at the factory with fluororesin grease, it may not satisfy the product specifications if turbin oil is applied.

### Piston Speed

### ⚠ Caution

In order to retain the particle generation grade, set a standard limit of 400 mm/s of travel distance.



# Clean Series/Common Precautions 3

Be sure to read before handling.

Refer to the main text for precautions for each series.

## Vacuum Flow Rate of Vacuum Types

### ⚠ Caution

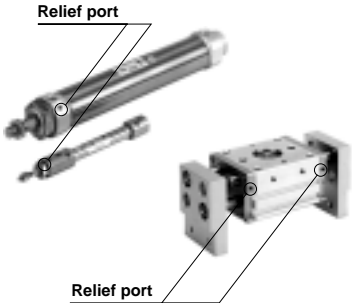
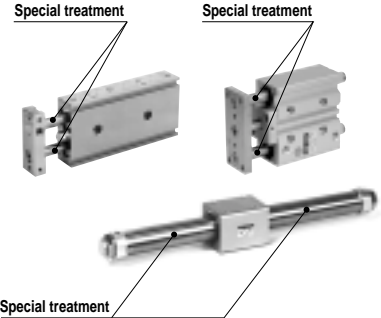



In case of a vacuum type (Series 11- / Series 13-), perform vacuum suction at the vacuum port to retain the particle generation grade.

The optimum suction rate varies among series and sizes. Refer to the following table for guidelines. (The vacuum pressure may be approximately -13kPa to -27kPa around the vacuum port.) Consult SMC for other types and models.

(Reference value)

Series	Model	Bore size (mm)	Suction flow rate (l/min)(ANR)
Air cylinder	11-CJ2	ø10, ø16	1
	11-CM2	ø20 to ø40	2
	11-CG1	ø20 to ø40	10
ø50, ø63		20	
Compact cylinder	11-CQS	ø12 to ø25	5
	11-CQ2	ø32, ø40	5
		ø50, ø63	10
Mini free mount cylinder	11-CUJ	ø6, ø8	2
		ø10	3
Free mount cylinder	11-CU	ø6	6
		ø10	10
		ø16 to ø25	12
Sine cylinder	11-REC	ø20	1
		ø25 to ø40	2
Dual rod cylinder (Compact type)	11-CXSJ	ø6	7
		ø10	15
Dual rod cylinder	11-CXSL	ø6	2
		ø10	5
		ø15	10
		ø20, ø25	15
		ø32	20
Compact cylinder with guide	13-MGPL	ø12 to ø25	5
		ø32, ø40	10
		ø50 to ø63	10
Rotary actuator	11-CRA1	size30	1
		size50	5
Rotary table	11-MSQ	Size10 to Size50	1
Air gripper	11-MHZ2	ø10	1
		ø16	1
		ø20	2
		ø25	2
	11-MHR2-3	Size10 to Size30	10
11-MHL2	ø10 to ø32	25	
Air slide table	13-MXS,MXQ	ø6 to ø12	1
		ø16	2
		ø20	3
		ø25	5
	11-MXP,MXPJ6	ø6	1
		ø10	3
		ø12	4
	ø16	6	

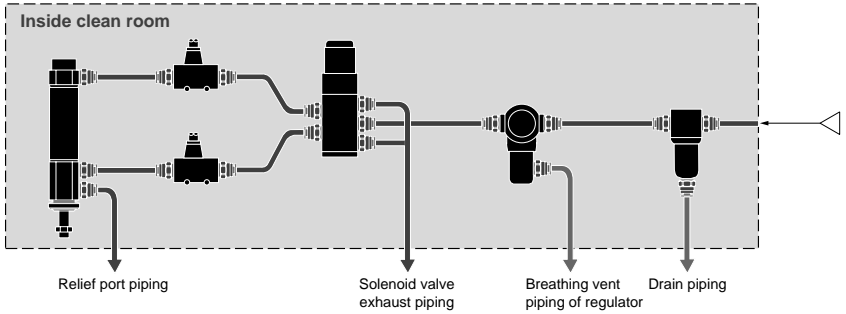
# 1 Clean Series Basic Specifications

	Discharges Particles Out of The Clean Room	Prevents Particle Generation
<b>Actuator</b>	<ul style="list-style-type: none"> <li>● <b>Air Cylinder/Rotary Actuator/Air Gripper</b> Any external leakage is exhausted outside the clean room through the relief port.</li> </ul> 	<ul style="list-style-type: none"> <li>● <b>Cylinder with Guide/Rodless Cylinder</b> Special treatment on the guide and sliding part prevents grease scattering.</li> </ul> 
<b>Solenoid Valve</b>	<ul style="list-style-type: none"> <li>● <b>Solenoid Valve</b> Common exhaust mechanism allows air from the pilot valve to be exhausted outside the clean room.</li> </ul> 	
<b>Air Line Equipment</b>	<ul style="list-style-type: none"> <li>● <b>Regulator</b> Breathing air is exhausted outside the clean room through the relief port.</li> <li>● <b>Air Filter</b> Drainage is exhausted outside the clean room through the drain guide.</li> </ul> 	<ul style="list-style-type: none"> <li>● <b>Clean Regulator</b> Excellent corrosion resistance due to use of stainless steel for all fluid contact parts and electrolytic aluminum on external metal parts.</li> <li>● <b>Clean Gas Filter</b> The PTFE membrane element enables precision filtering.</li> </ul> 
<b>Fittings &amp; Tubing</b>		<ul style="list-style-type: none"> <li>● <b>Clean One-touch Fittings</b> Prevents sliding and reduces particle generation by holding cushion and fixing packing. Blow type is completely oil free and uses non-metal material for fluid contact areas.</li> <li>● <b>Clean Tubing</b> Polyolefine resin</li> </ul>

## 2 System Circuit in Clean Room

Following are the actuator driving system and circuit configuration of blow system employed to reduce particle generation when using pneumatic equipment in a clean room.

### ● Actuator driving system



#### Actuator



##### Air cylinder

Air cylinder  
Series ☞ C.J2/C.J2W/C.J2RA

Air cylinder  
Series ☞ CM2/CM2W/CM2R

Air cylinder  
Series ☞ CG1CG1W/CG1R

Mini free mount cylinder  
Series ☞ CUJ

Free mount cylinder  
Series ☞ CU

Compact cylinder  
Series ☞ CQS

Compact cylinder  
Series ☞ CQ2

End lock cylinder  
Series 10-CBM2

Sine cylinder  
Series ☞ REC

Dual rod cylinder/Compact  
Series ☞ CXSJ

Dual rod cylinder  
Series ☞ CXSL

Compact cylinder with guide  
Series ☞ MGPL

Guide table  
Series 10-MGF

Air slide table  
Series 11-MXP/MXPJ6

Air slide table  
Series 13-MXQ

Air slide table  
Series 13-MXS

Clean rodless cylinder  
Series CYP

Magnetically coupled rodless cylinder  
Series 12-CY1B

Magnetically coupled rodless cylinder  
Series 12-CY1R

Sine rodless cylinder  
Series 12-REA

Low speed cylinder  
Series ☞ CQSX

Low speed cylinder  
Series ☞ CQ2X

Low speed cylinder  
Series ☞ CM2X

**Rotary actuator**

Rotary actuator/Vane type  
Series 10-CRB1

Rotary actuator/Rack pinion type  
Series 11-CRA1

Rotary table/Rack pinion type  
Series 11-MSQ

**Air gripper**

Parallel type air gripper  
11-MHZ2

Rotary type air gripper  
11-MHR2

Rotary type air gripper  
11-MHR3

Wide opening parallel type air gripper  
11-MHL2

#### Flow control equipment



##### Clean speed controller

AS-FPG/FPQ

With One-touch fitting  
(Elbow/Universal)

10-AS-F

With One-touch fitting stainless steel specifications  
(Elbow/Universal)

10-AS-FG

With One-touch fitting stainless steel specifications  
(In-line)

10-AS-FG

With One-touch fitting dual type

10-ASD

With One-touch fitting low speed specifications  
10-AS-FM

With One-touch fitting low speed/dual type  
10-ASD-FM

With One-touch fitting stainless steel/dual type  
10-ASD-FG

Cylinder direct mount type metal elbow  
10-AS1200 to 4200

Inline type  
10-AS1000 to 5000

#### Directional control valve



5 port solenoid valve  
10-SZ3000

5 port solenoid valve  
10-SQ1000/2000

4/5 port solenoid valve  
10-SY3000/5000/7000

4/5 port solenoid valve  
10-SYJ3000/5000

3 port solenoid valve  
10-SY100

3 port solenoid valve  
10-SYJ300/500

5 port solenoid valve  
10-VQ1000/2000

3 port solenoid valve  
10-VQ100

4 port solenoid valve  
10-VQD1000

#### Air filter/Regulator



##### Air filter/Modular type

10-AF3000 to 6000

Mist separator/Modular type  
10-AFM3000/4000

Micromist separator/Modular type  
10-AFD3000/4000

Regulator/Modular type  
10-AR2000 to 6000

Direct operated precision regulator/Modular type  
10-ARP3000

Regulator with check valve/Modular type  
10-AR2500/3000/4000

Filter regulator/Modular type  
10-AW3000/4000

Mist separator regulator/Modular type  
10-AWM3000/4000

Micro mist separator regulator/Modular type  
10-AWD3000/4000

Precision regulator  
10-IR1000/2000/3000

#### Fittings & Tubing



Clean One-touch fittings (for blow)

Series KP

Clean One-touch fittings (for air piping of driving system)

Series KPQ/KPG

One-touch mini  
10-KJ

One-touch fittings  
10-KQ

One-touch fittings stainless specifications  
10-KG

Insert fittings  
10-KF

Miniature fittings  
10-M

Stainless steel miniature fittings  
10-MS

Rectangular multi-connector  
10-KDM

Clean tubing/Polyolefin  
Series TPH

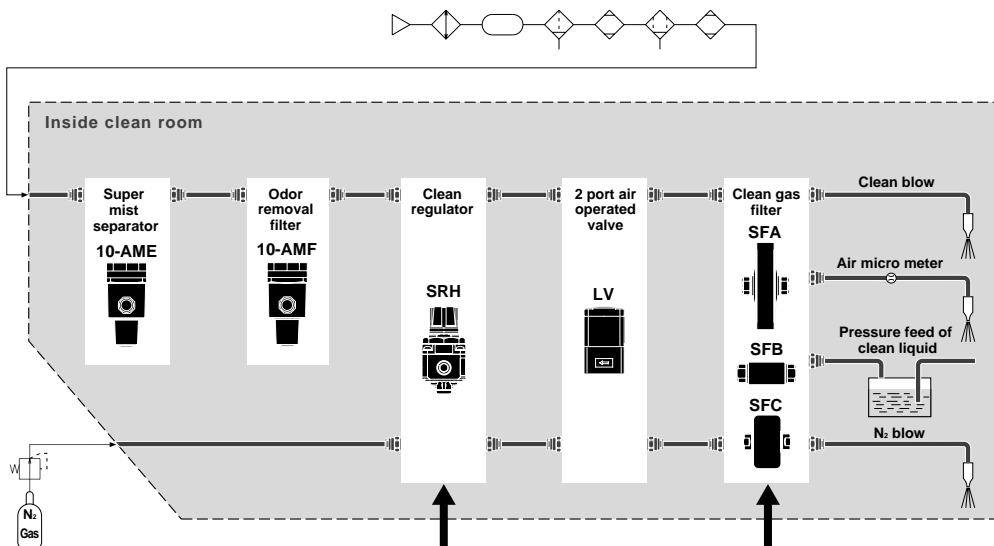
Clean tubing/Soft polyolefine  
Series TPS

Polyurethane tubing  
10-TU

Polyurethane coil tubing  
10-TCU

Polyurethane flat tubing  
10-TFU

## ● Clean blowing system



### Clean regulator

Excellent corrosion resistance due to use of stainless steel for all fluid contact parts and electrolytic aluminum on external metal parts.



Clean room regulator  
SRH 3000/4000

### Air preparation equipment

Mist separator	10-AM150 to 850
Micromist separator	10-AMD150 to 850
Super mist separator	10-AME150 to 850
Order removal filter	10-AMF150 to 850

### Fittings & Tubing

Clean One-touch fitting  
KP  
Clean tubing  
TPH/TPS



### Clean gas filter

All products undergo consistent manufacturing process in a clean room (of CLASS 100 atmosphere) including ultrasonic pure water cleaning, assembly, inspection and double bag sealing.

#### Cartridge type

**Disc type**  
SFA100/200/300



**Straight type**  
SFB100



#### Disposable type

**Straight type**  
SFB300



**Multiple disc type**  
SFC100



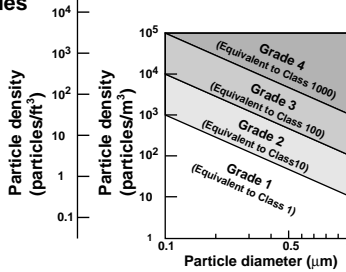
### 3 How to Use Clean Series

The position of the pneumatic equipment in relation to the workpiece is determined by the degree of particle generation.

The grade number of the pneumatic equipment or more

The grade number of the particle density around the workpiece

#### Classification of particle generation grades



\* The grading in the left figure is based on SMC original representation. The grade number decreases with the amount of particle generation. (For particle generation measurement method, please refer to Item 4 particle generation measurement method.)

#### Selection procedure

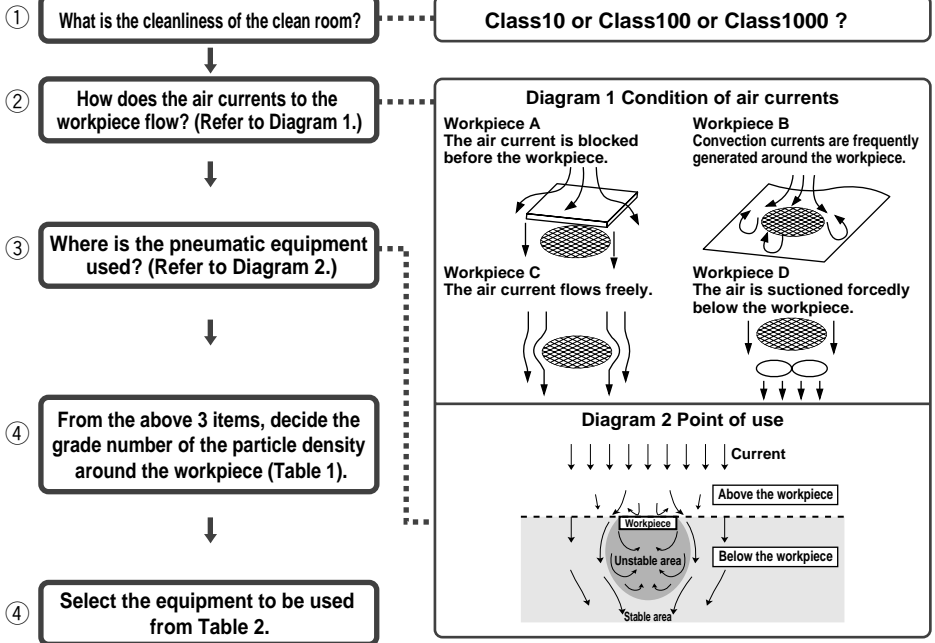


Table 1 Grades of particle density around the workpiece

② Workpiece		A, B			C			D		
③ Position of the equipment to be used		Upstream to the workpiece	Downstream to the workpiece		Upstream to the workpiece	Downstream to the workpiece		Upstream to the workpiece	Downstream to the workpiece	
			Unstable area	Stable area		Unstable area	Stable area		Unstable area	Stable area
① Cleanliness	Class 10				Grade 1		Grade 2	Grade 1	Grade 2	
	Class 100				Grade 2	Grade 3	Grade 2		Grade 3	
	Class 1000	Grade 1	Grade 2	Grade 3	Grade 2	Grade 3		Grade 4	Grade 2	Grade 3

The cleanliness of Class 10 and 1000 is not available for the sections indicated with because of dust accumulation and flotation.

# Table 2 Grading of Particle Generation for Pneumatic Equipment

	Model	Standard product	Series 10-	Series 11-	Series 12-	Series 13-			
Air cylinder	CJ2 CM2 CG1	Grade 3	Grade 2	Grade 1					
Compact cylinder	CQS CQ2								
Mini free mount cylinder	CUJ								
Free mount cylinder	CU								
End lock cylinder	CBM2								
Sine cylinder	REC								
Dual rod cylinder Compact type	CXSJL CXSJM				Grade 3 Grade 4		Grade 1 Grade 1	Grade 2	
Dual rod cylinder	CXSL CXSM				Grade 3 Grade 4		Grade 1	Grade 2	
Compact cylinder with guide	MGPL				Grade 4			Grade 3	Grade 2
Air slide table	MXS MXQ								Grade 3 Grade 4
		* The option without adjuster is not available for 11-MXP6.							
	MXP (J)			Grade 1 Grade 2 Grade 4					
Clean rodless cylinder	CYP	Grade 2							
Magnetically coupled rodless cylinder	CY1B CY1R	Grade 4			Grade 3				
Sine rodless cylinder	REA								
Guide table	MGF	Grade 4	Grade 2						
Rotary actuator	MSQ	Grade 3		Grade 1 Grade 2					
	CRA1 CRB1	Grade 4	Grade 2						
	MHR MHL2 MHZ2	Grade 4		Grade 1 Grade 2 Grade 2					
Speed controller	Standard type		Grade 1						
	With one-touch fittings		Grade 3						
Clean one-touch fittings	For blowing/KP For piping of driving air/MQP	Grade 1							
Fittings	Insert	KF		Grade 1					
	Miniature	M, MS		Grade 3					
	One-touch	KQ, KJ, KG		Grade 3					
Solenoid valve	VQ SY/SX	Grade 3 (Rubber seal)		Grade 1					
Regulator	AR	Grade 3		Grade 1					
Filter	AF	Grade 3		Grade 1					
Clean regulator	SRH	Grade 1							
Precision clean regulator	SRP	Grade 3							
Clean exhaust cleaner	AMP	Grade 3							

● Indicates that production is possible. Please contact SMC for details.

Note) With one-touch fittings (KQ/KG, solenoid valve manifold with built-in one-touch fittings and speed controller with one-touch fittings), changes in internal pressure may cause the collet chuck to move slightly, which can result in particle generation. Therefore, please avoid using the above-mentioned products in the Grade 1 and Grade 2 areas. This will not happen with insert fittings (KF) and miniature fittings (M, MS).

## 4 Particle Generation Measuring Method

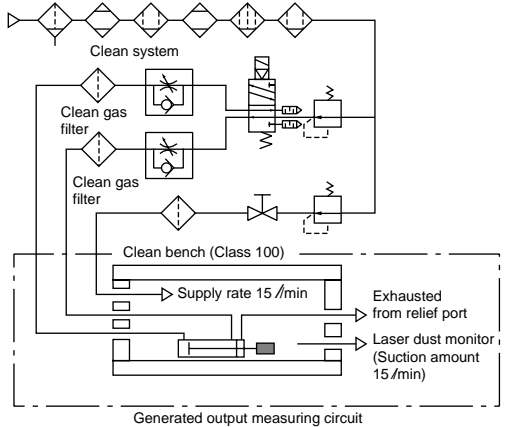
The particle generation data for the SMC CLEAN SERIES are measured in the following test method.

### [Test method 1] (Example)

Put the specimen in the acrylic resin chamber and operate it while supplying the same flow rate of clean air as the suction flow rate of the measurement equipment (15 /min). Measure the chronological changes of the particle density until the number of cycles reaches the specified point. The chamber is located in a Class 100 clean bench.

### [Measurement conditions]

Chamber	Unobstructed	15 /
	Quality of supply air	Same as the supply air for driving.
Measuring instrument	Name	Laser dust monitor (automatic particle counter by light scattering method)
	Model	TS-1500
	Minimum measurable particle diameter	0.17 $\mu$ m
	Inlet flow rate	15 /min
	Manufacturer	Hitachi electronic engineering Co. Ltd.
Setting conditions	Sampling time	5min
	Interval time	55min
	Sampling air flow	75 /



### [Evaluation method]

To obtain the measured value of particle density, the accumulated value <sup>Note 1)</sup> of particles captured by the laser dust monitor every 5 minutes is converted into the particle density in every 1m<sup>3</sup>.

The value used to determine the particle generation grade <sup>Note 2)</sup> is considered to be 100% against the percentage of the average of actually measured particle density value assumed as 95%.

The extra 5% is added to ensure cleanliness in the actual operation.

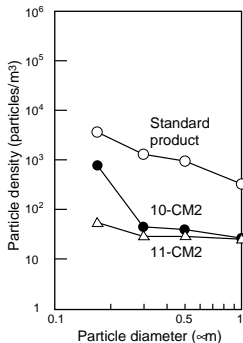
The graphs are plotted based on the value considered to be 100% against the percentage of the average particle density as 95%. The extra 5% is added to ensure cleanliness in the actual operation.

Note 1) Sampling air: Number of particles contained in 75/ of air

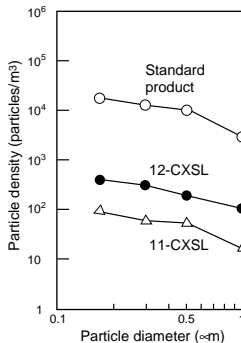
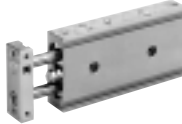
Note 2) Actuator: 1 million cycles

Solenoid valve: 20 million cycles

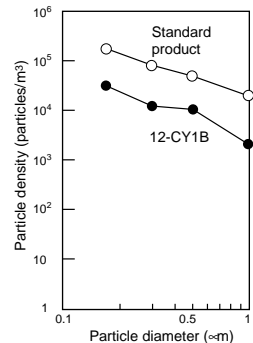
#### ■ Particle generation characteristics of CM2



#### ■ Particle generation characteristics of CXSL



#### ■ Particle generation characteristics of CY1B





# Clean Series Index Guide

## Basic Series

10-11- <b>CJ2</b>	Air Cylinder Series CJ2 P.8
10-11- <b>CM2</b>	Air Cylinder Series CM2 P.20
10-11- <b>CG1</b>	Air Cylinder Series CG1 P.36
10-11- <b>CUJ</b>	Mini Free Mount Cylinder Series CUJ P.48
10-11- <b>CU</b>	Free Mount Cylinder Series CU P.52

10-11- <b>CQS</b>	Compact Cylinder Series CQS P.56
10-11- <b>CQ2</b>	Compact Cylinder Series CQ2 P.64
10-11- <b>CBM2</b>	End Lock Cylinder Series CBM2 P.72
10-11- <b>REC</b>	Sine Cylinder Series REC P.78

## Cylinder with Guide

11-12- <b>CXSJ</b>	Dual Rod Cylinder/Compact Type Series CXSJ P.84
11-12- <b>CXSL</b>	Dual Rod Cylinder Series CXSL P.88
12-13- <b>MGPL</b>	Compact Type Cylinder with Guide Series MGPL P.98
10-11- <b>MGF</b>	Guide Cylinder Table Series MGF P.102

## Air Slide Table

11- <b>MXP/MXPJR</b>	Air Slide Table Series MXP/MXPJ6 P.106
13- <b>MXQ</b>	Air Slide Table Series 13-MXQ P.116
13- <b>MXS</b>	Air Slide Table Series 13-MXS P.144

## Rodless Cylinder

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12- <b>CY1B</b>	Magnetically Coupled Rodless Cylinder Series CY1B P.172
12- <b>CY1R</b>	Magnetically Coupled Rodless Cylinder Series 12-CY1R P.176
12- <b>REA</b>	Sine Rodless Cylinder Series REA P.178

## Low Speed Cylinder

10-11- <b>CQ5X</b>	Low Speed Cylinder Series CQ5X P.180
10-11- <b>CQ2X</b>	Low Speed Cylinder Series CQ2X P.182
10-11- <b>CM2X</b>	Low Speed Cylinder Series CM2X P.184

10- <b>CRB1</b>	Vane Type Series CRB1 P.192
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11- <b>CRA1</b>	Rack Pinion Type Series CRA1 P.204
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11- <b>MSQ</b>	Rotary Table/Rack and Pinion Type Series MSQ P.210
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11- <b>MHZ2</b>	Parallel Type Series MHZ2 P.216
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11- <b>MHR2</b>	Rotary Actuated Series MHR2 P.220
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11- <b>MHR3</b>	Rotary Actuated Series MHR3 P.226
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11- <b>MHL2</b>	Wide Opening Parallel Type Series MHL2 P.230
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10- <b>SZ</b>	5 Port SZ3000 P.240
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10- <b>SY</b>	5 Port SY3000/5000/7000 P.270
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10- <b>SY</b>	3 Port SY100 P.344
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10- <b>VQ</b>	5 Port VQ1000/2000 P.368
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10- <b>VQD</b>	4 Port VQD1000 P.428
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10- <b>SQ</b>	5 Port SQ1000/2000 P.254
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10- <b>SYJ</b>	4/5 Port SYJ3000/5000 P.310
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10- <b>SYJ</b>	3 Port SYJ300/500 P.352
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10- <b>VQ</b>	3 Port VQ100 P.418
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## Flow Control Equipment

<b>AS</b>	Clean Speed Controller Series AS P.434
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10- <b>AS</b>	Speed Controller Series AS P.438
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## Air Filter/Regulator

10- <b>AF</b>	Air Filter Series AF P.474
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10- <b>AR</b>	Regulator Series AR P.482
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10- <b>AW</b>	Filter Regulator Series AW P.494
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10- <b>IR</b>	Precision Regulator Series IR P.506
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## Fittings & Tubing

10- <b>K</b>	Fittings & Tubing Series K P.514
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10- <b>AM</b>	Mist Separator Series AM P.592
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10- <b>AME</b>	Super Mist Separator Series AME P.600
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10- <b>IDG</b>	Hollow Fiber Membrane Air Dryer Series IDG P.608
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10- <b>AMD</b>	Micro Mist Separator Series AMD P.596
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10- <b>AMF</b>	Odor Removal Filter Series AMF P.604
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<b>AMP</b>	Exhaust Cleaner for Clean Room Series AMP P.610
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10- <b>PSE</b>	High Precision Separate Type Digital Pressure Switch P.618
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10- <b>ZSE40(F) ISE40</b>	High Precision Digital Pressure Switch P.626
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10- <b>ZSE5B ISE5B</b>	Digital Pressure Switch With Backlight P.632
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10- <b>ZSE6B ISE6B</b>	Digital Pressure Switch With Backlight P.636
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<b>SRH</b>	Clean Regulator SRH3000*4000 P.640
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<b>SRP</b>	Precision Clean Regulator SRP1000 P.644
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<b>SF</b>	Clean Gas Filter Series SFA,SFB,SFC P.650
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Actuator

Rotary Actuator

Air Gripper

Directional Control Valve

Air Line Equipment

Air Preparation Equipment

Pressure Switch

Clean Regulator

Clean Gas Filter



# Clean Series Actuator

## Basic Series

10-11- <b>CJ2</b>	Air Cylinder Series CJ2 P.8
10-11- <b>CM2</b>	Air Cylinder Series CM2 P.20
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10-11- <b>CQS</b>	Compact Cylinder Series CQS P.56
10-11- <b>CQ2</b>	Compact Cylinder Series CQ2 P.64
10-11- <b>CBM2</b>	End Lock Cylinder Series CBM2 P.72
10-11- <b>REC</b>	Sine Cylinder Series REC P.78

## Cylinder with Guide

11-12- <b>CXSJ</b>	Dual Rod Cylinder/Compact Type Series CXSJ P.84
11-12- <b>CXSL</b>	Dual Rod Cylinder Series CXS P.88
12-13- <b>MGPL</b>	Compact Cylinder with Guide Series MGPL P.98
10-11- <b>MGF</b>	Guide Table Series MGF P.102

## Air Slide Table

11- <b>MXP/MXPJ6</b>	Air Slide Table Series MXP/MXPJ6 P.106
13- <b>MXQ</b>	Air Slide Table Series 13-MXQ P.116
13- <b>MXS</b>	Air Slide Table Series 13-MXS P.144

## Rodless Cylinder

<b>CYP</b>	Clean Rodless Cylinder Series CYP P.166
12- <b>CY1B</b>	Magnetically Coupled Rodless Cylinder Series CY1B P.172
12- <b>CY1R</b>	Magnetically Coupled Rodless Cylinder Series 12-CY1R P.176
12- <b>REA</b>	Sine Rodless Cylinder Series REA P.178

## Low Speed Cylinder

10-11- <b>CQSX</b>	Low Speed Cylinder Series CQSX P.180
10-11- <b>CQ2X</b>	Low Speed Cylinder Series CQ2X P.182
10-11- <b>CM2X</b>	Low Speed Cylinder Series CM2X P.184



# Actuator/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Precautions on Design

### Warning

- 1 There is a possibility of dangerous sudden action by air cylinders if the sliding parts of machinery are twisted due to external forces, etc.**  
In such cases, it may cause human injury by catching in human hands or feet or damage the machinery. Adjust the equipment for smooth movement and design a system that can prevent human injury.
- 2 Install a protective cover to minimize the risk of injury in case it is especially likely that human injury may be caused.**  
If the driven object or the movable part of the cylinder can cause danger to the human body, design a configuration that will not allow human body to contact these parts directly.
- 3 Securely tighten all stationary parts and joints so that they will not become loose.**  
Adopt a secure fastening method when the cylinder operates at a high frequency or is installed in a place with a lot of vibration.
- 4 A deceleration circuit may be required.**  
If the driven object moves at a high speed or has a heavy weight, the cylinder cushion alone may not be able to absorb the impact. Install a circuit for deceleration before cushioning to moderate the impact.  
In this case, the rigidity of the machinery should also be examined.
- 5 Consider possible drops in circuit pressure due to power failure or some other factors.**  
In case the cylinder is used in a clamping mechanism, a drop in circuit pressure may result in decrease of the clamping force and consequently dropping of the work piece.  
Install safety equipment to protect the human body or machinery against injury or damage. Suspension mechanism and lifting devices also need measurement against dropping.
- 6 Consider a possible loss of power source.**  
If the product is controlled by pneumatic pressure, electricity or hydraulic pressure, take measures against possible failure of the power source so that the failure will cause no human injury or damage to equipment.
- 7 Design circuitry to prevent sudden lurching of the driven object.**  
When the cylinder is driven with an exhaust center directional control valve or is started after the residual pressure is exhausted from the circuit, the pressure is applied to one side of the piston in the absence of air inside the cylinder. Therefore, the driven object will lurch at a high speed, which can cause human injury by catching in hands and feet or damage to equipment. Select equipment and design circuit so that lurching will be prevented.
- 8 Consider the behavior at an emergency stop.**  
Design a system that will prevent human injury or equipment damage caused by the cylinder movement when the machine is halted by a manual emergency stop or by a safety device detecting abnormality such as power failure.
- 9 Consider the behavior on restart after an emergency stop or abnormal stop.**  
Design a system so that no damage to human or equipment will be caused on restart of operation.  
When the cylinder has to be reset at the start position, install manual safety equipment.

## Selection

### Warning

- 1 Confirm the specifications.**  
The products in this catalog are designed to be used in industrial compressed air systems only. If the products are used in an environment where pressure, temperature, etc. are out of the specified range, damage and/or malfunction may be caused. Do not use under such conditions. (Refer to the specifications).  
Consult SMC in case any fluid other than compressed air is to be used.
- 2 Intermediate stop**  
When the cylinder piston is stopped at an intermediate position with a 3 position closed center directional control valve, it is difficult, due to air compressibility, to achieve a stop position as precisely and accurately as in cases using hydraulic pressure. Furthermore, since valves and cylinders are not guaranteed for zero air leakage, they may not be able to hold a stop position for an extended period of time. Consult SMC in case it is necessary to hold a stopped position for an extended period.

### Caution

- 1 Do not exceed the maximum applicable stroke.**  
Operation at a stroke exceeding the maximum stroke may damage the piston rod. Refer to the model selection procedure for information about the maximum applicable stroke.
- 2 Operate the piston within the proper range so that collision damage will not occur at the stroke end.**  
Operate within a range that will not cause any damage when the piston having inertial force stops by striking the cover at the stroke end. Refer to the cylinder selection procedures for the range within which damage will not be caused.
- 3 Use a speed controller to adjust the driving speed of the cylinder, gradually increasing it from a small value to the desired speed setting.**
- 4 Provide an intermediate support for a cylinder with a long stroke.**  
If the cylinder has a long stroke, provide an intermediate support to prevent rod sagging and tube flexing, as well as to prevent damage to the rod due to vibrations or external loads.



## Actuator/Common Precaution 2

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

### Mounting

#### Caution

- 1 **Be sure to connect the rod and the load so that their axial centers and movement directions match.**

If the cylinder is not properly aligned, the rod and tube may be twisted. This can wear out the inner surface of the tube, bushings, rod surface and seals, causing damage to these parts.

- 2 **When using an external guide, connect the rod end and the load in such a way that there is no interference at any point within the stroke.**

- 3 **Do not scratch or gouge the sliding parts of the cylinder tube or piston rod by striking them with other objects or holding them in your mouth.**

Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause malfunction. Also, scratches or gouges on the sliding part of the piston rod may damage seals and cause air leakage.

- 4 **When using an external guide, connect the rod end and the load in such a way that there is no interference at any point within the stroke.**

After mounting, repair or modification, etc., connect the air supply and electric power and conduct appropriate function and leakage inspections to confirm proper installation.

- 5 **The operation manual**

Mount and operate the product after reading the manual carefully and understanding its contents.

Also keep the manual where it can be referred to as necessary.

### Cushion

#### Caution

- 1 **Readjust with a cushion needle.**

Though the cushion is adjusted at the time of shipment, readjust the cushion needle on the cover according to the size of the load and operating speed before operating the actuator. Turn the cushion needle clockwise and meter in the throttle to improve the cushion effect. After completing the adjustment, fasten the lock nut firmly.

- 2 **Do not operate the product with the cushion needle fully closed.**

Otherwise the packing may be damaged.

### Air Supply

#### Warning

- 1 **Use clean air.**

Do not use compressed air that contains synthetic oil, salt, and corrosive gases in which chemicals and organic solvents are present, because it could cause equipment damage or malfunction.

#### Caution

- 1 **Mount the air filter.**

Install an air filter close to and upstream of the valve. Select a filtering degree of 5- $\mu$ m or smaller.

- 2 **Take measures such as installation of after cooler, air dryer or drain catch.**

Compressed air containing excessive condensate may cause the valve or other pneumatic equipment to malfunction. Take countermeasures such as installation of an after cooler, air dryer or drain catch.

- 3 **Use the product within the specified range of fluid and ambient temperature.**

Take freeze proof measures when the temperature is 5°C or below. Otherwise the moisture in the circuit may freeze to cause damage to the packing or malfunction.

For detailed information regarding the quality of the compressed air described above, refer to pages 8 to 9 of Front Matter.



## Actuator/Common Precautions 3

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

### Environment

#### Warning

- ❶ Do not use in environments where there is danger of corrosion.  
Refer to the construction drawings regarding cylinder materials.
- ❷ Install a cover over the rod if it is used in an area that is dusty, or in an environment in which water or washing solvent splashes on the cylinder.

### Maintenance

#### Warning

- ❶ Maintenance should be conducted according to procedures described in the operation manual.  
Improper handling may result in malfunction and damage of machinery or equipment.
- ❷ Machine maintenance and supply/exhaust of compressed air  
When machine is to be serviced, first check for removal of work pieces and run-away of equipment, etc. Then, shut off the supply pressure and power and exhaust compressed air in the system through residual pressure release mechanism.  
When machinery is restarted, confirm that a lurch prevention measure is taken.

#### Caution

- ❶ Drain  
Remove condensate from air filters regularly.



# Auto Switch/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Design • Selection

### ⚠ Warning

#### ① Confirm the specifications.

The product may be damaged or malfunction if it is used outside the specified range of current load, voltage, temperature or impact.

#### ② Take precautions when multiple cylinders are used close together.

When multiple auto switch cylinders are used in close proximity, magnetic field interference may cause the switches to malfunction. Design a minimum interval of 40mm between the cylinder tubes. (When the allowable interval is indicated for each cylinder series, use the specified value.)

#### ③ Pay attention to the length of period when the switch is ON at an intermediate stroke position.

In case an auto switch is placed at an intermediate position of the stroke and the load is supposed to be driven while the piston passes, an excessively high piston speed may not allow enough time for the load to operate, even though the auto switch will operate. The maximum detectable piston speed is

$$V \text{ (mm/s)} = \frac{\text{Auto switch operation range (mm)}}{\text{Load operation time (ms)}} \times 1000$$

For a high piston speed, auto switches with built-in off delay timer (approx. 200ms) (D-F5NT, F7NT, G5NT and M5□T) can be used to extend the load operation time.

#### ④ Keep the wiring as short as possible.

<Reed switch>

The rush current at the time of switching ON increases with the length of wiring to the load, which may shorten the product's life (The switch will stay ON all the time).

- 1) For an auto switch without a contact protection circuit, use a contact protection box when the wire length is 5m or longer.
- 2) Even when an auto switch has a built-in contact protection circuit, with a lead wire length of 30m or longer, the rush current may not be adequately absorbed and the life of the switch may be shortened. Contact SMC in such a case, as it will be necessary to connect a contact protection box to extend the life of the switch.

<Solid state switch>

- 3) Although the length should not affect the switch function, use a wire of 100m or shorter.

#### ⑤ Watch for internal voltage drops of the switch.

<Reed switch>

- 1) Switches with indicator light (Not including Models D-A56, A76H, A96, A96V, C76, E76A and Z76).

● In the same way, when operating below the specified voltage, although an auto switch may operate normally, the load may not operate. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

Supply voltage - Internal voltage drop of switch > Minimum operating voltage of load

- 2) If the internal resistance of the light emitting diode causes a problem, select a switch without an indicator light (Models: D-A6□, A80, A80H, A90, A90V, C80, R80, 90, E80A, Z80).

<Solid state switch>

- 3) Generally, the internal voltage drop will be greater with a 2 wire solid state auto switch than with a reed switch. Take the same precautions as in 1).

Also, note that a 12VDC relay is not applicable.

#### ⑥ Take precautions against leakage current.

<Solid state switch>

With a 2 wire solid auto switch, current (leakage current) flows to the load to operate the internal circuit even when the switch is OFF.

$$\text{Operating current of load (Input OFF current of controller)} > \text{Leakage current}$$

If the above condition is not met, the switch will not be reset properly (will stay ON). Use a 3 wire switch if the specification is not satisfied.

The leakage current flow to the load will be "n" times as large when "n" pieces of auto switches are connected in parallel.

#### ⑦ Do not use a load that generates surge voltage.

<Reed switch>

When driving a load that generates a surge voltage, such as a relay, use a switch with a built-in contact protection circuit or use a contact protection box.

<Solid state switch>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still be caused if the surge is applied repeatedly. When a load, such as a relay or solenoid, which generates surge is driven directly, use a switch with a built-in surge absorbing element.

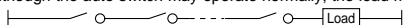
#### ⑧ Caution for use in an interlocking circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to avoid trouble by providing a mechanical protection function or by also using another switch (sensor) together with the auto switch.

At the same time, perform periodic inspections to confirm proper operation.

#### ⑨ Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.





# Auto Switch/Common Precautions 2

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Mounting • Adjustment

### Warning

#### ① Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/s<sup>2</sup> or more for reed switches and 1000m/s<sup>2</sup> or more for solid state switches) while handling. Although the body of the switch may not be damaged, the internal parts could be damaged and cause a problem.

#### ② Do not carry a cylinder by the auto switch lead wires.

It may not only cause the lead wires to be cut off but also cause internal elements of the switch to be damaged by stress applied to the internal parts of the switch.

#### ③ When installing the product, observe the prescribed tightening torque specifications.

When a switch is tightened with a force larger than the tightening torque range, the mounting screws, mounting brackets or switch may be damaged.

On the other hand, tightening with a force below the tightening torque range may allow the switch to slip out of position.

#### ④ Mount the switch at the center of the operating range.

Adjust the mounting position of the auto switch so that the piston will stop at the center of the operating range (the range in which the auto switch is ON). (The catalog shows the optimum mounting position at the stroke end.) If mounted on the edge of the operating range (around the border between ON and OFF ranges), the operation may be unstable.

## Wiring

### Warning

#### ① Do not apply repeated bending stress or stretching force to the lead wire.

Disconnection may result from wiring that applies repeated bending stress or stretching force to lead wires.

#### ② Be sure to connect the load before power is applied.

<2 wire>

The switch will be instantly damaged by an overcurrent if it is turned on without any load connected.

#### ③ Confirm proper insulation of wiring.

Make sure that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may be caused due to excess current flow into the auto switch.

#### ④ Do not wire with power lines or high voltage lines.

Wire separately from power lines or high voltage lines, avoiding parallel wiring or wiring in the same conduit with these lines. Control circuits, including auto switches, may malfunction due to noise from these other lines.

## Wiring

#### ⑤ Do not allow short circuits of loads.

<Reed switch>

If the power is turned ON while the load is short circuited, the switch will be instantly damaged because of excess current flow into the switch.

<Solid state switch>

Models D-F9□(V), F9□W(V), J51, G5NB and all models of PNP output switches do not have built-in short circuit prevention circuits. If loads are short circuited, the switches will be instantly damaged.

Take special care to avoid reverse wiring of the power supply line (brown) and the output line (black) with 3 wire type switches.

#### ⑥ Avoid incorrect wiring.

<Reed switch>

A 24VDC switch with indicator light has polarity. The brown lead wire or terminal No.1 is (+), and the blue lead wire or terminal No.2 is (-).

[In the case of model D-97, the side without indicator is (+) and the black line side is (-).]

1) If connections are reversed, the switch will operate, however, the light emitting diode will not light up.

Also, not that a current larger than that specified will damage the light emitting diode, making it unable to operate again.

Applicable models

D-A73, A73H, A73C, C73, C73C, E73A, Z73, R73

D-97, 93A, A93, A93V

D-A33, A34, A33A, A34A, A44, A44A

D-A53, A54, B53, B54

2) However, when using a 2 color indication auto switch (D-A79W, A59W, B59W), be aware that the switch will constantly remain ON if the connections are reversed.

<Solid state switch>

1) If connections are reversed on a 2 wire type switch, the switch will not be damaged when protected by a protection circuit, but it will always stay ON. However, it is still necessary to avoid reverse connections since they will damage the switch when the load is short circuited.

2) If connections are reversed (power supply line + and power supply line -) on a 3 wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue (black) wire and the power supply line (-) to the black (white) wire, the switch will be damaged.

#### ⑦ Process the terminal before carrying the auto switch into the clean room.

Some lead wires contain white powder to prevent anastomosis of the sheath and the core wires. If this powder can possibly be a problem, before carrying it into the clean room, cut the lead wire, remove the powder adhering to the insulator and coat the sheath sectional area with an insulation tape to prevent powder from leaking out.





# Auto Switch/Common Precautions 3

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Environment

### Warning

- ❶ **Never use in an atmosphere with explosive gases.**  
The construction of auto switches is not designed to prevent explosion. Never use in an atmosphere with explosive gases since it may cause a serious explosion.
- ❷ **Do not use in an area where a magnetic field is generated.**  
It can cause the auto switch to malfunction or demagnetize the magnet inside the cylinder. (Consult SMC regarding the availability of magnetic field resistant auto switches.)
- ❸ **Do not use switches in applications where the switch is continually exposed to water splash or spray.**  
Although switches except D-A3□, A44□, G39□, K39□ satisfy the IEC standard IP67 enclosure (JIS C 0920: anti-immersion enclosure), do not use switches in applications where they are continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.
- ❹ **Do not use in an environment with oil or chemicals.**  
Consult SMC if auto switches will be used in an environment with coolant, washing solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected, resulting in poor insulation, malfunction due to swelling of the potting resin or hardening of the lead wires.
- ❺ **Do not use in an environment where there is excessive impact shock.**  
Consult SMC if switches are used where there are temperature cycles other than normal temperature changes, as they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.
- ❻ **Do not use in an environment where there is excessive impact shock.**  
<Reed switch>  
When excessive impact (300m/s<sup>2</sup>) is applied to a reed switch during operation, the contact point will malfunction and turn the signal on or off momentarily (for 1ms or shorter). Consult SMC regarding the need to use a solid state switch depending upon the environment.
- ❼ **Do not use in an environment where surges are generated.**  
<Solid state switch>  
Where there are units (Solenoid lifter, high frequency induction furnace, motor, etc.) which generate a large amount of surge in the area around cylinders with solid state auto switch, the switch may deteriorate or be damaged. Avoid sources of surge generation and disorganized lines.
- ❽ **Avoid close contact with magnetic substances.**  
When a magnetic substance (an object that can be attracted by magnets) is brought into close proximity with an auto switch cylinder, it may absorb the magnetic force inside the cylinder, causing the auto switch to malfunction.

## Maintenance

### Warning

- ❶ **Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.**
  - 1)Secure and tighten switch mounting screws.  
If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.
  - 2)Confirm that there is no damage to lead wires.  
To prevent faulty insulation, replace switches or repair lead wires, etc. when damage is discovered.
  - 3)Confirm that the green LED on the 2 color indicator lights up.  
Confirm that the green LED is on when the piston is stopped at the established position. If the red LED is on, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

## Other

### Warning

- ❶ **Consult SMC concerning water resistance, elasticity of lead wires, etc.**

### \*Lead Wire Color Changes


Lead wire colors of SMC switches and related products have been changed in order to meet NECA (Nippon Electric Control Equipment Industries Association) Standard 0402 for production beginning September, 1996 and thereafter.

Special care should be taken regarding wire polarity during the time that the old colors still coexist with the new colors.

2-wire system			3-wire system		
	Old	New		Old	New
Output (+)	Red	Brown	Power supply +	Red	Brown
Output (-)	Black	Blue	Power supply GND	Black	Blue
			Output	White	Black
Solid state with diagnostic output			Solid state with latch diagnostic output		
	Old	New		Old	New
Power supply +	Red	Brown	Power supply +	Red	Brown
Power supply GND	Black	Blue	Power supply GND	Black	Blue
Output	White	Black	Output	White	Black
Diagnostic output	Yellow	Orange	Latch type diagnostic output	Yellow	Orange

# Series 10-11-CJ2 Air Cylinder/ø6,ø10,ø16

## How to Order



**Clean Series**  
 10 — Relief type  
 11 — Vacuum suction type

**Built-in magnet**  
 Nil — No  
 D — With auto switch (Built-in magnet)

**Mounting**  
 B — Basic  
 L — Axial foot  
 F — Front flange

**Bore size (mm)**

**Cylinder stroke (mm)**

**Cushion**  
 Nil — Rubber bumper (Standard)  
 A — Air cushion (Not including ø6)

**Head cover port location**

Symbol	Bore size (mm)	
	6	10, 16
Nil	—	Perpendicular
R	Axial direction	Axial direction

**Type of auto switch**  
 Reed switch  
 C73  
 Solid state switch  
 H7B  
 H7A1  
 \*Band mounting only

**Number of auto switches**  
 Nil — 2  
 S — 1  
 n — n

**Model**

## Model

Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
							Rubber	Air
10-CJ2□6	6	M5 X 0.8	Non-lube	Double acting single rod	15,30,45,60	Available	Available (Standard)	Available (Not including ø6)
10-CJ2□10	10				15,30,45,60,75,100,125,150			
10-CJ2□16	16				15,30,45,60,75,100,125,150,175,200			
11-CJ2□6	6				15,30,45,60			
11-CJ2□10	10				15,30,45,60,75,100,125,150			
11-CJ2□16	16				15,30,45,60,75,100,125,150,175,200			

## Specifications

Item	Bore size (mm)	
	6	10, 16
<b>Proof pressure</b>	1.05MPa	
<b>Max. operating pressure</b>	0.7MPa	
<b>Min. operating pressure</b>	0.14MPa	0.08MPa (Air cushion 0.1MPa)
<b>Ambient and fluid temperature</b>	Without auto switch : -10°C to 70°C, With auto switch -10°C to 60°C (With no condensation)	
<b>Piston speed</b>	50 to 400mm/s	
<b>Stroke length tolerance</b>	+1.0	
<b>Mounting</b>	Basic, Axial foot, Front flange	

**Auto Switch Specifications** (Refer to page 1.3-2 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

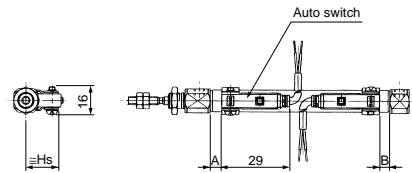
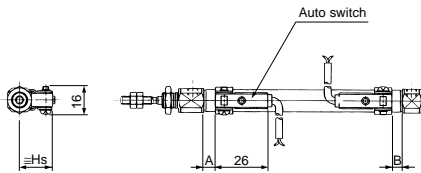
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC	5 to 40mA	Yes	Relay, PLC
		100VAC	5 to 20mA		
Solid state switch	2-wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	3-wire system D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

\*Auto switch mounting method is band mounting only.

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

D-C73

D-H7A1/H7B



(mm)

Bore size	D-C73			D-H7A1/H7B		
	A	B	Hs	A	B	Hs
6	2	2	15	1	1	15
10	2.5	2.5	17	1.5	1.5	17
16	3	3	20.5	2	2	20.5

**Mounting Bracket/Part No.**

Mounting bracket	Bore size (mm)		
	6	10	16
Foot bracket	CJ-L010B	CJ-L016B	CJK-L016B
Flange	CJ-F010B	CJ-F016B	CJK-F016B

**⚠ Specific Product Precautions**

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Mounting**

**⚠ Caution**

① When installing the cylinder, secure the rod cover and tighten by applying an appropriate tightening torque to the retaining nut or tighten the body of the rod cover by applying proper tightening torque. Fixing the head cover or tightening the body of the head cover may lead to a deviation due to rotation of the head cover.

② Apply proper screw tightening torque within the following ranges.

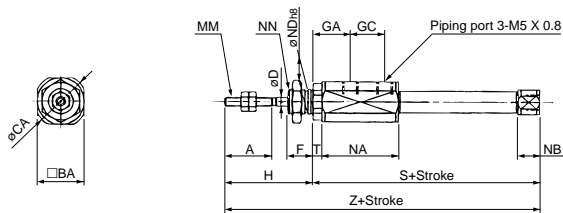
- ø6 : 5.9 to 6.4Nm
- ø10 : 10.8 to 11.8Nm
- ø16 : 20.0 to 21.0Nm

# Air Cylinder 10-CJ2/11-CJ2

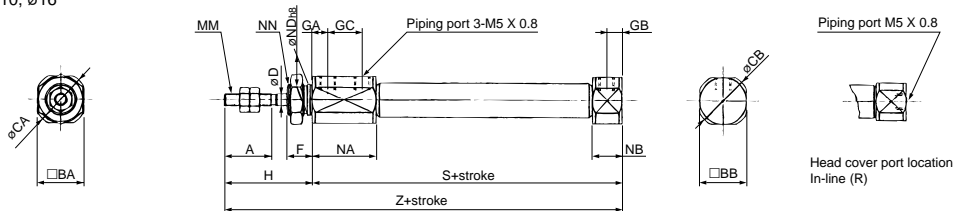
## Basic (B)/10-CJ2B, 11-CJ2B

### With Rubber Bumper

ø6

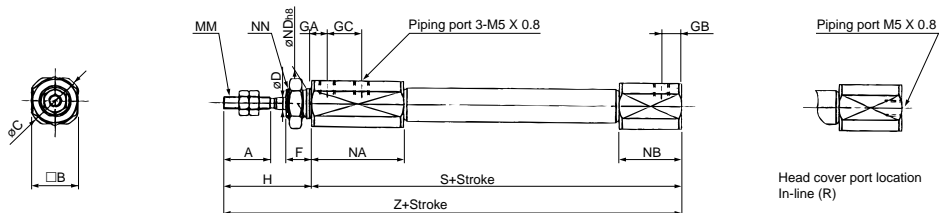
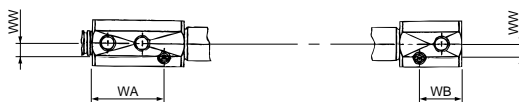


ø10, ø16



																			(mm)		
Bore size	A	BA	BB	CA	CB	D	F	GA	GB	GC	H	MM	NA	NB	ND <sub>h8</sub>	NN	S	T	Z		
6	15	15	—	17	—	3	8	12	—	11	28	M3 X 0.5	24.5	7	8 <sup>0.022</sup>	M8 X 1.0	57.5	3	85.5		
10	15	15	12	17	14	4	8	5	5	11	28	M4 X 0.7	20.5	9.5	10 <sup>0.022</sup>	M10 X 1.0	54	—	82		
16	15	18	18	20	20	5	8	5	5	11	28	M5 X 0.8	20.5	9.5	12 <sup>0.027</sup>	M12 X 1.0	55	—	83		

### With Air Cushion

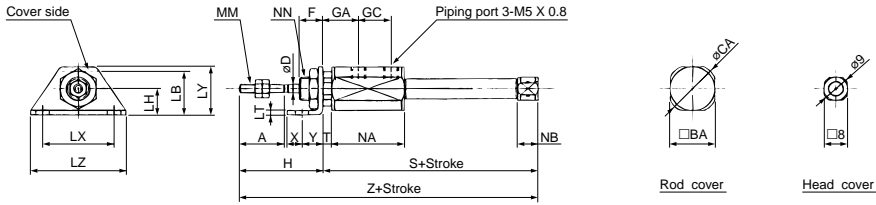


																			(mm)		
Bore size	A	B	C	D	F	GA	GB	GC	H	MM	NA	NB	ND <sub>h8</sub>	NN	S	WA	WB	WW	Z		
10	15	15	17	4	8	5	6.5	11	28	M4 X 0.7	29.5	20	10 <sup>0.022</sup>	M10 X 1.0	73.5	23	13.5	4.5	101.5		
16	15	18	20	5	8	5	6.5	11	28	M5 X 0.8	29.5	20	12 <sup>0.027</sup>	M12 X 1.0	74.5	23	13.5	5.5	102.5		

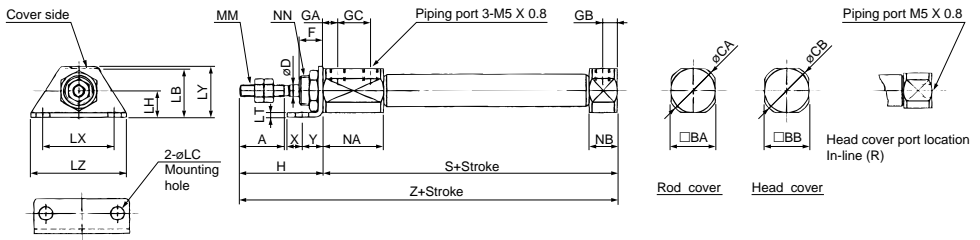
**Axial Foot (L)/10-CJ2L, 11-CJ2L**

**With Rubber Bumper**

ø6

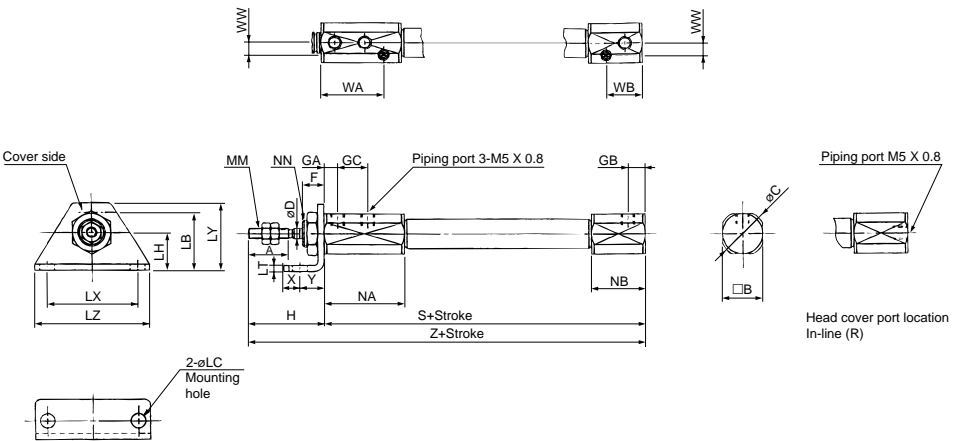


ø10, ø16



		(mm)																									
Bore size	A	BA	BB	CA	CB	D	F	GA	GB	GC	H	LB	LC	LH	LT	LX	LY	LZ	MM	NA	NB	NN	S	T	X	Y	Z
6	15	15	—	17	—	3	8	12	—	11	28	16.5	4.5	9	1.6	24	16.5	32	M3 X 0.5	24.5	7	M8 X 1.0	57.5	3	5	7	85.5
10	15	15	12	17	14	4	8	5	5	11	28	21.5	5.5	14	2.3	33	25	42	M4 X 0.7	20.5	9.5	M10 X 1.0	54	—	6	9	82
16	15	18	18	20	20	5	8	5	5	11	28	23	5.5	14	2.3	33	25	42	M5 X 0.8	20.5	9.5	M12 X 1.0	55	—	6	9	83

**With Air Cushion**



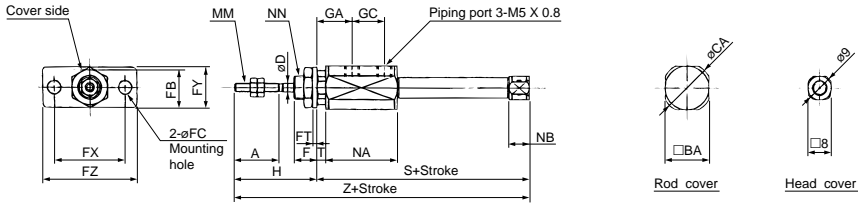
		(mm)																									
Bore size	A	B	C	D	F	GA	GB	GC	H	LB	LC	LH	LT	LX	LY	LZ	MM	NA	NB	NN	S	WA	WB	WW	X	Y	Z
10	15	15	17	4	8	5	6.5	11	28	21.5	5.5	14	2.3	33	25	42	M4 X 0.7	29.5	20	M10 X 1.0	73.5	23	13.5	4.5	6	9	101.5
16	15	18	20	5	8	5	6.5	11	28	23	5.5	14	2.3	33	25	42	M5 X 0.8	29.5	20	M12 X 1.0	74.5	23	13.5	5.5	6	9	102.5

# Air Cylinder 10-CJ2/11-CJ2

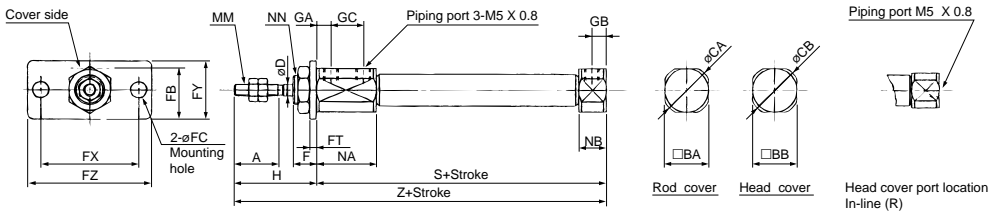
## Front Flange (F)/10-CJ2F, 11-CJ2F

### With Rubber Bumper

ø6

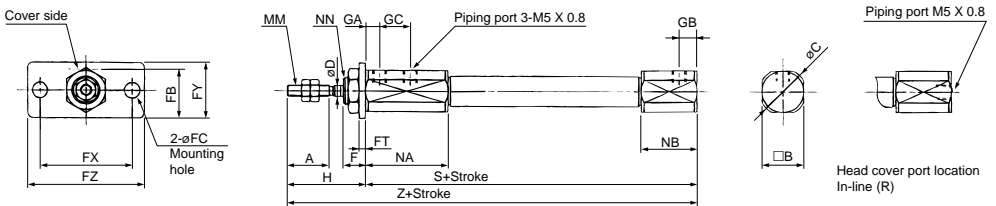
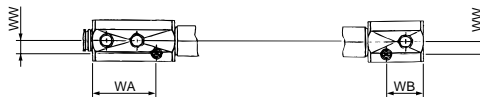


ø10, ø16



																				(mm)				
Bore size	A	BA	BB	CA	CB	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	GC	H	MM	NA	NB	NN	S	T	Z
6	15	15	—	17	—	3	8	14.5	4.5	1.6	24	14	32	12	—	11	28	M3 X 0.5	24.5	7	M8 X 1.0	57.5	3	85.5
10	15	15	12	17	14	4	8	17.5	5.5	2.3	33	20	42	5	5	11	28	M4 X 0.7	20.5	9.5	M10 X 1.0	54	—	82
16	15	18	18	20	20	5	8	19	5.5	2.3	33	20	42	5	5	11	28	M5 X 0.8	20.5	9.5	M12 X 1.0	55	—	83

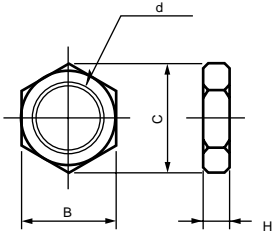
### With Air Cushion



																				(mm)				
Bore size	A	B	C	D	F	FB	FC	FT	FX	FY	FZ	GA	GB	GC	H	MM	NA	NB	NN	S	WA	WB	WW	Z
10	15	15	17	4	8	17.5	5.5	2.3	33	20	42	5	6.5	11	28	M4 X 0.7	29.5	20	M10 X 1.0	73.5	23	13.5	4.5	101.5
16	15	18	20	5	8	19	5.5	2.3	33	20	42	5	6.5	11	28	M5 X 0.8	29.5	20	M12 X 1.0	74.5	23	13.5	5.5	102.5

### Mounting Nut

Material: Brass

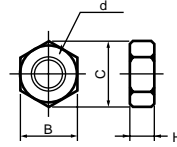


(mm)

Part no.	Applicable bore size	B	C	d	H
<b>SNJ-010B</b>	6	11	12.7	M8 X 1.0	4
<b>SNJ-016B</b>	10	14	16.2	M10 X 1.0	4
<b>SNKJ-016B</b>	16	17	19.6	M12 X 1.0	4

### Rod End Nut

Material: Iron

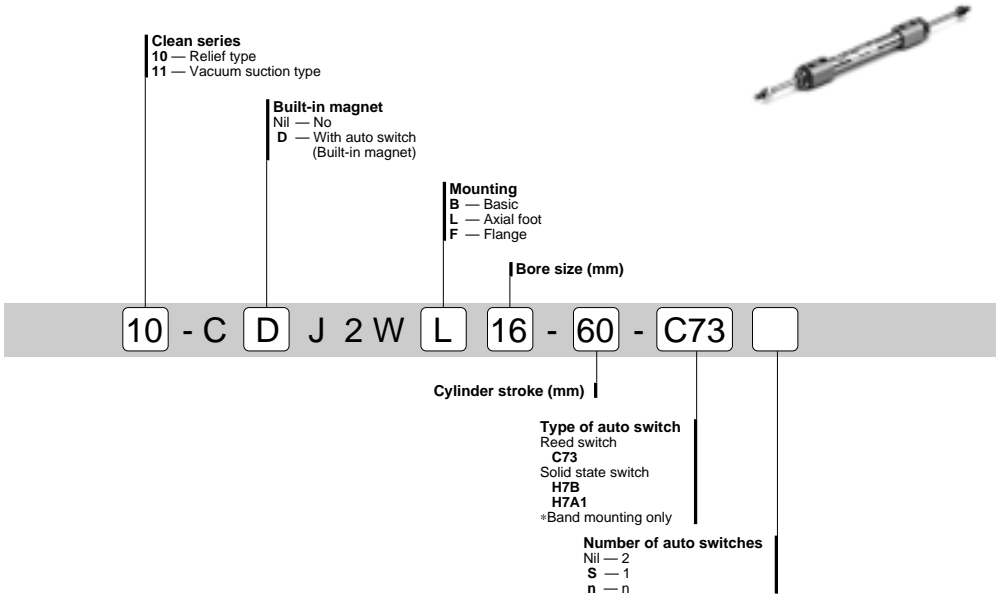


(mm)

Part no.	Applicable bore size	B	C	d	H
<b>NTJ-006A</b>	6	5.5	6.4	M3 X 0.5	2.4
<b>NTJ-010A</b>	10	7	8.1	M4 X 0.7	3.2
<b>NTJ-015A</b>	16	8	9.2	M5 X 0.8	4

# Series<sup>10-</sup><sub>11-</sub> CJ2W Double Rod Cylinder/ø10,ø16

## How to Order



## Model

Relief type	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Vacuum suction type	10-CJ2W□10	10	M5 X 0.8	Non-lube	Double acting double rod	15,30,45,60	Available	Available (Standard)	Not available
	10-CJ2W□16	16							
	11-CJ2W□10	10							
	11-CJ2W□16	16							

## Specifications

Item	Bore size (mm)
Item	10,16
Proof pressure	1.05MPa
Max. operating pressure	0.7MPa
Min. operating pressure	0.1MPa
Ambient and fluid temperature	Without auto switch : -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	50 to 400mm/s
Stroke length tolerance	+1.0 0
Mounting	Basic, Axial foot, Flange



**Auto Switch Specifications** (Refer to page 1.3-13 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC	5 to 40mA	Yes	Relay, PLC
		100VAC	5 to 20mA		
Solid state switch	2-wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	3-wire system D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

\*Auto switch mounting method is band mounting only.

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

Same as those of the double acting single rod type. Refer to page 9.

### Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Mounting

#### Caution

①When installing the cylinder, secure the rod cover closer to the mounting position and apply proper tightening torque to the retaining nut or tighten the body of the rod cover closer to the mounting position by applying proper tightening torque. Fixing the rod cover on the opposite side or tightening the body of the rod cover on the opposite side may cause deviation due to rotation of the cover.

②Apply proper screw tightening torque within the following ranges.

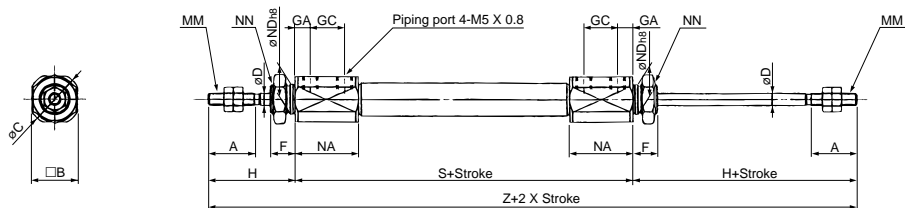
ø6 : 5.9 to 6.4Nm

ø10 : 10.8 to 11.8Nm

ø16 : 20.0 to 21.0Nm

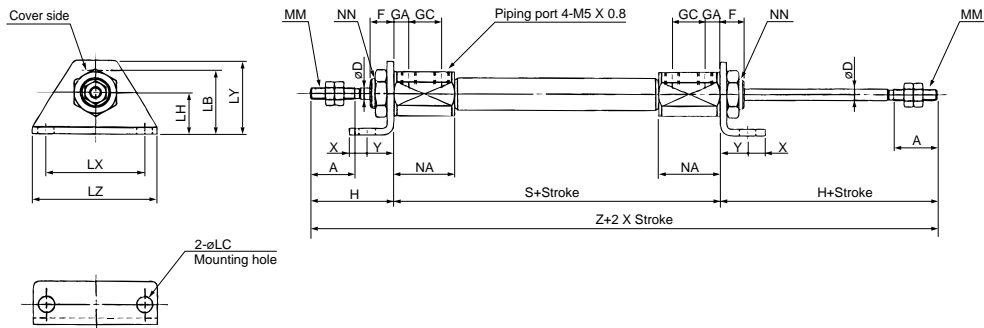
# Air Cylinder 10-CJ2W/11-CJ2W

## Basic (B)/10-CJ2WB, 11-CJ2WB



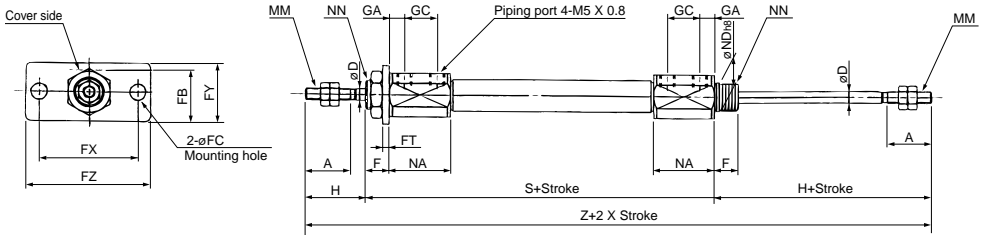
														(mm)	
Bore size	A	B	C	D	F	GA	GC	H	MM	NA	ND <sub>h8</sub>	NN	S	Z	
10	15	15	17	4	8	5	11	28	M4 X 0.7	20.5	10 <sup>h8/0.022</sup>	M10 X 1.0	65	121	
16	15	18	20	5	8	5	11	28	M5 X 0.8	20.5	12 <sup>h8/0.027</sup>	M12 X 1.0	66	122	

## Axial Foot (L)/10-CJ2WL, 11-CJ2WL



														(mm)						
Bore size	A	D	F	GA	GC	H	LB	LC	LH	LT	LX	LY	LZ	MM	NA	NN	S	X	Y	Z
10	15	4	8	5	11	28	21.5	5.5	14	2.3	33	25	42	M4 X 0.7	20.5	M10 X 1.0	65	6	9	121
16	15	5	8	5	11	28	23	5.5	14	2.3	33	25	42	M5 X 0.8	20.5	M12 X 1.0	66	6	9	122

**Flange (F)**10-CJ2WF, 11-CJ2WF



Actuator

																	(mm)	
Bore size	A	D	F	FB	FC	FT	FX	FY	FZ	GA	GC	H	MM	NA	ND <sub>h8</sub>	NN	S	Z
10	15	4	8	17.5	5.5	2.3	33	20	42	5	11	28	M4 X 0.7	20.5	10 <sup>0</sup> <sub>-0.022</sub>	M10 X 1.0	65	121
16	15	5	8	19	5.5	2.3	33	20	42	5	11	28	M5 X 0.8	20.5	12 <sup>0</sup> <sub>-0.027</sub>	M12 X 1.0	66	122

# Series 10-11-CJ2RA Direct Mount Cylinder/ø10,ø16

## How to Order



**Clean series**  
 10 — Relief type  
 11 — Vacuum suction type

**Built-in magnet**  
 Nil — No  
 D — With auto switch (Built-in magnet)

**Bore size (mm)**  
 10 - C D J 2 R A 16 - 60 R - C73

**Cylinder stroke (mm)**

Head cover port location	
Symbol	Head cover port location
Nil	Perpendicular
R	Axial direction

**Type of auto switch**  
 Reed switch  
 C73 Solid state switch  
 H7B  
 H7A1  
 \*Band mounting only

**Number of auto switches**  
 Nil — 2  
 S — 1  
 n — n

## Model

Model		Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-CJ2RA10	10	M5 X 0.8	Non-lube	Double acting single rod	15,30,45,60,75,100,125,150	Available	Available (Standard)	Not available
	10-CJ2RA16	16				15,30,45,60,75,100,125,150,175,200			
Vacuum suction type	11-CJ2RA10	10				15,30,45,60,75,100,125,150			
	11-CJ2RA16	16				15,30,45,60,75,100,125,150,175,200			

## Specifications

Item	Bore size (mm)
Item	10,16
Proof pressure	1.05MPa
Max. operating pressure	0.7MPa
Min. operating pressure	0.08MPa
Ambient and fluid temperature	Without auto switch: -10° to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	50 to 400mm/s
Stroke length tolerance	+1.0
Mounting	Bottom mounting

**Auto Switch Specifications** (Refer to page 1.3-56 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

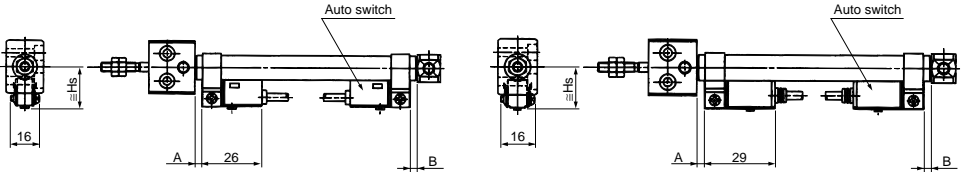
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC	5 to 40mA	Yes	Relay, PLC
		100VAC	5 to 20mA		
Solid state switch	D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

\*Auto switch mounting method is band mounting only.

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

D-C73

D-H7A1/H7B



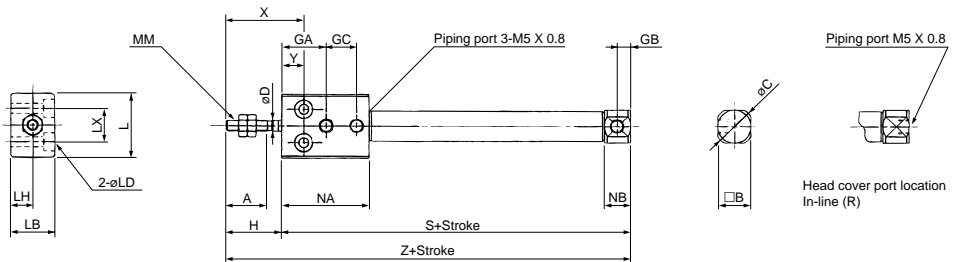
(mm)

Bore size	D-C73			D-H7A1/H7B		
	A	B	Hs	A	B	Hs
10	2.5	2.5	17	1.5	1.5	17
16	3	3	20.5	2	2	20.5

**⚠ Caution**

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Bottom Mounting/10-CJ2RA, 11-CJ2RA**



(mm)

Bore size	A	B	C	D	GA	GB	GC	H	L	LB	LD	LH	LX	MM	NA	NB	S	X	Y	Z
10	15	12	14	4	16	5	11	20	23	16	ø3.5,ø6.5depth of counter bore4	8	12	M4 X 0.7	31.5	9.5	65	28	8	85
16	15	18	20	5	16	5	11	20	26	20	ø4.5,ø8depth of counter bore5	10	16	M5 X 0.8	31.5	9.5	66	28	8	86

# Series 10-11-CM2 Air Cylinder/ø20,ø25,ø32,ø40

## How to Order

**Clean series**  
 10 — Relief type  
 11 — Vacuum suction type

**Built-in magnet**  
 Nil — No  
 D — With auto switch (Built-in magnet)

**Mounting**  
 B — Basic  
 L — Axial foot  
 F — Front flange  
 G — Rear flange  
 BZ — Boss-cut basic  
 FZ — Boss-cut front flange


**Bore size (mm)**

**Cylinder stroke (mm)**

**Cushion**  
 Nil — Rubber bumper  
 A — Air cushion

**Type of auto switch**  
 Reed switch  
 C73  
 Solid state switch  
 H7B  
 H7A1

**Number of auto switches**  
 Nil — 2  
 S — 1  
 n — n



10 - C D M 2 L 40 - 150 A - C73

## Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-CM2□20	20	Rc1/8	Non-lube	Double acting single rod	25, 50, 75, 100, 125, 150, 175, 200, 250, 300	Available	Available	Available
	10-CM2□25	25							
	10-CM2□32	32							
	10-CM2□40	40							
Vacuum suction type	11-CM2□20	20	Rc1/8	Non-lube	Double acting single rod	25, 50, 75, 100, 125, 150, 175, 200, 250, 300	Available	Available	Available
	11-CM2□25	25							
	11-CM2□32	32							
	11-CM2□40	40							

## Specifications

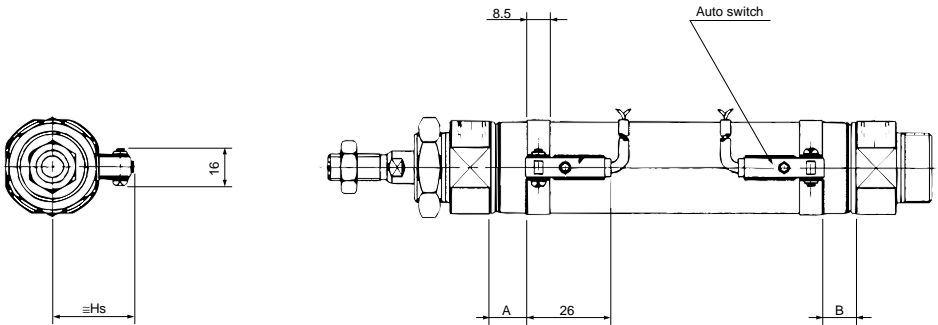
Item	Bore size (mm)
Item	20,25,32,40
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Ambient and fluid temperature	Without auto switch : -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	30 to 400mm/s
Stroke length tolerance	$^{+1.4}_0$
Mounting	Basic,Axial foot,Front flange,Rear flange

**Auto Switch Specifications** (Refer to page 1.4-3 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

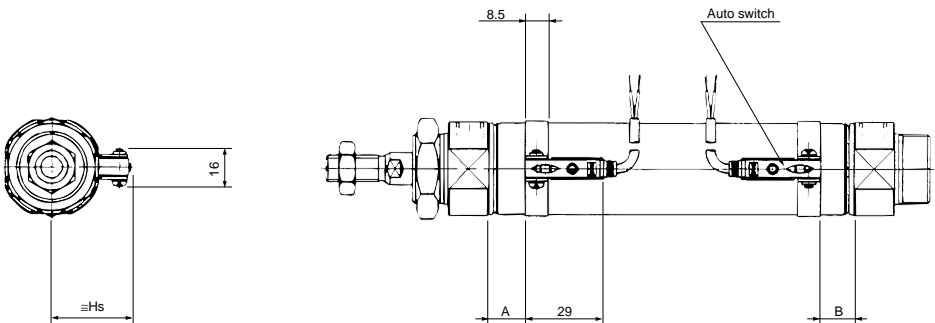
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	3-wire system D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

**D-C73**



**D-H7A1/H7B**



(mm)

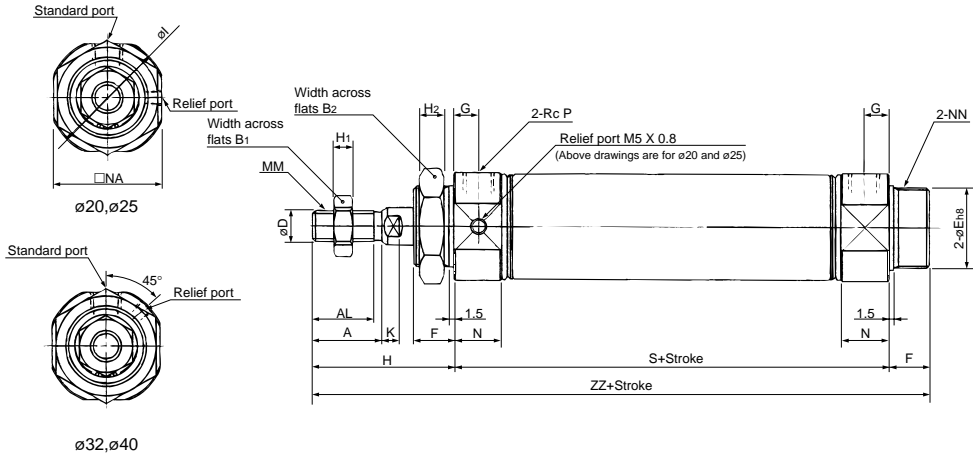
Bore size	D-C73			D-H7A1/H7B		
	A	B	Hs	A	B	Hs
<b>20</b>	7 (5)	6 (4)	22.5	6 (4)	5 (3)	22.5
<b>25</b>	7 (5)	6 (4)	25	6 (4)	5 (3)	25
<b>32</b>	8 (6)	7 (5)	28.5	7 (5)	6 (4)	28.5
<b>40</b>	13	12	32.5	12	11	32.5

Note) Descriptions in parentheses are for types with air cushion.

# Air Cylinder 10-CM2/11-CM2

## Basic (B)/10-CM2B, 11-CM2B

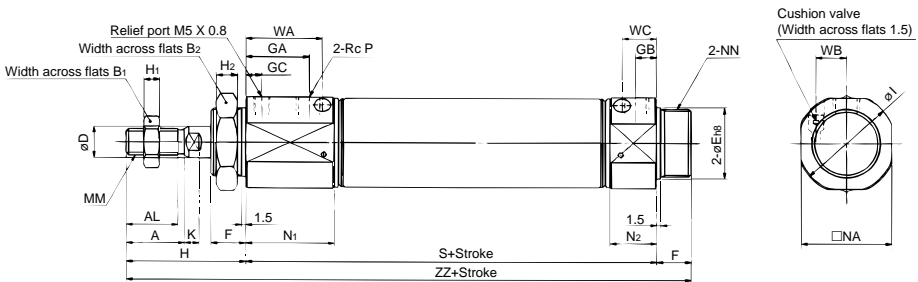
### With Rubber Bumper



(mm)

Bore size	A	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	20 <sup>0.033</sup>	13	8	41	5	8	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	62	116
25	22	19.5	17	32	10	26 <sup>0.033</sup>	13	8	45	6	8	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	62	120
32	22	19.5	17	32	12	26 <sup>0.033</sup>	13	8	45	6	8	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	122
40	24	21	22	41	14	32 <sup>0.039</sup>	16	11	50	8	10	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	154

### With Air Cushion



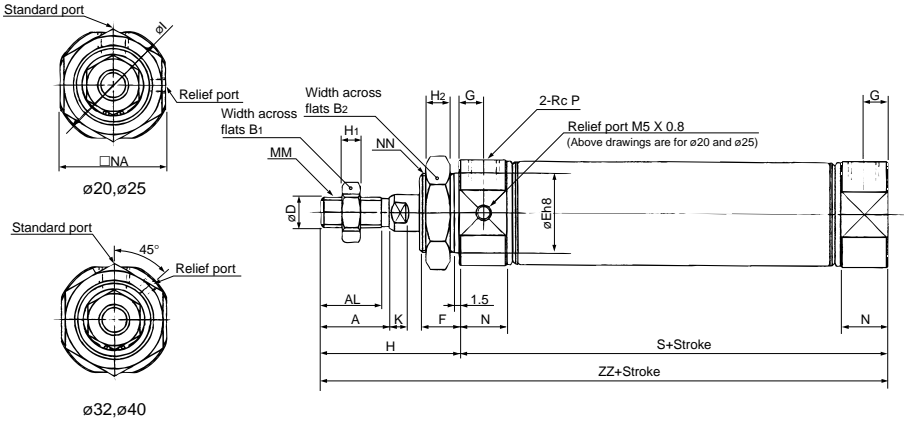
(mm)

Bore size	A	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	G	GA	GB	GC	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N <sub>1</sub>	N <sub>2</sub>	NA	NN	P	S	WA	WB	WC	ZZ
20	18	15.5	13	26	8	20 <sup>0.033</sup>	13	26	8	6	41	5	8	28	5	M8 X 1.25	35.5	17.5	24	M20 X 1.5	1/8	80	31	8.5	13	134	
25	22	19.5	17	32	10	26 <sup>0.033</sup>	13	26	8	6	45	6	8	33.5	5.5	M10 X 1.25	35.5	17.5	30	M26 X 1.5	1/8	80	31	10.5	13	138	
32	22	19.5	17	32	12	26 <sup>0.033</sup>	13	26	8	6	45	6	8	37.5	5.5	M10 X 1.25	35.5	17.5	34.5	M26 X 1.5	1/8	82	31	11.5	13	140	
40	24	21	22	41	14	32 <sup>0.039</sup>	16	31	11	6	50	8	10	46.5	7	M14 X 1.5	41.5	21.5	42.5	M32 X 2	1/4	108	36	15	16	174	



**Boss-Cut Basic (BZ)/10-CM2BZ, 11-CM2BZ**

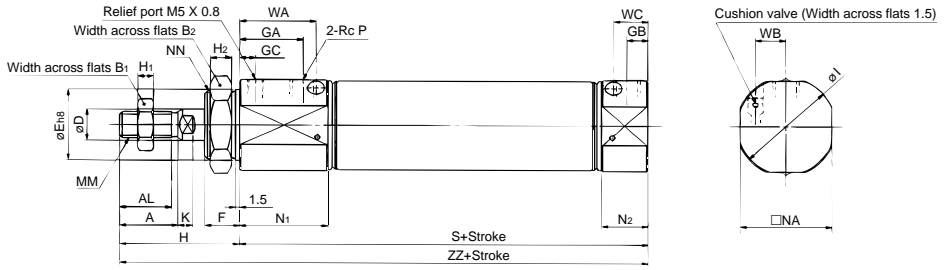
**With Rubber Bumper**



(mm)

Bore size	A	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	20 <sup>±0.033</sup>	13	8	41	5	8	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	62	103
25	22	19.5	17	32	10	26 <sup>±0.033</sup>	13	8	45	6	8	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	62	107
32	22	19.5	17	32	12	26 <sup>±0.033</sup>	13	8	45	6	8	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	109
40	24	21	22	41	14	32 <sup>±0.039</sup>	16	11	50	8	10	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	138

**With Air Cushion**

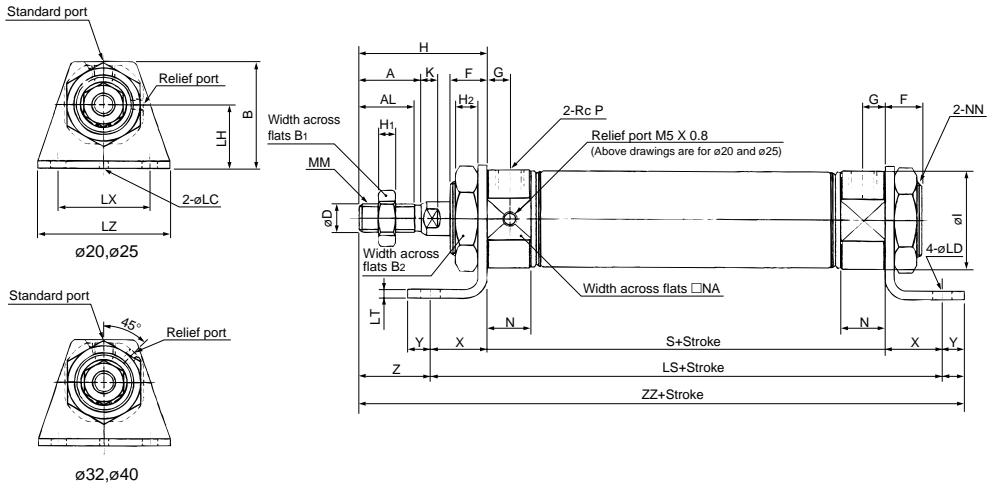


(mm)

Bore size	A	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	G	GA	GB	GC	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N <sub>1</sub>	N <sub>2</sub>	NA	NN	P	S	WA	WB	WC	ZZ
20	18	15.5	13	26	8	20 <sup>±0.033</sup>	13	26	8	6	41	5	8	28	5	M8 X 1.25	35.5	17.5	24	M20 X 1.5	1/8	80	31	8.5	13	121	
25	22	19.5	17	32	10	26 <sup>±0.033</sup>	13	26	8	6	45	6	8	33.5	5.5	M10 X 1.25	35.5	17.5	30	M26 X 1.5	1/8	80	31	10.5	13	125	
32	22	19.5	17	32	12	26 <sup>±0.033</sup>	13	26	8	6	45	6	8	37.5	5.5	M10 X 1.25	35.5	17.5	34.5	M26 X 1.5	1/8	82	31	11.5	13	127	
40	24	21	22	41	14	32 <sup>±0.039</sup>	16	31	11	6	50	8	10	46.5	7	M14 X 1.5	41.5	21.5	42.5	M32 X 2	1/4	108	36	15	16	158	

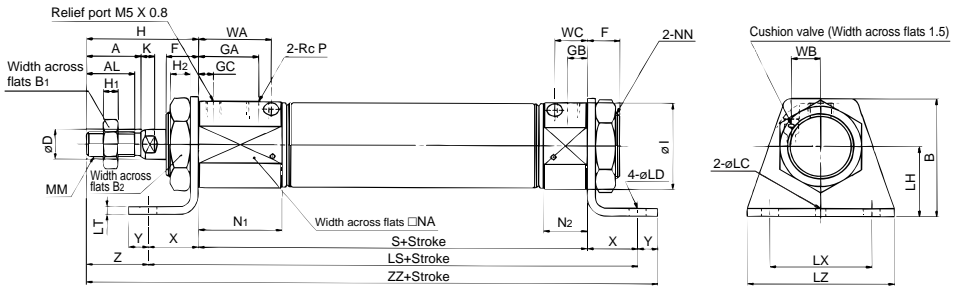
**Axial Foot (L)/10-CM2L, 11-CM2L**

**With Rubber Bumper**



		(mm)																												
Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	D	F	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	LC	LD	LH	LS	LT	LX	LZ	MM	N	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	4	6.8	25	102	3.2	40	55	M8 X 1.25	15	24	M20 X 1.5	1/8	62	20	8	21	131
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	4	6.8	28	102	3.2	40	55	M10 X 1.25	15	30	M26 X 1.5	1/8	62	20	8	25	135
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	55	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	20	8	25	137
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	134	3.2	55	75	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	23	10	27	171

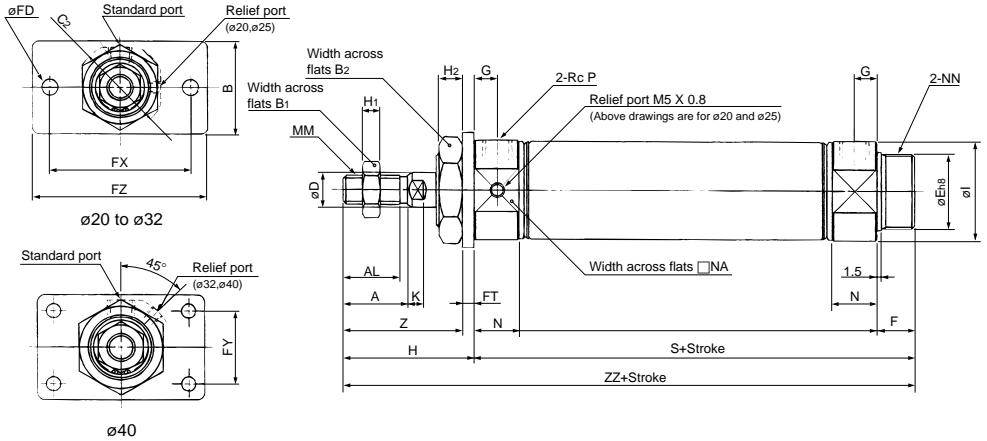
**With Air Cushion**



		(mm)																																		
Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	D	F	GA	GB	GC	H	H <sub>1</sub>	H <sub>2</sub>	I	K	LC	LD	LH	LS	LT	LX	LZ	MM	N <sub>1</sub>	N <sub>2</sub>	NA	NN	P	S	WA	WB	WC	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	26	8	6	41	5	8	28	5	4	6.8	25	120	3.2	40	55	M8 X 1.25	35.5	17.5	24	M20 X 1.5	1/8	80	31	8.5	13	20	8	21	149
25	22	19.5	47	17	32	10	13	26	8	6	45	6	8	33.5	5.5	4	6.8	28	120	3.2	40	55	M10 X 1.25	35.5	17.5	30	M26 X 1.5	1/8	80	31	10.5	13	20	8	25	153
32	22	19.5	47	17	32	12	13	26	8	6	45	6	8	37.5	5.5	4	6.8	28	122	3.2	40	55	M10 X 1.25	35.5	17.5	34.5	M26 X 1.5	1/8	82	31	11.5	13	20	8	25	155
40	24	21	54	22	41	14	16	31	11	6	50	8	10	46.5	7	4	7	30	154	3.2	55	75	M14 X 1.5	41.5	21.5	42.5	M32 X 2	1/4	108	36	15	16	23	10	27	191

**Front Flange (F)/10-CM2F, 11-CM2F**

With Rubber Bumper

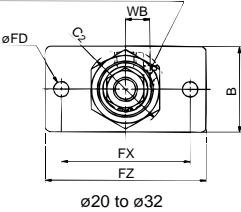


(mm)

Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C <sub>2</sub>	D	E	F	FD	FT	FX	FY	FZ	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 <sup>0.033</sup>	13	7	4	60	—	75	8	41	5	8	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	62	37	116
25	22	19.5	40	17	32	37	10	26 <sup>0.033</sup>	13	7	4	60	—	75	8	45	6	8	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	62	41	120
32	22	19.5	40	17	32	37	12	26 <sup>0.033</sup>	13	7	4	60	—	75	8	45	6	8	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	41	122
40	24	21	52	22	41	47.3	14	32 <sup>0.039</sup>	16	7	5	66	36	82	11	50	8	10	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	45	154

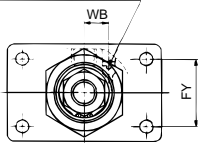
With Air Cushion

Cushion valve (Width across flats 1.5)

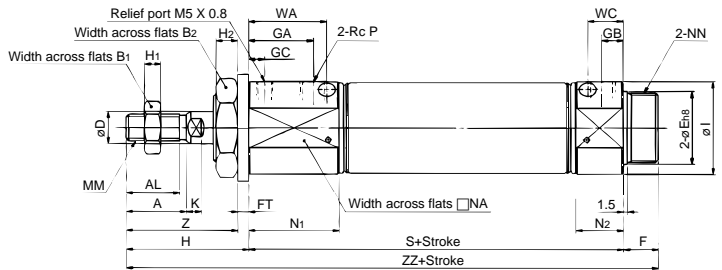


ø20 to ø32

Cushion valve (Width across flats 1.5)



ø40

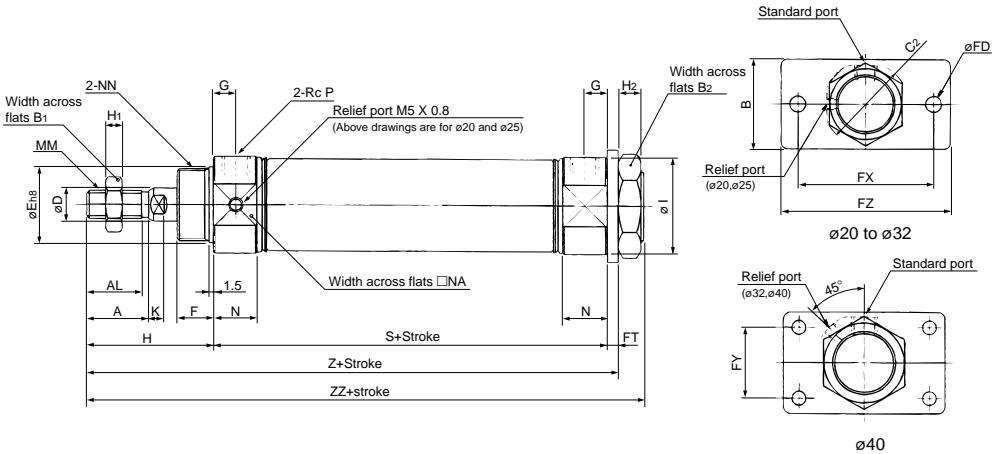


(mm)

Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C <sub>2</sub>	D	E	F	FD	FT	FX	FY	FZ	GA	GB	GC	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N <sub>1</sub>	N <sub>2</sub>	NA	NN	P	S	WA	WB	WC	Z	ZZ
20	18	15.5	34	13	26	30	8	20 <sup>0.033</sup>	13	7	4	60	—	75	26	8	6	41	5	8	28	5	M8 X 1.25	35.5	17.5	24	M20 X 1.5	1/8	80	31	8.5	13	37	134
25	22	19.5	40	17	32	37	10	26 <sup>0.033</sup>	13	7	4	60	—	75	26	8	6	45	6	8	33.5	5.5	M10 X 1.25	35.5	17.5	30	M26 X 1.5	1/8	80	31	10.5	13	41	138
32	22	19.5	40	17	32	37	12	26 <sup>0.033</sup>	13	7	4	60	—	75	26	8	6	45	6	8	37.5	5.5	M10 X 1.25	35.5	17.5	34.5	M26 X 1.5	1/8	82	31	11.5	13	41	140
40	24	21	52	22	41	47.3	14	32 <sup>0.039</sup>	16	7	5	66	36	82	31	11	6	50	8	10	46.5	7	M14 X 1.5	41.5	21.5	42.5	M32 X 2	1/4	108	36	15	16	45	174

**Rear Flange (G)/10-CM2G, 11-CM2G**

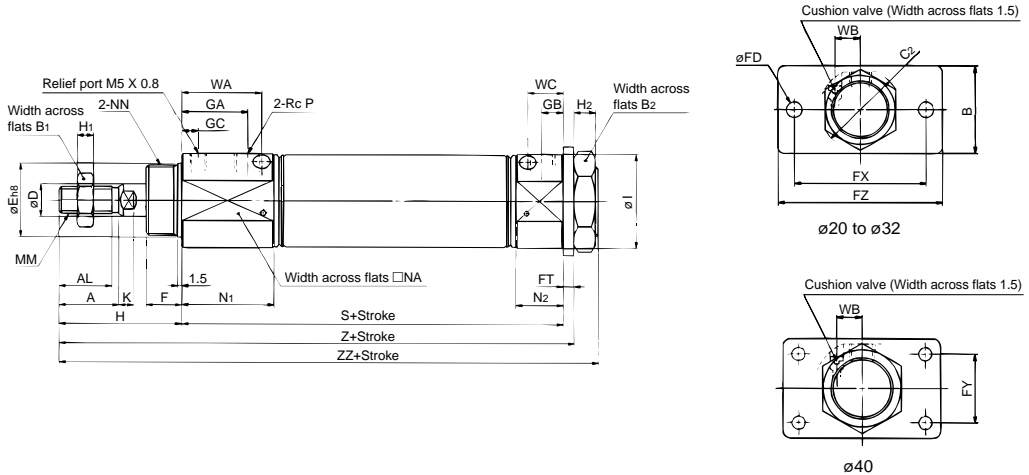
**With Rubber Bumper**



(mm)

Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C <sub>2</sub>	D	E	F	FD	FT	FX	FY	FZ	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 <sup>0.033</sup>	13	7	4	60	—	75	8	41	5	8	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	62	107	116
25	22	19.5	40	17	32	37	10	26 <sup>0.033</sup>	13	7	4	60	—	75	8	45	6	8	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	62	111	120
32	22	19.5	40	17	32	37	12	26 <sup>0.033</sup>	13	7	4	60	—	75	8	45	6	8	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	113	122
40	24	21	52	22	41	47.3	14	32 <sup>0.039</sup>	16	7	5	66	36	82	11	50	8	10	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	143	154

**With Air Cushion**



(mm)

Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C <sub>2</sub>	D	E	F	FD	FX	FY	FZ	GA	GB	GC	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N <sub>1</sub>	N <sub>2</sub>	NA	NN	P	S	WA	WB	WC	Z	ZZ	
20	18	15.5	34	13	26	30	8	20 <sup>0.033</sup>	13	7	4	60	—	75	26	8	6	41	5	8	28	5	M8 X 1.25	35.5	17.5	24	M20 X 1.5	1/8	80	31	8.5	13	125	134
25	22	19.5	40	17	32	37	10	26 <sup>0.033</sup>	13	7	4	60	—	75	26	8	6	45	6	8	33.5	5.5	M10 X 1.25	35.5	17.5	30	M26 X 1.5	1/8	80	31	10.5	13	129	138
32	22	19.5	40	17	32	37	12	26 <sup>0.033</sup>	13	7	4	60	—	75	26	8	6	45	6	8	37.5	5.5	M10 X 1.25	35.5	17.5	34.5	M26 X 1.5	1/8	82	31	11.5	13	131	140
40	24	21	52	22	41	47.3	14	32 <sup>0.039</sup>	16	7	5	66	36	82	31	11	6	50	8	10	46.5	7	M14 X 1.5	41.5	21.5	42.5	M32 X 2	1/4	108	36	15	16	163	174

## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Precautions

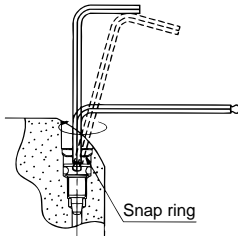
#### ⚠ Warning

- ① **Do not rotate the cover.**  
When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover is rotated.
- ② **Do not open the cushion valve of the type with air cushion to the position beyond the stopper.**
  - Do not open the cushion valve larger than the snap ring holding the cushion valve (full open) or do not remove the snap ring intentionally.
  - If the above items are not confirmed before compressed air is supplied, the cushion valve may pop out of the cover.
  - Use the hexagon wrench key shown below when adjusting the cushion valve.

#### ⚠ Caution

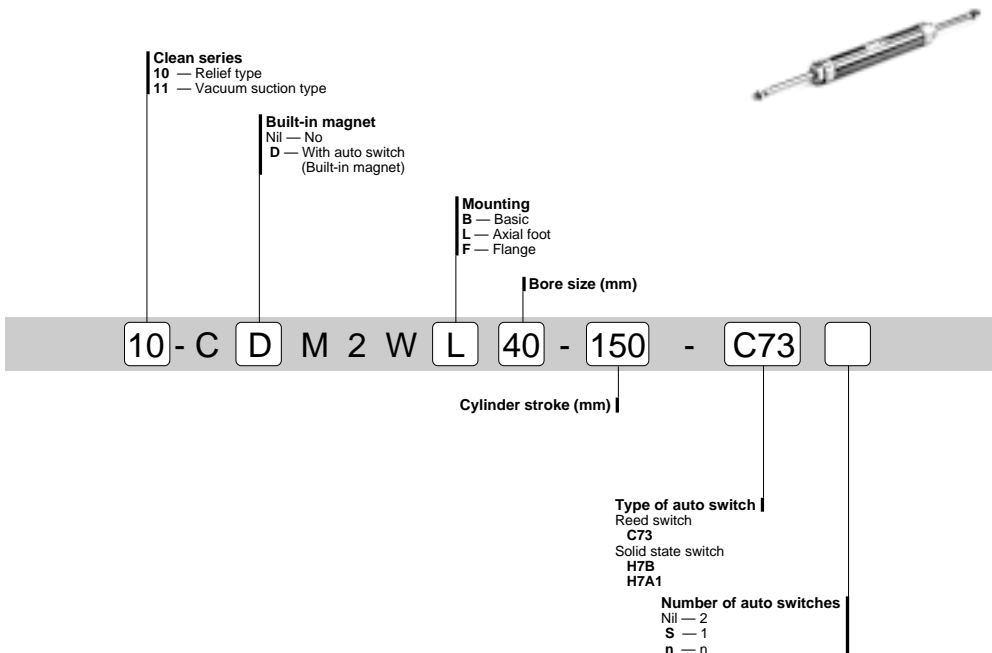
- ① **Be careful to prevent the snap ring from popping out.**  
When replacing the rod seal, take special precautions not to allow the snap ring to pop out.
- ② **Do not touch the cylinder during operation.**  
If the cylinder is operating at a high frequency, be aware the cylinder tube surface could become very hot, leading to danger of burns.

Bore size (mm)	Cushion valve Width across flats of hexagon socket (mm)	Tool
20, 25, 32, 40	1.5	JISB4648 Hexagon wrench key1.5



# Series<sup>10-</sup><sub>11-</sub> **CM2W** Double Rod Cylinder/ø20,ø25,ø32,ø40

## How to Order



## Model

Model		Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-CM2W□20	20	Rc1/8	Non-lube	Double acting double rod	25, 50, 75, 100, 125 150, 200, 250, 300	Available	Available	Not available
	10-CM2W□25	25							
	10-CM2W□32	32							
	10-CM2W□40	40							
Vacuum suction type	11-CM2W□20	20	Rc1/8						
	11-CM2W□25	25							
	11-CM2W□32	32							
	11-CM2W□40	40							

## Specifications

Item	Bore size (mm)
Item	20,25,32,40
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.08MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	30 to 400mm/s
Stroke length tolerance	$^{+1.4}_0$
Mounting	Basic, Axial foot, Flange

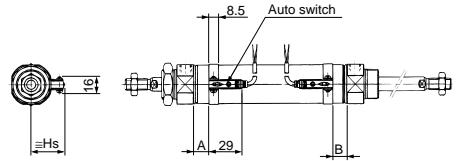
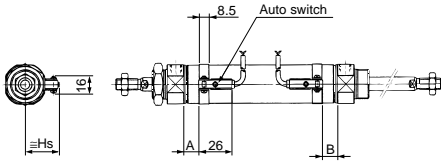
**Auto Switch Specifications** (Refer to page 1.4-2 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application	
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC	
Solid state switch	2-wire system	D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	3-wire system	D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

D-C7 type

D-H7A1/H7B



(mm)

Bore size	D-C73			D-H7A1/H7B		
	A	B	Hs	A	B	Hs
20	7	6	22.5	6	5	22.5
25	7	6	25	6	5	25
32	8	7	28.5	7	6	28.5
40	13	12	32.5	12	11	32.5

**⚠ Specific Product Precautions**

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Precautions**

**⚠ Warning**

① Do not rotate the cover.

When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover is rotated.

**⚠ Caution**

① Be careful to prevent the snap ring from popping out.

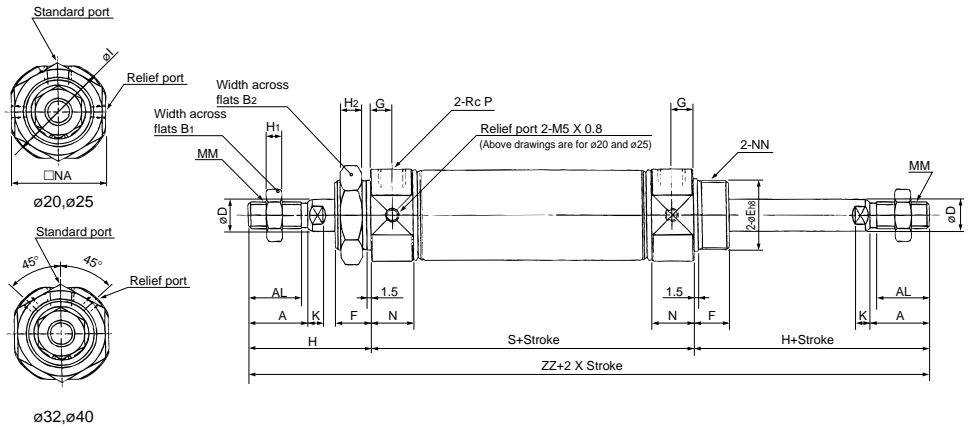
When replacing the rod seal, take special precautions not to allow the snap ring to pop out.

② Do not touch the cylinder during operation.

If the cylinder is operating at a high frequency, be aware the cylinder tube surface could become very hot, leading to danger of burns.

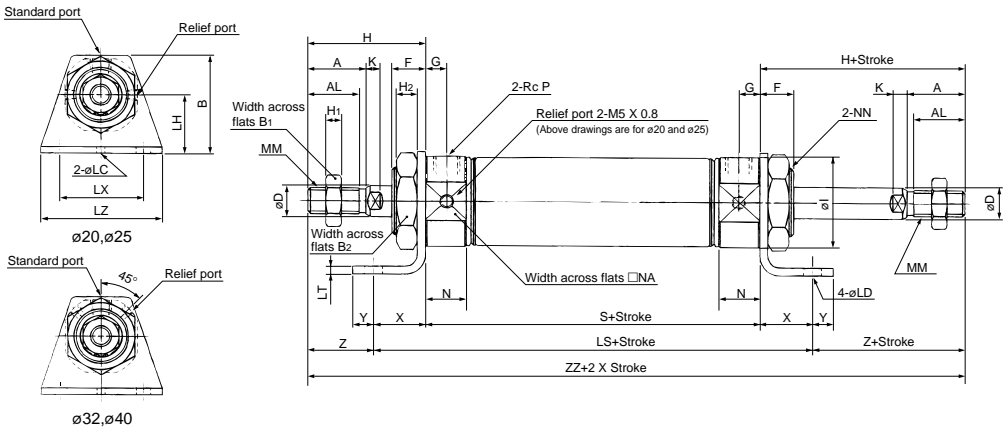
# Air Cylinder 10-CM2W/11-CM2W

## Basic (B)/10-CM2WB, 11-CM2WB



																				(mm)	
Bore size	A	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	ZZ	
20	18	15.5	13	26	8	20 <sup>-0.033</sup>	13	8	41	5	8	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	62	144	
25	22	19.5	17	32	10	26 <sup>-0.033</sup>	13	8	45	6	8	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	62	152	
32	22	19.5	17	32	12	26 <sup>-0.033</sup>	13	8	45	6	8	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	154	
40	24	21	22	41	14	32 <sup>-0.039</sup>	16	11	50	8	10	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	188	

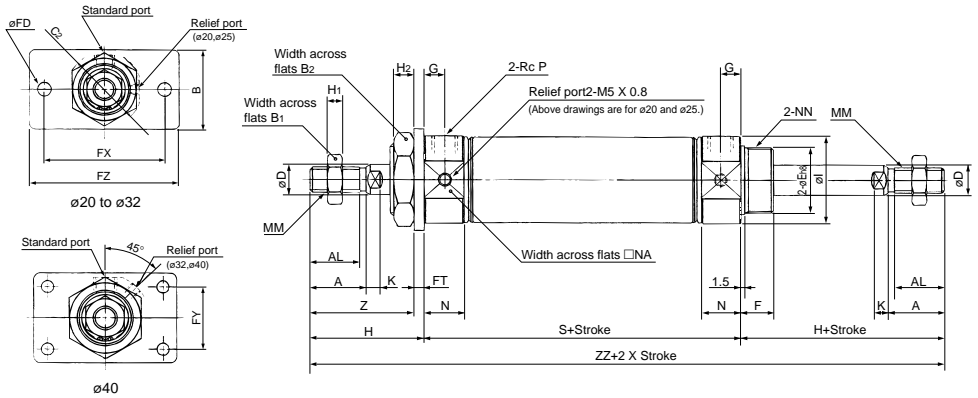
## Axial Foot Type (L)/10-CM2WL, 11-CM2WL



																				(mm)										
Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	D	F	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	LC	LD	LH	LS	LT	LX	LZ	MM	N	NA	NN	P	S	X	Y	Z	ZZ
20	18	15.5	40	13	26	8	13	8	41	5	8	28	5	4	6.8	25	102	3.2	40	55	M8 X 1.25	15	24	M20 X 1.5	1/8	62	20	8	21	144
25	22	19.5	47	17	32	10	13	8	45	6	8	33.5	5.5	4	6.8	28	102	3.2	40	55	M10 X 1.25	15	30	M26 X 1.5	1/8	62	20	8	25	152
32	22	19.5	47	17	32	12	13	8	45	6	8	37.5	5.5	4	6.8	28	104	3.2	40	55	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	20	8	25	154
40	24	21	54	22	41	14	16	11	50	8	10	46.5	7	4	7	30	134	3.2	55	75	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	23	10	27	188



**Flange (F)**10-CM2WF, 11-CM2WF



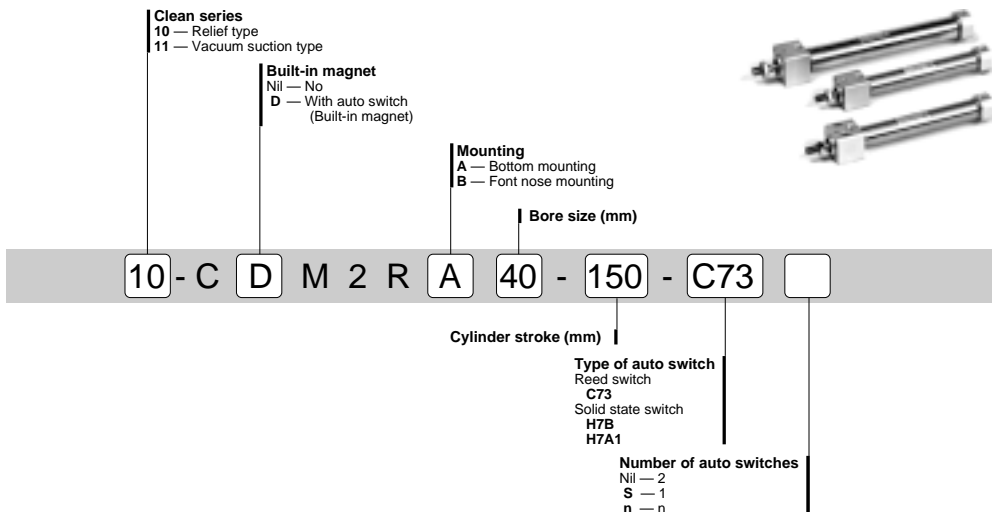
(mm)

Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C <sub>2</sub>	D	E	F	FD	FT	FX	FY	FZ	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	Z	ZZ
20	18	15.5	34	13	26	30	8	20 <sup>-0.033</sup>	13	7	4	60	—	75	8	41	5	8	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	62	37	144
25	22	19.5	40	17	32	37	10	26 <sup>-0.033</sup>	13	7	4	60	—	75	8	45	6	8	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	62	41	152
32	22	19.5	40	17	32	37	12	26 <sup>-0.033</sup>	13	7	4	60	—	75	8	45	6	8	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	41	154
40	24	21	52	22	41	47.3	14	32 <sup>-0.038</sup>	16	7	5	66	36	82	11	50	8	10	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	45	188

# Series 10-11-**CM2R** Direct Mount Cylinder

ø20,ø25,ø32,ø40

## How to Order



## Model

Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion		
							Rubber	Air	
Relief type	10-CM2R□20	20	Non-lube	Double acting single rod	25,50,75,100,125,150	Available	Available	Not available	
	10-CM2R□25	25			25,50,75,100,125,150,200				
	10-CM2R□32	32			25,50,75,100,125,150,200,250,300				
Vacuum suction type	10-CM2R□40	40			Rc1/4				25,50,75,100,125,150
	11-CM2R□20	20			Rc1/8				25,50,75,100,125,150,200
	11-CM2R□25	25							25,50,75,100,125,150,200
	11-CM2R□32	32	25,50,75,100,125,150,200,250,300						
11-CM2R□40	40	Rc1/4	25,50,75,100,125,150,200,250,300						

## Specifications

Item	Bore size (mm)	
Item	20,25,32,40	
Proof pressure		1.5MPa
Max. operating pressure		1.0MPa
Min. operating pressure		0.05MPa
Ambient and fluid temperature		With auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed		30 to 400mm/s
Stroke length tolerance		$^{+1.4}_0$
Mounting		Bottom mounting, Front nose mounting

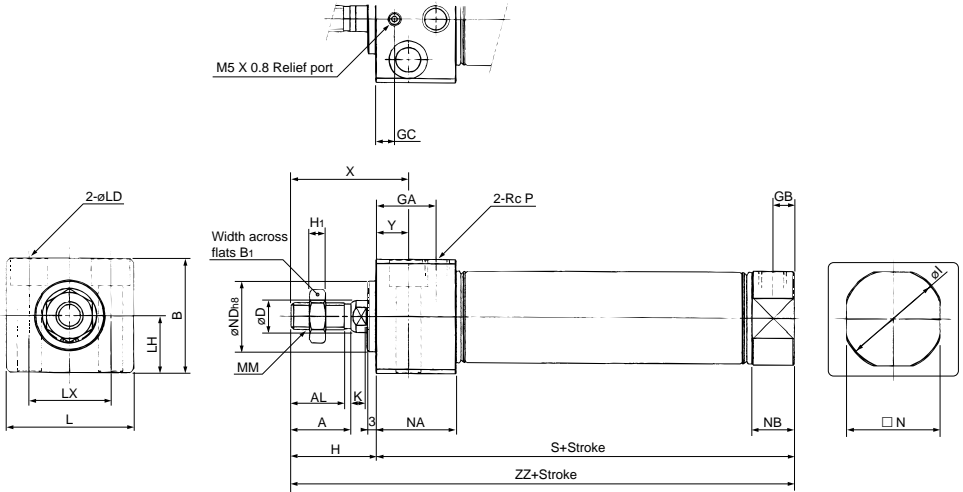
## Auto Switch Specifications (Refer to page 1.4-66 of Best Pneumatics No. ② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state (Switch)	<sup>2</sup> wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	<sup>3</sup> wire system D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

## Auto Switch/Proper Mounting Positions for Stroke End Detection

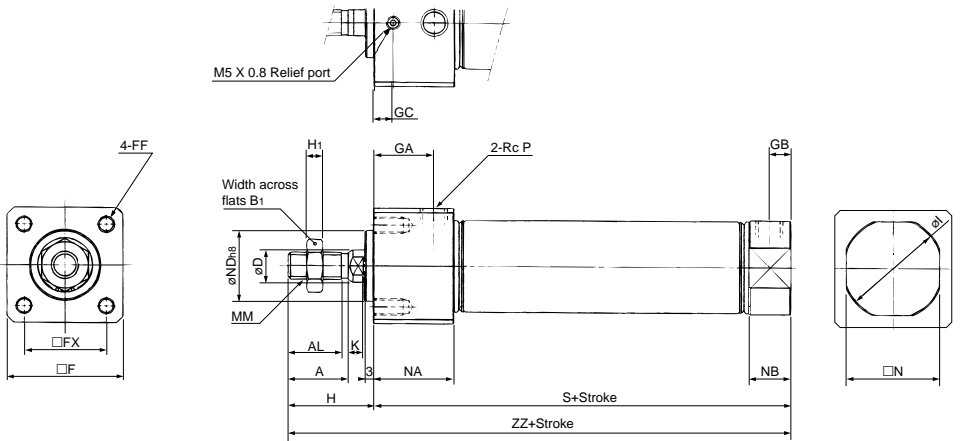
Same as those of the double acting single rod type. Refer to P. 21.

**Bottom Mounting/10-CM2RA, 11-CM2RA**



																						(mm)				
Bore size	A	AL	B	B <sub>1</sub>	D	GA	GB	GC	H	H <sub>1</sub>	I	K	L	LD	LH	LX	MM	N	NA	NB	ND	P	S	X	Y	ZZ
20	18	15.5	30.3	13	8	22	8	6	27	5	28	5	33.5	ø5.5,ø9.5 depth of counter bore 6.5	15	21	M8 X 1.25	24	29	15	20 <sup>0.033</sup>	1/8	76	39	12	103
25	22	19.5	36.3	17	10	22	8	6	31	6	33.5	5.5	39	ø6.6,ø11 depth of counter bore 7.5	18	25	M10 X 1.25	30	29	15	26 <sup>0.033</sup>	1/8	76	43	12	107
32	22	19.5	42.3	17	12	22	8	7	31	6	37.5	5.5	47	ø9,ø14 depth of counter bore 10	21	30	M10 X 1.25	34.5	29	15	26 <sup>0.033</sup>	1/8	78	43	12	109
40	24	21	52.3	22	14	27	11	9	34	8	46.5	7	58.5	ø11,ø17.5 depth of counter bore 12.5	26	38	M14 X 1.5	42.5	37.5	21.5	32 <sup>0.039</sup>	1/4	104	49	15	138

**Front Nose Mounting/10-CM2RB, 11-CM2RB**



																						(mm)			
Bore size	A	AL	B <sub>1</sub>	D	F	FF	FX	GA	GB	GC	H	H <sub>1</sub>	I	K	MM	N	NA	NB	ND	P	S	ZZ			
20	18	15.5	13	8	30.4	M5 X 0.8 thread depth 9	22	22	8	6	27	5	28	5	M8 X 1.25	24	29	15	20 <sup>0.033</sup>	1/8	76	103			
25	22	19.5	17	10	36.4	M6 X 1 thread depth 11	26	22	8	6	31	6	33.5	5.5	M10 X 1.25	30	29	15	26 <sup>0.033</sup>	1/8	76	107			
32	22	19.5	17	12	42.4	M6 X 1 thread depth 11	30	22	8	7	31	6	37.5	5.5	M10 X 1.25	34.5	29	15	26 <sup>0.033</sup>	1/8	78	109			
40	24	21	22	14	52.4	M8 X 1.25 thread depth 14	36	27	11	9	34	8	46.5	7	M14 X 1.5	42.5	37.5	21.5	32 <sup>0.039</sup>	1/4	104	138			

## Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Precautions

#### Warning

① **Do not rotate the cover.**

When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover is rotated.

#### Caution

① **Be careful to prevent the snap ring from popping out.**

When replacing the rod seal, take special precautions not to allow the snap ring to pop out.

② **Do not touch the cylinder during operation.**

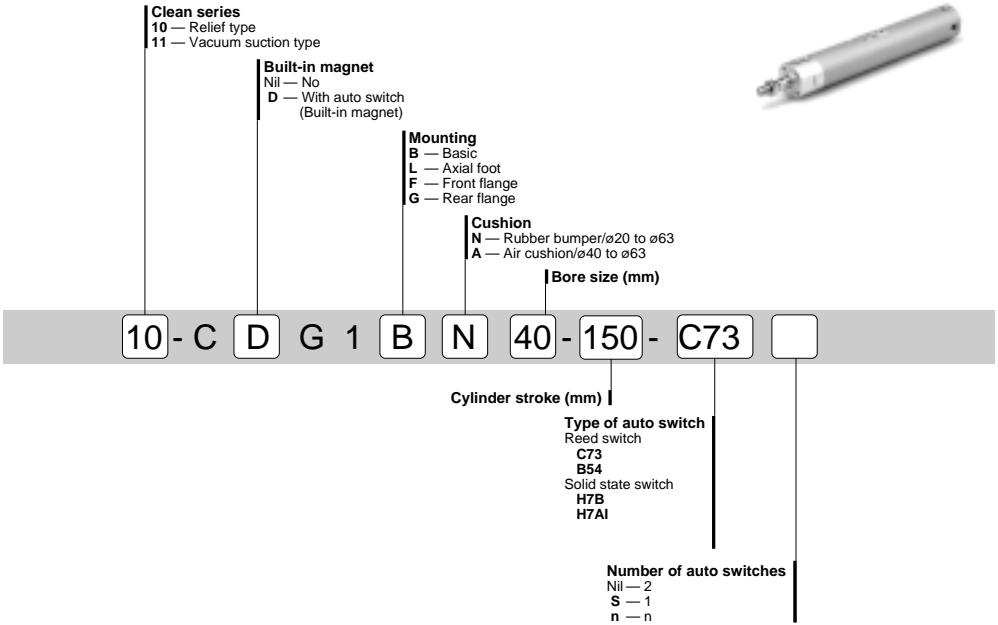
If the cylinder is operating at a high frequency, be aware the cylinder tube surface could become very hot, leading to danger of burns.



# Series 10-11-**CG1** Air Cylinder

ø20,ø25,ø32,ø40,ø50,ø63

## How to Order



## Model

Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion						
							Rubber	Air					
Relief type	10-CG1□20	20	Non-lube	Double acting single rod	25,50,75,100,125,150,200	Available	Available	Available (ø40 to ø63)					
	10-CG1□25	25							20, 50, 75, 100,125, 150, 200, 250, 300				
	10-CG1□32	32			Rc1/4								
	10-CG1□40	40											
	10-CG1□50	50											
10-CG1□63	63												
Vacuum suction type	11-CG1□20	20			Rc1/8				25,50,75,100,125,150,200	20, 50, 75, 100,125, 150, 200, 250, 300	Available	Available	Available (ø40 to ø63)
	11-CG1□25	25											
	11-CG1□32	32							Rc1/4				
	11-CG1□40	40											
	11-CG1□50	50											
	11-CG1□63	63											

Note) Consult SMC for longer stroke length.

## Specifications

Item	Bore size (mm)
Proof pressure	20,25,32,40,50,63
Max. operating pressure	1.5MPa
Min. operating pressure	1.0MPa
Ambient and fluid temperature	0.05MPa
Piston speed	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Stroke length tolerance	30 to 400mm/s
Mounting	Up to 300st <sup>+1.4</sup> / <sub>0</sub> mm
	Basic, Axial foot, Rod side flange, Rear flange

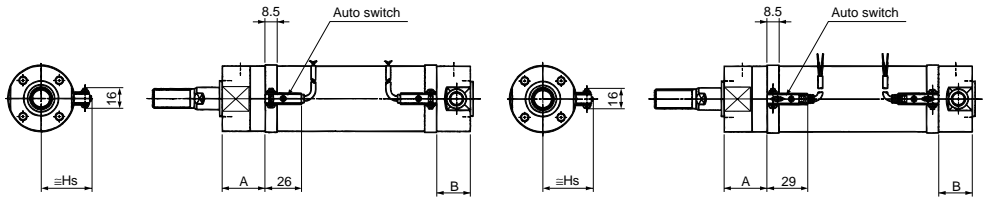
**Auto Switch Specifications** (Refer to page 1.6-2 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	3-wire system D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

D-C73

D-H7B/H7A1



(mm)

Bore size	D-C73			D-H7B/H7A1		
	A	B	Hs	A	B	Hs
20	38	20.5[28.5]	24.5	37	19.5[27.5]	24.5
25	38	20.5[28.5]	27	37	19.5[27.5]	27
32	39	21.5[29.5]	30.5	38	20.5[28.5]	30.5
40	35.5(44.5)	23.5[32.5]	35	34.5(43.5)	22.5[31.5]	35
50	43 (55)	28.5[40.5]	40.5	42 (54)	27.5[39.5]	40.5
63	43 (55)	28.5[40.5]	47.5	42 (54)	27.5[39.5]	47.5

Note) Descriptions in "( )" are for types with air cushion. Those in "[ ]" are for double rod types.

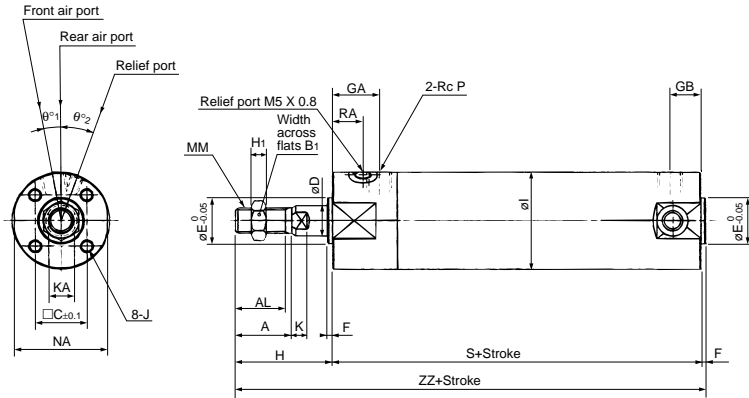
**⚠ Caution**

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

# Air Cylinder 10-CG1/11-CG1

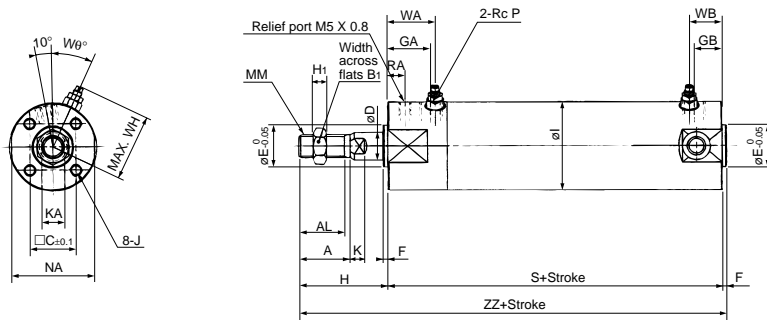
## Basic (B)/10-CG1B, 11-CG1B

### With Rubber Bumper



		(mm)																						
Bore size	Standard stroke range	A	AL	B <sub>1</sub>	C	D	E	F	GA	GB	H	H <sub>1</sub>	I	J	K	KA	MM	NA	P	RA	S	θ <sup>1</sup>	θ <sup>2</sup>	ZZ
20	Up to 200	18	15.5	13	14	8	12	2	20	10	35	5	26	M4 X 0.7 depth 7	4	6	M8 X 1.25	24	1/8	7	77	0	0	114
25	Up to 300	22	19.5	17	16.5	10	14	2	20	10	40	6	31	M5 X 0.8 depth 7.5	5.5	8	M10 X 1.25	29	1/8	7	77	0	0	119
32	Up to 300	22	19.5	17	20	12	18	2	20	10	40	6	38	M5 X 0.8 depth 8	5.5	10	M10 X 1.25	35.5	1/8	7	79	0	0	121
40	Up to 300	30	27	19	26	16	25	2	13	10	50	8	47	M6 X 1 depth 12	6	14	M14 X 1.5	44	1/8	9	78	10	23	130
50	Up to 300	35	32	27	32	20	30	2	14	12	58	11	58	M8 X 1.25 depth 16	7	18	M18 X 1.5	55	1/4	10	90	10	23	150
63	Up to 300	35	32	27	38	20	32	2	14	12	58	11	72	M10 X 1.5 depth 16	7	18	M18 X 1.5	69	1/4	10	90	10	20	150

### With Air Cushion

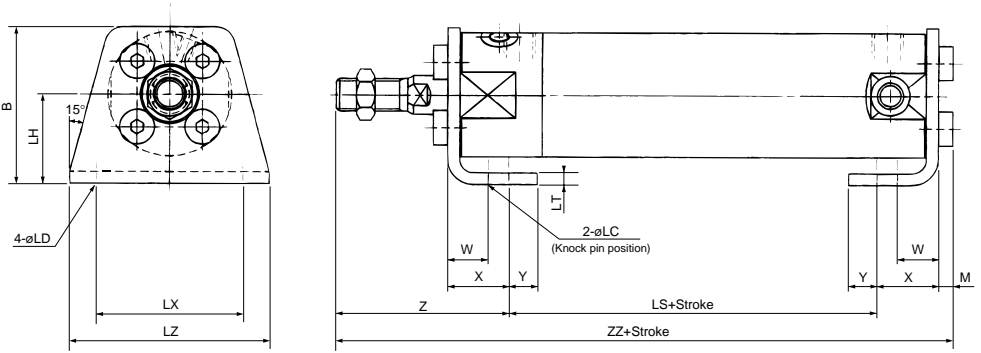


		(mm)																								
Bore size	Standard stroke range	A	AL	B <sub>1</sub>	C	D	E	F	GA	GB	H	H <sub>1</sub>	I	J	K	KA	MM	NA	P	RA	S	WA	WB	WH	Wθ	ZZ
40	Up to 300	30	27	19	26	16	25	2	22	10	50	8	47	M6 X 1 depth 12	6	14	M14 X 1.5	44	1/8	8	87	25	15	33	20°	139
50	Up to 300	35	32	27	32	20	30	2	26	12	58	11	58	M8 X 1.25 depth 16	7	18	M18 X 1.5	55	1/4	9	102	30	17	40.5	20°	162
63	Up to 300	35	32	27	38	20	32	2	26	12	58	11	72	M10 X 1.5 depth 16	7	18	M18 X 1.5	69	1/4	9	102	30	17	47.5	20°	162



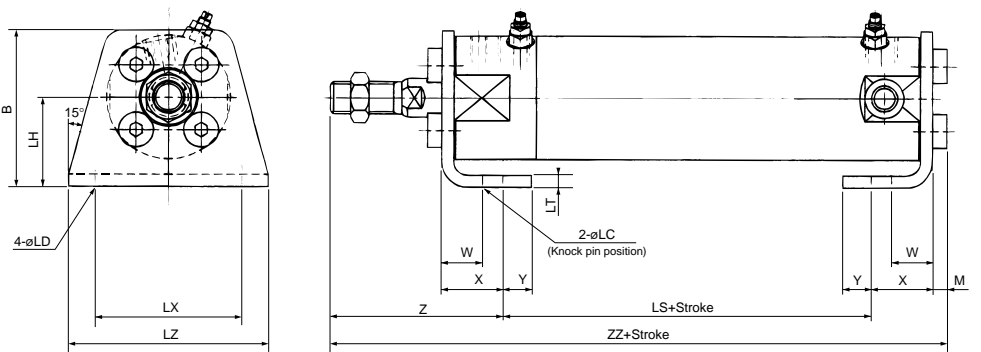
**Axial Foot (L)**/10-CG1L, 11-CG1L

**With Rubber Bumper**



(mm)															
Bore size	B	L	CL	LD	LH	LS	LT	LX	LZ	M	W	X	Y	Z	ZZ
20	34	4	6	20	53	3	32	44	3	10	15	7	47	118	
25	38.5	4	6	22	53	3	36	49	3.5	10	15	7	52	123.5	
32	45	4	7	25	53	3	44	58	3.5	10	16	8	53	125.5	
40	54.5	4	7	30	51	3	54	71	4	10	16.5	8.5	63.5	135	
50	70.5	5	10	40	55	4.5	66	86	5	17.5	22	11	75.5	157.5	
63	82.5	5	12	45	55	4.5	82	106	5	17.5	22	13	75.5	157.5	

**With Air Cushion**

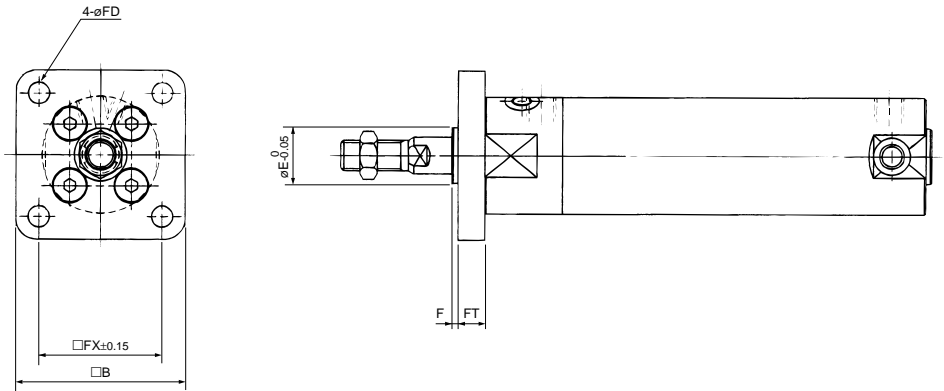


(mm)															
Bore size	B	L	CL	LD	LH	LS	LT	LX	LZ	M	W	X	Y	Z	ZZ
40	54.5	4	7	30	60	3	54	71	4	10	16.5	8.5	63.5	144	
50	70.5	5	10	40	67	4.5	66	86	5	17.5	22	11	75.5	169.5	
63	82.5	5	12	45	67	4.5	82	106	5	17.5	22	13	75.5	169.5	

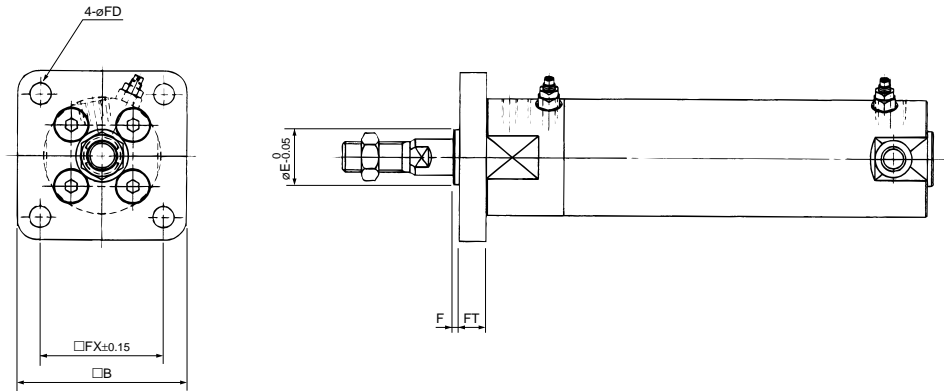
# Air Cylinder 10-CG1/11-CG1

## Front Flange (F)10-CG1F, 11-CG1F

### With Rubber Bumper



### With Air Cushion

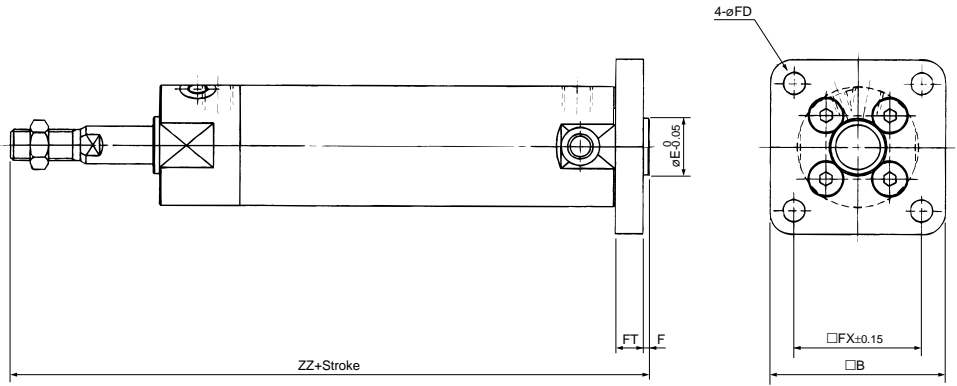


	(mm)					
Bore size	B	E	F	FX	FD	FT
20	40	12	2	28	5.5	6
25	44	14	2	32	5.5	7
32	53	18	2	38	6.6	7
40	61	25	2	46	6.6	8
50	76	30	2	58	9	9
63	92	32	2	70	11	9

Note1) End boss of  $\phi E$  is already processed for flange mounting.  
 Note2) Rubber bumper type and air cushion type ( $\phi 40$  to  $\phi 63$ ) have the same dimensions.

Rear Flange (G)/10-CG1G, 11-CG1G

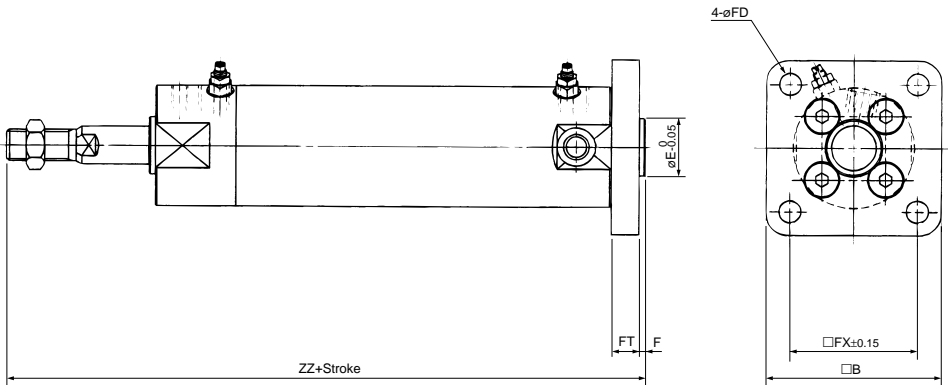
With Rubber Bumper



(mm)							
Bore size	B	E	F	FX	FD	FT	ZZ
<b>20</b>	40	12	2	28	5.5	6	120
<b>25</b>	44	14	2	32	5.5	7	126
<b>32</b>	53	18	2	38	6.6	7	128
<b>40</b>	61	25	2	46	6.6	8	138
<b>50</b>	76	30	2	58	9	9	159
<b>63</b>	92	32	2	70	11	9	159

Note) End boss of øE is already processed for flange mounting.

With Air Cushion



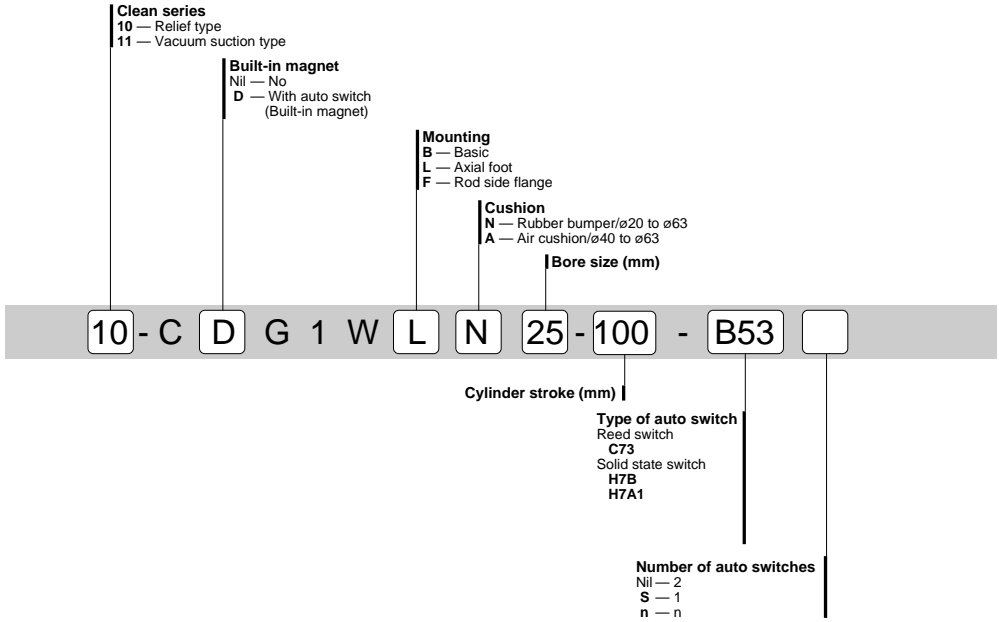
(mm)							
Bore size	B	E	F	FX	FD	FT	ZZ
<b>40</b>	61	25	2	46	6.6	8	147
<b>50</b>	76	30	2	58	9	9	171
<b>63</b>	92	32	2	70	11	9	171

Note) End boss of øE is already processed for flange mounting.

# Series 10-11-**CG1W** Double Rod Cylinder

ø20,ø25,ø32,ø40,ø50,ø63

## How to Order



## Model

Model		Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-CG1W□20	20	Rc1/8	Non-lube	Double acting double rod	25,50,75,100,125,150,200	Available	Available	Available (ø40 to ø63)
	10-CG1W□25	25				25, 50, 75, 100, 125, 150, 200, 250, 300			
	10-CG1W□32	32							
	10-CG1W□40	40							
	10-CG1W□50	50							
10-CG1W□63	63	Rc1/4							
Vacuum suction type	11-CG1W□20	20	Rc1/8	Non-lube	Double acting double rod	25,50,75,100,125,150,200	Available	Available	Available (ø40 to ø63)
	11-CG1W□25	25				25, 50, 75, 100, 125, 150, 200, 250, 300			
	11-CG1W□32	32							
	11-CG1W□40	40							
	11-CG1W□50	50				Rc1/4			
	11-CG1W□63	63							

## Specifications

Item	Bore size (mm)
Item	20,25,32,40,50,63
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.08MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	30 to 400mm/s
Stroke length tolerance	Up to 300st $\pm 0.1$ mm
Mounting	Basic, Axial foot, Front flange

**Auto Switch Specifications** (Refer to page 1.6-14 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

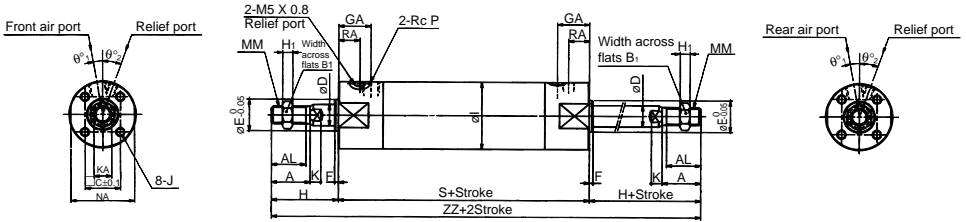
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system	D-H7B	24VDC (10 to 28VDC)	5 to 150mA	24VDC relay, PLC
	3-wire system	D-H7A1	28VDC or less	150mA or less	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

Refer to page 37 of double acting single rod type.

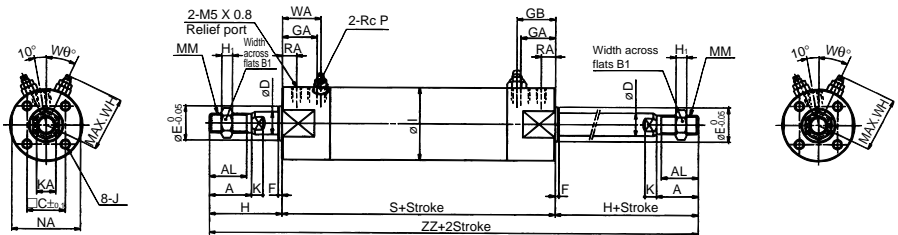
**Basic (B)/10-CG1WB, 11-CG1WB**

With Rubber Bumper



Bore size	A	AL	B <sub>1</sub>	C	D	E	F	GA	H	H <sub>1</sub>	I	J	K	KA	MM	NA	P	RA	S	θ <sub>1</sub>	θ <sub>2</sub>	ZZ
20	18	15.5	13	14	8	12	2	20	35	5	26	M4 X 0.7 depth 7	4	6	M8 X 1.25	24	1/8	7	93	0	0	163
25	22	19.5	17	16.5	10	14	2	20	40	6	31	M5 X 0.8 depth 7.5	5	8	M10 X 1.25	29	1/8	7	93	0	0	173
32	22	19.5	17	20	12	18	2	20	40	6	38	M5 X 0.8 depth 8	5.5	10	M10 X 1.25	35.5	1/8	7	95	0	0	175
40	30	27	19	26	16	25	2	13	50	8	47	M6 X 1 depth 12	6	14	M14 X 1.5	44	1/8	9	87	10	23	187
50	35	32	27	32	20	30	2	14	58	11	58	M8 X 1.25 depth 16	7	18	M18 X 1.5	55	1/4	10	102	10	23	218
63	35	32	27	38	20	32	2	14	58	11	72	M10 X 1.5 depth 16	7	18	M18 X 1.5	69	1/4	10	102	10	20	218

With Air Cushion

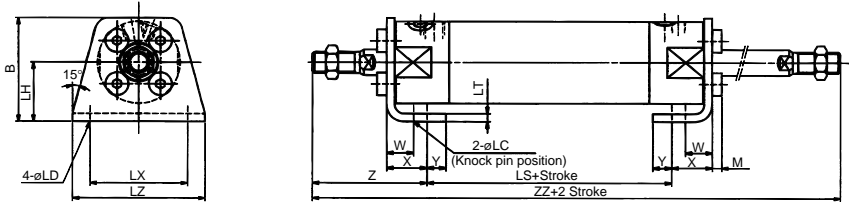


Bore size	A	AL	B <sub>1</sub>	C	D	E	F	GA	H	H <sub>1</sub>	I	J	K	KA	MM	NA	P	RA	S	WA	WH	Wθ	ZZ
40	30	27	19	26	16	25	2	22	50	8	47	M6 X 1 depth 12	6	14	M14 X 1.5	44	1/8	8	105	25	33	20°	205
50	35	32	27	32	20	30	2	26	58	11	58	M8 X 1.25 depth 16	7	18	M18 X 1.5	55	1/4	9	126	30	40.5	20°	242
63	35	32	27	38	20	32	2	26	58	11	72	M10 X 1.5 depth 16	7	18	M18 X 1.5	69	1/4	9	126	30	47.5	20°	242

## Double Rod Cylinder 10-CG1W/11-CG1W

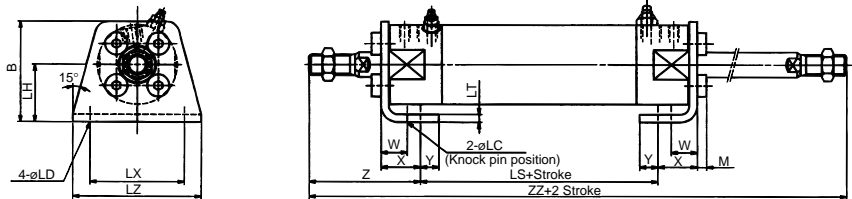
### Axial Foot (L)/10-CG1WL, 11-CG1WL

With Rubber Bumper



														(mm)		
Bore size	B	LC	LD	LH	LS	LT	LX	LZ	M	W	X	Y	Z	ZZ		
20	34	4	6	20	69	3	32	44	3	10	15	7	47	163		
25	38.5	4	6	22	69	3	36	49	3.5	10	15	7	52	173		
32	45	4	7	25	69	3	44	58	3.5	10	16	8	53	175		
40	54.5	4	7	30	60	3	54	71	4	10	16.5	8.5	63.5	187		
50	70.5	5	10	40	67	4.5	66	86	5	17.5	22	11	75.5	218		
63	82.5	5	12	45	67	4.5	82	106	5	17.5	22	13	75.5	218		

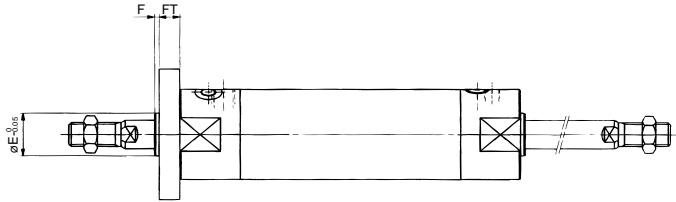
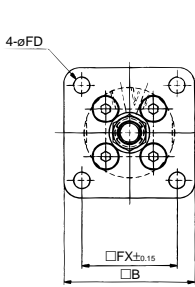
With Air Cushion



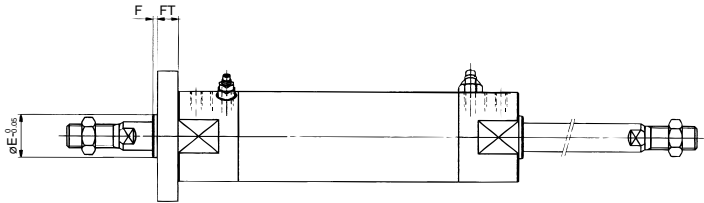
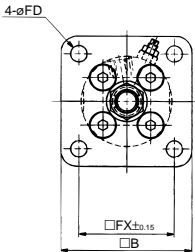
														(mm)		
Bore size	B	LC	LD	LH	LS	LT	LX	LZ	M	W	X	Y	Z	ZZ		
40	54.5	4	7	30	78	3	54	71	4	10	16.5	8.5	63.5	205		
50	70.5	5	10	40	91	4.5	66	86	5	17.5	22	11	75.5	242		
63	82.5	5	12	45	91	4.5	82	106	5	17.5	22	13	75.5	242		

**Front Flange (F)/10-CG1WF, 11-CG1WF**

With Rubber Bumper



With Air Cushion



	(mm)					
Bore size	B	E	F	FX	FD	FT
<b>20</b>	40	12	2	28	5.5	6
<b>25</b>	44	14	2	32	5.5	7
<b>32</b>	53	18	2	38	6.6	7
<b>40</b>	61	25	2	46	6.6	8
<b>50</b>	76	30	2	58	9	9
<b>63</b>	92	32	2	70	11	9

Note1) End boss of øE is already processed for flange mounting.

Note2) Rubber bumper type and air cushion type (ø40 to ø63) have the same dimensions.

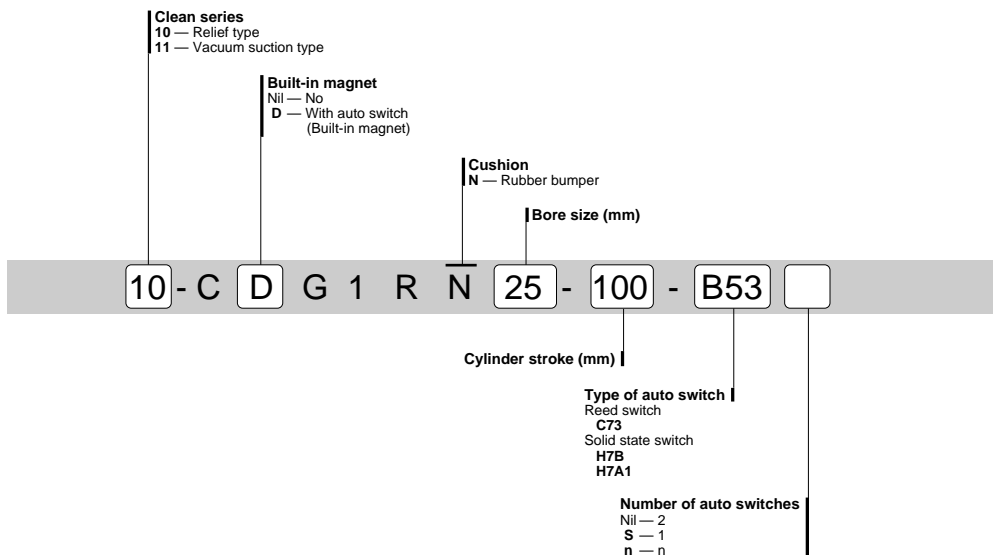
**⚠ Caution**

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

# Series 10-11-CG1R Direct Mount Cylinder

ø20,ø25,ø32,ø40,ø50,ø63

## How to Order



## Model

Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion					
							Rubber	Air				
Relief type	10-CG1RN20	20	Non-lube	Double acting single rod	20, 50, 75, 100, 125, 150,	Available	Available	Not available				
	10-CG1RN25	25			25, 50, 75, 100, 125, 150, 200							
	10-CG1RN32	32			25, 50, 75, 100, 125, 150, 200, 250, 300							
	10-CG1RN40	40										
	10-CG1RN50	50										
10-CG1RN63	63											
Vacuum suction type	11-CG1RN20	20			Rc1/8				20, 50, 75, 100, 125, 150,	Available	Available	Not available
	11-CG1RN25	25							25, 50, 75, 100, 125, 150, 200			
	11-CG1RN32	32							25, 50, 75, 100, 125, 150, 200, 250, 300			
	11-CG1RN40	40										
	11-CG1RN50	50										
11-CG1RN63	63											

## Specifications

Item	Bore size (mm)
	20, 25, 32, 40, 50, 63
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Ambient and fluid temperature	With auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	30 to 400mm/S
Stroke length tolerance	Up to 300 <sup>+14</sup> / <sub>0</sub> mm

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.



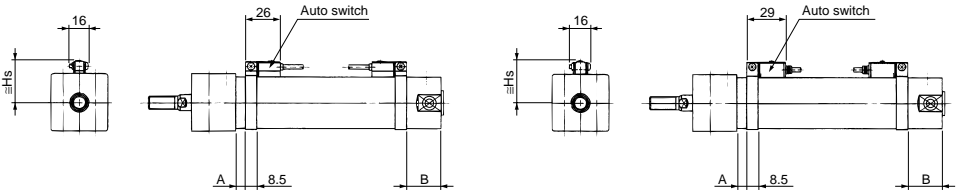
**Auto Switch Specifications** (Refer to page 1.6-35 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system	D-H7B	24VDC (10 to 28VDC)	5 to 150mA	24VDC relay, PLC
	3-wire system	D-H7A1	28VDC or less	150mA or less	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

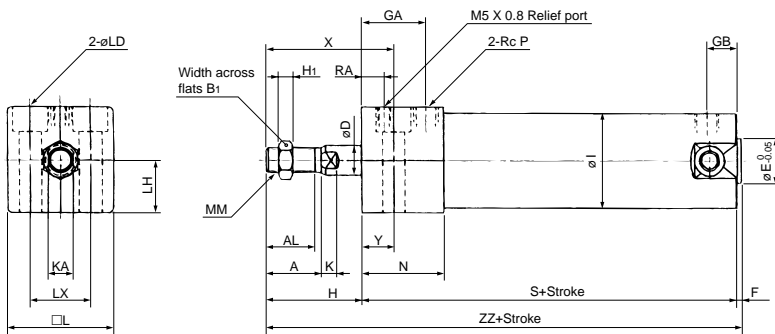
D-C73

D-H7B/H7A1



Bore size	D-C73			D-H7B/H7A1		
	A	B	Hs	A	B	Hs
20	9	20.5	24.5	8	19.5	24.5
25	9	20.5	27	8	19.5	27
32	10	21.5	30.5	9	20.5	30.5
40	14.5	23.5	35	13.5	22.5	35
50	17	28.5	40.5	16	27.5	40.5
63	17	28.5	47.5	16	27.5	40.5

**Basic/10-CG1RN, 11-CG1RN**



Bore size	Stroke range	A	AL	B	D	E	F	GA	GB	H	H <sub>1</sub>	I	K	KA	L	LD	LH	LX	MM	N	P	RA	S	X	Y	ZZ
20	Up to 150	18	15.5	13	8	12	2	20	10	27	5	26	4	6	30.4	ø5.5,ø9.5 recessed area depth 6	15	18	M8 X 1.25	27	1/8	7	75	38	11	104
25	Up to 200	22	19.5	17	10	14	2	22	10	32	6	31	5.5	8	36.4	ø6.6,ø11 recessed area depth 7	18	22	M10 X 1.25	29	1/8	9	77	44	12	111
32	Up to 200	22	19.5	17	12	18	2	26	10	32	6	38	5.5	10	42.4	ø9,ø14 recessed area depth 9	21	24	M10 X 1.25	33	1/8	9	83	45	13	117
40	Up to 300	30	27	19	16	25	2	30	10	39	8	47	6	14	52.4	ø11,ø17.5 recessed area depth 12	26	32	M14 X 1.5	37	1/8	11	94	55	16	135
50	Up to 300	35	32	27	20	30	2	33	12	45	11	58	7	18	64.5	ø14,ø20 recessed area depth 14	32	41	M18 X 1.5	44	1/4	12	108	62	17	155
63	Up to 300	35	32	27	20	32	2	39	12	45	11	72	7	18	76.6	ø18,ø26 recessed area depth 18	38	46	M18 X 1.5	50	1/4	12	114	64	19	161

# Series 10-11-**CUJ** Mini Free Mount Cylinder

ø6,ø8,ø10

## How to Order

Double acting

10-C D UJB 6-8 D [ ] F8N [ ]

**Clean series**

10	Relief type
11	Vacuum suction type

**Magnet**

Nil	—
D	With (Built-in)

**Number of auto switches**

Nil	2
S	1

**Type of auto switch**

Nil	Without auto switch (Built-in magnet)
-----	---------------------------------------

\*Select the part number of an applicable auto switch model from table ② below.

**Rod end male thread**

Nil	Rod end female thread
M	Rod end male thread

**Stroke**  
Refer to Table ①.

**Bore size**

6	6mm
8	8mm
10	10mm

**Table ① Standard Strokes**

Action	Bore size (mm)	Standard stroke (mm)
Double acting	6	4, 6, 8, 10, 15
	8, 10	4, 6, 8, 10, 15, 20

**Table ② Auto Switch Specifications** (Refer to CAT.ES20-157 for detailed specifications and auto switches not in the following table.)

Style	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Switch model	*Lead wire length (m)			Applicable load		
					DC	AC		Electrical entry direction	0.5	3		5	
Solid state switch	—	Grommet	Yes	3-wire (NPN) 2-wire	24V	12V	—	Perpendicular,vertical	●	●	○	—	Relay, PLC
								F8N	●	●	○		
								F8B	●	●	○		

\*Lead wire length symbol: 0.5m..... Nil (Example)F8N

3m..... L (Example)F8NL

\*Auto switches marked with a "○" symbol are made to order.

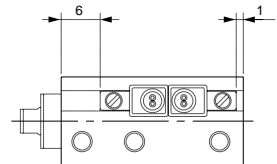
## Specifications

Bore size (mm)	6	8	10
<b>Action</b>	Double acting		
<b>Fluid</b>	Air		
<b>Proof pressure</b>	1.05MPa		
<b>Min. operating pressure</b>	Double acting	0.15MPa	0.1MPa
<b>Max. operating pressure</b>	0.7MPa		
<b>Ambient and fluid temperature</b>	Without auto switch: -10°C to 70°C (With no condensation) With auto switch: -10°C to 60°C (With no condensation)		
<b>Cushion</b>	No		
<b>Lubrication</b>	Non-lube		
<b>Piston speed</b>	50 to 400mm/s		
<b>Thread tolerance</b>	JIS Class 2		
<b>Stroke length tolerance</b>	+0.5 0		
<b>Mounting</b>	Through hole		

## Auto Switch

Proper Mounting Positions for Stroke End Detection (ø6, ø8, ø10 Common)

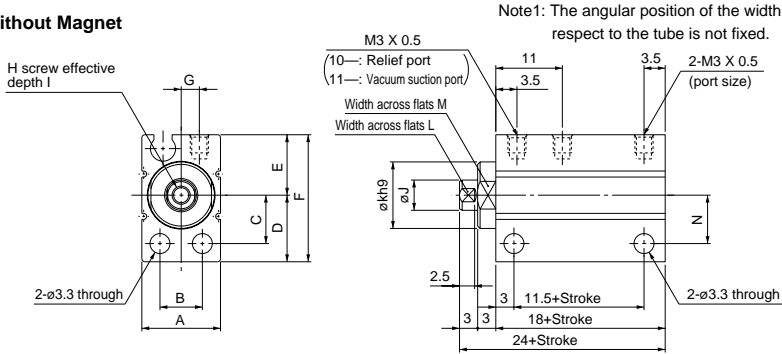
### D-F8N-F8B



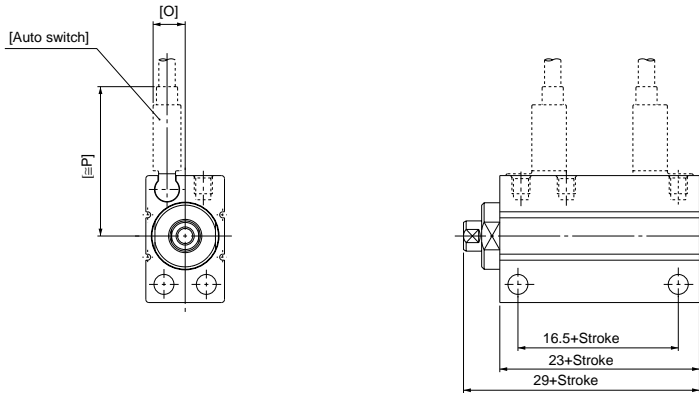
**Dimensions  $\phi 6$  to  $\phi 10$**

<sup>10</sup>/<sub>11</sub>-C(D)UJB

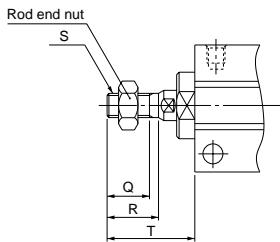
**Without Magnet**



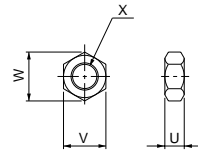
**Built-in Magnet**



**Rod End Male Thread**



**Rod End Nut/Accessory (Option)**



Rod End Male Thread (mm)				
Bore size	Q	R	S	T
6	5.5	6.5	M3 X 0.5	12.5
8	7	8.5	M4 X 0.7	14.5
10	9	10.5	M5 X 0.8	16.5

Rod End Nut/Accessory (Option) (mm)					
Part no.	Applicable bore size	U	V	W	X
NTJ-006A	6	2.4	5.5	6.4	M3 X 0.5
NTJ-010A	8	3.2	7	8.1	M4 X 0.7
NTJ-015A	10	4	8	9.2	M5 X 0.8

**Standard**

Bore size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
6	13	7	7	10	9	19	3	M2.5 X 0.45	5	4	9	3.5	8	7	5.3	24
8	13	7	8	11	10	21	3	M3 X 0.5	6	5	11	4.5	10	8	5.3	25
10	13.5	7	8.5	11.5	10.5	22	3.2	M3 X 0.5	6	6	12	5	11	8.5	5.6	25.5

## ⚠ Specific Product Precautions

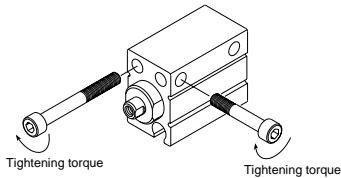
Be sure to read before handling.  
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Mounting

#### ⚠ Caution

When mounting a mini free mount cylinder, tighten the bolts with the proper tightening torque.

	Bolt	Appropriate tightening torque Nm
ø6	M3 X 0.5	1.06
ø8		
ø10		

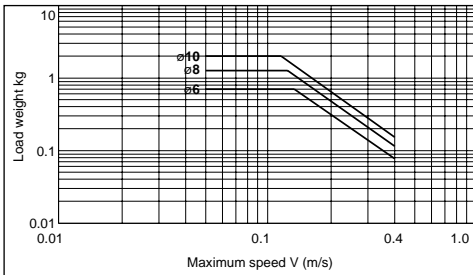


### Allowable Kinetic Energy

#### ⚠ Caution

When driving an inertial load, operate a cylinder with kinetic energy not exceeding the allowable value. The range in the chart below delineated by bold solid lines indicates the relation between load weights and maximum driving speeds.

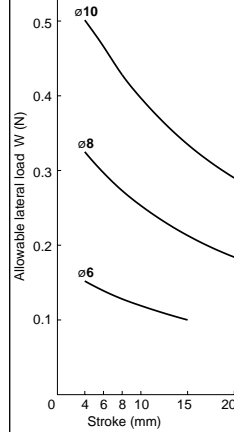
Bore size (mm)	<b>6</b>	<b>8</b>	<b>10</b>
Piston speed (m/s)	0.05 to 0.4		
Allowable kinetic energy (J)	$6.25 \times 10^{-3}$	$9.35 \times 10^{-3}$	$12.5 \times 10^{-3}$



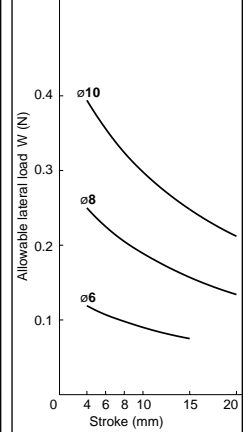
### Selection

Strictly observe the limiting range of lateral load on a piston rod. (See the graphs below.) If this product is used beyond the limits, it may shorten the machine life or cause damage.

**With Auto Switch**



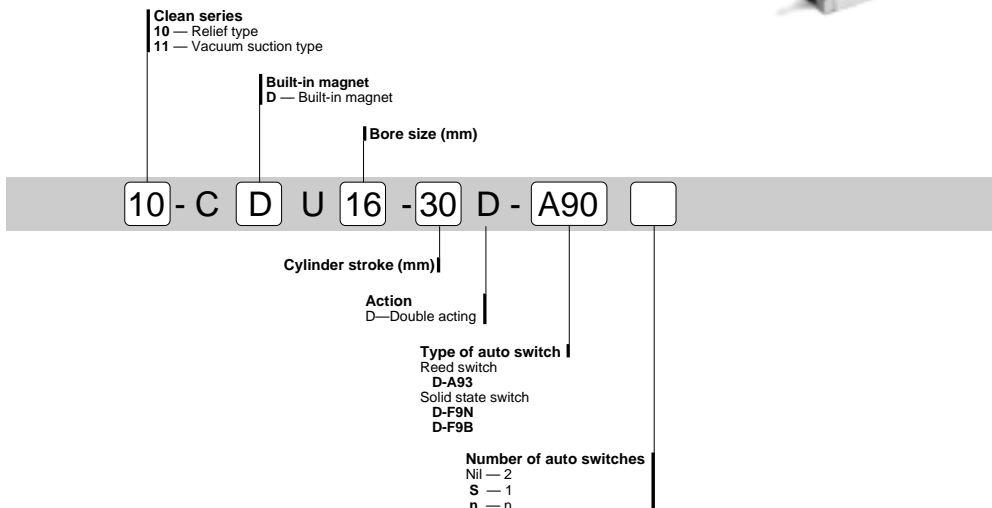
**Without Auto Switch**





# Series 10-11-CU Free Mount Cylinder/ø6, ø10, ø16, ø20, ø25

## How to Order



## Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-CDU6	6	M5 X 0.8	Non-lube	Double acting Single rod	5, 10, 15, 20, 25, 30	Available	Available	Not available
	10-CDU10	10							
	10-CDU16	16							
	10-CDU20	20							
	10-CDU25	25							
Vacuum suction type	11-CDU6	6				5, 10, 15, 20, 25, 30, 40, 50			
	11-CDU10	10							
	11-CDU16	16							
	11-CDU20	20							
	11-CDU25	25							
						5, 10, 15, 20, 25, 30, 40, 50			

## Specifications

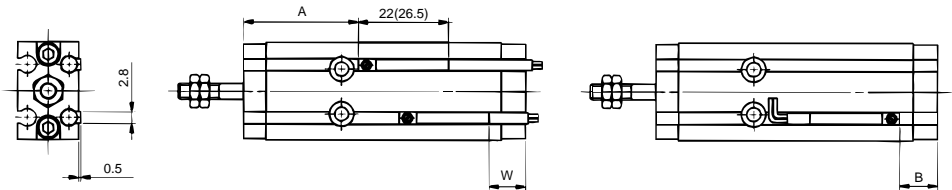
Item	Bore size (mm)		
	6	10, 16	20, 25
Proof pressure	1.05MPa		
Max. operating pressure	0.7MPa		
Min. operating pressure	0.12MPa	0.06MPa	0.05MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)		
Piston speed	50 to 400mm/s		
Stroke length tolerance	+0.0		

**Auto Switch Specifications** (Refer to page 2.1-15 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-A93	24VDC	5 to 40mA (24VDC)	Yes	Relay, PLC
Solid state switch	2-wire system D-F9N	28VDC or less	40mA or less	Yes	IC circuit, Relay, PLC
	3-wire system D-F9B	24VDC (10 to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

D-A93  
D-F9N/F9B



Dimensions in parentheses are for D-F9B.

Bore size (mm)	D-A93			D-F9B			D-F9N		
	A	B	W	A	B	W	A	B	W
6	29	5.5	-3.5	33.5	10	5	33.5	10	0.5
10	29	9	-7.5	33.5	13.5	1	33.5	13.5	-3.5
16	35.5	11	-9.5	40	15.5	-1	40	15.5	-5.5
20	40.5	14.5	-13	45	19	-4.5	45	19	-9
25	41	16	-14.5	45.5	20.5	-6	45.5	20.5	-10.5

Note1) The negative values in the table indicate that the auto switch is mounted inside the cylinder body in case of W and outside in case of B.

Note2) In case of 5mm stroke (with 1 pc.) or 10mm stroke (2 pcs.), the switch(es) may not go off or more than one switch may turn on simultaneously. Set them at 1 to 4mm out of the values in the above table.

**! Specific Product Precautions**

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Mounting****! Caution**

① Observe the proper tightening torque in the right table in mounting.

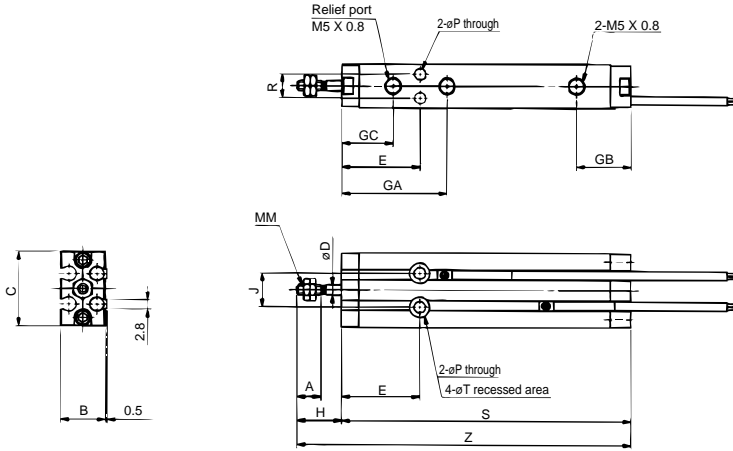
Appropriate tightening torque

Bore size (mm)	Hexagon socket head cap bolt size (mm)	Appropriate tightening torque Nm
ø6, ø10	M3	1.08 ±10%
ø16	M4	2.45 ±10%
ø20, ø25	M5	5.10 ±10%

Free Mount Cylinder **10-CU/11-CU**

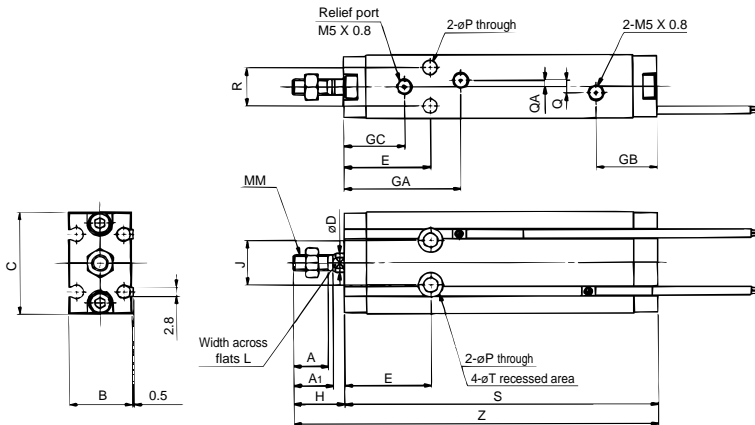
10-CU6 to 25, 11-CU6 to 25

ø6, ø10



Bore size	A	B	C	D	E	GA	GB	GC	H	J	MM	P	R	T	S					Z						
															5	10	15	20	25	30	5	10	15	20	25	30
															6	7	13	22	3	23	31	16	15	13	10	M3 X 0.5
10	10	15	24	4	24	33.5	16	15.5	16	11	M4 X 0.7	3.2	9	6 depth 5	64	69	74	79	84	89	80	85	90	95	100	105

ø16 to ø25




Bore size	A	A <sub>1</sub>	B	C	D	E	GA	GB	GC	H	J	L	MM	P	Q	QA	R	T	S										Z									
																			5	10	15	20	25	30	40	50	5	10	15	20	25	30	40	50				
																			16	11	12.5	20	32	6	27	36.5	19	19	16	14	5	M5 X 0.8	4.5	4	2	12	7.6 depth 6.5	72.5
20	12	14	26	40	8	30	40	21.5	22	19	16	6	M6 X 1.0	5.5	9	4.5	16	9.5 depth 8	81	86	91	96	101	106	116	126	100	105	110	115	120	125	135	145				
25	15.5	18	32	50	10	29	40.5	22	22	23	20	8	M8 X 1.25	5.5	9	4.5	20	9.5 depth 9	83	88	93	98	103	108	118	128	106	111	116	121	126	131	141	151				





# Series 10-11-CQS Compact Cylinder/ø12, ø16, ø20, ø25

## How to Order



**Clean series**  
 10 — Relief type  
 11 — Vacuum suction type

**Built-in magnet**  
 Nil — No  
 D — With auto switch (Built-in magnet)

**Mounting**  
 B — Through-hole/Both ends tapped(Standard)

**Bore size (mm)**

**10 - C D Q S B 25 - 30 D M - A93**

**Cylinder stroke (mm)**

**Double acting**

**Rod end thread**  
 Nil — Female thread  
 M — Male thread

**Type of auto switch**  
 Reed switch  
 A93  
 Solid state switch  
 F9B  
 F9N

**Number of auto switches**  
 Nil — 2  
 S — 1  
 n — n

## Model

Model		Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion		
								Rubber	Air	
Relief type	10-CQSB12	12	M5 X 0.8	Non-lube	Double acting single rod	5, 10, 15, 20, 25, 30	Available	Not available	Not available	
	10-CQSB16	16								
	10-CQSB20	20								
Vacuum suction type	10-CQSB25	25				5, 10, 15, 20, 25, 30, 35, 40, 45, 50,				
	11-CQSB12	12								5, 10, 15, 20, 25, 30
	11-CQSB16	16								
	11-CQSB20	20								
	11-CQSB25	25								

## Specifications

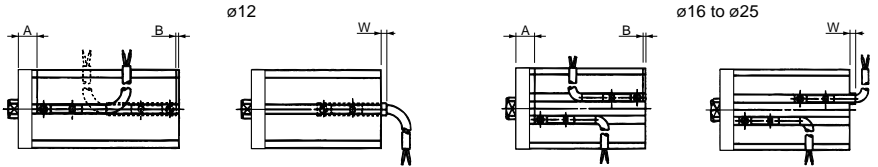
Item	Bore size (mm)
Item	12,16,20,25
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	30 to 400mm/s
Stroke length tolerance	$^{+1.0}_0$
Mounting	Through-hole, Both ends tapped

**Auto Switch Specifications** (Refer to page 2.2-16 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

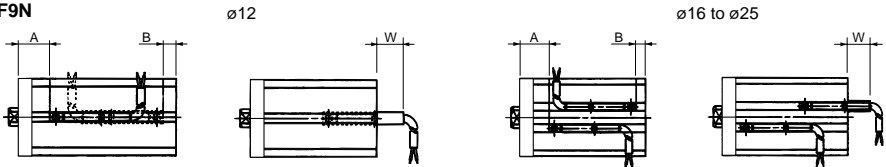
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-A93	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-F9B	24VDC (10 to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system D-F9N	28VDC or less	40mA or less	Yes	24VDC relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

D-A9□



D-F9B/F9N



Bore size (mm)	D-A93			D-F9B			D-F9N		
	A	B	W	A	B	W	A	B	W
12	11.5	0	4	15.5	4.5	5.5	15.5	4.5	5.5
16	12	0	4.5	16	4	6	16	4	6
20	16	3.5	1	20	7.5	2.5	20	7.5	2.5
25	17	5.5	-1	21	9.5	0.5	21	9.5	0.5

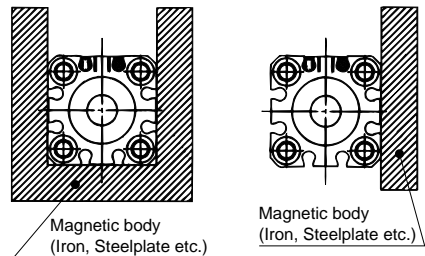
**⚠ Specific Product Precautions**

Be sure to read before handling.  
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Mounting**

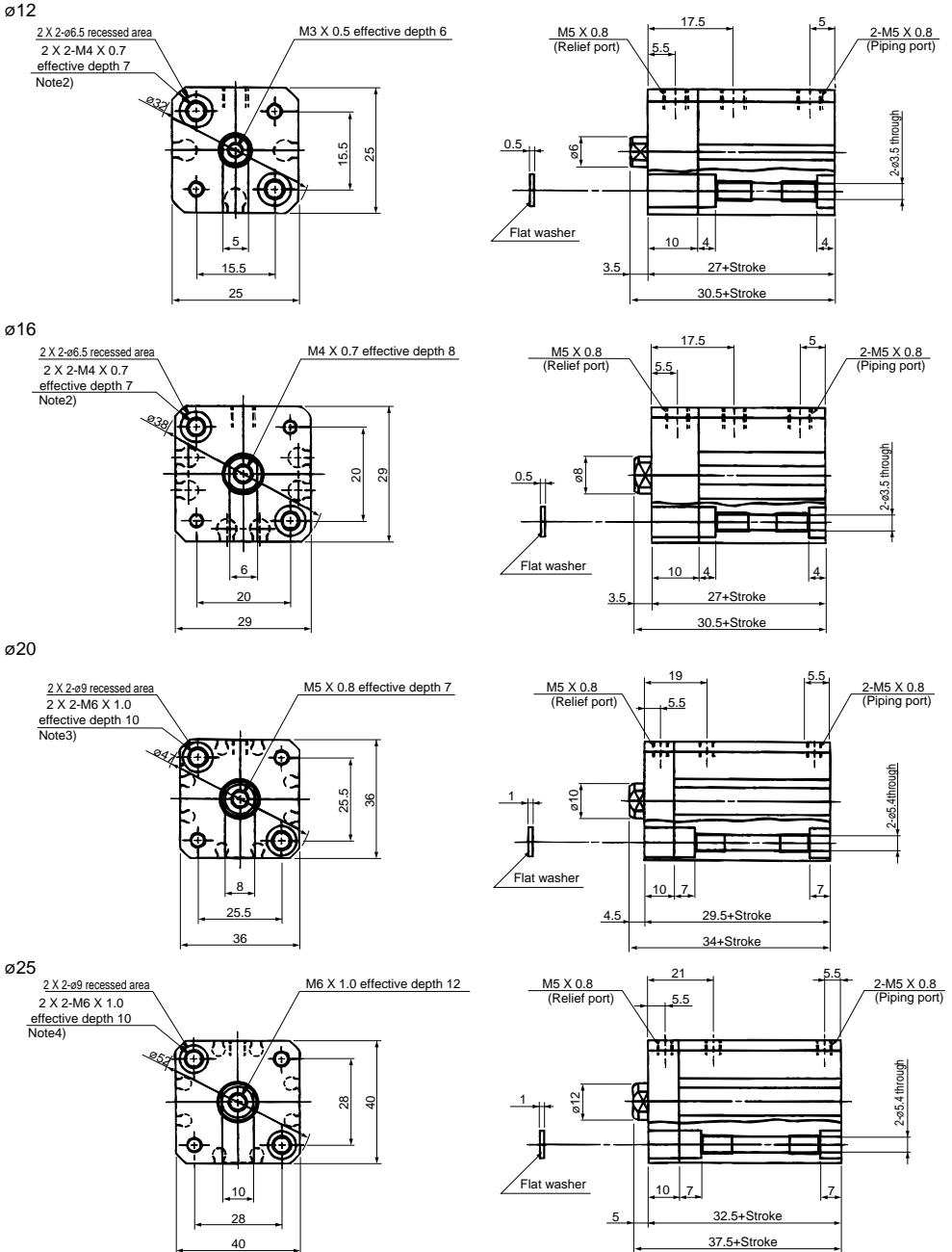
**⚠ Caution**

①When a magnetic object comes in close proximity with the cylinder as shown in the right picture (including proximity on one side only), the auto switch operation may become unstable. Consult SMC in such cases.



**Compact Cylinder 10-CQS/11-CQS**

**Standard/10-CQSB12 to 25, 11-CQSB12 to 25**

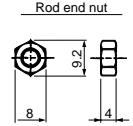
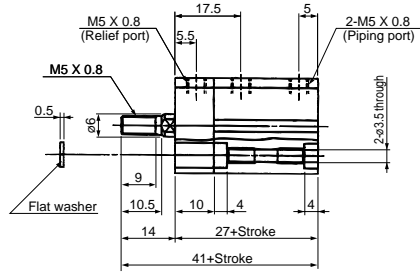
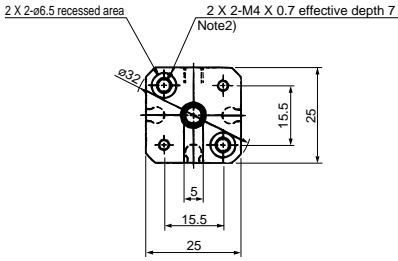


Note 1) Standard strokes available in 5mm increments. 2) Through-hole in case of 5mm stroke.

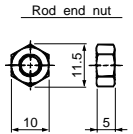
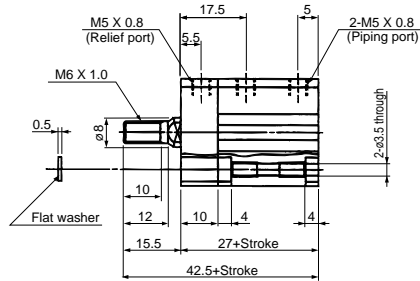
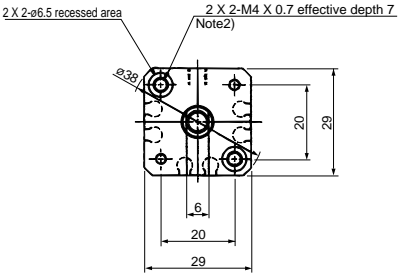
3) Through hole in case of 5 to 15mm stroke. 4) Through-hole in case of 5 or 10mm stroke.

Standard/Rod End Male Thread/10-CQSB12 to 25, 11-CQSB12 to 25

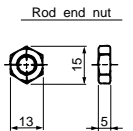
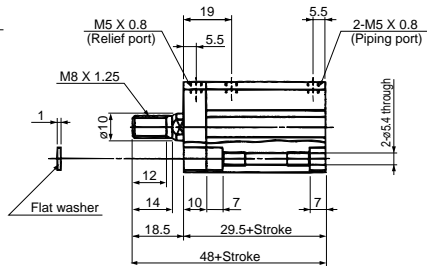
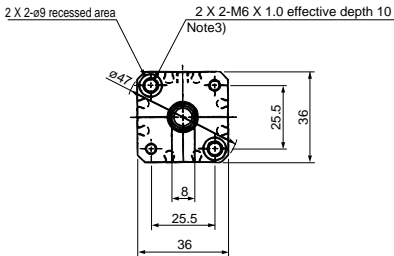
ø12



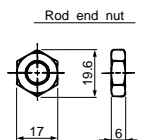
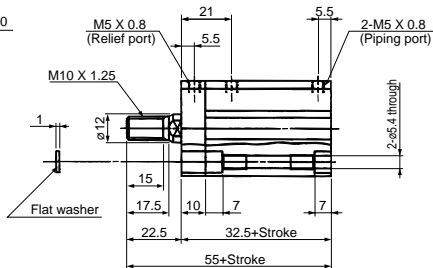
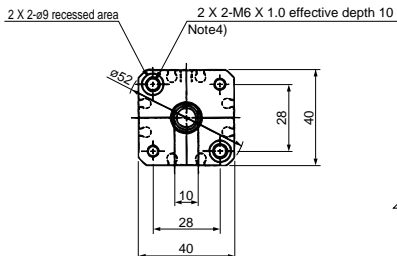
ø16



ø20



ø25

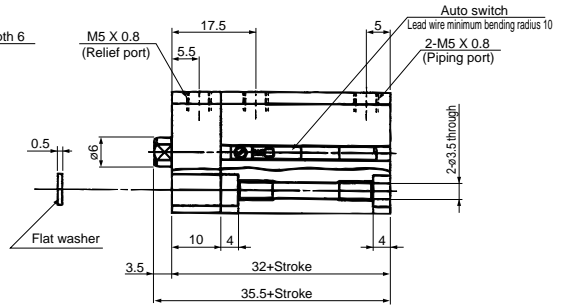
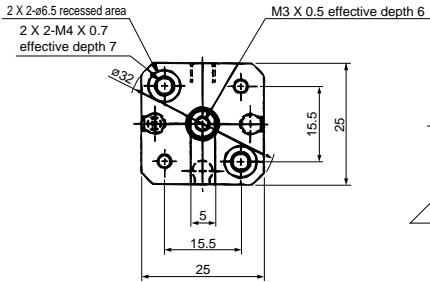


Note 1) Standard strokes available in 5mm increments. 2) Through-hole in case of 5mm stroke.  
3) Through hole in case of 5 to 15mm stroke. 4) Through-hole in case of 5 or 10mm stroke.

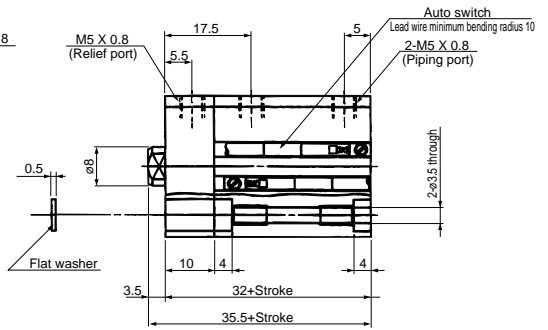
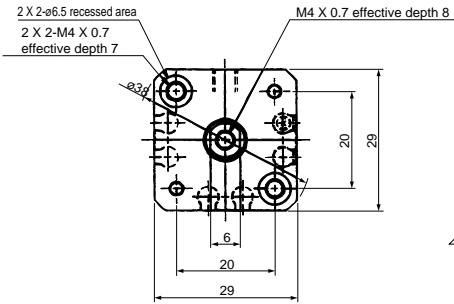
# Compact Cylinder 10-CQS/11-CQS

With Auto Switch/10-CDQSB12 to 25, 11-CDQSB12 to 25

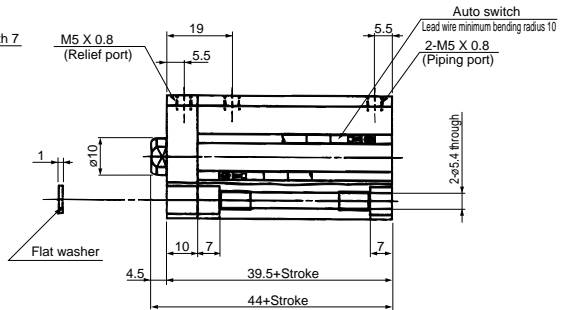
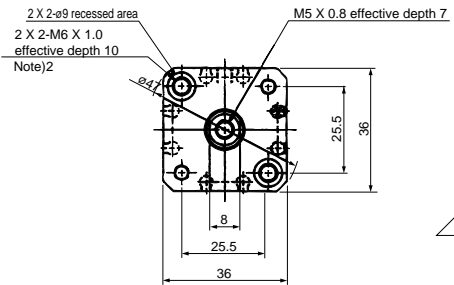
ø12



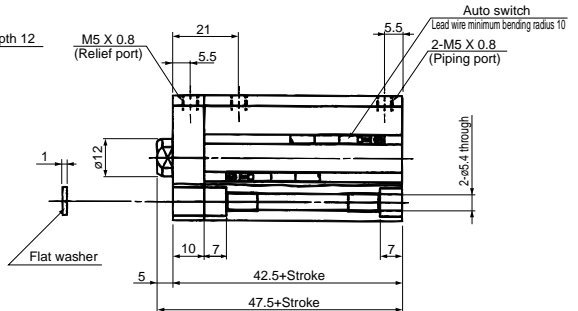
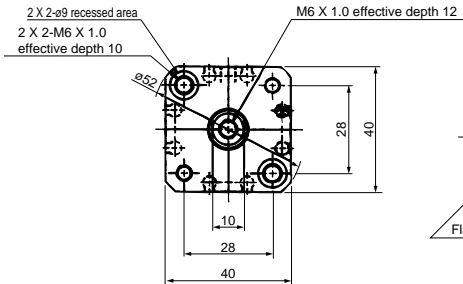
ø16



ø20



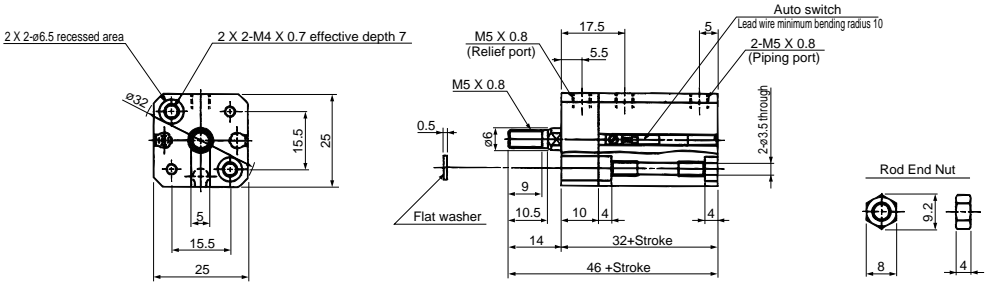
ø25



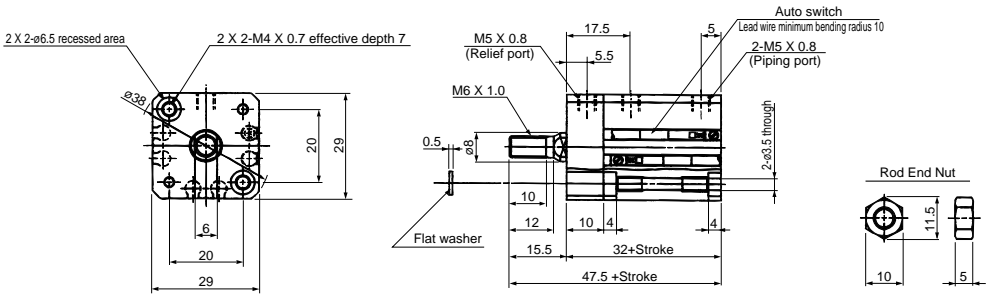
Note 1) Standard strokes available in 5mm increments. 2) Through-hole in case of 5mm stroke.

With Auto Switch/Rod End Male Thread/10-CDQSB12 to 25, 11-CDQSB12 to 25

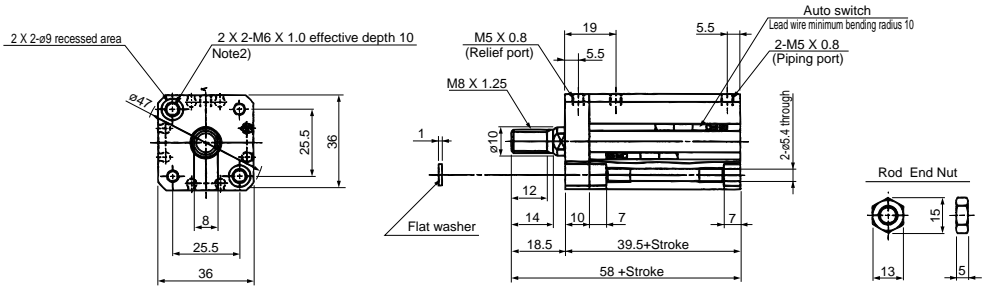
ø12



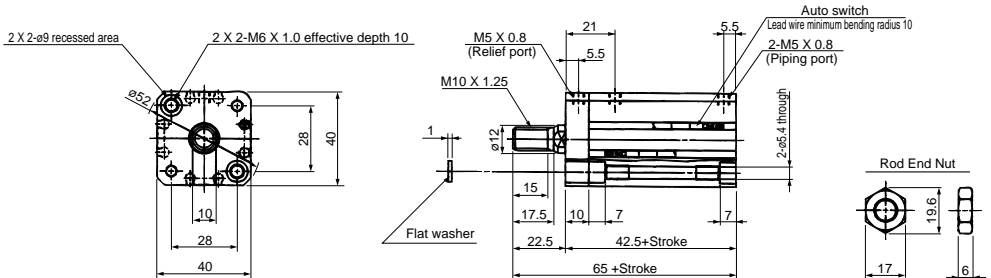
ø16



ø20



ø25



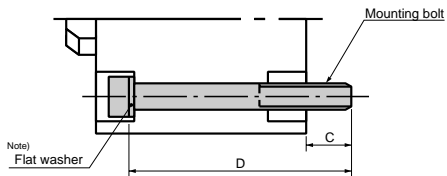
Note 1) Standard strokes available in 5mm increments. 2) Through-hole in case of 5mm stroke.

### CQS Mounting Bolt

**Mounting:** Special long bolt for through-hole mounting is available as option.

**How to Order:** Prefix "Bolt" to the part No. of the required bolt.

**Example)** Bolt M3 X 35/2 pieces



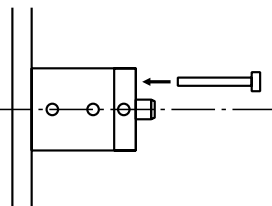
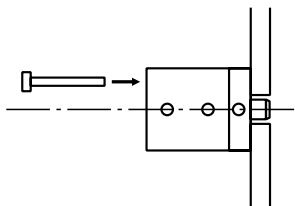
Note) Be sure to use the attached plain washer when mounting a cylinder with a through-hole.

#### Front Mounting/Without Auto Switch

Model		C	D	Mounting bolt
10-	11-	6.5	CQSB12-5D	35 M3 X 35/
			-10D	40 X 40/
			-15D	45 X 45/
			-20D	50 X 50/
			-25D	55 X 55/
			-30D	60 X 60/
10-	11-	6.5	CQSB16-5D	35 M3 X 35/
			-10D	40 X 40/
			-15D	45 X 45/
			-20D	50 X 50/
			-25D	55 X 55/
			-30D	60 X 60/
10-	11-	6.5	CQSB20-5D	35 M5 X 35/
			-10D	40 X 40/
			-15D	45 X 45/
			-20D	50 X 50/
			-25D	55 X 55/
			-30D	60 X 60/
			-35D	65 X 65/
			-40D	70 X 70/
			-45D	75 X 75/
			-50D	80 X 80/
10-	11-	8.5	CQSB25-5D	40 M5 X 40/
			-10D	45 X 45/
			-15D	50 X 50/
			-20D	55 X 55/
			-25D	60 X 60/
			-30D	65 X 65/
			-35D	70 X 70/
			-40D	75 X 75/
			-45D	80 X 80/
			-50D	85 X 85/

#### Rear Mounting/Without Auto Switch

Model		C	D	Mounting bolt
10-	11-	6.5	CQSB12-5D	25 M3 X 25/
			-10D	30 X 30/
			-15D	35 X 35/
			-20D	40 X 40/
			-25D	45 X 45/
			-30D	50 X 50/
10-	11-	6.5	CQSB16-5D	25 M3 X 25/
			-10D	30 X 30/
			-15D	35 X 35/
			-20D	40 X 40/
			-25D	45 X 45/
			-30D	50 X 50/
10-	11-	6.5	CQSB20-5D	25 M5 X 25/
			-10D	30 X 30/
			-15D	35 X 35/
			-20D	40 X 40/
			-25D	45 X 45/
			-30D	50 X 50/
			-35D	55 X 55/
			-40D	60 X 60/
			-45D	65 X 65/
			-50D	70 X 70/
10-	11-	8.5	CQSB25-5D	30 M5 X 30/
			-10D	35 X 35/
			-15D	40 X 40/
			-20D	45 X 45/
			-25D	50 X 50/
			-30D	55 X 55/
			-35D	60 X 60/
			-40D	65 X 65/
			-45D	70 X 70/
			-50D	75 X 75/



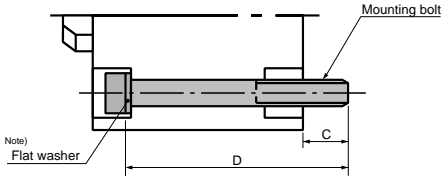


### CDQS Mounting Bolt

**Mounting:** Special long bolt for through-hole mounting is available as option.

**How to Order:** Prefix "Bolt" to the part No. of the required bolt.

**Example)** Bolt M3 X 40/2 pieces



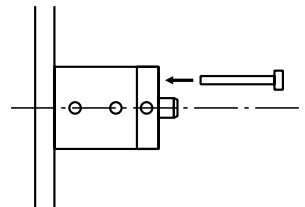
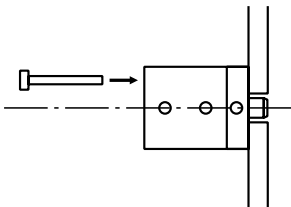
Note) Be sure to use the attached plain washer when mounting a cylinder with a through-hole.

#### Front Mounting/With Auto Switch

	Model	C	D	Mounting bolt
10-11-	CDQSB12-5D	6.5	40	M3 X 40/
	-10D		45	X 45/
	-15D		50	X 50/
	-20D		55	X 55/
	-25D		60	X 60/
	-30D		65	X 65/
10-11-	CDQSB16-5D	6.5	40	M3 X 40/
	-10D		45	X 45/
	-15D		50	X 50/
	-20D		55	X 55/
	-25D		60	X 60/
	-30D		65	X 65/
10-11-	CDQSB20-5D	6.5	45	M5 X 45/
	-10D		50	X 50/
	-15D		55	X 55/
	-20D		60	X 60/
	-25D		65	X 65/
	-30D		70	X 70/
	-35D		75	X 75/
	-40D		80	X 80/
	-45D		85	X 85/
	-50D		90	X 90/
	10-11-		CDQSB25-5D	8.5
-10D		55	X 55/	
-15D		60	X 60/	
-20D		65	X 65/	
-25D		70	X 70/	
-30D		75	X 75/	
-35D		80	X 80/	
-40D		85	X 85/	
-45D		90	X 90/	
-50D		95	X 95/	

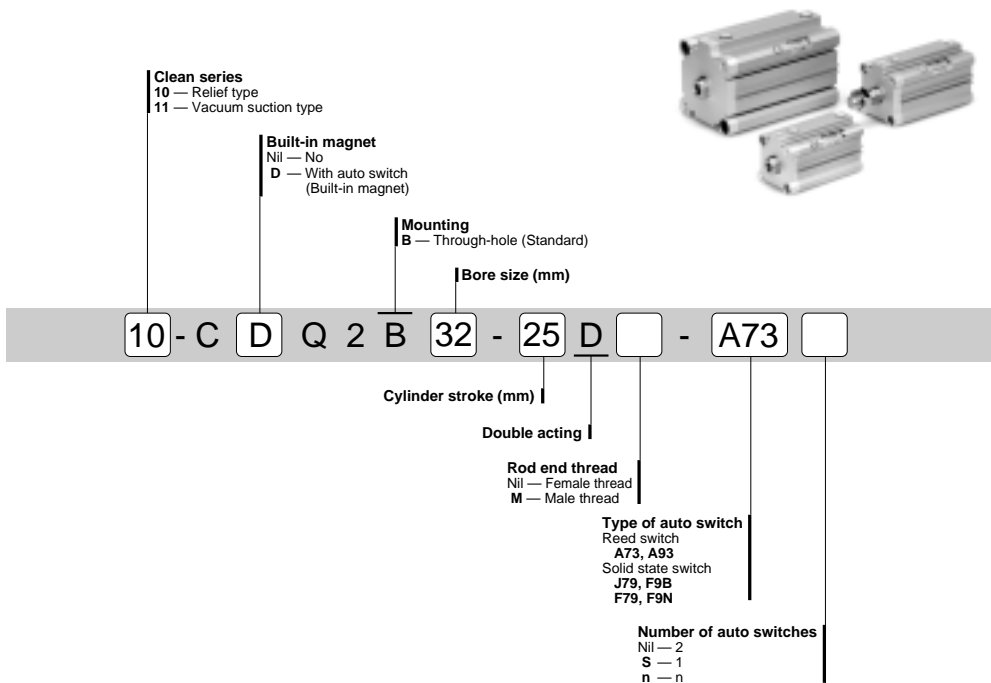
#### Rear Mounting/With Auto Switch

	Model	C	D	Mounting bolt
10-11-	CDQSB12-5D	6.5	30	M3 X 30/
	-10D		35	X 35/
	-15D		40	X 40/
	-20D		45	X 45/
	-25D		50	X 50/
	-30D		55	X 55/
10-11-	CDQSB16-5D	6.5	30	M3 X 30/
	-10D		35	X 35/
	-15D		40	X 40/
	-20D		45	X 45/
	-25D		50	X 50/
	-30D		55	X 55/
10-11-	CDQSB20-5D	6.5	35	M5 X 35/
	-10D		40	X 40/
	-15D		45	X 45/
	-20D		50	X 50/
	-25D		55	X 55/
	-30D		60	X 60/
	-35D		65	X 65/
	-40D		70	X 70/
	-45D		75	X 75/
	-50D		80	X 80/
	10-11-		CDQSB25-5D	8.5
-10D		45	X 45/	
-15D		50	X 50/	
-20D		55	X 55/	
-25D		60	X 60/	
-30D		65	X 65/	
-35D		70	X 70/	
-40D		75	X 75/	
-45D		80	X 80/	
-50D		85	X 85/	



# Series 10-11-CQ2 Compact Cylinder/ø32, ø40, ø50, ø63

## How to Order



## Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-CQ2B32	32	M5 X 0.8, Rc1/8 <sup>Note1)</sup>	Non-lube	Double acting single rod	5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100	Available	Not available	Not available
	10-CQ2B40	40	Rc1/8						
	10-CQ2B50	50	Rc1/4						
	10-CQ2B63	63							
Vacuum suction type	11-CQ2B32	32	M5 X 0.8, Rc1/8 <sup>Note1)</sup>			5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 75, 100			
	11-CQ2B40	40	Rc1/8						
	11-CQ2B50	50	Rc1/4						
	11-CQ2B63	63							

Note1) In case of ø32 without auto switch, only the 5mm stroke type has a port size of M5 X 0.8.

## Specifications

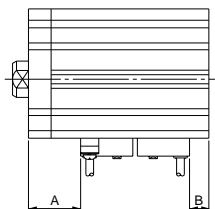
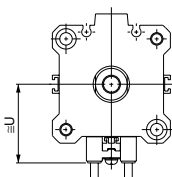
Item	Bore size (mm)
Item	32,40,50,63
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	30 to 400mm/s
Stroke length tolerance	$^{+1.0}_0$
Mounting	Through hole

**Auto Switch Specifications** (Refer to page 2.3-2 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

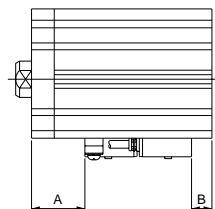
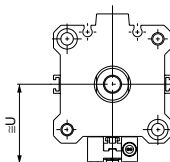
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application	
Reed switch	D-A73, D-A93	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC	
Solid state switch	2-wire system	D-J79, F9B	24VDC (10 to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system	D-F79, F9N	28VDC or less	40mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

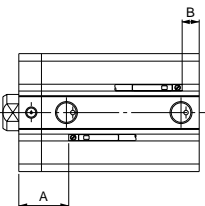
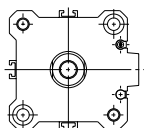
D-A73



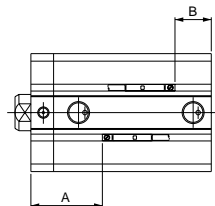
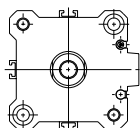
D-J79/F79



D-A93



D-F9N/F9B



Bore size (mm)	D-A73			D-J79/F79			D-A93		D-F9B/F9N	
	A	B	≅U	A	B	≅U	A	B	A	B
32	19	6	31.5	19.5	6.5	32.5	18	5	22	9
40	23	8.5	35	23.5	9	36	22	7.5	26	11.5
50	21	11.5	41	21.5	12	42	20	10.5	24	14.5
63	23.5	14.5	47.5	24	15	48.5	22.5	13.5	26.5	17.5

**⚠ Specific Product Precautions**

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Installation and Removal of Snap Rings**

**⚠ Caution**

- ① Use a proper pair of pliers (a tool to install a C snap ring) in installation and removal.
- ② Be careful even when using a proper pair of pliers (tools to install a C snap ring). There is still danger of the C snap ring being detached from the tip of the pliers and popping up, which can cause human injury or damage to peripheral equipment. When mounting the cylinder, confirm that the C snap ring securely fits in the ring groove before supplying air.

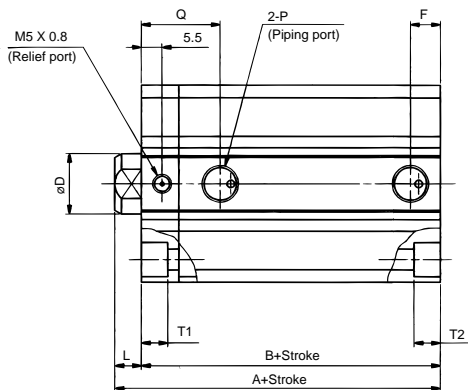
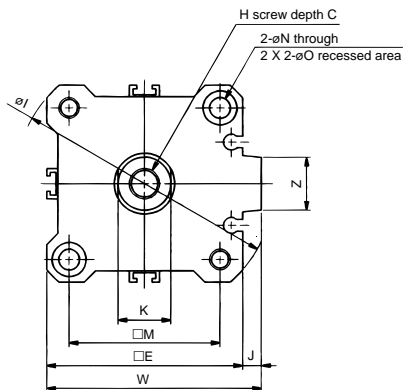
**Precautions**

**⚠ Caution**

- ① Always apply the load to the piston rod in the axial direction.
  - Align carefully when mounting the cylinder.
  - When using it as a stopper, install a guide or take some other measures to prevent lateral load from being directly applied to the piston rod.
- ② Do not loosen or remove the hexagon socket head cap screw securing the rod cover. It may cause the rod cover to be detached, resulting in human injury or damage to peripheral equipment.

# Compact Cylinder 10-CQ2/11-CQ2

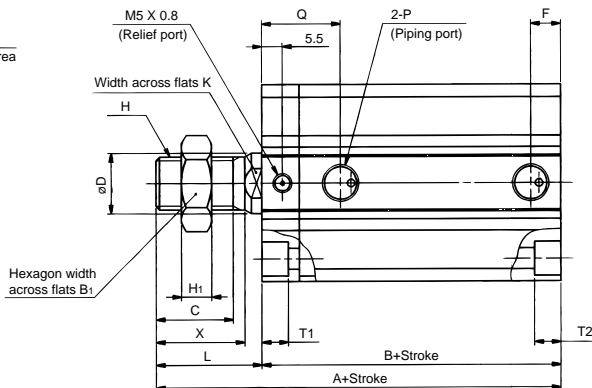
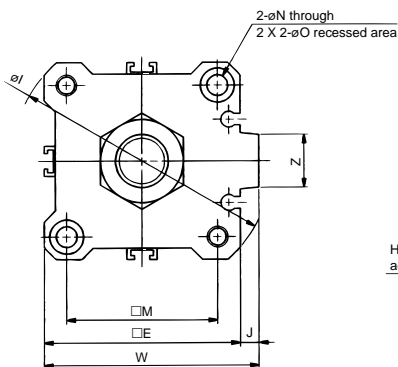
## 10-CQ2B32 to 50, 11-CQ2B32 to 50



Bore size	A		B		C	D	E	F	H	I	J	K	L	M	N	O	P	Q	T1	T2	W	Z	Note1) Stroke range
	50ST or less	75,100ST	50ST or less	75,100ST																			
32	40	50	33	43	13	16	45	5.5 7.5	M8 X 1.25	60	4.5	14	7	34	5.5	9	M5 X 0.8 Rc1/8	21.5 20.5	7	7	49.5	14	5 10 to 50,75,100
40	46.5	56.5	39.5	49.5	13	16	52	8	M8 X 1.25	69	5	14	7	40	5.5	9	Rc1/8	21	6	7	57	14	5 to 50,75,100
50	48.5	58.5	40.5	50.5	15	20	64	10.5	M10 X 1.5	86	7	17	8	50	6.6	11	Rc1/4	20.5	18	8	71	19	10 to 50,75,100

Note1) A spacer of 5, 10, 15 or 20mm is attached to a 75 or 100mm stroke to make an intermediate stroke (55, 60, 65, 70 or 80, 85, 90, 95). Therefore it will have the same dimensions as the 75 or 100mm stroke.

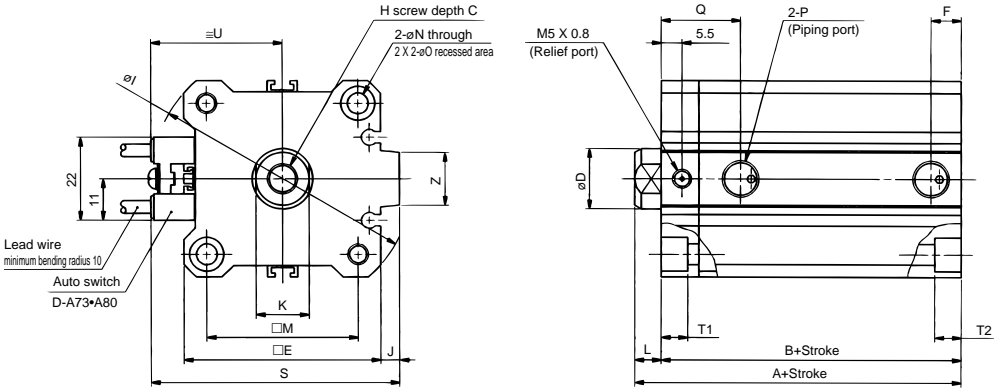
### Rod End Male Thread



Bore size	A		B		B <sub>1</sub>	C	D	E	F	H	H <sub>1</sub>	I	J	K	L	M	N	O	P	Q	T1	T2	W	X	Z	Note1) Stroke range
	50ST or less	75,100ST	50ST or less	75,100ST																						
32	61.5	71.5	33	43	22	20.5	16	45	5.5 7.5	M14 X 1.5	8	60	4.5	14	28.5	34	5.5	9	M5 X 0.8 Rc1/8	21.5 20.5	7	7	49.5	23.5	14	5 10 to 50,75,100
40	68	78	39.5	49.5	22	20.5	16	52	8	M14 X 1.5	8	69	5	14	28.5	40	5.5	9	Rc1/8	21	6	7	57	23.5	14	5 to 50,75,100
50	74	84	40.5	50.5	27	26	20	64	10.5	M18 X 1.5	11	86	7	17	33.5	50	6.6	11	Rc1/4	20.5	18	8	71	28.5	19	10 to 50,75,100

Note1) A spacer of 5, 10, 15 or 20mm is attached to a 75 or 100mm stroke to make an intermediate stroke (55, 60, 65, 70 or 80, 85, 90, 95). Therefore it will have the same dimensions as the 75 or 100mm stroke.

10-CDQ2B32 to 50, 11-CDQ2B32 to 50

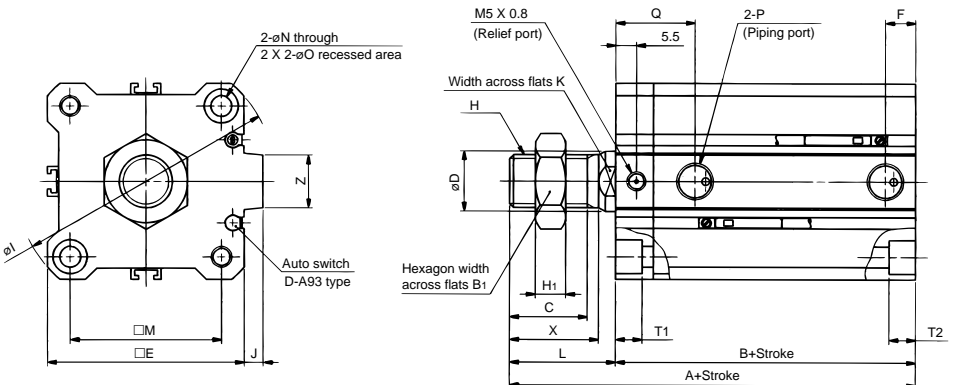


Above drawings are for D-A73 and D-A80.

Bore size	A	B	C	D	E	F	H	I	J	K	L	M	N	O	P	Q	T1	T2	S	U	Z	Stroke range <small>Note1)</small>
32	50	43	13	16	45	7.5	M8 X 1.25	60	4.5	14	7	34	5.5	9	Rc1/8	20.5	7	7	58.5	31.5	14	5 to 50,75,100
40	56.5	49.5	13	16	52	8	M8 X 1.25	69	5	14	7	40	5.5	9	Rc1/8	21	6	7	66	35	14	5 to 50,75,100
50	58.5	50.5	15	20	64	10.5	M10 X 1.5	86	7	17	8	50	6.6	11	Rc1/4	20.5	18	8	80	41	19	10 to 50,75,100

Note1) A spacer of 5, 10, 15 or 20mm is attached to a 75 or 100mm stroke to make an intermediate stroke (55, 60, 65, 70 or 80, 85, 90, 95). Therefore it will have the same dimensions as the 75 or 100mm stroke.

Rod End Male Thread

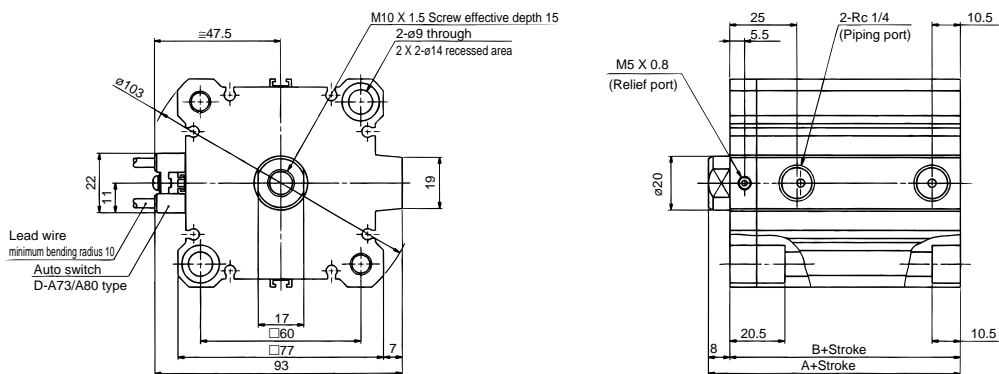


Above drawings are for D-A93.

Bore size	A	B	B <sub>1</sub>	C	D	E	F	H	H <sub>1</sub>	I	J	K	L	M	N	O	P	Q	T1	T2	X	Z	Stroke range <small>Note1)</small>
32	71.5	43	22	20.5	16	45	7.5	M14 X 1.5	8	60	4.5	14	28.5	34	5.5	9	Rc1/8	20.5	7	7	23.5	14	5 to 50,75,100
40	78	49.5	22	20.5	16	52	8	M14 X 1.5	8	69	5	14	28.5	40	5.5	9	Rc1/8	21	6	7	23.5	14	5 to 50,75,100
50	84	50.5	27	26	20	64	10.5	M18 X 1.5	11	86	7	17	33.5	50	6.6	11	Rc1/4	20.5	18	8	28.5	19	10 to 50,75,100

Note1) A spacer of 5, 10, 15 or 20mm is attached to a 75 or 100mm stroke to make an intermediate stroke (55, 60, 65, 70 or 80, 85, 90, 95). Therefore it will have the same dimensions as the 75 or 100mm stroke.

**10-C(D)Q2B63, 11-C(D)Q2B63**



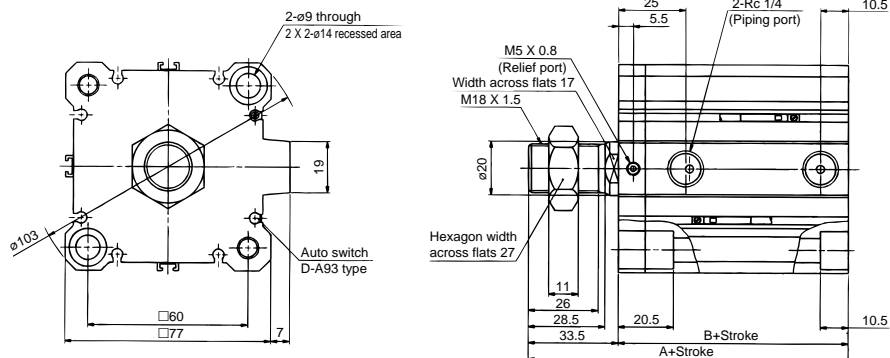
Above drawings are for D-A73 and D-A80.

(mm)

Bore size	Without auto switch		With auto switch		Stroke range Note1)
	A	B	A	B	
63	54	46	64	56	10 to 50
	64	56			75, 100

Note1) A spacer of 5, 10, 15 or 20mm is attached to a 75 or 100mm stroke to make an intermediate stroke (55, 60, 65, 70 or 80, 85, 90, 95). Therefore it will have the same dimensions as the 75 or 100mm stroke.

**Rod End Male Thread**



Above drawings are for D-A93.

(mm)

Bore size	Without auto switch		With auto switch		Stroke range Note1)
	A	B	A	B	
63	79.5	46	89.5	56	10 to 50
	89.5	56			75, 100

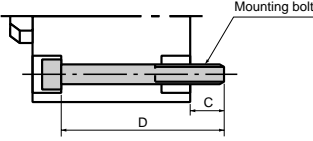
Note1) A spacer of 5, 10, 15 or 20mm is attached to a 75 or 100mm stroke to make an intermediate stroke (55, 60, 65, 70 or 80, 85, 90, 95). Therefore it will have the same dimensions as the 75 or 100mm stroke.

**Mounting Bolt for CQ2**

**Mounting:** Special long bolt for through-hole mounting is available as option.

**How to Order:** Prefix "Bolt" to the part No. of the required bolt.

Example) Bolt M5 X 40/2 pieces

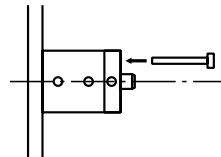
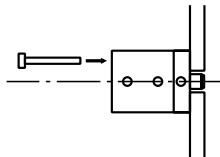


**Front Mounting/Without Auto Switch**

	Model	C	D	Mounting bolt
10-	11-	9	CQ2B32-5D	40 M5 X 40/
			-10D	45 X 45/
			-15D	50 X 50/
			-20D	55 X 55/
			-25D	60 X 60/
			-30D	65 X 65/
			-35D	70 X 70/
			-40D	75 X 75/
			-45D	80 X 80/
			-50D	85 X 85/
			-75D	120 X 120/
-100D	145 X 145/			
10-	11-	7.5	CQ2B40-5D	45 M5 X 45/
			-10D	50 X 50/
			-15D	55 X 55/
			-20D	60 X 60/
			-25D	65 X 65/
			-30D	70 X 70/
			-35D	75 X 75/
			-40D	80 X 80/
			-45D	85 X 85/
			-50D	90 X 90/
			-75D	125 X 125/
-100D	150 X 150/			
10-	11-	12.5	CQ2B50-10D	55 M6 X 55/
			-15D	60 X 60/
			-20D	65 X 65/
			-25D	70 X 70/
			-30D	75 X 75/
			-35D	80 X 80/
			-40D	85 X 85/
			-45D	90 X 90/
			-50D	95 X 95/
			-75D	130 X 130/
			-100D	155 X 155/
10-	11-	14.5	CQ2B63-10D	60 M8 X 60/
			-15D	65 X 65/
			-20D	70 X 70/
			-25D	75 X 75/
			-30D	80 X 80/
			-35D	85 X 85/
			-40D	90 X 90/
			-45D	95 X 95/
			-50D	100 X 100/
			-75D	135 X 135/
			-100D	160 X 160/

**Rear Mounting/Without Auto Switch**

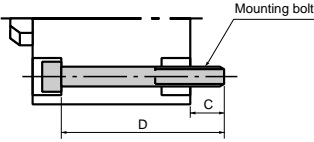
	Model	C	D	Mounting bolt
10-	11-	9	CQ2B32-5D	40 M5 X 40/
			-10D	45 X 45/
			-15D	50 X 50/
			-20D	55 X 55/
			-25D	60 X 60/
			-30D	65 X 65/
			-35D	70 X 70/
			-40D	75 X 75/
			-45D	80 X 80/
			-50D	85 X 85/
			-75D	120 X 120/
-100D	145 X 145/			
10-	11-	11.5	CQ2B40-5D	50 M5 X 50/
			-10D	55 X 55/
			-15D	60 X 60/
			-20D	65 X 65/
			-25D	70 X 70/
			-30D	75 X 75/
			-35D	80 X 80/
			-40D	85 X 85/
			-45D	90 X 90/
			-50D	95 X 95/
			-75D	130 X 130/
-100D	155 X 155/			
10-	11-	12.5	CQ2B50-10D	45 M6 X 45/
			-15D	50 X 50/
			-20D	55 X 55/
			-25D	60 X 60/
			-30D	65 X 65/
			-35D	70 X 70/
			-40D	75 X 75/
			-45D	80 X 80/
			-50D	85 X 85/
			-75D	120 X 120/
			-100D	145 X 145/
10-	11-	14.5	CQ2B63-10D	50 M8 X 50/
			-15D	55 X 55/
			-20D	60 X 60/
			-25D	65 X 65/
			-30D	70 X 70/
			-35D	75 X 75/
			-40D	80 X 80/
			-45D	85 X 85/
			-50D	90 X 90/
			-75D	125 X 125/
			-100D	150 X 150/



**Mounting Bolt for CDQ2**

**Mounting:** Special long bolt for through-hole mounting is available as option.

**How to Order:** Prefix "Bolt" to the part No. of the required bolt.  
 Example) Bolt M5 X 50/2 pieces

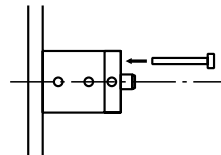
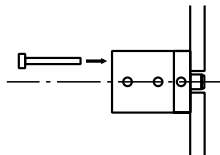


**Front Mounting/With Auto Switch**

	Model	C	D	Mounting bolt
10-	11-	9	CDQ2B32-5D	50 M5 X 50/
			-10D	55 X 55/
			-15D	60 X 60/
			-20D	65 X 65/
			-25D	70 X 70/
			-30D	75 X 75/
			-35D	80 X 80/
			-40D	85 X 85/
			-45D	90 X 90/
			-50D	95 X 95/
-75D	120 X 120/			
-100D	145 X 145/			
10-	11-	7.5	CDQ2B40-5D	55 M5 X 55/
			-10D	60 X 60/
			-15D	65 X 65/
			-20D	70 X 70/
			-25D	75 X 75/
			-30D	80 X 80/
			-35D	85 X 85/
			-40D	90 X 90/
			-45D	95 X 95/
			-50D	100 X 100/
-75D	125 X 125/			
-100D	150 X 150/			
10-	11-	12.5	CDQ2B50-10D	65 M6 X 65/
			-15D	70 X 70/
			-20D	75 X 75/
			-25D	80 X 80/
			-30D	85 X 85/
			-35D	90 X 90/
			-40D	95 X 95/
			-45D	100 X 100/
			-50D	105 X 105/
			-75D	130 X 130/
-100D	155 X 155/			
10-	11-	14.5	CDQ2B63-10D	70 M8 X 70/
			-15D	75 X 75/
			-20D	80 X 80/
			-25D	85 X 85/
			-30D	90 X 90/
			-35D	95 X 95/
			-40D	100 X 100/
			-45D	105 X 105/
			-50D	110 X 110/
			-75D	135 X 135/
-100D	160 X 160/			

**Rear Mounting/With Auto Switch**

	Model	C	D	Mounting bolt
10-	11-	9	CDQ2B32-5D	50 M5 X 50/
			-10D	55 X 55/
			-15D	60 X 60/
			-20D	65 X 65/
			-25D	70 X 70/
			-30D	75 X 75/
			-35D	80 X 80/
			-40D	85 X 85/
			-45D	90 X 90/
			-50D	95 X 95/
-75D	120 X 120/			
-100D	145 X 145/			
10-	11-	11.5	CDQ2B40-5D	60 M5 X 60/
			-10D	65 X 65/
			-15D	70 X 70/
			-20D	75 X 75/
			-25D	80 X 80/
			-30D	85 X 85/
			-35D	90 X 90/
			-40D	95 X 95/
			-45D	100 X 100/
			-50D	105 X 105/
-75D	130 X 130/			
-100D	155 X 155/			
10-	11-	12.5	CDQ2B50-10D	55 M6 X 55/
			-15D	60 X 60/
			-20D	65 X 65/
			-25D	70 X 70/
			-30D	75 X 75/
			-35D	80 X 80/
			-40D	85 X 85/
			-45D	90 X 90/
			-50D	95 X 95/
			-75D	120 X 120/
-100D	145 X 145/			
10-	11-	14.5	CDQ2B63-10D	60 M8 X 60/
			-15D	65 X 65/
			-20D	70 X 70/
			-25D	75 X 75/
			-30D	80 X 80/
			-35D	85 X 85/
			-40D	90 X 90/
			-45D	95 X 95/
			-50D	100 X 100/
			-75D	125 X 125/
-100D	150 X 150/			

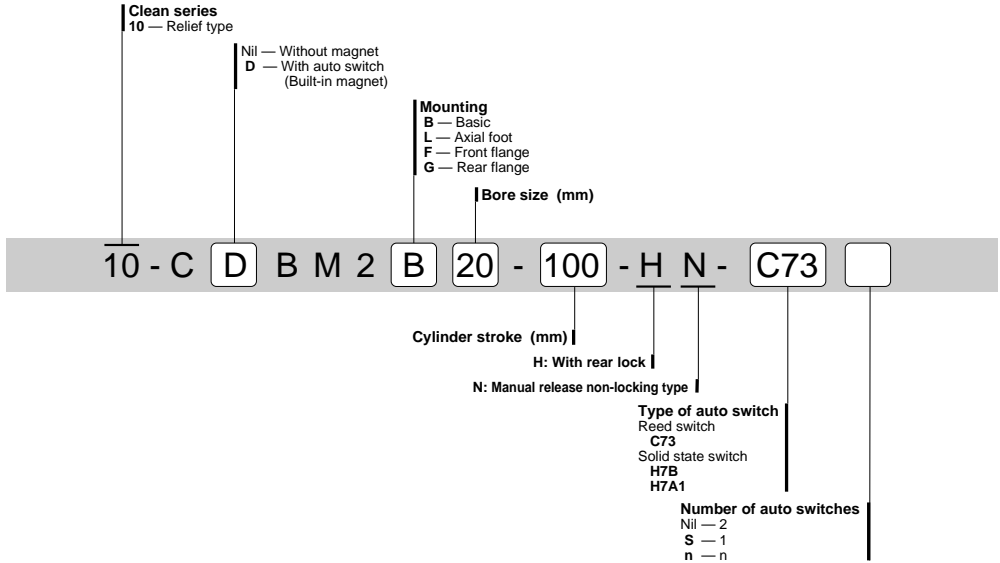






# Series 10-CBM2 End Lock Cylinder/ø20,ø25,ø32,ø40 (With Rear Lock)

## How to Order



## Model

Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
							Rubber	Air
10-CBM2□20	20	Rc1/8	Non-lube	Double acting single rod	25, 50, 75, 100, 125 150, 200, 250, 300	Available	Available	Not available
10-CBM2□25	25							
10-CBM2□32	32							
10-CBM2□40	40	Rc1/4						

## Specifications

Item	Bore size (mm)
Item	20,25,32,40
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	≈0.15MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	30 to 400mm/s
Stroke length tolerance	$^{+1.4}_0$
Mounting	Basic, Axial foot, Front flange, Rear flange

≈0.05 MPa for parts other than the lock part.

## Lock Specifications

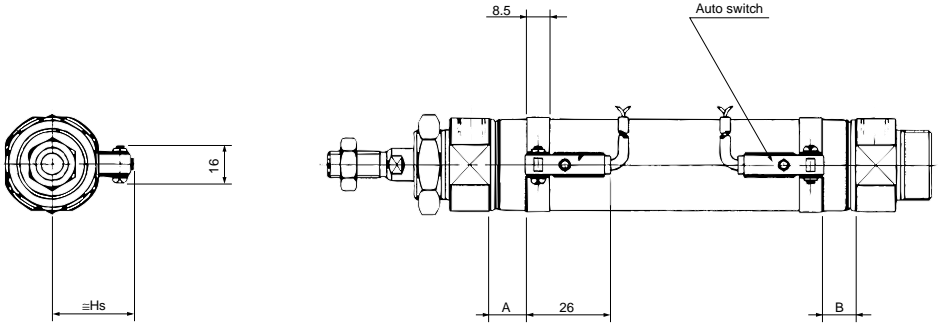
Lock position	Head end			
	ø20	ø25	ø32	ø40
Holding force (Max.) N	215	330	550	860
Backlash	1mm or less			
Manual release	Non-locking type			

**Auto Switch Specifications** (Refer to page 3.4-4 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

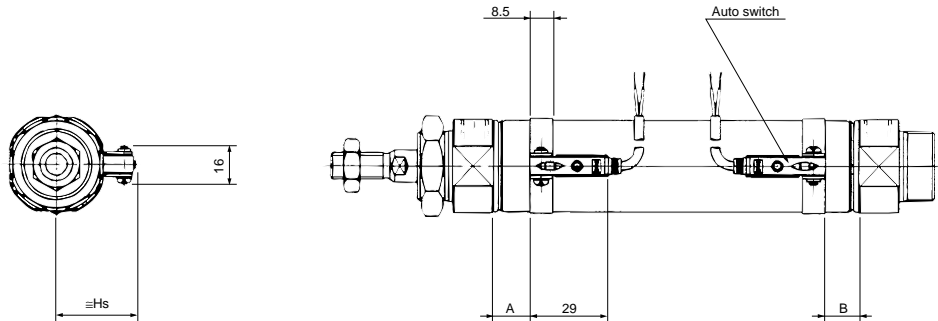
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	3-wire system D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

**D-C73**



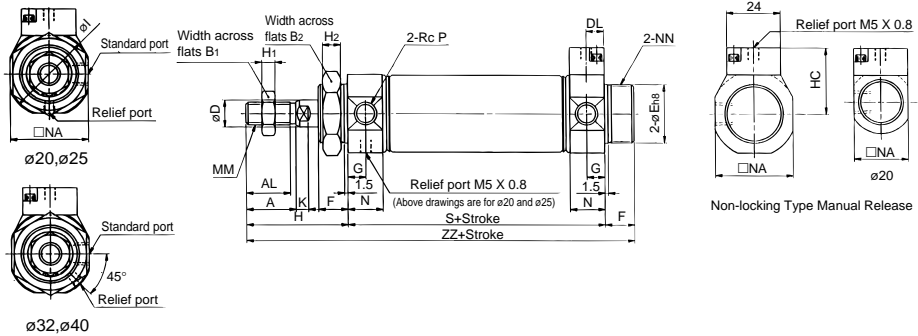
**D-H7A1/H7B**



Bore size	D-C73			D-H7A1/H7B		
	A	B	Hs	A	B	Hs
<b>20</b>	7	6	22.5	6	5	22.5
<b>25</b>	7	6	25	6	5	25
<b>32</b>	8	7	28.5	7	6	28.5
<b>40</b>	13	12	32.5	12	11	32.5

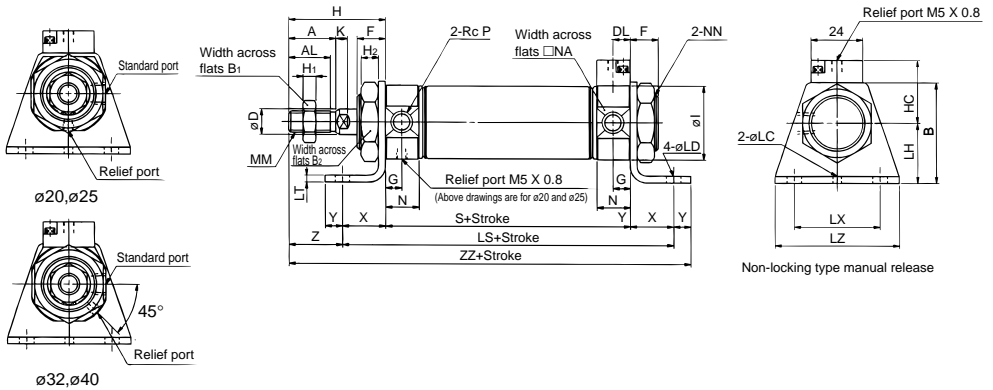
# End Lock Cylinder 10-CBM2

## Basic (B)/10-CBM2B



(mm)																						
Bore size	A	AL	B <sub>1</sub>	B <sub>2</sub>	D	DL	E	F	G	H	H <sub>1</sub>	H <sub>2</sub>	HC	I	K	MM	N	NA	NN	P	S	ZZ
20	18	15.5	13	26	8	7.5	20 <sup>0.033</sup>	13	8	41	5	8	24	28	5	M8 X 1.25	15	24	M20 X 1.5	1/8	62	116
25	22	19.5	17	32	10	7.5	26 <sup>0.033</sup>	13	8	45	6	8	27	33.5	5.5	M10 X 1.25	15	30	M26 X 1.5	1/8	62	120
32	22	19.5	17	32	12	7.5	26 <sup>0.033</sup>	13	8	45	6	8	29.3	37.5	5.5	M10 X 1.25	15	34.5	M26 X 1.5	1/8	64	122
40	24	21	22	41	14	10.5	32 <sup>0.033</sup>	16	11	50	8	10	33.3	46.5	7	M14 X 1.5	21.5	42.5	M32 X 2	1/4	88	154

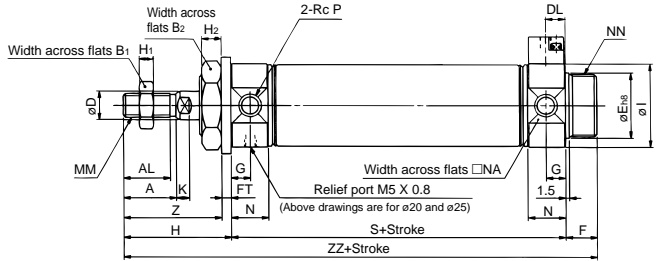
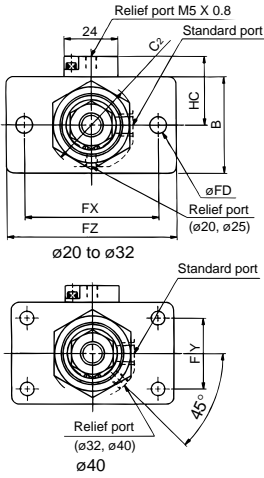
## Axial Foot Type (L)/10-CBM2L



(mm)																							
Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	D	DL	F	G	H	H <sub>1</sub>	H <sub>2</sub>	HC	I	K	LC	LD	LH	LS	LT	LX	LZ	MM
20	18	15.5	40	13	26	8	7.5	13	8	41	5	8	24	28	5	4	6.8	25	102	3.2	40	55	M8 X 1.25
25	22	19.5	47	17	32	10	7.5	13	8	45	6	8	27	33.5	5.5	4	6.8	28	102	3.2	40	55	M10 X 1.25
32	22	19.5	47	17	32	12	7.5	13	8	45	6	8	29.3	37.5	5.5	4	6.8	28	104	3.2	40	55	M10 X 1.25
40	24	21	54	22	41	14	10.5	16	11	50	8	10	33.3	46.5	7	4	7	30	134	3.2	55	75	M14 X 1.5

(mm)										
Bore size	N	NA	NN	P	S	X	Y	Z	ZZ	
20	15	24	M20 X 1.5	1/8	62	20	8	21	131	
25	15	30	M26 X 1.5	1/8	62	20	8	25	135	
32	15	34.5	M26 X 1.5	1/8	64	20	8	25	137	
40	21.5	42.5	M32 X 2	1/4	88	23	10	27	171	

**Front Flange (F)10-CBM2F**



Actuator

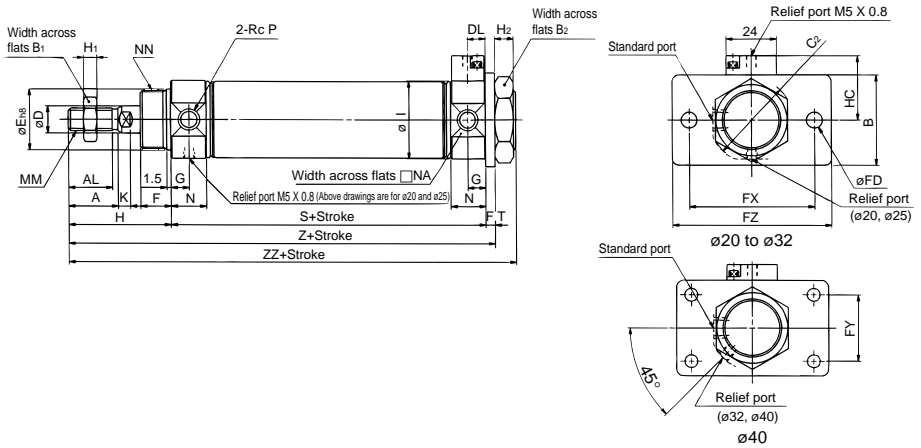
(mm)

Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C <sub>2</sub>	D	DL	E	F	FD	FT	FX	FY	FZ	G	H	H <sub>1</sub>	H <sub>2</sub>	HC	I	K	MM
20	18	15.5	34	13	26	30	8	7.5	20 <sup>0.033</sup>	13	7	4	60	—	75	8	41	5	8	24	28	5	M8 X 1.25
25	22	19.5	40	17	32	37	10	7.5	26 <sup>0.033</sup>	13	7	4	60	—	75	8	45	6	8	27	33.5	5.5	M10 X 1.25
32	22	19.5	40	17	32	37	12	7.5	26 <sup>0.033</sup>	13	7	4	60	—	75	8	45	6	8	29.3	37.5	5.5	M10 X 1.25
40	24	21	52	22	41	47.3	14	10.5	32 <sup>0.033</sup>	16	7	5	66	36	82	11	50	8	10	33.3	46.5	7	M14 X 1.5

(mm)

Bore size	N	NA	NN	P	S	Z	ZZ
20	15	24	M20 X 1.5	1/8	62	37	116
25	15	30	M26 X 1.5	1/8	62	41	120
32	15	34.5	M26 X 1.5	1/8	64	41	122
40	21.5	42.5	M32 X 2	1/4	88	45	154

Rear Flange (G)/10-CBM2G



(mm)

Bore size	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C <sub>2</sub>	D	DL	E	F	FD	FT	FX	FY	FZ	G	H	H <sub>1</sub>	H <sub>2</sub>	HC	I	K	MM
20	18	15.5	34	13	26	30	8	7.5	20 <sup>0,033</sup>	13	7	4	60	—	75	8	41	5	8	24	28	5	M8 X 1.25
25	22	19.5	40	17	32	37	10	7.5	26 <sup>0,033</sup>	13	7	4	60	—	75	8	45	6	8	27	33.5	5.5	M10 X 1.25
32	22	19.5	40	17	32	37	12	7.5	26 <sup>0,033</sup>	13	7	4	60	—	75	8	45	6	8	29.3	37.5	5.5	M10 X 1.25
40	24	21	52	22	41	47.3	14	10.5	32 <sup>0,033</sup>	16	7	5	66	36	82	11	50	8	10	33.3	46.5	7	M14 X 1.5

(mm)

Bore size	N	NA	NN	P	S	Z	ZZ
20	15	24	M20 X 1.5	1/8	62	107	116
25	15	30	M26 X 1.5	1/8	62	111	120
32	15	34.5	M26 X 1.5	1/8	64	113	122
40	21.5	42.5	M32 X 2	1/4	88	143	154

## ⚠ Specific Product Precautions

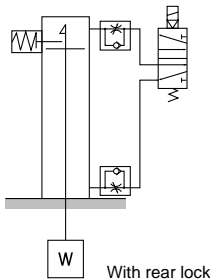
Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Refer to the Recommended Air Pressure Circuit

## ⚠ Caution

- ① It is required for proper lock engagement and disengagement.



### Precautions

## ⚠ Caution

- ① **Do not use a 3 position solenoid valve.**  
Avoid use in combination with a 3 position solenoid valve (especially those of the closed center metal seal type). The lock will not be engaged if air pressure is contained in the port with a lock mechanism.  
Even if the lock is engaged, air leaked from the solenoid valve will enter the cylinder and cause it unlocked after a certain period of time.
- ② **Back pressure is required for unlocking.**  
Before starting, make sure that air is supplied to the side without a lock mechanism as shown in the above diagram. (Refer to Lock Disengagement.) Otherwise, the lock may not be disengaged.
- ③ **Disengage the lock before installing or adjusting the cylinder.**  
If installation proceeds with the lock engaged, the lock may be damaged.
- ④ **Keep the load ratio at 50% or below.**  
If the load ratio exceeds 50%, the lock may not be disengaged or even be damaged.
- ⑤ **Do not operate two or more end lock cylinders synchronized.**  
Do not operate two or more end lock cylinders synchronized to move a single work piece. Either of the cylinders may not be disengaged when required.
- ⑥ **Operate the speed controller for meter-out control.**  
The lock may not be disengaged under meter-in control.
- ⑦ **On the side with a lock, make sure that the controller is operated at the stroke end of the cylinder.**  
The lock may not be engaged or disengaged if the piston in the cylinder has not reached the stroke end.

### Operating Pressure

## ⚠ Caution

- ① Supply an air pressure of 0.15MPa or higher to the port on the side with a lock mechanism, as it is necessary to disengage the lock.

### Exhaust Speed

## ⚠ Caution

- ① The lock will engage automatically if air pressure at the port on the side with a lock mechanism falls below 0.05MPa. Be aware that if the piping on the side with a lock mechanism is narrow and long, or if the speed controller is located far from the cylinder port, the speed of exhaust air could decrease, leading to a longer time for the lock to be engaged. A similar result will ensue if the silencer that is installed on the exhaust port of the solenoid valve is clogged.

### Lock Disengagement

## ⚠ Warning

- ① Before disengaging the lock, be sure to supply air pressure to the port on the side without a lock mechanism, thus preventing the load from being applied to the lock mechanism. (Refer to the recommended air pressure circuit.) If the lock is disengaged while the port on the side without a lock mechanism is exhausting air and the load is being applied to the lock mechanism, undue force will be applied to the lock mechanism. Also, it could be extremely dangerous because the piston rod could move suddenly.

### Manual Disengagement

## ⚠ Caution

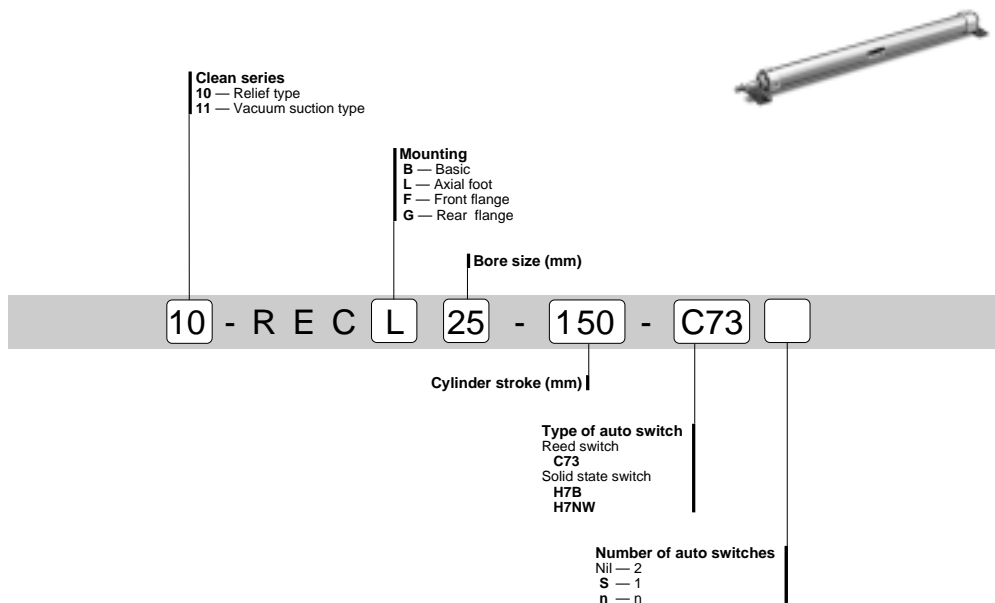
- ① Insert the attached bolt through the cap relief port, screw it into the lock piston and pull the bolt to disengage the lock. Release the bolt to re-engage the lock. The bolt size, pulling force and stroke are given below.

Bore size (mm)	Bolt size	Pulling force	Stroke (mm)
ø20,ø25,ø32	M2.5 X 0.45 X 25/or more	4.9N	2
ø40	M3 X 0.5 X 30/or more	10N	3

Remove the bolt in normal operation. Otherwise, it may cause malfunction failure of the locking.

# Series 10-11-REC Sine Cylinder/ø20, ø25, ø32, ø40

## How to Order



## Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	Effective cushion stroke (mm)
Relief type	10-REC□20	20	Rc1/8	Non-lube	Double acting Single rod	150 to 700	Available	Air cushion (Both sides)	45
	10-REC□25	25				150 to 1000			50
	10-REC□32	32				200 to 1000			60
Vacuum suction type	11-REC□20	20	Rc1/4			150 to 700			45
	11-REC□25	25				150 to 1000			50
	11-REC□32	32	Rc1/4			200 to 1000			60
	11-REC□40	40		200 to 1000	60				

## Specifications

Item	Bore size (mm)
Item	20,25,32,40
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.2MPa
Ambient and fluid temperature	Without auto switch: -10°C to 70°C, With auto switch: -10°C to 60°C (With no condensation)
Piston speed	50 to 400mm/s
Cushion	Air cushion
Stroke length tolerance	to 250 <sup>ST: +1.0</sup> <sub>0</sub> , 251 to 1,000 <sup>ST: +1.4</sup> <sub>0</sub> , 1,001 to 1,500 <sup>ST: +1.8</sup> <sub>0</sub>
Mounting	Standard, Axial foot, Front flange, Rear flange

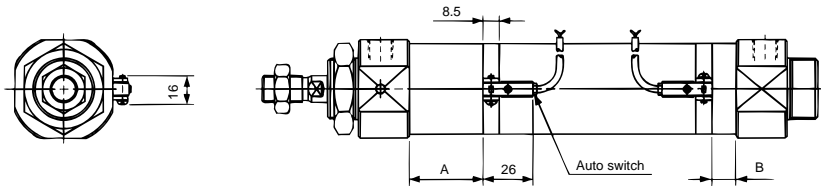


**Auto Switch Specifications** (Refer to page 4.9-6 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

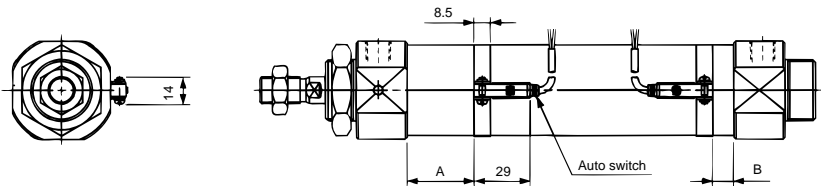
Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC, PLC
	3-wire system D-H7NW	28VDC or less	80mA or less	Yes	Relay, IC circuit, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

**D-C73**



**D-H7B/H7NW**

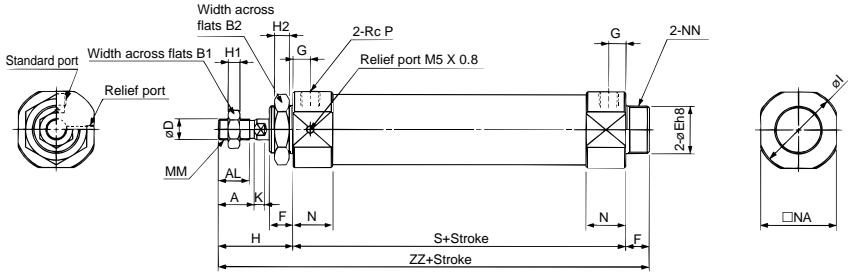


Bore size	D-C73		D-H7B		D-H7NW	
	A	B	A	B	A	B
<b>20</b>	56.1	31.6	55.1	30.6	53.5	29.1
<b>25</b>	56.1	31.6	55.1	30.6	53.5	29.1
<b>32</b>	59.4	36.6	58.4	35.6	56.9	34.1
<b>40</b>	69.9	39.7	68.9	38.7	67.4	37.2

# Sine Cylinder 10-REC/11-REC

## Dimensions

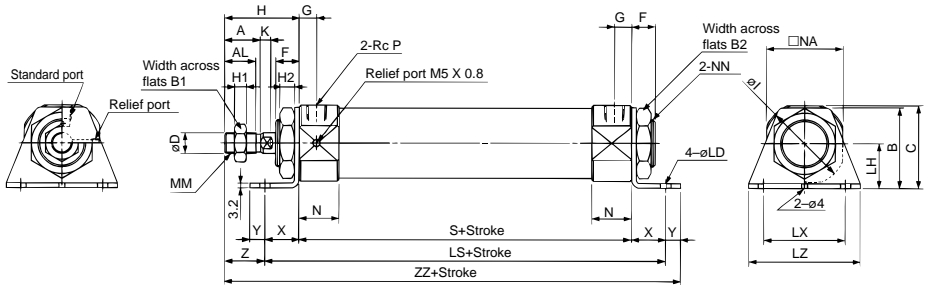
### Basic (B)/10-RECB, 11-RECB



(mm)

Bore size	Stroke range	A	AL	B <sub>1</sub>	B <sub>2</sub>	D	E	F	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	ZZ
20	150 to 700	18	15.5	13	26	8	20 <sup>0.033</sup>	13	10	41	5	8	33.5	5	M8 X 1.25	20	30	M20 X 1.5	1/8	146	200
25	150 to 700	22	19.5	17	32	10	26 <sup>0.033</sup>	13	10	45	6	8	37.5	5.5	M10 X 1.25	20	34.5	M26 X 1.5	1/8	146	204
32	150 to 1000	22	19.5	17	32	12	26 <sup>0.033</sup>	13	11	45	6	8	46.5	5.5	M10 X 1.25	22	42.5	M26 X 1.5	1/8	159	217
40	200 to 1000	24	21	22	41	14	32 <sup>0.039</sup>	16	12.5	50	8	10	56	7	M14 X 1.5	26.5	51	M32 X 2	1/4	181	247

### Axial Foot (L)/10-RECL, 11-RECL

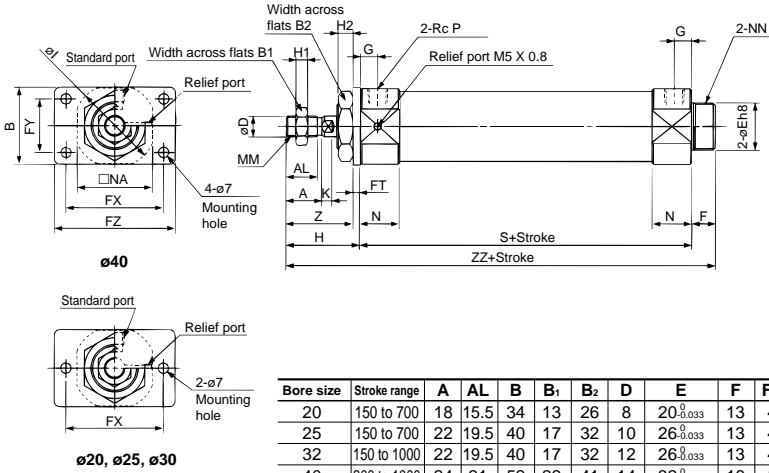


(mm)

Bore size	Stroke range	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	C	D	F	G	H	H <sub>1</sub>	H <sub>2</sub>	I	K	LD	LH	LS	LX	LZ	MM	N	NA
20	150 to 700	18	15.5	40	13	26	40	8	13	10	41	5	8	33.5	5	6.8	25	186	40	55	M8 X 1.25	20	30
25	150 to 700	22	19.5	47	17	32	45.5	10	13	10	45	6	8	37.5	5.5	6.8	28	186	40	55	M10 X 1.25	20	34.5
32	150 to 1000	22	19.5	47	17	32	49.5	12	13	11	45	6	8	46.5	5.5	6.8	28	199	40	55	M10 X 1.25	22	42.5
40	200 to 1000	24	21	54	22	41	55.5	14	16	12.5	50	8	10	56	7	7	30	227	55	75	M14 X 1.5	26.5	51

Bore size	Stroke range	NN	P	S	X	Y	Z	ZZ
20	150 to 700	M20 X 1.5	1/8	146	20	8	21	215
25	150 to 700	M26 X 1.5	1/8	146	20	8	25	219
32	150 to 1000	M26 X 1.5	1/8	159	20	8	25	232
40	200 to 1000	M32 X 2	1/4	181	23	10	27	264

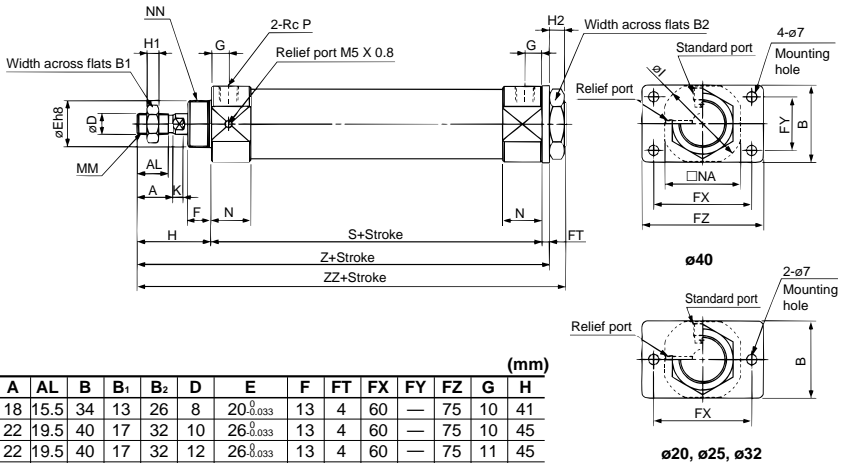
Front Flange (F) /10-RECF, 11-RECF



Bore size	Stroke range	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	D	E	F	FT	FX	FY	FZ	G	H
20	150 to 700	18	15.5	34	13	26	8	20 <sup>0.033</sup>	13	4	60	—	75	10	41
25	150 to 700	22	19.5	40	17	32	10	26 <sup>0.033</sup>	13	4	60	—	75	10	45
32	150 to 1000	22	19.5	40	17	32	12	26 <sup>0.033</sup>	13	4	60	—	75	11	45
40	200 to 1000	24	21	52	22	41	14	32 <sup>0.039</sup>	16	5	66	36	82	12.5	50

Bore size	Stroke range	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	Z	ZZ
20	150 to 700	5	8	33.5	5	M8 X 1.25	20	30	M20 X 1.5	1/8	146	37	200
25	150 to 700	6	8	37.5	5.5	M10 X 1.25	20	34.5	M26 X 1.5	1/8	146	41	204
32	150 to 1000	6	8	46.5	5.5	M10 X 1.25	22	42.5	M26 X 1.5	1/8	159	41	217
40	200 to 1000	8	10	56	7	M14 X 1.5	26.5	51	M32 X 2	1/4	181	45	247

Rear Flange (G) /10-RECG, 11-RECG



Bore size	Stroke range	A	AL	B	B <sub>1</sub>	B <sub>2</sub>	D	E	F	FT	FX	FY	FZ	G	H
20	150 to 700	18	15.5	34	13	26	8	20 <sup>0.033</sup>	13	4	60	—	75	10	41
25	150 to 700	22	19.5	40	17	32	10	26 <sup>0.033</sup>	13	4	60	—	75	10	45
32	150 to 1000	22	19.5	40	17	32	12	26 <sup>0.033</sup>	13	4	60	—	75	11	45
40	200 to 1000	24	21	52	22	41	14	32 <sup>0.039</sup>	16	5	66	36	82	12.5	50

Bore size	Stroke range	H <sub>1</sub>	H <sub>2</sub>	I	K	MM	N	NA	NN	P	S	Z	ZZ
20	150 to 700	5	8	33.5	5	M8 X 1.25	20	30	M20 X 1.5	1/8	146	191	200
25	150 to 700	6	8	37.5	5.5	M10 X 1.25	20	34.5	M26 X 1.5	1/8	146	195	204
32	150 to 1000	6	8	46.5	5.5	M10 X 1.25	22	42.5	M26 X 1.5	1/8	159	208	217
40	200 to 1000	8	10	56	7	M14 X 1.5	26.5	51	M32 X 2	1/4	181	236	247

## ⚠ Specific Product Precautions

Be sure to read before handling.  
 Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Speed Control

#### ⚠ Caution

①The throttle type of SMC's speed controller (Series 10-AS) is recommended.

##### Recommended speed controllers

Model	Model		
	Elbow type	Straight union type	In line type
⚠ <b>REC20</b>	10-AS2201F-01-06-X214	10-AS2301F-01-06-X214	10-AS2001F-06-X214
⚠ <b>REC25</b>	10-AS2201F-01-06-X214	10-AS2301F-01-06-X214	10-AS2001F-06-X214
⚠ <b>REC32</b>	10-AS2201F-01-06-X214	10-AS2301F-01-06-X214	10-AS3001F-08-X214
⚠ <b>REC40</b>	10-AS3201F-02-08-X214	10-AS3301F-02-08-X214	10-AS3001F-08-X214

②Although speed adjustment is possible with meter-in and meter-out speed controllers, smooth acceleration and deceleration may not be achieved.

In case the mounting orientation is not horizontal, a system with a pressure regulating circuit on the lower side is recommended. (It is also effective to shorten start-up delay in rising and for energy conservation.)

### Cushion Adjustment

#### ⚠ Caution

①Cushion adjustment mechanism is not provided.

It is not necessary because the model can perform smooth acceleration and deceleration in a wide range of strokes without an adjusting cushion.

### Relief Port

#### ⚠ Caution

①The clean series is not provided with hexagon socket head screws attached to the standard series. Therefore, the product can be used as a relief port without any changes. The standard product looks like a clean series product when the hexagon socket head screws are removed. Be careful, however, since the rod seal A and grease are not the same, the required performance may not be achieved.



# Series 11-12-**CXSJ** Dual Rod Cylinder/Compact Type $\varnothing 6, \varnothing 10$

## How to Order

**12 - CXS J L 6 - 50 - A93 S**

**Clean series**

11	Vacuum suction type
12	Relief type

**Compact type**

**Bearing**

M	Slide bearing
*L	Ball bushing bearing

\*Only ball bushing and bearing is available with series 12.

**Number of auto switches**

Nil	2
S	1
n	n

**Type of auto switch**

Nil	Without auto switch (Built-in magnet)
-----	---------------------------------------

\*Select the applicable auto switch from the table below.

**Bore size/Stroke (mm)**

Bore size	Standard stroke
6	10, 20, 30, 40, 50
10	10, 20, 30, 40, 50

## Auto Switch Specifications (Refer to CAT.ES20-53 E for detailed specifications and auto switches not in the following table.)

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage			Switch model	Lead wire length (m)*			Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)		
								Horizontal					
<b>Reed switch</b>	—	Grommet	Yes	2-wire	24V	12V	100V	<b>A93</b>	●	●	—	—	Relay, PLC
<b>Solid state switch</b>	—	Grommet	Yes	3-wire (NPN)	24V	12V	—	<b>F9N</b>	●	●	—	—	Relay, PLC
				2-wire				<b>F9B</b>	●	●	—	—	

\*Lead wire symbol 0.5m-----Nil (Example) A93  
3m-----L A93L

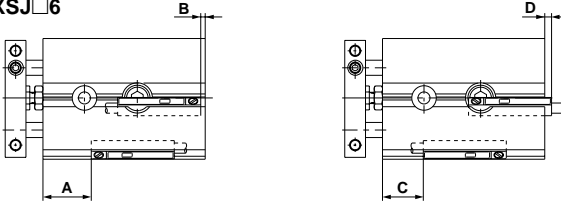
## Specifications

Bore size (mm)	6	10
<b>Fluid</b>	Air (Non-lube)	
<b>Proof pressure</b>	1.05MPa	
<b>Max. operating pressure</b>	0.7MPa	
<b>Min. operating pressure</b>	0.15MPa	0.1MPa
<b>Ambient and fluid temperature</b>	-10°C to 60°C (With no condensation)	
<b>Piston speed</b>	30 to 400mm/s	
<b>Cushion</b>	Rubber bumper	
<b>Stroke adjustable range</b>	0 to -5 mm on standard stroke	
<b>Port size</b>	M3 X 0.5	M5 X 0.8

\*The maximum piston operating speeds given in the table above are for the extending side. The maximum piston operating speed for the retracting side are approximately 70% those of the extending side.

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

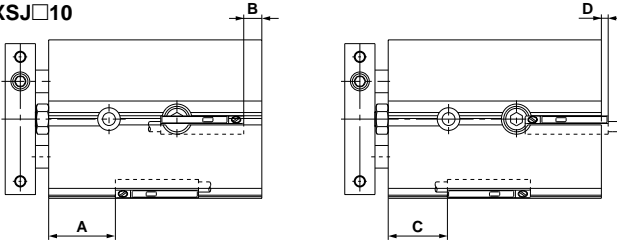
11-**CXSJ**□6  
12-**CXSJ**□6



Symbol	D-A93	D-F9□
<b>A</b>	18.9(20.2)	22.9(24.2)
Note1) <b>B</b>	—	2.1(0.8)
<b>C</b>	14.4(15.7)	12.9(11.6)
<b>D</b>	6.4(7.7)	7.9(9.2)

(mm)  
Note1) For D-A93, only electrical entry from outside (D dimension) is available.  
Note2) Dimensions in parentheses are for 12-CXSJ□6.

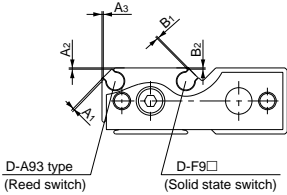
11-**CXSJ**□10  
12-**CXSJ**□10



Symbol	D-A93	D-F9□
<b>A</b>	30.2(31.3)	34.2(35.3)
Note1) <b>B</b>	—	3.3(2.2)
<b>C</b>	25.7(26.8)	24.2(25.3)
<b>D</b>	5.2(6.3)	6.7(7.8)

(mm)  
Note1) For D-A93, only electrical entry from outside (D dimension) is available.  
Note2) Dimensions in parentheses are for 12-CXSJ□10.

**Auto switch mounting dimensions**



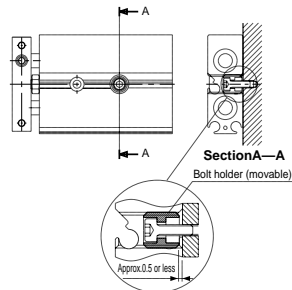
Switch model	Symbol	Bore size 6, 10
<b>D-A93</b>	A1	0.4
	A2, A3	0.3
	B1	0.4
<b>D-F9□</b>	B2	0.3

**⚠ Specific Product Precautions**

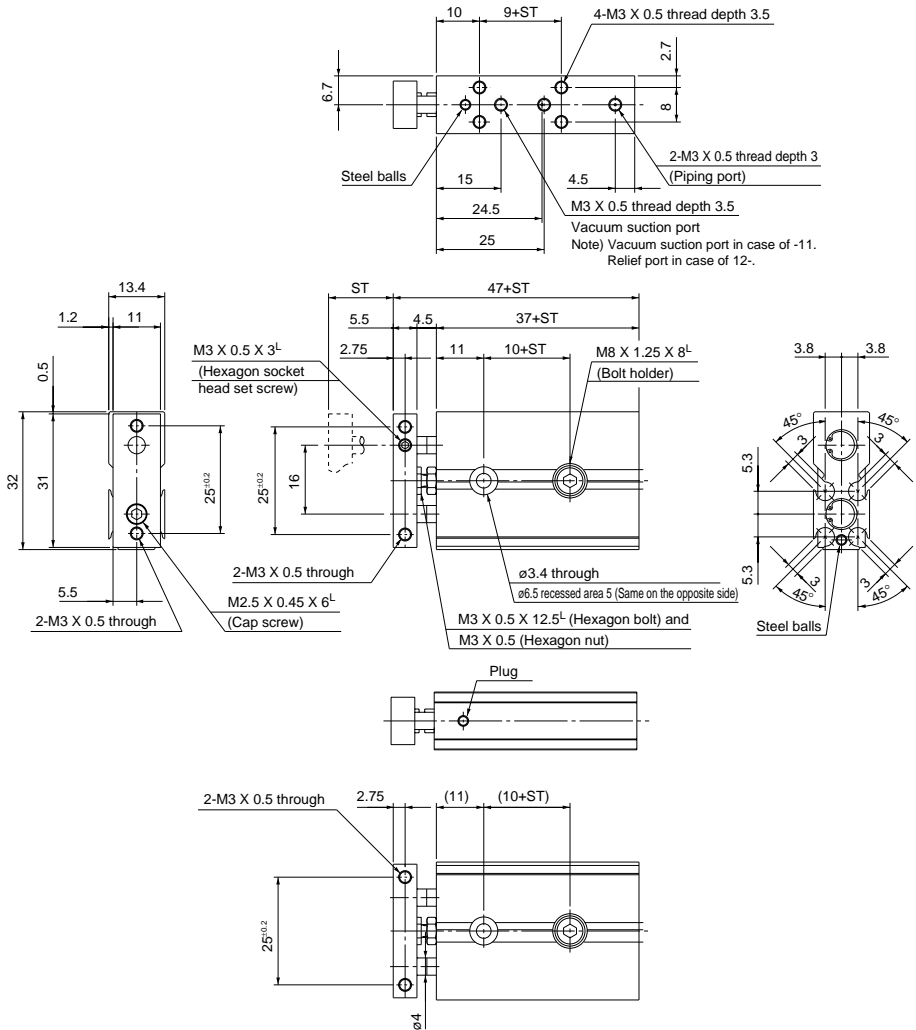
Be sure to read before handling.  
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Mounting**

Adjust the bolt holder position using a hexagon wrench with 3mm width across flats so that it will not protrude from the cylinder mounting surface. (An approx. 0.5mm recession might be a guideline). Be careful if the bolt holder position is not adjusted properly, it will interfere with the switch groove to hinder switch mounting.

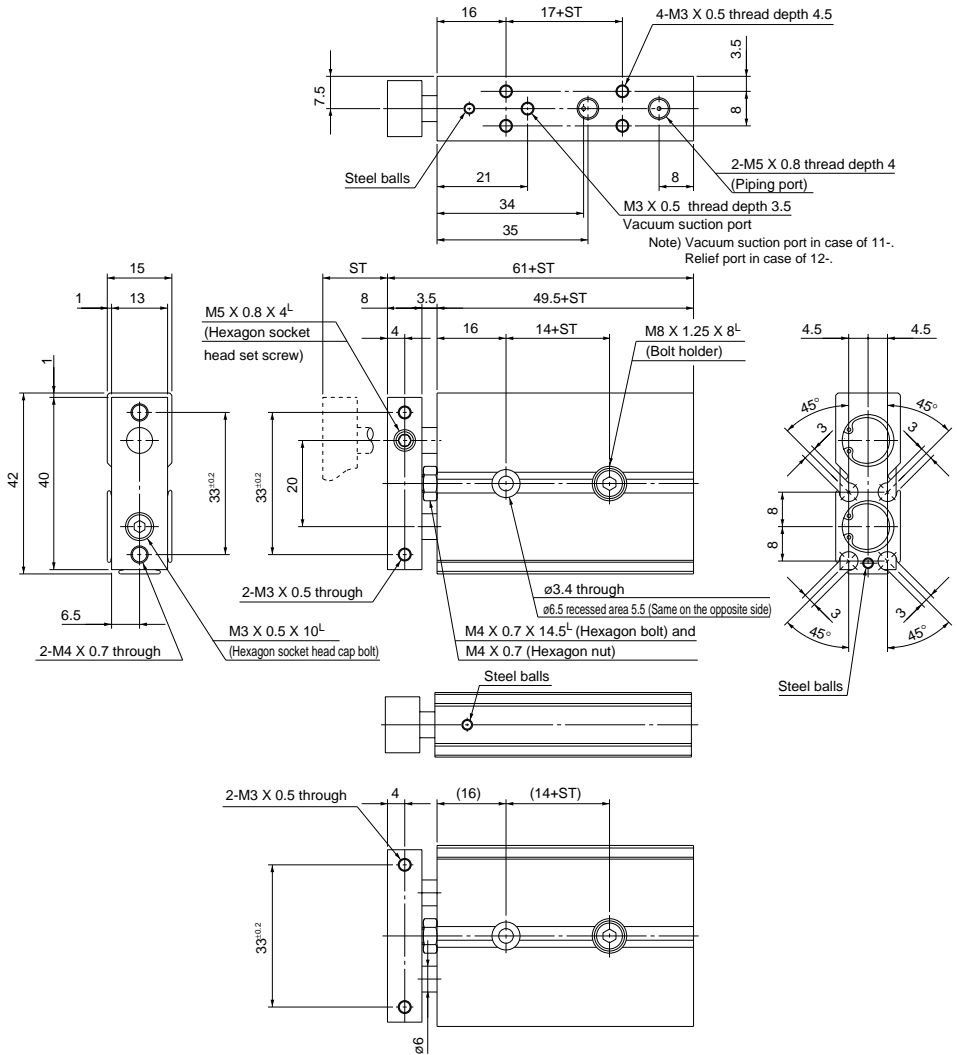


**Dimensions/ø6**



Part no.	ST	9+ST	10+ST	37+ST	47+ST
11-CXSJ□6-10	10	19	20	47	57
11-CXSJ□6-20	20	29	30	57	67
11-CXSJ□6-30	30	39	40	67	77
11-CXSJ□6-40	40	49	50	77	87
11-CXSJ□6-50	50	59	60	87	97



**Dimensions/ø10**

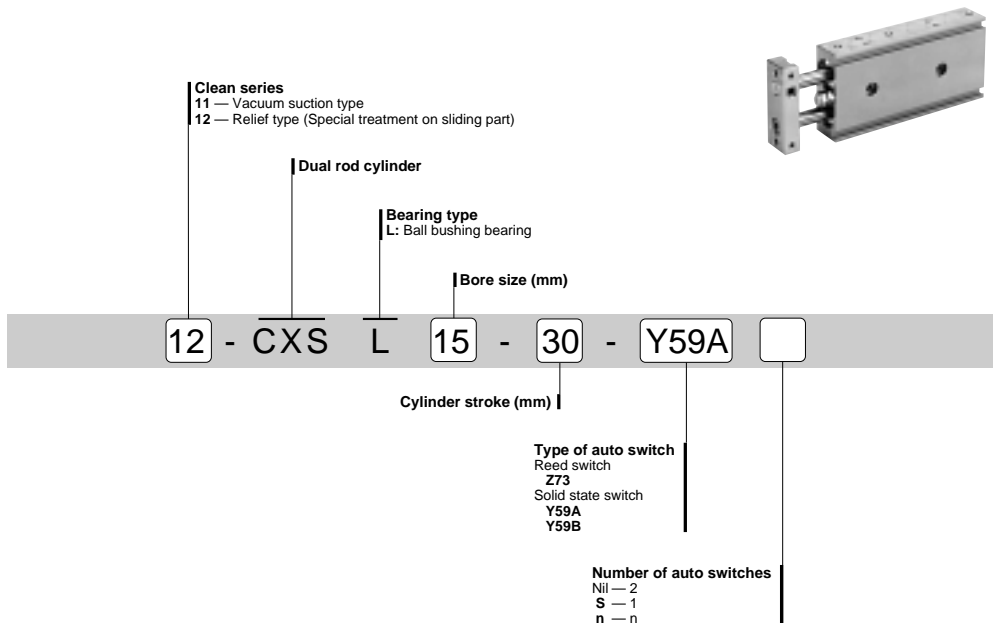
(mm)

Part no.	ST	14+ST	17+ST	49.5+ST	61+ST
$\frac{1}{2}$ CXSJ□10-10	10	24	27	59.5	71
$\frac{1}{2}$ CXSJ□10-20	20	34	37	69.5	81
$\frac{1}{2}$ CXSJ□10-30	30	44	47	79.5	91
$\frac{1}{2}$ CXSJ□10-40	40	54	57	89.5	101
$\frac{1}{2}$ CXSJ□10-50	50	64	67	99.5	111

# Series 11-12-CXSL

Dual Rod Cylinder  
 ø6, ø10, ø15, ø20, ø25, ø32

## How to Order



## Model

Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
							Rubber	Air
Vacuum suction type	11-CXSL6	6	Non-lube	Double acting Single rod	10, 20, 30, 40, 50	Available	Available (Both sides)	Not available
	11-CXSL10	10						
	11-CXSL15	15						
	11-CXSL20	20			10, 20, 30, 40, 50, 75, 100			
	11-CXSL25	25						
	11-CXSL32	32						
Relief type (special treatment on sliding part)	12-CXSL6	6	M5 X 0.8	Double acting Single rod	10, 20, 30, 40, 50	Available	Available (Both sides)	Not available
	12-CXSL10	10						
	12-CXSL15	15						
	12-CXSL20	20			10, 20, 30, 40, 50, 75, 100			
	12-CXSL25	25						
	12-CXSL32	32						

## Specifications

Item	Bore size (mm)	6	10, 15	20, 25, 32
<b>Proof pressure</b>			1.05MPa	
<b>Max. operating pressure</b>			0.7MPa	
<b>Min. operating pressure</b>		0.15MPa	0.1MPa	0.05MPa
<b>Ambient and fluid temperature</b>		-10 to 60°C (With no condensation)		
<b>Piston speed</b>		30 to 400mm/s		
<b>Stroke adjustable range</b>		0 to -5 mm on standard stroke		
<b>Bearing</b>		Ball bushing bearing		

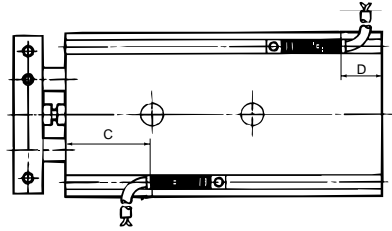
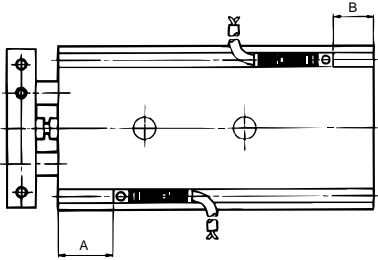
**Auto Switch Specifications** (Refer to page 3.7-2 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application	
Reed switch	D-Z73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC	
Solid state switch	2-wire system	D-Y59B	24VDC (10 to 28V)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system	D-Y59A	28VDC or less	40mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

Electrical entry direction/Inward

Electrical entry direction/Electrical entry: Outward



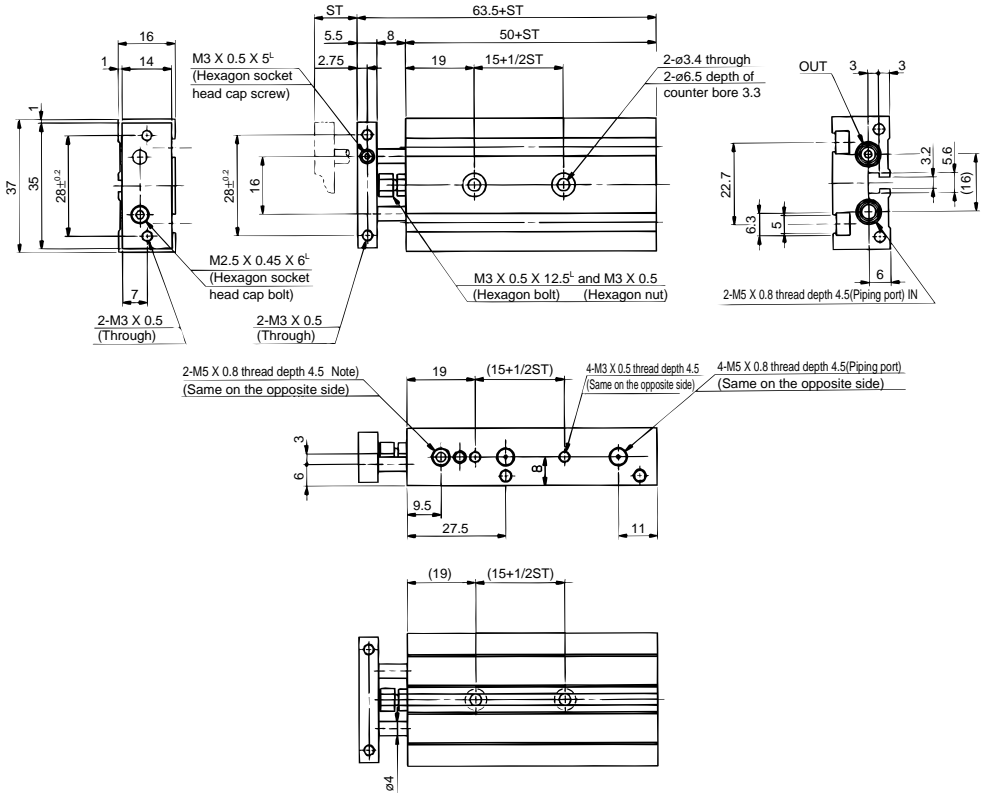
(mm)

Bore size	D-Z73,D-Y59A,D-Y59B			
	A	B	C	D
6	18	7	14	3
10	27	8	23	4
15	38	4.5	34	0.5
20	50	7	46	3
25	50.5	8.5	46.5	4.5
32	60	9	56	5

Switches are mounted with electrical entries from inside at the factory.

# Dual Rod Cylinder 11-CXSL/12-CXSL

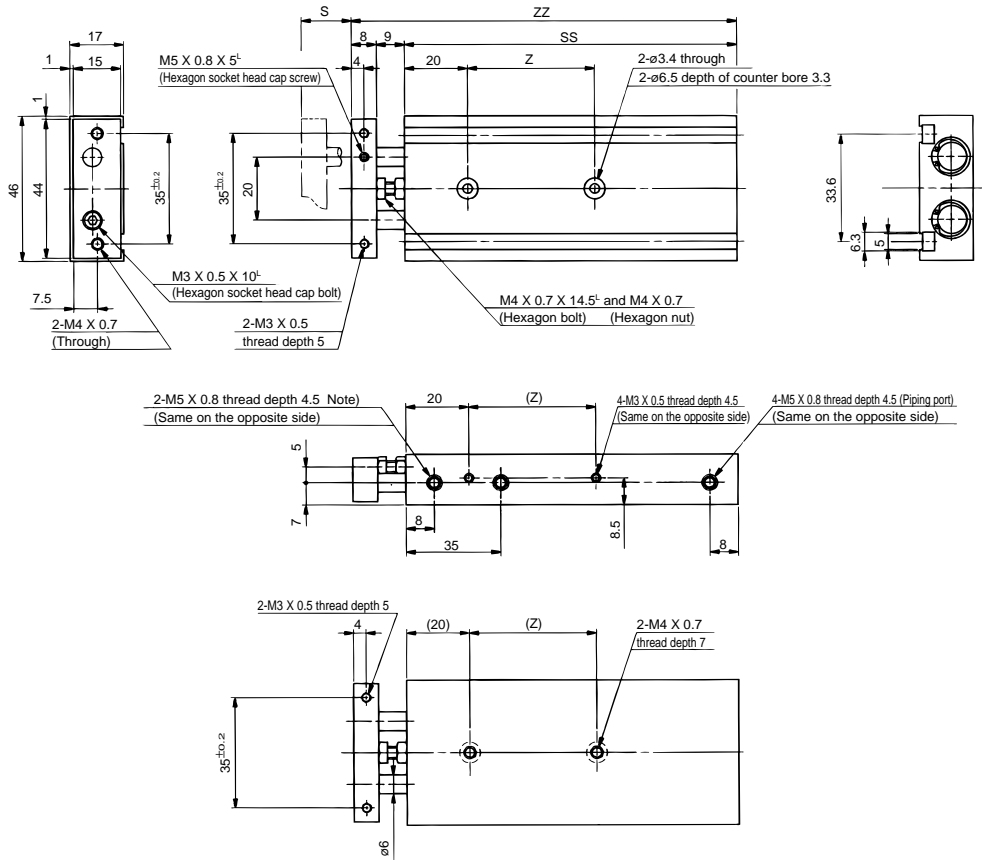
## Basic/11-CXSL6, 12-CXSL6



Note) Vacuum ports are used in case of 11-. Be sure to vacuum air from 2 ports on both sides.  
 Exhaust ports are used in case of 12-. Be sure to exhaust air from a port on one side. Unlike vacuum suction, exhaust does not require 2 ports so the piston rod B side port is plugged with 12-.

(mm)

Model	15+1/2ST	50+ST	63.5+ST
11-CXSL6-10	20	60	73.5
11-CXSL6-20	25	70	83.5
11-CXSL6-30	30	80	93.5
11-CXSL6-40	35	90	103.5
11-CXSL6-50	40	100	113.5

**Basic/11-CXSL10, 12-CXSL10**

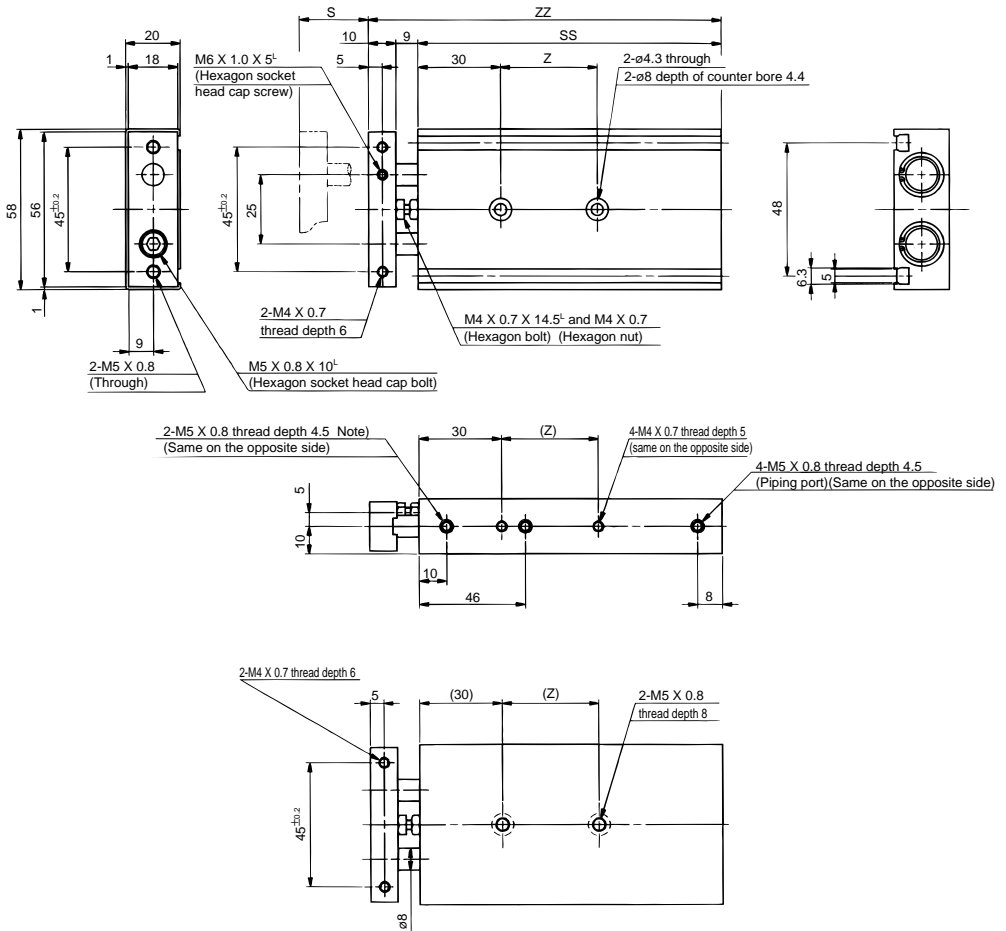
Note) Vacuum ports are used in case of 11-. Be sure to vacuum air from 2 ports on both sides.  
Exhaust ports are used in case of 12-. Be sure to exhaust air from a port on one side. Unlike vacuum suction, exhaust does not require 2 ports so the piston rod B side port is plugged with 12-.

(mm)

Model	S	SS	ZZ	Z
$\frac{1}{2}$ CXSL10-10	10	70	87	30
$\frac{1}{2}$ CXSL10-20	20	80	97	30
$\frac{1}{2}$ CXSL10-30	30	90	107	40
$\frac{1}{2}$ CXSL10-40	40	100	117	40
$\frac{1}{2}$ CXSL10-50	50	110	127	40

# Dual Rod Cylinder 11-CXSL/12-CXSL

## Basic/11-CXSL15, 12-CXSL15



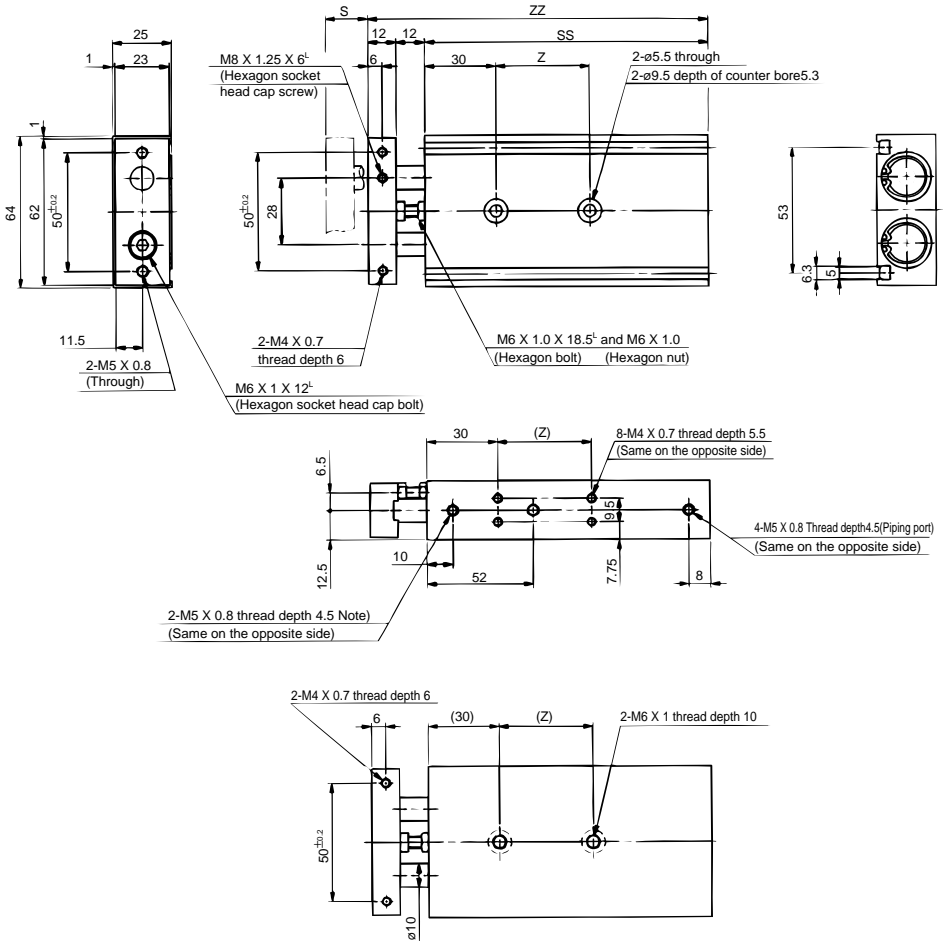
Note) Vacuum ports are used in case of 11-. Be sure to vacuum air from 2 ports on both sides.

Exhaust ports are used in case of 12-. Be sure to exhaust air from a port on one side. Unlike vacuum suction, exhaust does not require 2 ports so the piston rod B side port is plugged with 12-.

(mm)

Model	S	SS	ZZ	Z
11-CXSL15-10	10	77.5	96.5	25
11-CXSL15-20	20	87.5	106.5	25
11-CXSL15-30	30	97.5	116.5	35
11-CXSL15-40	40	107.5	126.5	35
11-CXSL15-50	50	117.5	136.5	45

Basic/11-CXSL20, 12-CXSL20

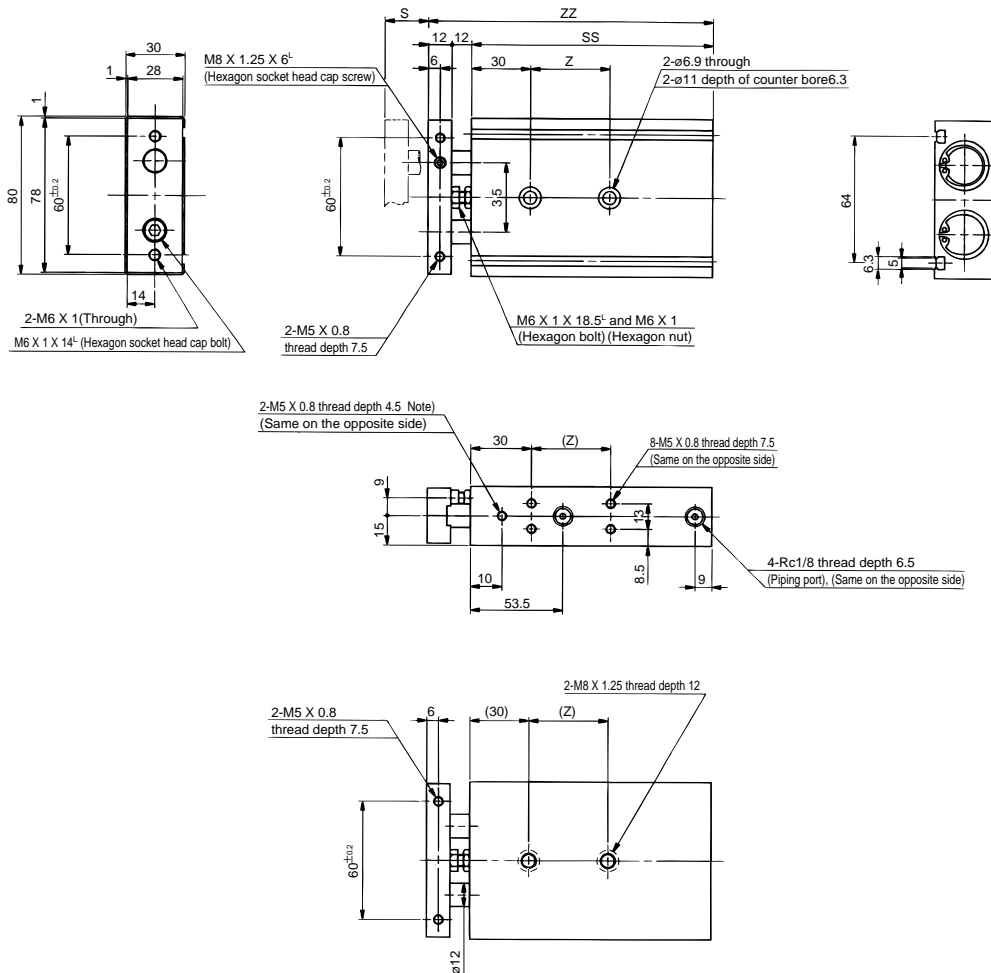


Note) Vacuum ports are used in case of 11-. Be sure to vacuum air from 2 ports on both sides.  
 Exhaust ports are used in case of 12-. Be sure to exhaust air from a port on one side. Unlike vacuum suction, exhaust does not require 2 ports so the piston rod B side port is plugged with 12-.

	(mm)			
Model	S	SS	ZZ	Z
11-CXSL20-10	10	92	116	30
11-CXSL20-20	20	102	126	40
11-CXSL20-30	30	112	136	40
11-CXSL20-40	40	122	146	40
11-CXSL20-50	50	132	156	60
11-CXSL20-75	75	157	181	60
11-CXSL20-100	100	182	206	80

# Dual Rod Cylinder 11-CXSL/12-CXSL

## Basic/11-CXSL25, 12-CXSL25

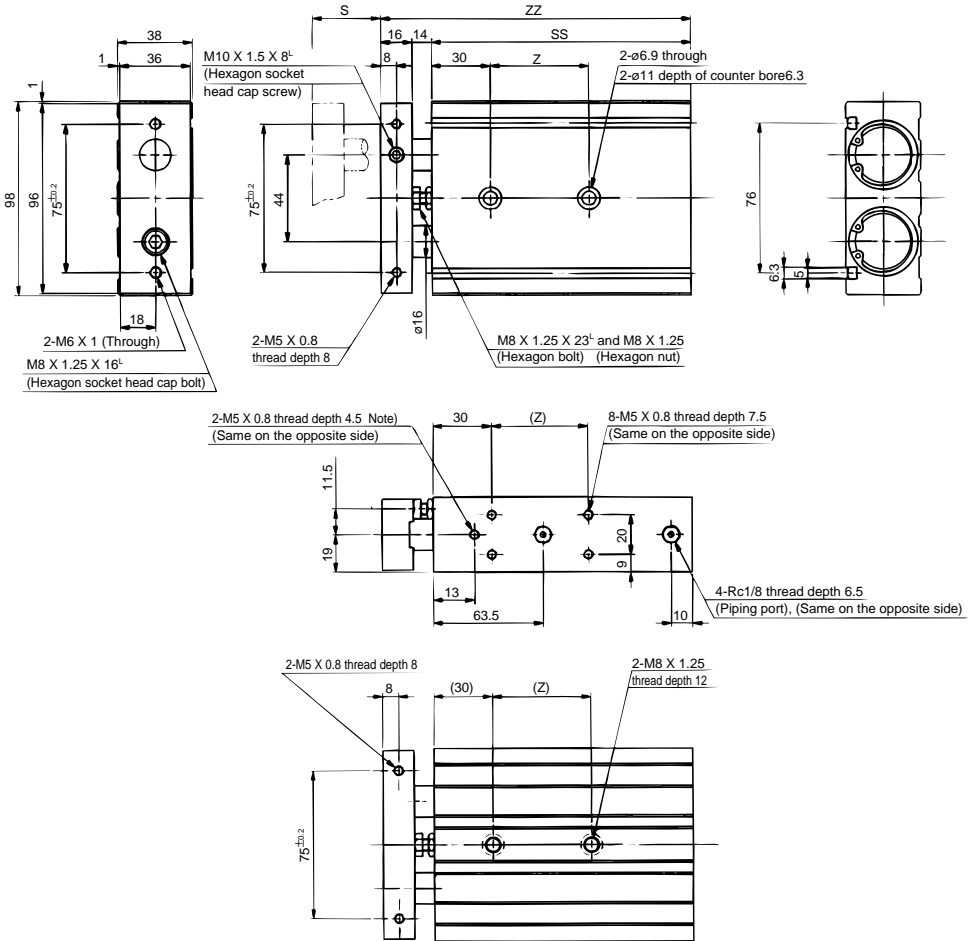


Note) Vacuum ports are used in case of 11-. Be sure to vacuum air from 2 ports on both sides.  
Exhaust ports are used in case of 12-. Be sure to exhaust air from a port on one side. Unlike vacuum suction, exhaust does not require 2 ports so the piston rod B side port is plugged with 12-.

	(mm)			
Model	S	SS	ZZ	Z
1 1/2 CXSL25-10	10	94	118	30
1 1/2 CXSL25-20	20	104	128	40
1 1/2 CXSL25-30	30	114	138	40
1 1/2 CXSL25-40	40	124	148	40
1 1/2 CXSL25-50	50	134	158	60
1 1/2 CXSL25-75	75	159	183	60
1 1/2 CXSL25-100	100	184	208	80



**Basic/11-CXSL32, 12-CXSL32**



Note) Vacuum ports are used in case of 11-. Be sure to vacuum air from 2 ports on both sides.  
 Exhaust ports are used in case of 12-. Be sure to exhaust air from a port on one side. Unlike vacuum suction, exhaust does not require 2 ports so the piston rod B side port is plugged with 12-.

	(mm)			
Model	S	SS	ZZ	Z
11-CXSL32-10	10	104	134	40
11-CXSL32-20	20	114	144	50
11-CXSL32-30	30	124	154	50
11-CXSL32-40	40	134	164	50
11-CXSL32-50	50	144	174	60
11-CXSL32-75	75	169	199	70
11-CXSL32-100	100	194	224	90

## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Mounting

#### ⚠ Caution

- ① **Make sure that the surface on which the cylinder is mounted is flat (reference value of flatness: 0.05mm or less).**  
Dual rod cylinders can be mounted from 3 directions. Make sure that the surface on which the cylinder is to be mounted is flat (reference value for flatness: 0.05 or less). Otherwise, the accuracy of the piston rod operation may not be achieved, leading to possible malfunction.
- ② **Retract the piston rod when mounting the cylinder.**  
Scratches and gouges on the piston rod may lead to damaged bearings and seals, which can cause malfunction or air leakage.
- ③ **Secure the plate before mounting the load.**  
If the load is mounted without the plate being secured, particle generation may result from piston rod twisting.

### Piping

#### ⚠ Caution

- ① **Switch the plugged ports according to the operating conditions.**  
Dual rod cylinders have 2 supply ports for each operating direction (or 3 supply ports only in case of  $\varnothing 6$ ). Plug the appropriate supply port according to the operating conditions. When the plugged port has been switched, check the seat surface. In case any small leakage is detected, unplug the port, check the seat surface and reassemble.
- ② **Change the plug position of the 12- relief port according to the operating conditions.**  
A relief port is provided on each side so change the plug position according to the operating conditions. After the change, apply a 0.1MPa pressure from the relief port to verify that there is no leakage in the plug section. If any small amount of leakage is detected, remove the plug again, confirm the seat surface and reassemble.
- ③ **With 11-, be sure to conduct vacuum suction from both sides.**  
Vacuum suction from one side is not sufficient. Be sure to conduct vacuum suction from both sides.

### Stroke Adjustment

#### ⚠ Caution

- ① **After adjusting the stroke, be sure to tighten the hexagon nut to prevent it from loosening.**  
Dual rod cylinders have a bolt to adjust 0 to -5mm strokes on the retracted end (IN).  
Loosening the hexagon nut makes adjustment easy but make sure to tighten it firmly after adjustment to prevent loosening.
- ② **Never operate a cylinder with its bumper bolt removed.**  
If the bumper bolt is removed, the piston will hit the head cover, resulting in damage to the cylinder. Therefore, do not use the cylinder with its bumper bolt removed.
- ③ **A bumper at the end of the bumper bolt is replaceable. In case it is lost or fatigued, order by the following part numbers.**

Model	CXS6/10/15	CXS20/25	CXS32
Part number	CXS10-34A 28747	CXS20-34A 28749	CXS32-34A 28751
No. of bumpers	1		

### Disassembly and Maintenance

#### ⚠ Caution

- ① **Never use a cylinder with its plate removed.**  
When removing the hexagon socket head cap screw from the end plate, first secure the piston rod to prevent rotation. However, if the sliding parts of the piston rod are scratched and gouged, malfunction may occur. If the plate is not required for your applications, use the cylinder that does not come with a plate, available through Made to Order (-X593) on page 53.
- ② **When disassembling and reassembling the cylinder, contact SMC or refer to the separate instruction manual.**

#### ⚠ Warning

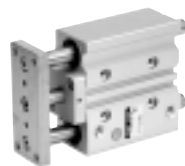
- ① **Never use a cylinder with its plate removed.**  
When the cylinder is operated, take extra precautions to avoid having your hand or fingers caught between the plate and housing.



# Series 12-13-MGPL Compact Cylinder with Guide

ø12,ø16,ø20,ø25,ø32,ø40,ø50,ø63

## How to Order



### Clean series

- 12 — Relief type (Special treatment on sliding part)
- 13 — Vacuum suction type (Special treatment on sliding part)

Ball bushing bearing

Bore size (mm)

12 - MGPL 25 - 50 - Z73

Cylinder stroke (mm)

Type of auto switch  
 Nil: Without auto switch  
 Reed switch  
 Z73  
 Solid state switch  
 Y59A  
 Y59B

Number of auto switches  
 Nil — 2  
 S — 1

## Model

	Model	Bore size (mm)	Port size	Lubrication	Action	Standard stroke (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type (Special treatment on sliding part)	12-MGPL12	12	M5 X 0.8	Non-lube	Double acting	10, 20, 30, 40, 50, 75, 100	Available	Available (Both sides)	Not available
	12-MGPL16	16							
	12-MGPL20	20							
	12-MGPL25	25	Rc1/8			20, 30, 40, 50, 75, 100, 125, 150, 175, 200			
	12-MGPL32	32							
	12-MGPL40	40	Rc1/4			25, 50, 75, 100, 125, 150, 175, 200			
12-MGPL50	50								
12-MGPL63	63								
Vacuum suction type (Special treatment on sliding part)	13-MGPL12	12	M5 X 0.8	Non-lube	Double acting	10, 20, 30, 40, 50, 75, 100	Available	Available (Both sides)	Not available
	13-MGPL16	16							
	13-MGPL20	20							
	13-MGPL25	25	Rc1/8			20, 30, 40, 50, 75, 100, 125, 150, 175, 200			
	13-MGPL32	32							
	13-MGPL40	40	Rc1/4			25, 50, 75, 100, 125, 150, 175, 200			
	13-MGPL50	50							
	13-MGPL63	63							

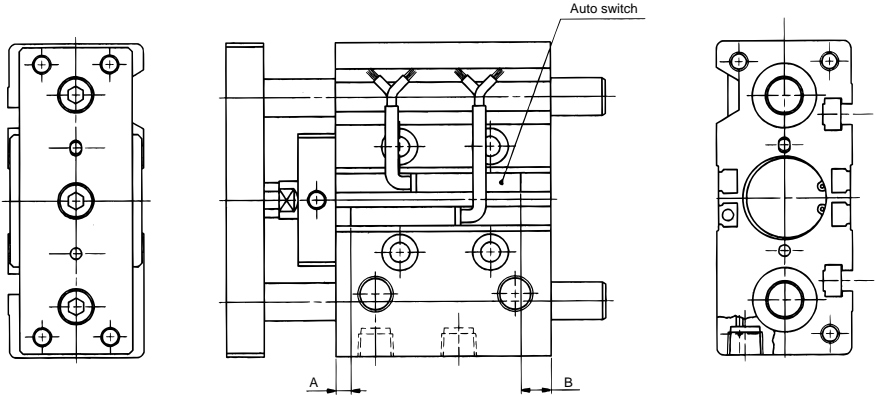
## Specifications

Item	Bore size (mm)	
	12, 16	20, 25, 32, 40, 50, 63
Proof pressure	1.5MPa	
Max. operating pressure	1.0MPa	
Min. operating pressure	0.12MPa	0.1MPa
Ambient and fluid temperature	-10°C to 60°C (With no condensation)	
Piston speed	50 to 400mm/s	
Stroke length tolerance	+1.5 0	

**Auto Switch Specifications** (Refer to page 3.17-16 of Best Pneumatics No.② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part No.	Load voltage	Load current range	Indicator light	Application	
Reed switch	D-Z73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC	
Solid state switch	2-wire system	D-Y59B	24VDC (10 to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system	D-Y59A	28VDC or less	40mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**



**Proper Mounting Position (mm)**

Bore size (mm)	A	B
12	1.5	3
16	4.5	4
20	4	8
25	4.5	8

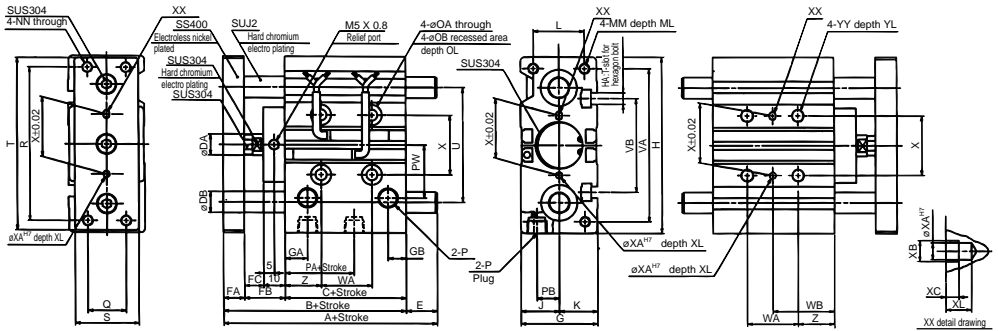
**(mm)**

Bore size (mm)	A	B
32	5.5	7
40	9.5	9.5
50	7.5	11.5
63	10	14

Note1) The minimum stroke for auto switch mounting is 10mm or larger for types with 2 pieces and 5mm or larger for types with 1 piece.

# Compact Cylinder with Guide 12-MGPL/13-MGPL

## Basic/12-MGPL 12 to 25, 13-MGPL 12 to 25

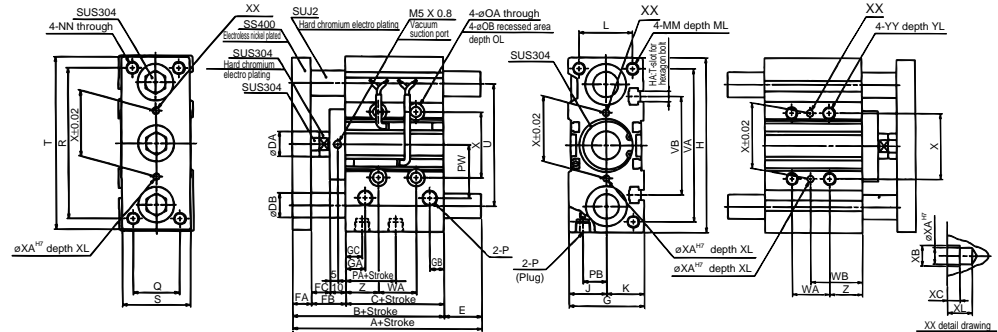


(mm)

Bore size	A			B	C	DA	DB	E			FA	FB	FC	G	GA	GB	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P	PA	PB
	30st or less	Over 30st and up to 100st	100st or more					30st or less	Over 30st and up to 100st	Over 100st																				
12	56	68	-	55	29	6	6	1	13	-	8	18	8	26	11	7.5	58	M4	13	13	18	M4 X 0.7	10	M4 X 0.7	4.3	8	4.5	M5 X 0.8	13	8
16	62	78	-	59	33	8	8	3	19	-	8	18	8	30	11	8	64	M4	15	15	22	M5 X 0.8	12	M5 X 0.8	4.3	8	4.5	M5 X 0.8	15	10
20	76	93	117	66	37	10	10	10	27	51	10	19	9	36	10.5	8.5	83	M5	18	24	M5 X 0.8	13	M5 X 0.8	5.6	9.5	5.5	Rc1/8	12.5	10.5	
25	82.5	98.5	117.5	66.5	37.5	12	13	16	32	51	10	19	9	42	11.5	9	93	M5	21	21	30	M6 X 1.0	15	M6 X 1.0	5.6	9.5	5.5	Rc1/8	12.5	13.5

Bore size	PW	Q	R	S	T	U	VA	VB	WA			WB			X	XA	XB	XC	XL	YY	YL	Z
									30st or less	Over 30st and up to 100st	Over 100st	30st or less	Over 30st and up to 100st	Over 100st								
12	18	14	48	22	56	41	50	37	20	40	-	15	25	-	23	3	3.5	3	6	M5 X 0.8	10	5
16	19	16	54	25	62	46	56	38	24	44	-	17	27	-	24	3	3.5	3	6	M5 X 0.8	10	5
20	25	18	70	30	81	54	72	44	24	44	120	29	39	77	28	3	3.5	3	6	M6 X 1.0	12	17
25	28.5	26	78	38	91	64	82	50	24	44	120	29	39	77	34	4	4.5	3	6	M6 X 1.0	12	17

## Basic/12-MGPL 32 to 63, 13-MGPL 32 to 63



(mm)

Bore size	A			B	C	DA	DB	E			FA	FB	FC	G	GA	GB	GC	H	HA	J	K	L	MM	ML	NN	OA	OB	OL	P	PA
	50st or less	Over 50st and up to 100st	Over 100st					50st or less	Over 50st and up to 100st	Over 100st																				
32	93	110	130	71.5	37.5	16	16	21.5	38.5	58.5	12	22	12	48	12.5	9	12.5	112	M6	24	24	34	M8 X 1.25	20	M8 X 1.25	6.6	11	7.5	Rc1/8	7
40	93	110	130	78	44	16	16	15	32	52	12	22	12	54	14	10	14	120	M6	27	27	40	M8 X 1.25	20	M8 X 1.25	6.6	11	7.5	Rc1/8	13
50	104	125	145	83	44	20	20	21	42	62	16	23	13	64	14	11	12	148	M8	32	32	46	M10 X 1.5	22	M10 X 1.5	8.6	14	9	Rc1/4	9
63	104	125	145	88	49	20	20	16	37	57	16	23	13	78	16.5	13.5	16.5	162	M10	39	39	58	M10 X 1.5	22	M10 X 1.5	8.6	14	9	Rc1/4	14

Bore size	PB	PW	Q	R	S	T	U	VA	VB	WA			WB			X	XA	XB	XC	XL	YY	YL	Z
										50st or less	Over 50st and up to 100st	Over 100st	50st or less	Over 50st and up to 100st	Over 100st								
32	15	34	30	96	44	110	78	98	63	24	48	124	33	45	83	42	4	4.5	3	6	M8 X 1.25	16	21
40	18	38	30	104	44	118	86	106	72	24	48	124	34	46	84	50	4	4.5	3	6	M8 X 1.25	16	22
50	21.5	47	40	130	60	146	110	130	92	24	48	124	36	48	86	66	5	6	4	8	M10 X 1.5	20	24
63	28	55	50	130	70	158	124	142	110	28	52	128	38	50	88	80	5	6	4	8	M10 X 1.5	20	24

## ⚠ Specific Product Precautions

Be sure to read before handling.

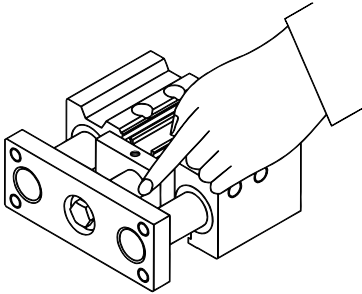
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Mounting

#### ⚠ Warning

- ① Do not put your hand or fingers between the cylinder and the body.

When air pressure is applied, take extra precautions to avoid having your hand or fingers caught between the cylinder body and the plate.

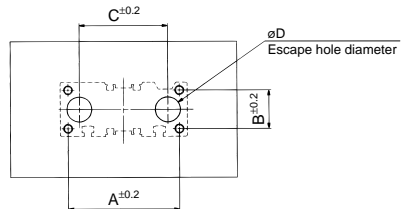
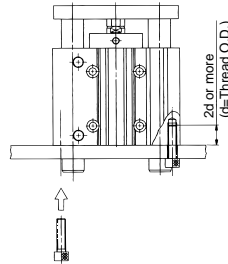


#### ⚠ Caution

- ① Do not scratch or gouge the sliding parts of the piston rod and guide rods.  
Damage to seals can cause air leakage or malfunction.

- ② Bottom of cylinder

The guide rods protrude from the bottom of the cylinder at the end of the retracting stroke and therefore, in cases where the cylinder is bottom mounted, it is necessary to provide escape (run-off) holes on the mounting surface for the guide rods, besides holes for the hexagon socket head screws used for mounting.

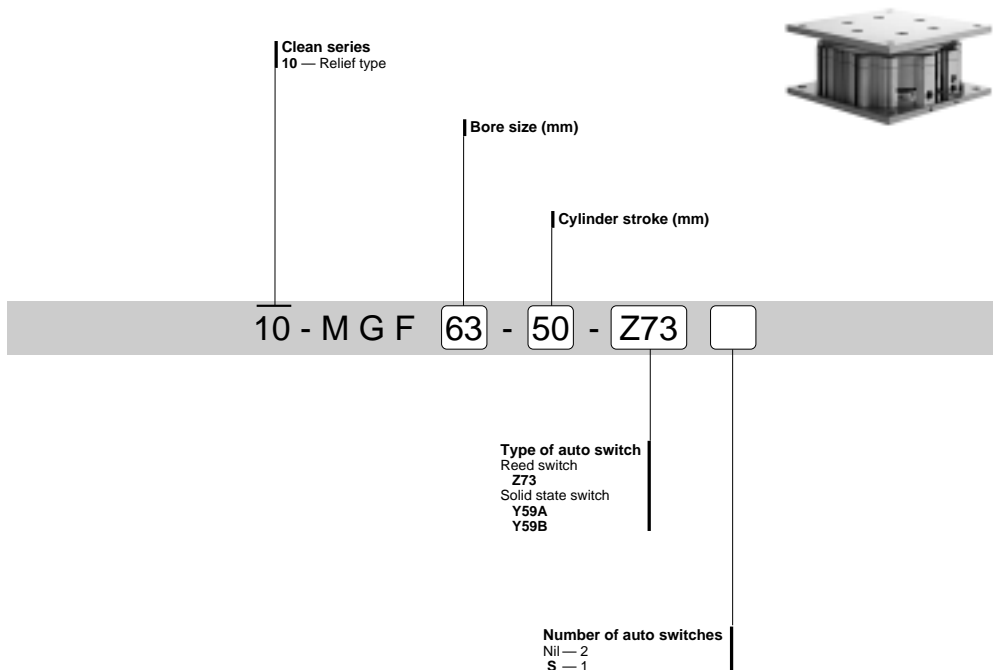


Bore size (mm)	A (mm)	B (mm)	C (mm)	$\phi D$ (mm)	Hexagon socket mounting bolt
12	50	18	41	8	M4 X 0.7
16	56	22	46	10	M5 X 0.8
20	72	24	54	12	M5 X 0.8
25	82	30	64	15	M6 X 1.0
32	98	34	78	18	M8 X 1.25
40	106	40	86	18	M8 X 1.25
50	130	46	110	22	M10 X 1.5
63	142	58	124	22	M10 X 1.5

# Series 10-MGF Guide Table

ø40, ø63, ø100

## How to Order



## Model

Model		Bore size (mm)	Port size	Lubrication	Action	Standard stroke* (mm)	Auto switch mounting	Cushion	
								Rubber	Air
Relief type	10-MGF40	40	Rc1/8	Non-lube	Double acting	30, 50, 75, 100	Available	Available (Both sides)	Not available
	10-MGF63	63	Rc1/4						
	10-MGF100	100							

\*Non-standard intermediate strokes (in 5mm increments) are manufactured by attaching spacers of 5, 10, 15, 20 and 25mm widths.

## Specifications

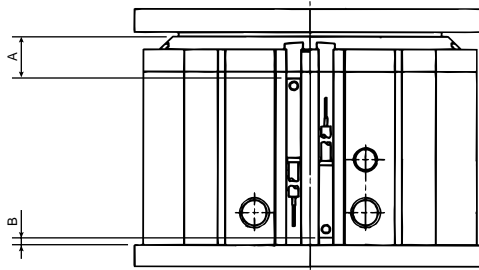
Item	Bore size (mm)
Item	40,63,100
Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Min. operating pressure	0.1MPa
Ambient and fluid temperature	-10 to 60°C (With no condensation)
Piston speed	20 to 200mm/s
Stroke length tolerance	$^{+1.0}$ mm



**Auto Switch Specifications** (Refer to page 3.21-4 of Best Pneumatics ② for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-Z73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-Y59B	24VDC (10V to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system D-Y59A	28VDC or less	40mA or less	Yes	IC circuit, Relay, PLC

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

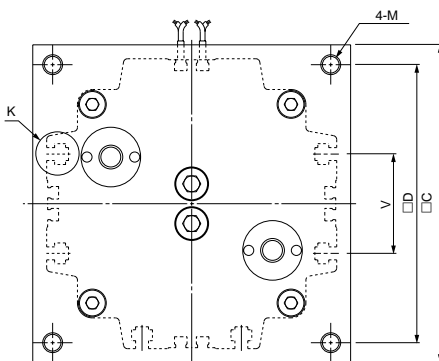
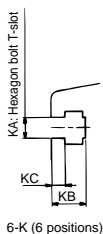
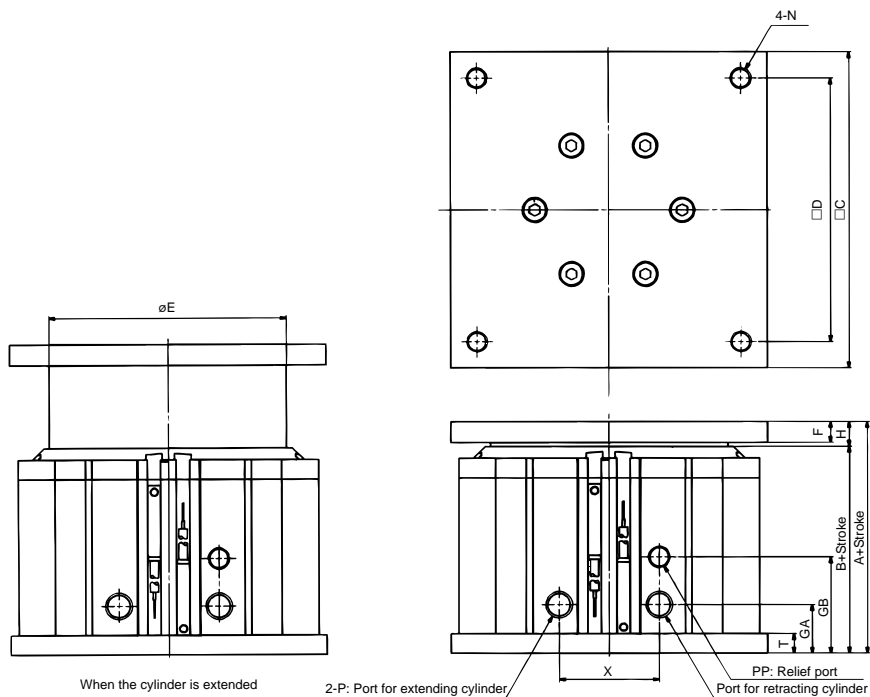


Proper mounting position (mm)		
Bore size	A	B
<b>40</b>	16	0
<b>63</b>	27.5	0
<b>100</b>	32.5	0

Actuator

## Dimensions

10-MGF40/63/100



		(mm)																		
Bore size	Standard stroke	A	B	C	D	E	F	GA	GB	H	KA	KB	KC	M	N	P	PP	T	V	X
40		58	48.5	120	100	90	8	18.5	36.5	9.5	M5	8.7	3.5	M8 X 1.25	M8 X 1.25	Rc1/8	Rc1/8	7.5	40	38
63	30,50,75,100	73	61.5	160	140	120	10	20	38	11.5	M6	11	4	M10 X 1.5	M10 X 1.5	Rc1/4	Rc1/8	9	50	46
100		78	66.5	200	170	160	10	20	38	11.5	M6	11	4	M12 X 1.75	M12 X 1.75	Rc1/4	Rc1/8	9	70	46

## ⚠ Specific Product Precautions

**Be sure to read before handling.**

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Selection

#### ⚠ Caution

**① Operate the load within the operating limits.**

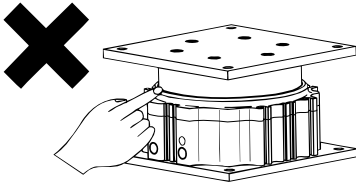
Select a load according to the allowable load in the horizontal direction, allowable rotational torque and allowable eccentric load. If the operating limits are exceeded, an excessive eccentric load applied to the tubing guide may cause wearing of the guide, larger rotation or damage to the fixing bolts, all having adverse effects on the product's life.

**② Do not scratch or gouge the mounting surface of the plate or end plate.**

It can decrease evenness of the mounting surface, resulting in larger guide rotation and more sliding resistance.

**③ Keep away your hand and fingers from the cylinder during operation.**

They may be caught between the body and the plate. Install a cover when it is necessary to approach the cylinder during operation.



**④ Keep away objects which can be influenced by magnets.**

The cylinder has magnets built in the body. Please keep away magnetic disks, cards or tapes. Otherwise the data can be erased.

**⑤ In case of operation involving vertical movement with a heavy load, some measures may be necessary to prevent lurching at the start of downward movement.**

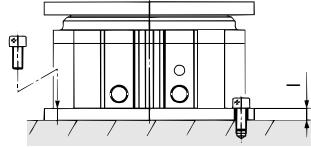
If the operation involves vertical movement with a heavy load, applying the same pressure in both upward and downward movement may allow the starting speed of downward movement exceed the control speed of the speed controller. To avoid this, use a dual pressure control circuit in the pneumatic circuit.

### Mounting

#### ⚠ Caution

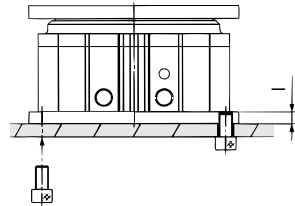
**① When mounting the cylinder, use screws of appropriate lengths and tighten with proper force not exceeding the maximum tightening torque.**

**Top mounting**



Model	Bolt	Maximum tightening torque Nm	/(mm)
MGF40	M6 X 1	10	7.5
MGF63	M8 X 1.25	25	9
MGF100	M10 X 1.5	51	9

**Bottom mounting**



Model	Bolt	Maximum tightening torque Nm	/(mm)
MGF40	M8 X 1.25	18	7.5
MGF63	M10 X 1.5	36	9
MGF100	M12 X 1.75	65	9

# Series 11-MXP/MXPJ6 Air Slide Table

ø6, ø10, ø12, ø16

## How to Order

**11-MXP 12 15 [ ] [ ] F9N [ ]**

**Clean series**  
11 — Vacuum suction type

**Bore size—Stroke mm**

ø6	5, 10
ø10	10, 20
ø12	15, 25
ø16	20, 30

**Number of auto switches**

Nil	2
s	1
n	n

**Type of auto switch**

Nil	Without auto switch
-----	---------------------

\*Refer to the table below for auto switch model numbers.

**Adjuster options**

Nil	Rubber stopper
C	Metal stopper
H	Without adjustment

\*The adjuster of series 11-MXP6 is only attached on one side. Types without adjuster are not available with series 11-MXP6.

**Auto switch**

Nil	With magnet and rail
N	Without magnet and rail

\*Auto switch cannot be mounted on types without magnet and rail (N).

## How to Order 11-MXPJ6

**11-MXPJ6-10**

**Clean series**  
11 — Vacuum suction type

**Stroke**

5	5mm
10	10mm

\*Types with auto switch are not available with 11-MXPJ6.

## Auto Switch Specifications (Refer to page 3.15-6 of Best Pneumatics ② for detailed specifications and auto switches not in the following table.)

Style	Special function	Electrical entry	Indicator	Siring (Output)	Load voltage			Switch model	*Lead wire length (m)		Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)		
<b>Reed switch</b>	—	Grommet	Yes	2-wire	24V	12V	100V	Horizontal	●	●	—	Relay, PLC
<b>Solid state switch</b>	—	Grommet	Yes	3-wire (NPN)	24V	12V	—	<b>F9N</b>	●	●	—	Relay, PLC
				2-wire		12V		<b>F9B</b>	●	●	—	

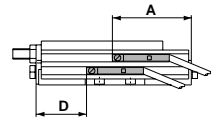
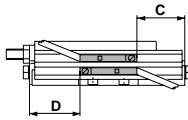
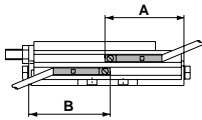
\*Lead wire symbol 0.5m.....Nil (Example) A93  
3m..... L A93L

**Specifications**

<b>Model</b>		<b>11-MXPJ6</b>	<b>11-MXP6</b>	<b>11-MXP10</b>	<b>11-MXP12</b>	<b>11-MXP16</b>
<b>Cylinder bore size (mm)</b>		6	6	10	12	16
<b>Port size</b>		M3 X 0.5		M5 X 0.8		
<b>Fluid</b>		Air				
<b>Action</b>		Double acting				
<b>Operating pressure</b>		0.15 to 0.7MPa				
<b>Proof pressure</b>		1.05MPa				
<b>Ambient and fluid temperature</b>		-10 to 60°C				
<b>Piston speed</b>		30 to 200mm/s				
<b>Cushion</b>		Rubber bumper	Rubber bumper(Rubber stopper)			
			—	Rubber bumper(Without adjustment)		
			No (Metal stopper)			
<b>Lubrication</b>		Non-lube				
<b>Stroke adjuster</b>		—	Standard (MXP6 adjustable on one side only)			
<b>Stroke adjustment range</b>	<b>Rubber stopper</b>	—	0 to 5mm at one side only	0 to 3 mm at both ends		
	<b>Metal stopper</b>	—	0 to 6mm at one side only	0 to 5 mm at both ends	0 to 4 mm at both ends	
<b>Stroke length tolerance</b>						$\begin{matrix} +1 \\ 0 \end{matrix}$ mm

**Auto Switch/Proper Mounting Positions for Stroke End Detection**

**11-MXP6**



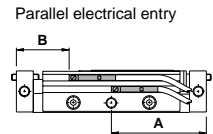
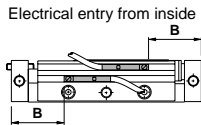
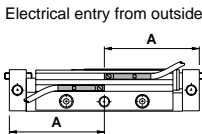
**Reed switch  
D-A93**

Model		Stroke (mm)				Auto switch operation range
		10	15	20	25	
11-MXP 6	A	34.5	—	—	—	5
	B	35.5	—	—	—	
	C	14.5	—	—	—	
	D	15.5	—	—	—	

**Solid state switch  
D-F9B, D-F9N**

Model		Stroke (mm)			Auto switch operation range
		5	10	15	
11-MXP 6	A	25.5	30.5	—	3
	B	26.5	31.5	—	
	C	13.5	18.5	—	
	D	14.5	19.5	—	

**11-MXP10,12,16**



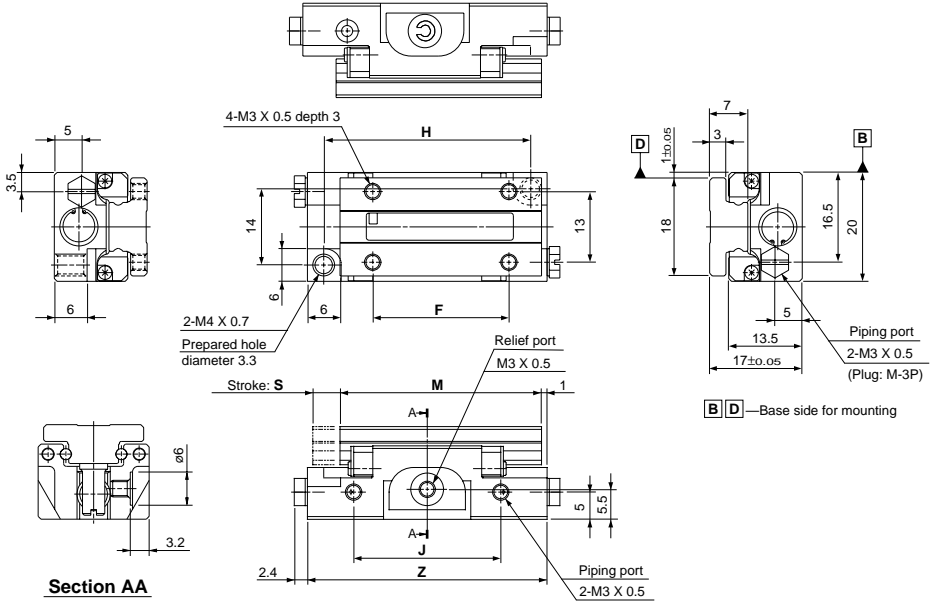
**Reed switch  
D-A93**

Model		Stroke (mm)					Auto switch operation range (mm)
		10	15	20	25	30	
11-MXP10	A	35	—	45	—	—	5
	B	15	—	25	—	—	
11-MXP12	A	—	40.5	—	50.5	—	
	B	—	20.5	—	30.5	—	
11-MXP16	A	—	—	51	—	59	
	B	—	—	31	—	39	

**Solid state switch  
D-F9B, D-F9N**

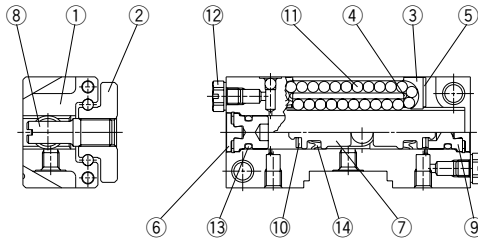
Model		Stroke (mm)					Auto switch operation range (mm)
		10	15	20	25	30	
11-MXP10	A	31	—	41	—	—	3
	B	19	—	29	—	—	
11-MXP12	A	—	36.5	—	46.5	—	
	B	—	24.5	—	34.5	—	
11-MXP16	A	—	—	47	—	55	
	B	—	—	35	—	43	

**Dimensions/11-MXPJ6**



	(mm)					
Model	F	H	J	M	S	Z
11-MXPJ6-5	25	38	27	37	5	44
11-MXPJ6-10	35	53	42	47	10	59

**Construction/11-MXPJ6**

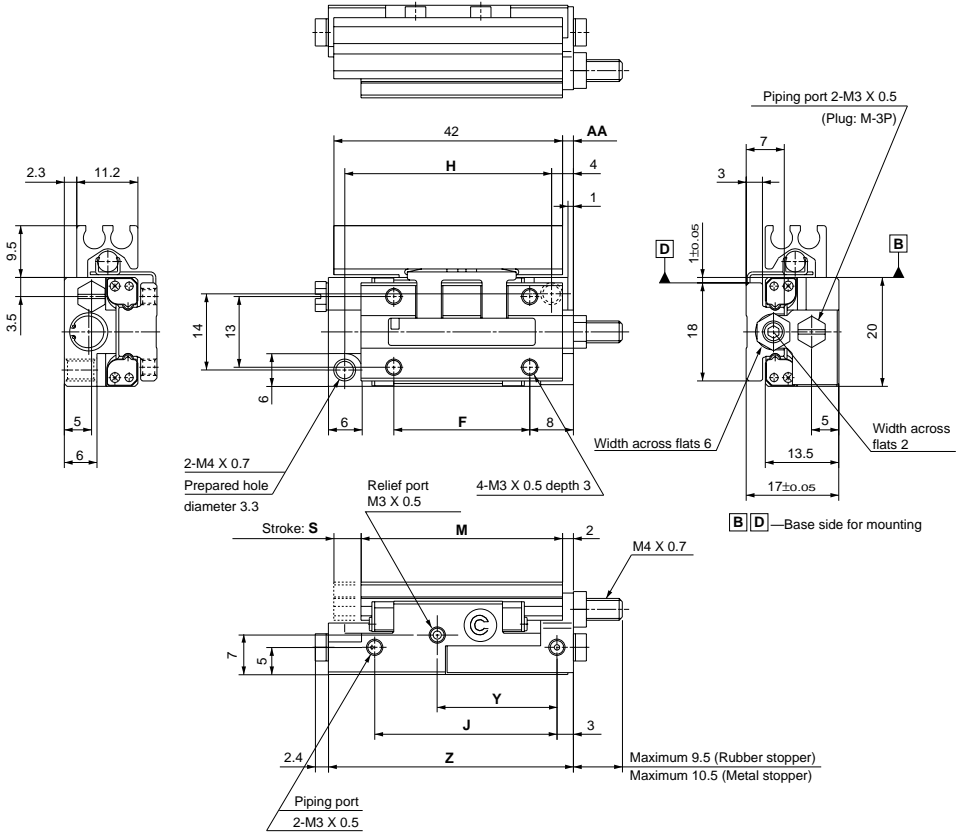


**Component parts**

No.	Description	Material	Note
①	Body	Stainless steel	Heat treatment
②	Table	Stainless steel	Heat treatment
③	Cover	Resin	
④	Return guide	Resin	
⑤	Scraper	Stainless steel	
⑥	Dust cap	Silicone rubber	
⑦	Piston	Brass	Electroless nickel plated
⑧	Joint shaft	Carbon steel	Electroless nickel plated

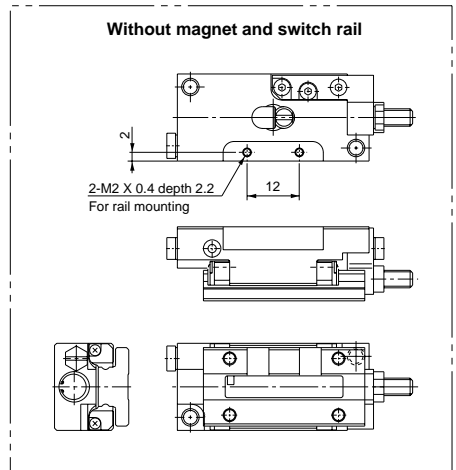
No.	Description	Material	Note
⑨	End cap	Brass	Electroless nickel plated
⑩	Rod bumper	Polyurethane	
⑪	Steel balls	High carbon chromium bearing steel	
⑫	Plug	Brass, PVC	Electroless nickel plated
⑬	O-ring	NBR	
⑭	Piston seal	NBR	

**Dimensions/11-MXP6**

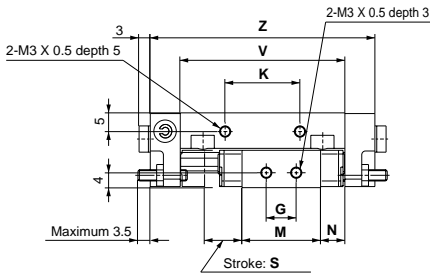


Model	F	H	J	M	S	Y	Z	AA
<b>11-MXP6-5</b>	25	38	33.5	37	5	22	45	2
<b>11-MXP6-10</b>	35	53	48.5	47	10	27.5	60	9.5

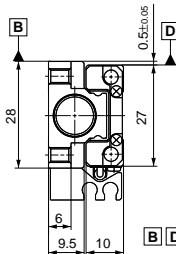
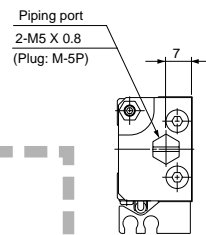
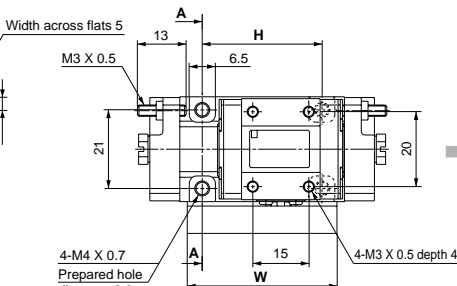
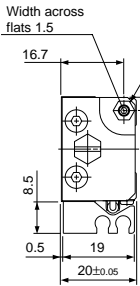
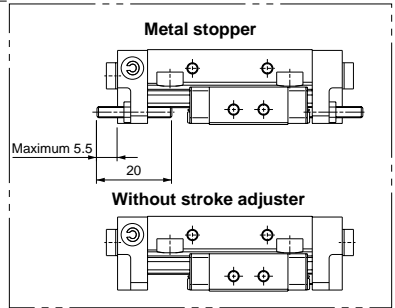
(mm)



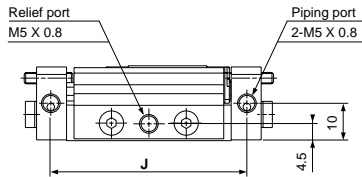
**Dimensions/11-MXP10**



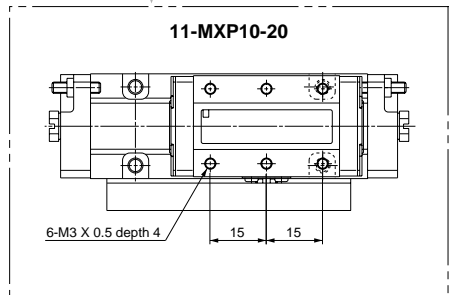
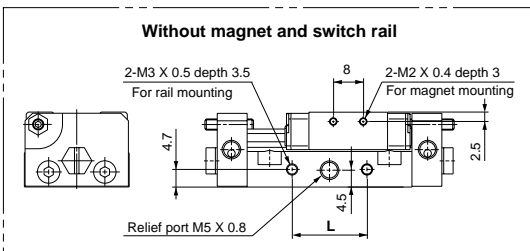
**11-MXP10-10**



**B D**—Base side for mounting



**Section AA**

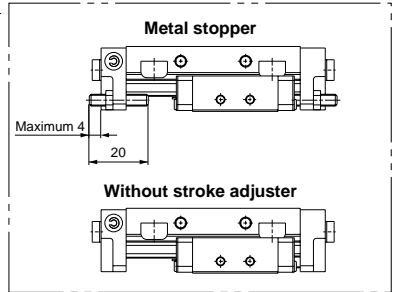
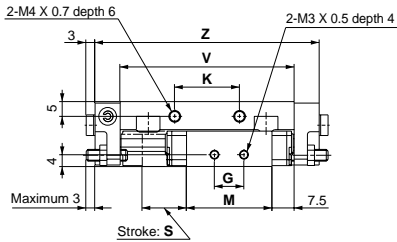


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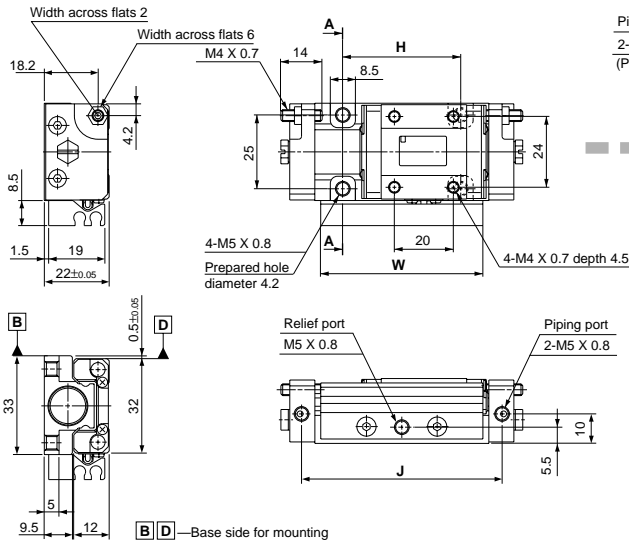
Model	G	H	J	K	L	M	N	S	V	W	Z
<b>11-MXP10-10</b>	8	32	52.4	20	20	21	6.5	10	44	40	60
<b>11-MXP10-20</b>	20	50	82.4	36	36	39	7.5	20	74	65	90



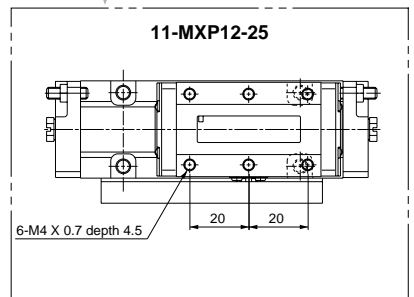
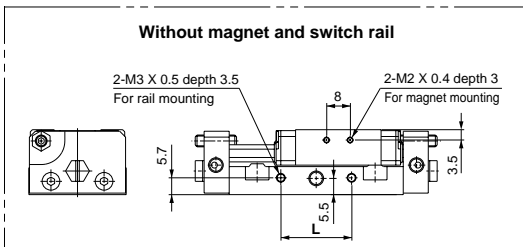
**Dimensions/11-MXP12**



**11-MXP12-15**



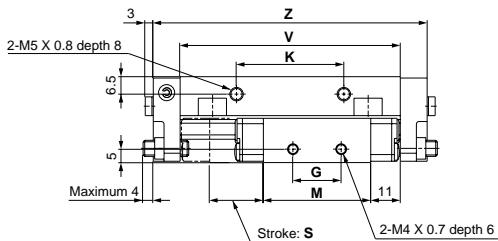
**Section AA**



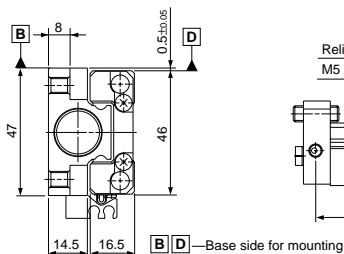
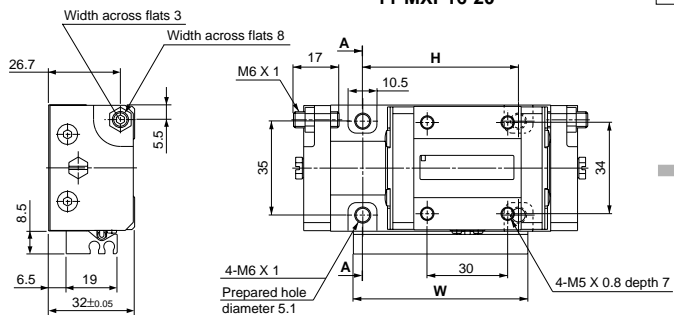
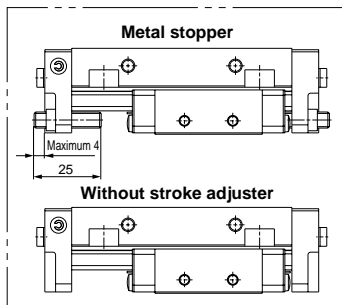
(mm)

Model	G	H	J	K	L	M	S	V	W	Z
11-MXP12-15	10	40	68	22	24	29	15	59	55	76
11-MXP12-25	30	60	98	40	42	49	25	89	75	106

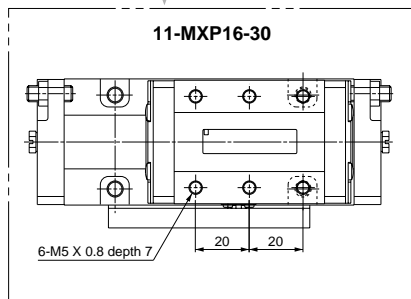
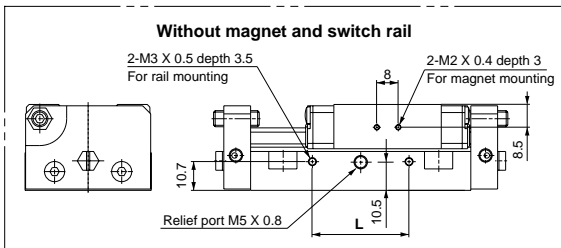
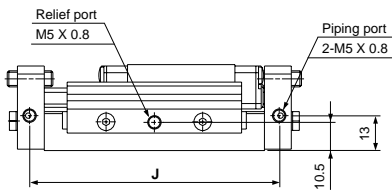
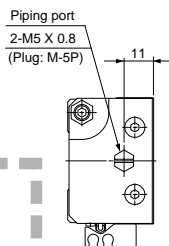
**Dimensions/11-MXP16**



**11-MXP16-20**



**Section AA**

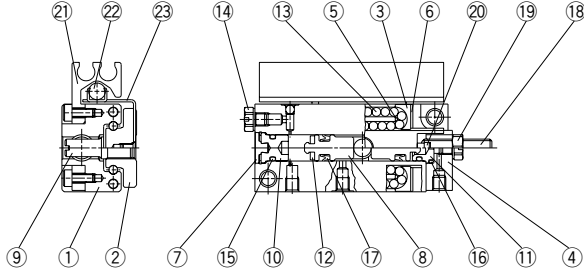


**11-MXP16-30**

(mm)

Model	G	H	J	K	L	M	S	V	W	Z
11-MXP16-20	18	58	93	40	36	40	20	82	65	102
11-MXP16-30	28	70	119	50	42	56	30	108	75	128

**Construction/11-MXP6**

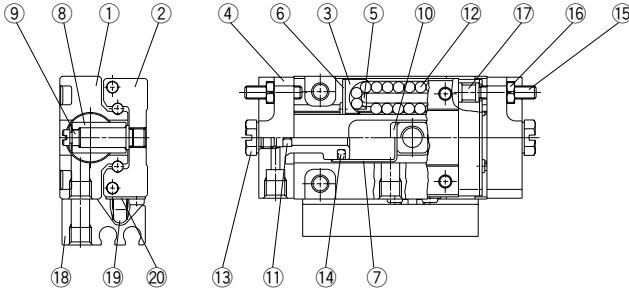


**Component parts**

No.	Description	Material	Note
①	Body	Stainless steel	Heat treatment
②	Table	Stainless steel	Heat treatment
③	Cover	Resin	
④	End plate	Aluminium alloy	Hard anodized
⑤	Return guide	Resin	
⑥	Scraper	Stainless steel	
⑦	Dust cap	Silicone rubber	
⑧	Piston	Brass	Electroless nickel plated
⑨	Joint shaft	Carbon steel	Electroless nickel plated
⑩	End cap	Brass	Electroless nickel plated
⑪	End cap	Brass	Electroless nickel plated
⑫	Rod bumper	Polyurethane	

No.	Description	Material	Note
⑬	Steel balls	High carbon chromium bearing steel	
⑭	Plug	Brass, PVC	Electroless nickel plated
⑮	O-ring	NBR	
⑯	O-ring	NBR	
⑰	Piston seal	NBR	
⑱	Adjustment bolt	Carbon steel (Rubber) Stainless steel (Metal)	Nickel plated
⑲	Adjustment nut	Carbon steel	Nickel plated
⑳	Adjustment bumper	Polyurethane	
㉑	Awitch rail	Aluminium alloy	Hard anodized
㉒	Magnet	Rare earth	
㉓	Magnet holder	Steel	Nickel plated

**Construction/11-MXP10,12,16**



**Component parts**

No.	Description	Material	Note
①	Body	Stainless steel	Heat treatment
②	Guide block	Stainless steel	Heat treatment
③	Cover	Resin	
④	End plate	Aluminium alloy	Hard anodized
⑤	Return guide	Resin	
⑥	Scraper	Stainless steel	
⑦	Tube, Tubing	Brass	Electroless nickel plated
⑧	Joint pipe	Stainless steel	
⑨	Joint shaft	Carbon steel	Electroless nickel plated
⑩	Joint bumper	Polyurethane	

No.	Description	Material	Note
⑪	Orifice	Brass	Electroless nickel plated
⑫	Steel balls	High carbon chromium bearing steel	
⑬	Plug	Brass, PVC	Electroless nickel plated
⑭	Piston seal	NBR	
⑮	Adjustment bolt	Carbon steel (Rubber) Stainless steel (Metal)	Nickel plated
⑯	Adjustment nut	Carbon steel	Nickel plated
⑰	Adjustment bumper	Polyurethane	
⑱	Switch rail	Aluminium alloy	Hard anodized
⑲	Magnet	Rare earth	
⑳	Magnet holder	Steel	Nickel plated

## Made to Order

<b>Guide Rust Prevention Specification</b>	<b>-X42</b>
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**11-MXP** Refer to How to Order on P. 106 for standard products **-X42**

**11-MXPJ6** Refer to How to Order on P. 106 for standard products **-X42**

Although martensitic stainless steel is used for the body, table and guide blocks, these specifications can be used in case even more anti-corrosion measures are required.

Anti-corrosion treatment is applied to the body, table and guide blocks <sup>Note 2)</sup>.

Note 1) Dimensions are same as those of the standard type.

Note 2) The color of the body, table and guide blocks will be black due to special anticorrosive treatment.

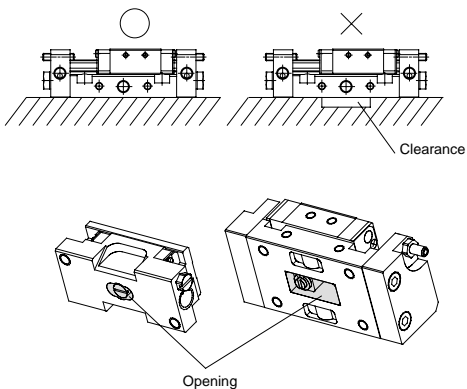
## ! Specific Product Precautions

Be sure to read before handling.  
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

## Mounting

### ! Caution

Mount the body on a flat surface so that there will be no clearance between the body mounting surface and the mounting base. Sufficient vacuum suction may not be achieved in presence of any clearances.





# Series 13-MXQ

Air Slide Table  
 $\varnothing 6, \varnothing 8, \varnothing 12, \varnothing 16, \varnothing 20, \varnothing 25$

## How to Order

**13-MXQ 12 50 F9N**

**Clean series**  
 13-Vacuum suction type  
 (Special treatment on guide)

**Symmetric style**

Nil	Standard
L	Symmetric

**Bore size — Stroke mm**

6	10, 20, 30, 40, 50
8	10, 20, 30, 40, 50, 75
12	10, 20, 30, 40, 50, 75, 100
16	10, 20, 30, 40, 50, 75, 100, 125
20	10, 20, 30, 40, 50, 75, 100, 125, 150
25	10, 20, 30, 40, 50, 75, 100, 125, 150

**Adjuster options**

Nil	Without adjuster	
AS	Rubber stopper	Extension
AT		Retraction
A		Both ends
CS	Metal stopper	Extension
CT		Retraction
C		Both ends

**Functional option**

Nil	Standard
Note P	Axial piping

Note) Axial piping is not available with adjusters at both ends or one at the retraction end.


**Number of auto switches**

Nil	2
S	1
n	n

**Type of auto switch**

Nil	Without auto switch
-----	---------------------

\* Refer to the table below for auto switch model numbers.



## Auto Switch Specifications (Refer to page 3.12-6 of Best Pneumatics ② for detailed specifications and auto switches not in the following table.)

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage			Switch model	*Lead wire length (m)		Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)		
								Horizontal				
<b>Reed switch</b>	—	Grommet	Yes	2-wire	24V	12V	100V	<b>A93</b>	●	●	—	Relay, PLC
<b>Solid state switch</b>	—	Grommet	Yes	3-wire (NPN)	24V	12V	—	<b>F9N</b>	●	●	—	Relay, PLC
				2-wire				<b>F9B</b>	●	●	—	

\*Lead wire length symbols: 0.5m-----Nil (Example) A93  
 3m-----L A93L

## Specifications

Bore size (mm)	6	8	12	16	20	25
Fluid	Air					
Action	Double acting					
Operating pressure	0.15 to 0.7MPa					
Proof pressure	1.05MPa					
Ambient and fluid temperature	-10 to 60°C (With no condensation)					
Piston speed	50 to 300mm/s (Adjuster options/Metal stopper: 50 to 200mm/s)					
Cushion	Rubber bumper (Standard, adjuster option / Rubber stopper) None (Adjuster options/Metal stopper)					
Lubrication	Non-lube					
Stroke length tolerance	+ <sub>0</sub> <sup>0.1</sup> mm					

## Adjuster Option Stroke Adjustment Range

Rubber stopper	Extension (AS)	Stroke adjustment range 0 to 5mm
	Retraction (AT)	
	Both ends (A)	
Metal stopper	Extension (CS)	Stroke adjustment range 0 to 5mm
	Retraction (CT)	
	Both ends (C)	

## Auto Switch/Proper Mounting Positions for Stroke End Detection



## Reed Switch: D-A93

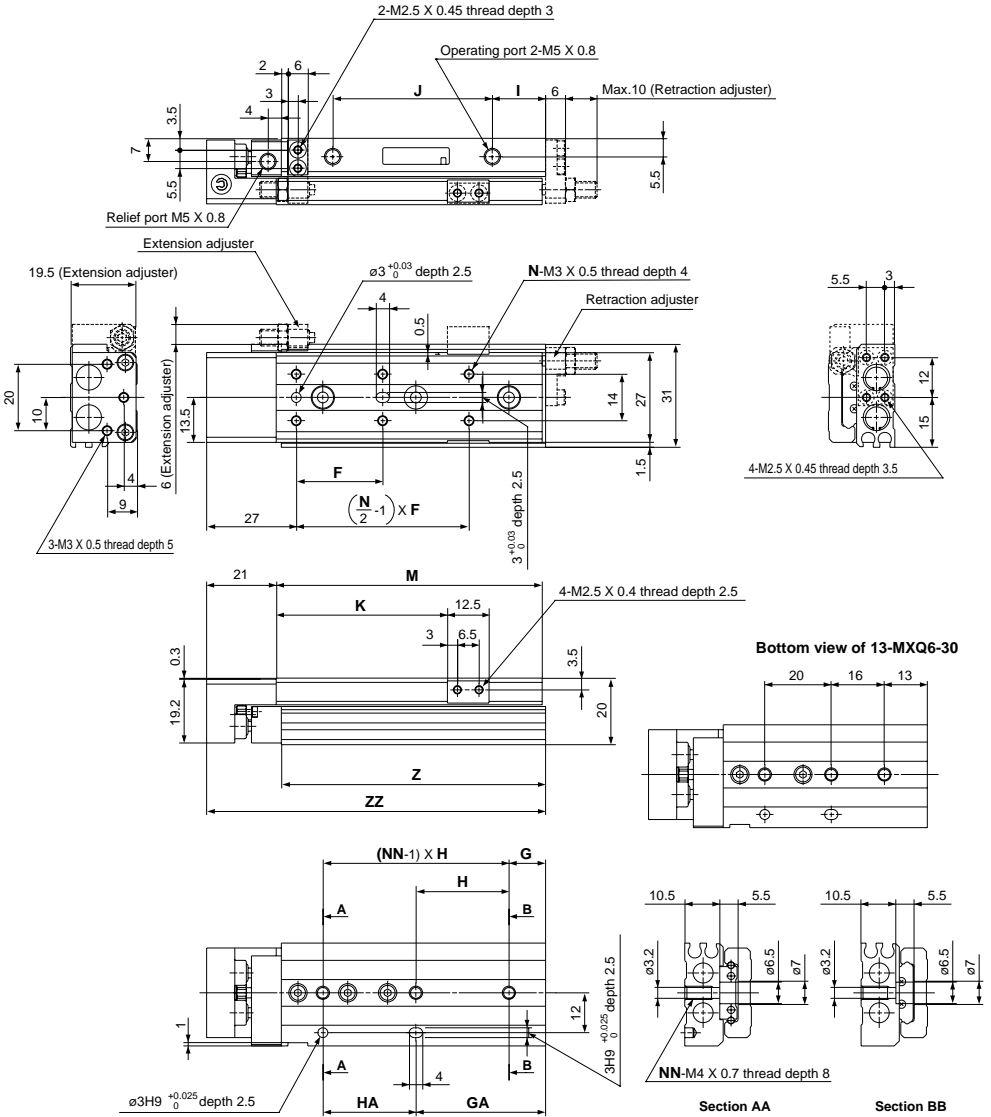
Model	A	B Stroke									E Stroke									Auto switch operation range
		10	20	30	40	50	75	100	125	150	10	20	30	40	50	75	100	125	150	
13-MXQ6 (L)	6	5.5	5.5	5.5	13.5	13.5	—	—	—	—	1	1	1	9	9	—	—	—	—	4.5
13-MXQ8 (L)	7.5	8	8	12	16	31	32	—	—	—	3.5	3.5	7.5	11.5	26.5	27.5	—	—	—	5
13-MXQ12 (L)	11.5	24.5	14.5	14.5	21.5	21.5	40.5	40.5	—	—	20	10	10	17	17	36	36	—	—	6
13-MXQ16 (L)	16.5	30.5	20.5	20.5	20.5	26.5	33.5	51.5	51.5	—	26	16	16	22	29	47	47	—	—	7
13-MXQ20 (L)	19	43.5	33.5	23.5	33.5	31.5	39.5	71.5	74.5	77.5	39	29	19	29	27	35	67	70	75	8
13-MXQ25 (L)	22	52.5	42.5	32.5	32.5	46.5	46.5	60.5	88.5	88.5	48	38	28	28	42	42	56	84	75	9

## Solid State Switch: D-F9B,D-F9N

Model	A	B Stroke									E Stroke									Auto switch operation range
		10	20	30	40	50	75	100	125	150	10	20	30	40	50	75	100	125	150	
13-MXQ6 (L)	10	9.5	9.5	9.5	17.5	17.5	—	—	—	—	-0.5	-0.5	-0.5	7.5	7.5	—	—	—	2	
13-MXQ8 (L)	11.5	12	12	16	20	35	36	—	—	—	2	2	6	10	25	26	—	—	2.5	
13-MXQ12 (L)	15.5	28.5	18.5	18.5	25.5	25.5	44.5	44.5	—	—	18.5	8.5	8.5	15.5	15.5	34.5	34.5	—	3	
13-MXQ16 (L)	20.5	34.5	24.5	24.5	24.5	30.5	37.5	55.5	55.5	—	24.5	14.5	14.5	14.5	20.5	27.5	45.5	45.5	4	
13-MXQ20 (L)	23	47.5	37.5	27.5	37.5	35.5	43.5	75.5	78.5	81.5	37.5	27.5	17.5	27.5	25.5	33.5	65.5	68.5	6	
13-MXQ25 (L)	27	56.5	46.5	36.5	36.5	50.5	50.5	64.5	92.5	92.5	46.5	36.5	26.5	26.5	40.5	40.5	54.5	82.5	6	

**Dimensions/13-MXQ6**

Basic



(mm)

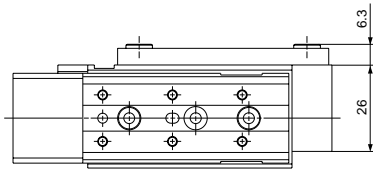
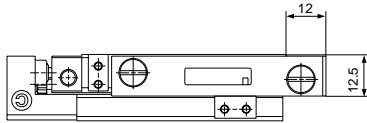
Model	F	N	G	H	NN	GA	HA	I	J	K	M	Z	ZZ
13-MXQ6-10	22	4	6	23	2	13	16	9	17	21.5	42	41.5	64
13-MXQ6-20	25	4	13	26	2	13	26	9	27	31.5	52	51.5	74
13-MXQ6-30	21	6	<i>Note)</i>	<i>Note)</i>	3	29	20	9	37	41.5	62	61.5	84
13-MXQ6-40	26	6	11	28	3	39	28	16	48	51.5	80	79.5	102
13-MXQ6-50	27	6	21	28	3	49	28	9	65	61.5	90	89.5	112

Note) Refer to the bottom drawing of 13-MXQ6-30.

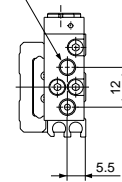


**Dimensions/13-MXQ6**

Axial Piping (ø6) 13-MXQ6-□□P



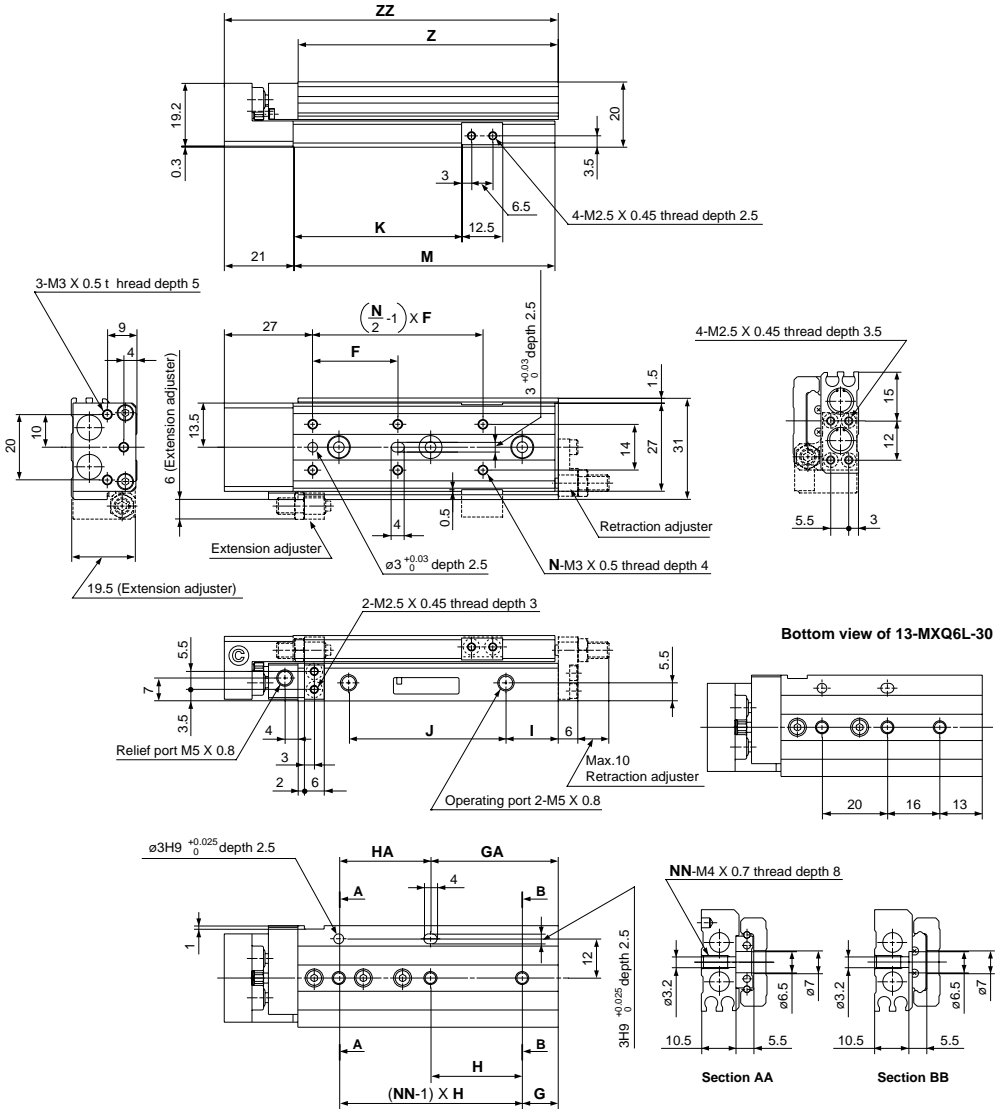
Operating port 2-M5 X 0.8



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ6L/Symmetric Style**

Basic

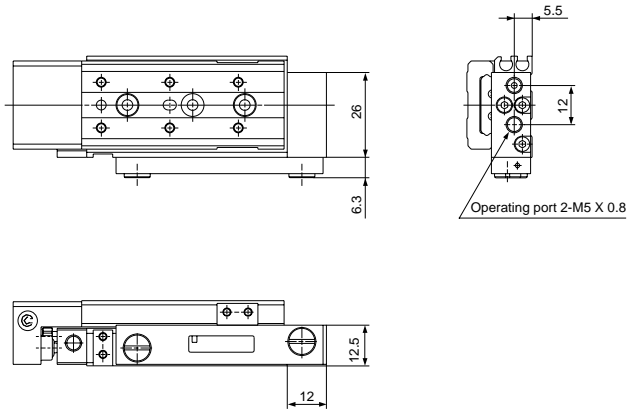


Model	F	N	G	H	NN	GA	HA	I	J	K	M	Z	ZZ
13-MXQ6L-10	22	4	6	23	2	13	16	9	17	21.5	42	41.5	64
13-MXQ6L-20	25	4	13	26	2	13	26	9	27	31.5	52	51.5	74
13-MXQ6L-30	21	6	Note	Note	3	29	20	9	37	41.5	62	61.5	84
13-MXQ6L-40	26	6	11	28	3	39	28	16	48	51.5	80	79.5	102
13-MXQ6L-50	27	6	21	28	3	49	28	9	65	61.5	90	89.5	112

Note) Refer to the bottom drawing of 13-MXQ6L-30.

**Dimensions/13-MXQ6L/Symmetric Style**

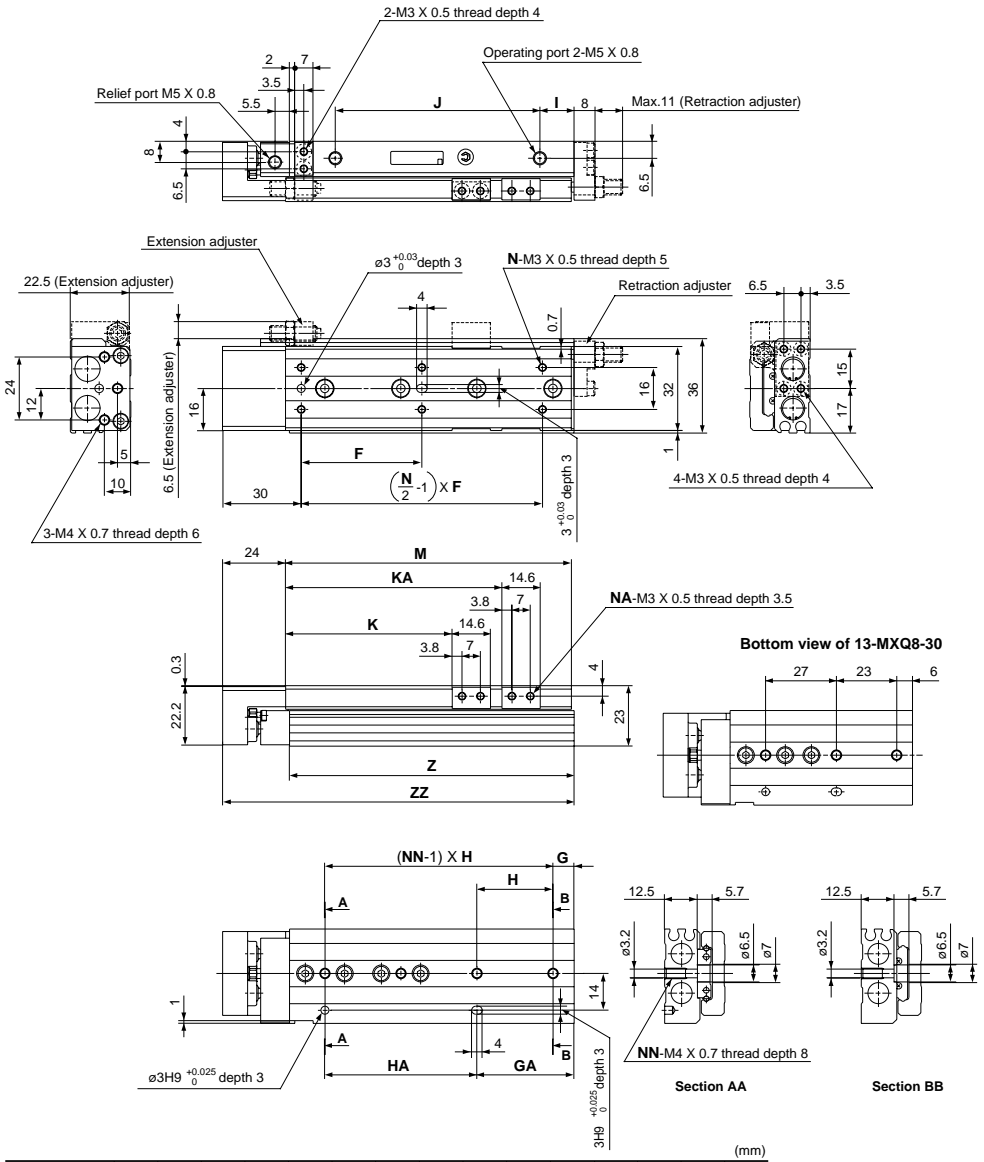
Axial Piping (ø6) 13-MXQ6L-□□P



\* Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ8**

Basic

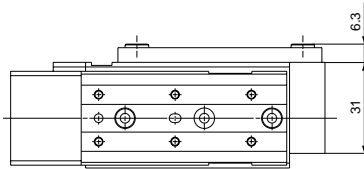
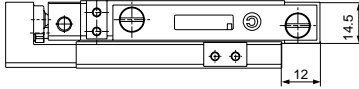


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ8-10	25	4	7	25	2	13	19	11	17	23.5	—	4	46	45.5	71
13-MXQ8-20	25	4	14	28	2	14	28	10	28	33.5	—	4	56	55.5	81
13-MXQ8-30	26	6	$\frac{N}{2}$	$\frac{N}{2}$	3	29	27	12	40	43.5	—	4	70	69.5	95
13-MXQ8-40	32	6	8	31	3	39	31	14	52	53.5	—	4	84	83.5	109
13-MXQ8-50	46	6	8	29	4	37	58	13	78	63.5	82.5	8	109	108.5	134
13-MXQ8-75	50	6	31	30	4	61	60	12	105	88.5	112.5	8	135	134.5	160

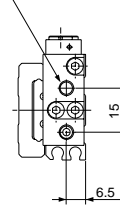
Note) Refer to the bottom drawing of 13-MXQ8-30.

**Dimensions/13-MXQ8**

Axial Piping (ø8) 13-MXQ8-□□P



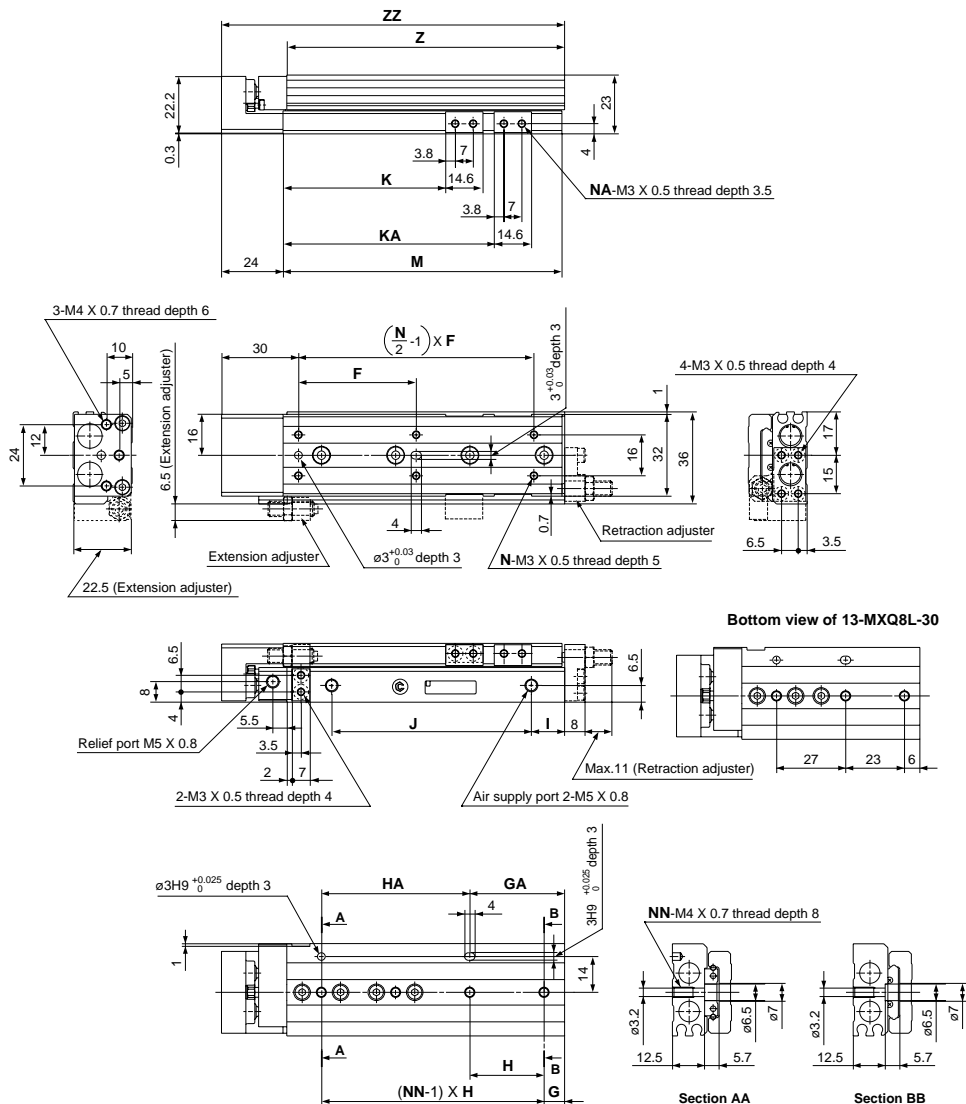
Operating port 2-M5 X 0.8



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ8L/Symmetric Style**

Basic

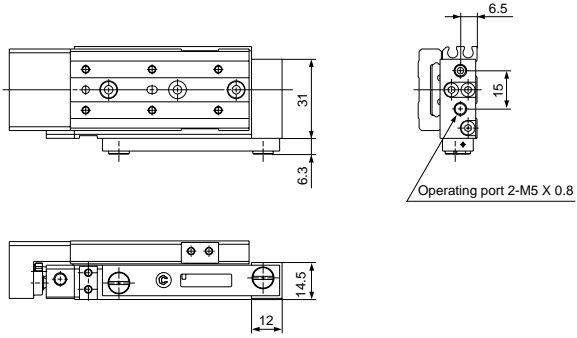


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ8L-10	25	4	7	25	2	13	19	11	17	23.5	—	4	46	45.5	71
13-MXQ8L-20	25	4	14	28	2	14	28	10	28	33.5	—	4	56	55.5	81
13-MXQ8L-30	26	6	$\frac{N(20)}{No(10)}$	$\frac{N(20)}{No(10)}$	3	29	27	12	40	43.5	—	4	70	69.5	95
13-MXQ8L-40	32	6	8	31	3	39	31	14	52	53.5	—	4	84	83.5	109
13-MXQ8L-50	46	6	8	29	4	37	58	13	78	63.5	82.5	8	109	108.5	134
13-MXQ8L-75	50	6	31	30	4	61	60	12	105	88.5	112.5	8	135	134.5	160

Note) Refer to the bottom drawing of 13-MXQ8L-30.

**Dimensions/13-MXQ8L/Symmetric Style**

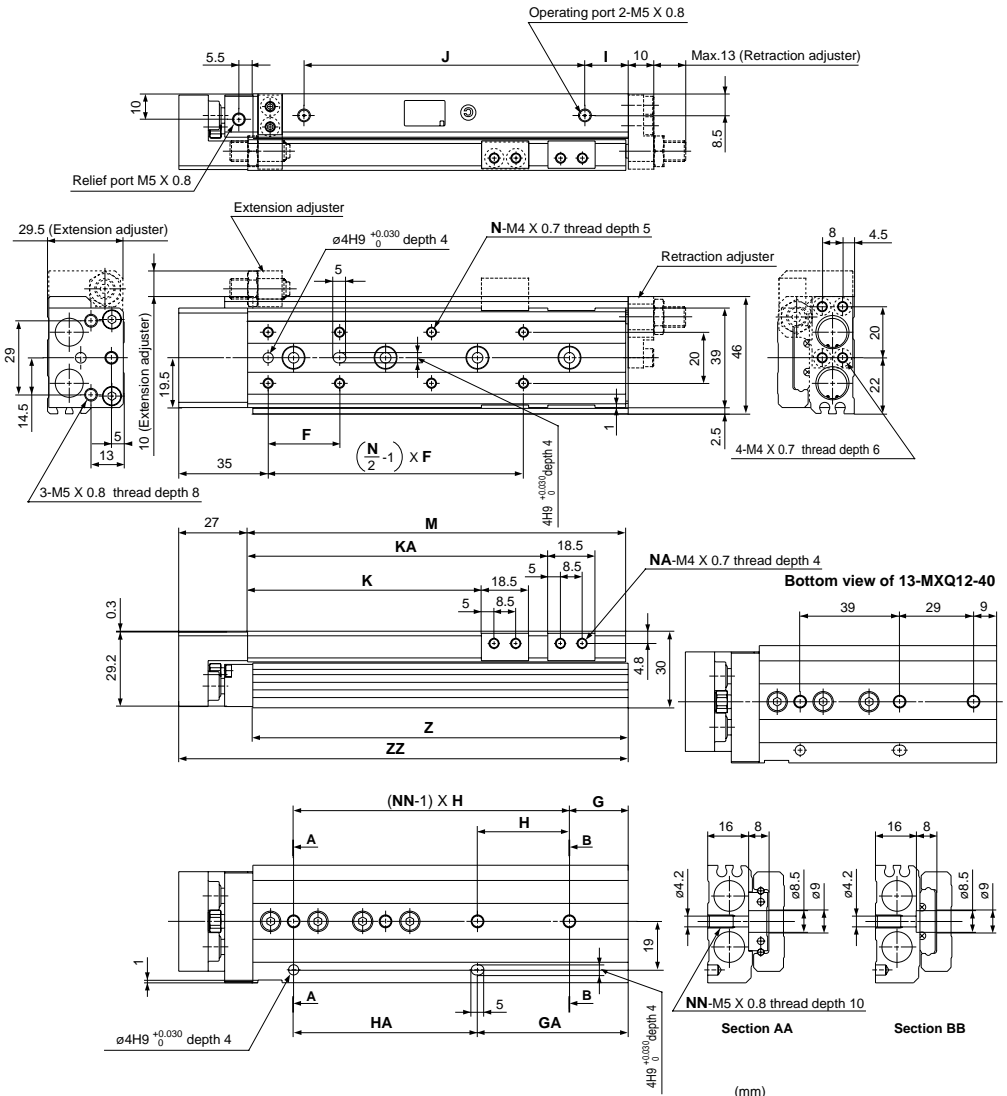
Axial Piping (ø8) 13-MXQ8L-□□P



\* Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ12**

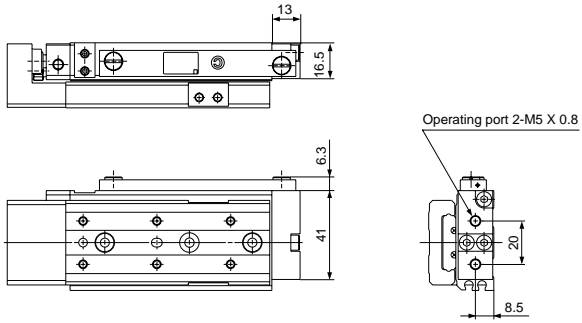
Basic



Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ12- 10	28	4	18	32	2	18	32	12	34	26.5	—	4	67	66	95
13-MXQ12- 20	28	4	18	32	2	18	32	12	34	36.5	—	4	67	66	95
13-MXQ12- 30	38	4	20	40	2	20	40	14	42	46.5	—	4	77	76	105
13-MXQ12- 40	34	6	<sup>NO20</sup> <sub>NO10</sub>	<sup>NO30<sub>NO15</sub></sup>	3	38	39	15	58	56.5	—	4	94	93	122
13-MXQ12- 50	34	6	9	39	3	48	39	13	70	66.5	—	4	104	103	132
13-MXQ12- 75	36	8	23	36	4	59	72	17	110	91.5	117.5	8	148	147	176
13-MXQ12-100	36	10	12	36	5	84	72	17	135	116.5	142.5	8	173	172	201

Note) Refer to the bottom drawing of 13-MXQ12-40.

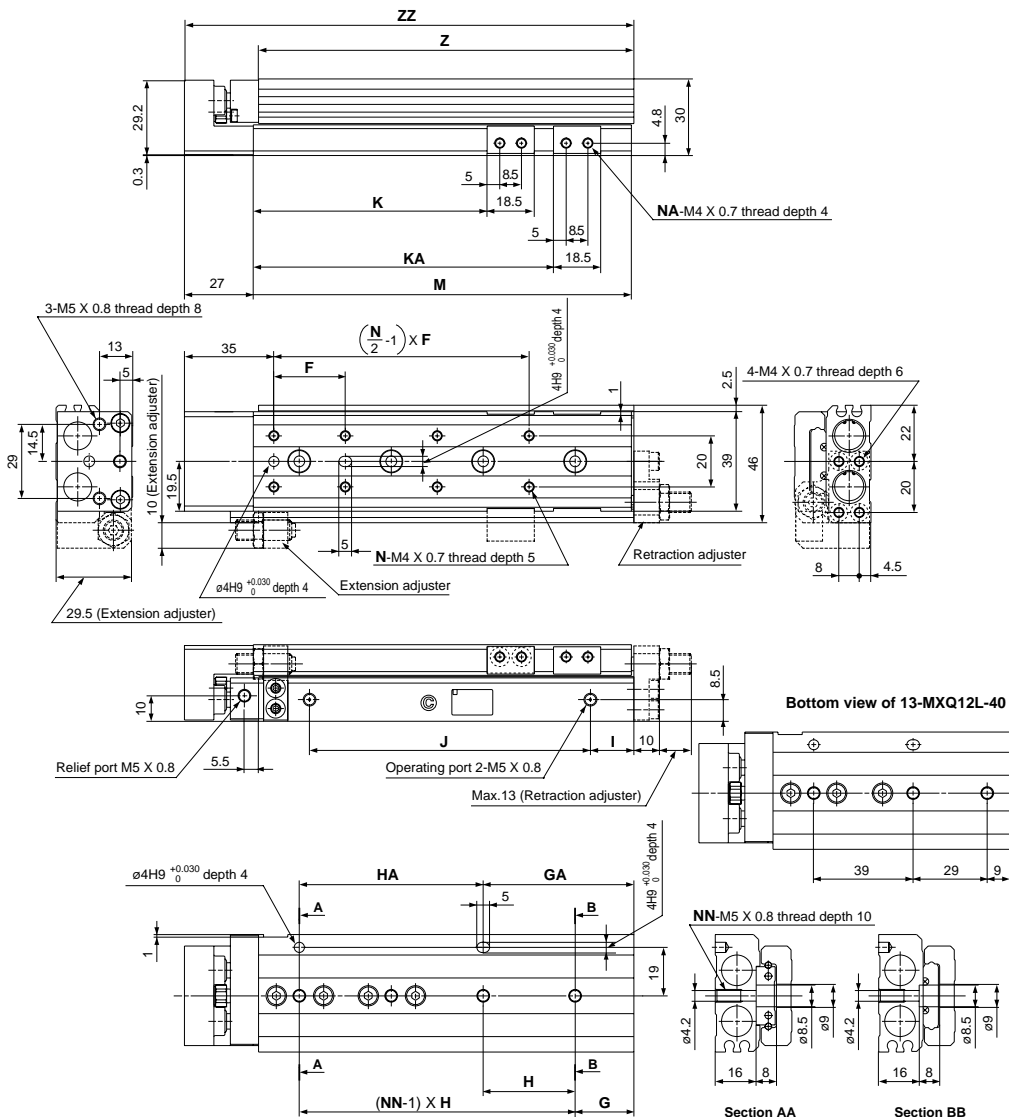


**Dimensions/13-MXQ12**Axial Piping ( $\phi 12$ ) 13-MXQ12-□□P

\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ12L/Symmetric Style**

Basic

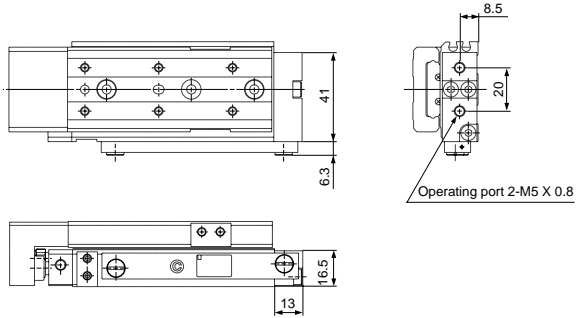


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ12L- 10	28	4	18	32	2	18	32	12	34	26.5	—	4	67	66	95
13-MXQ12L- 20	28	4	18	32	2	18	32	12	34	36.5	—	4	67	66	95
13-MXQ12L- 30	38	4	20	40	2	20	40	14	42	46.5	—	4	77	76	105
13-MXQ12L- 40	34	6	<sup>100</sup> <sub>0</sub>	<sup>100</sup> <sub>0</sub>	3	38	39	15	58	56.5	—	4	94	93	122
13-MXQ12L- 50	34	6	9	39	3	48	39	13	70	66.5	—	4	104	103	132
13-MXQ12L- 75	36	8	23	36	4	59	72	17	110	91.5	117.5	8	148	147	176
13-MXQ12L-100	36	10	12	36	5	84	72	17	135	116.5	142.5	8	173	172	201

Note) Refer to the bottom drawing of 13-MXQ12L-40.

**Dimensions/13-MXQ12L/Symmetric Style**

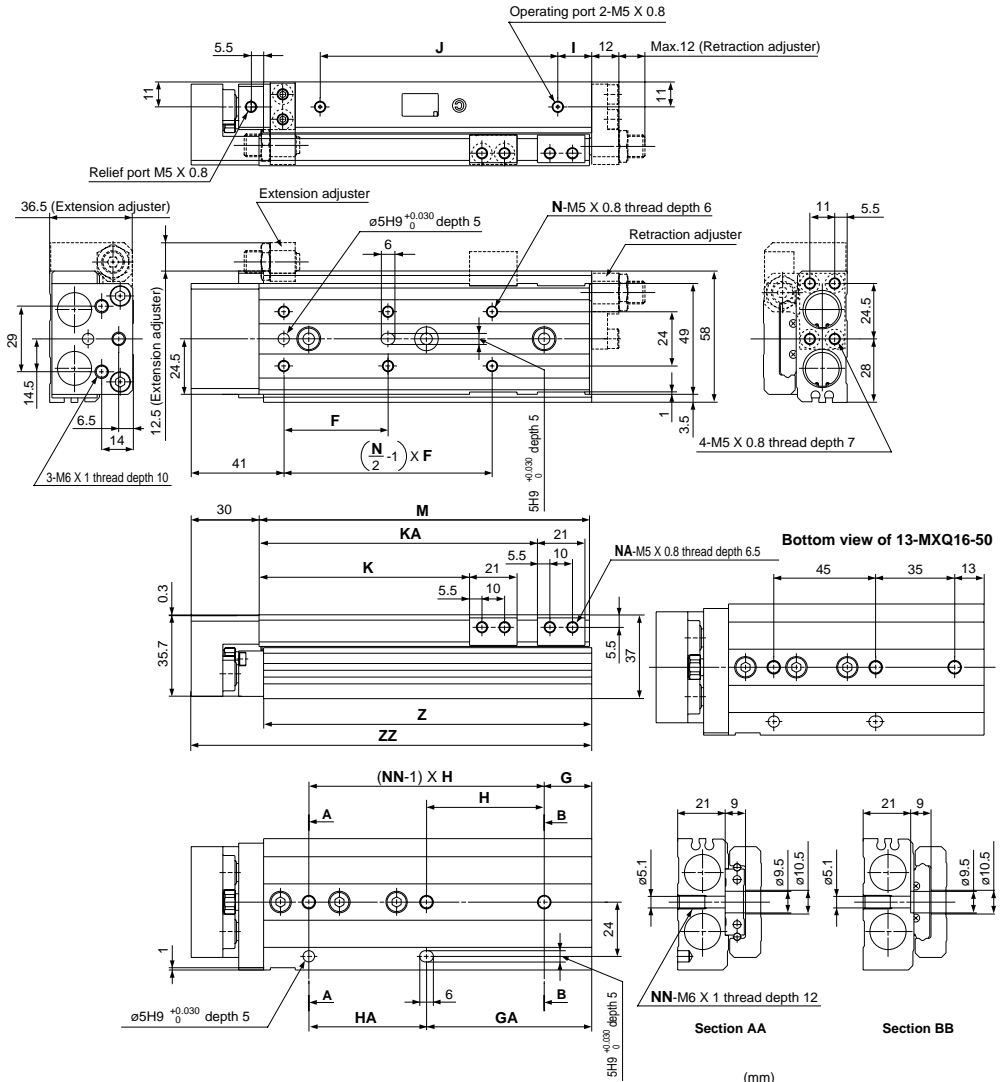
Axial Piping (ø12) 13-MXQ12L-□□P



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ16**

Basic

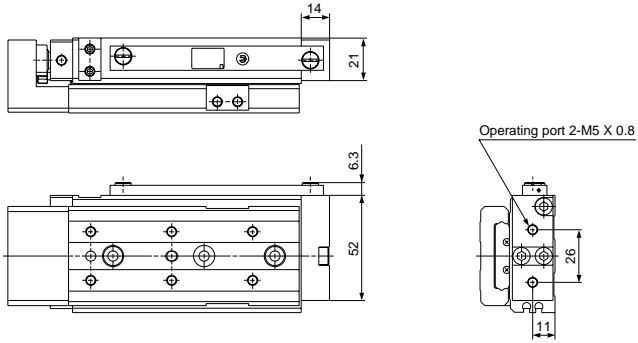


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ16- 10	38	4	18	39	2	18	39	12	40	28	—	4	78	77	109
13-MXQ16- 20	38	4	18	39	2	18	39	12	40	38	—	4	78	77	109
13-MXQ16- 30	48	4	19	48	2	19	48	12	50	48	—	4	88	87	119
13-MXQ16- 40	58	4	19	58	2	19	58	12	60	58	—	4	98	97	129
13-MXQ16- 50	40	6	$\frac{M}{2}$	$\frac{N}{2}$	3	48	45	20	68	68	91	8	114	113	145
13-MXQ16- 75	46	6	21	52	3	73	52	15	105	93	123	8	146	145	177
13-MXQ16-100	44	8	36	44	4	80	88	18	145	118	166	8	189	188	220
13-MXQ16-125	44	10	17	44	5	105	88	23	165	143	191	8	214	213	245

Note) Refer to the bottom drawing of 13-MXQ16-50.

**Dimensions/13-MXQ16**

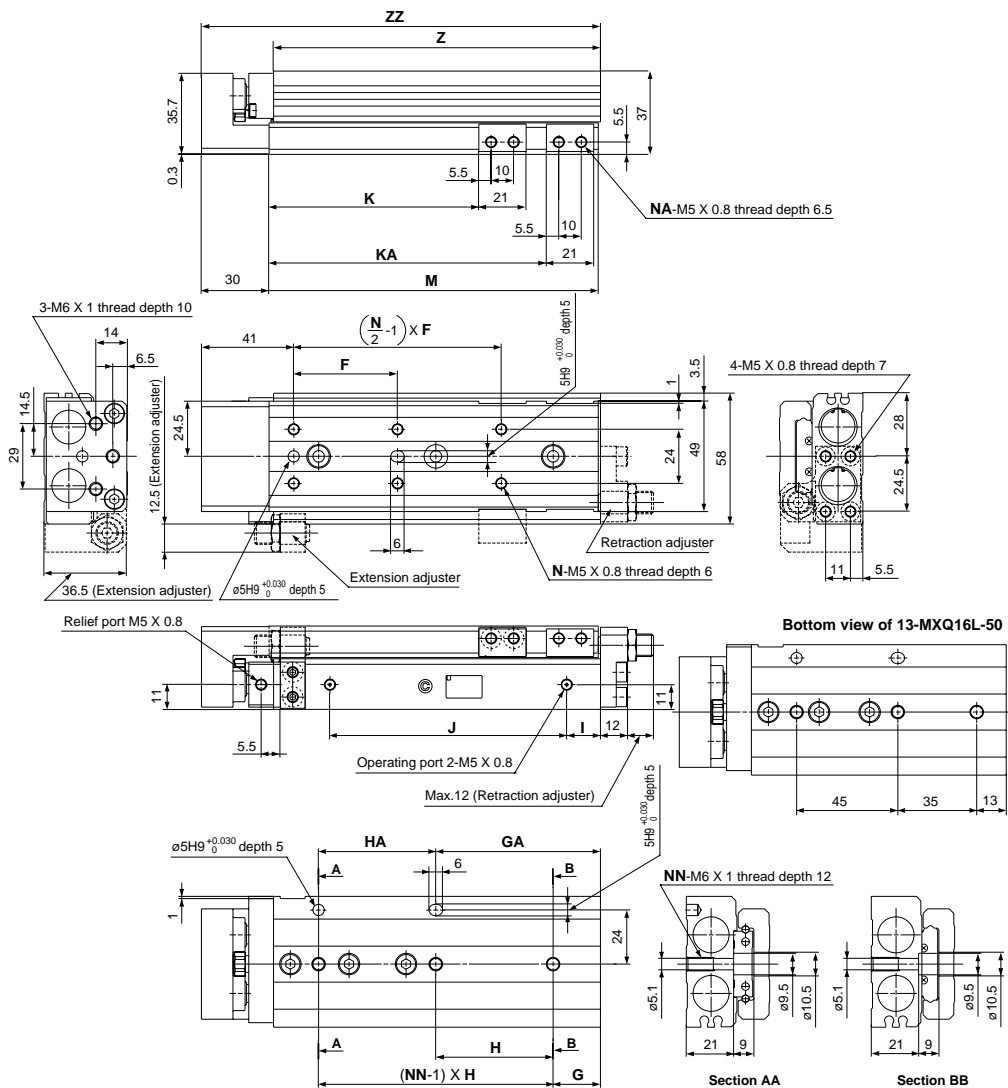
Axial Piping (∅16) 13-MXQ16-□□P



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ16L/Symmetric Style**

Basic

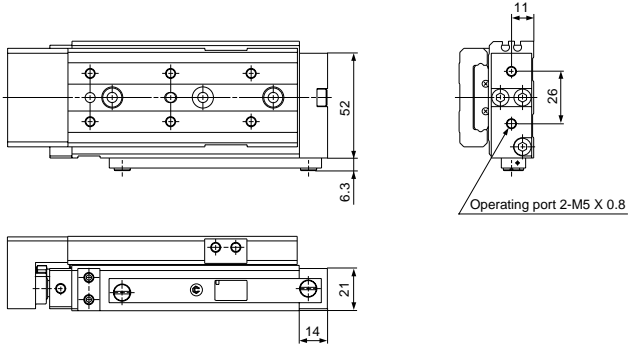


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ16L- 10	38	4	18	39	2	18	39	12	40	28	—	4	78	77	109
13-MXQ16L- 20	38	4	18	39	2	18	39	12	40	38	—	4	78	77	109
13-MXQ16L- 30	48	4	19	48	2	19	48	12	50	48	—	4	88	87	119
13-MXQ16L- 40	58	4	19	58	2	19	58	12	60	58	—	4	98	97	129
13-MXQ16L- 50	40	6	$\frac{19}{2}$	$\frac{58}{2}$	3	48	45	20	68	68	91	8	114	113	145
13-MXQ16L- 75	46	6	21	52	3	73	52	15	105	93	123	8	146	145	177
13-MXQ16L-100	44	8	36	44	4	80	88	18	145	118	166	8	189	188	220
13-MXQ16L-125	44	10	17	44	5	105	88	23	165	143	191	8	214	213	245

Note) Refer to the bottom drawing of 13-MXQ16L-50.

**Dimensions/13-MXQ16L/Symmetric Style**

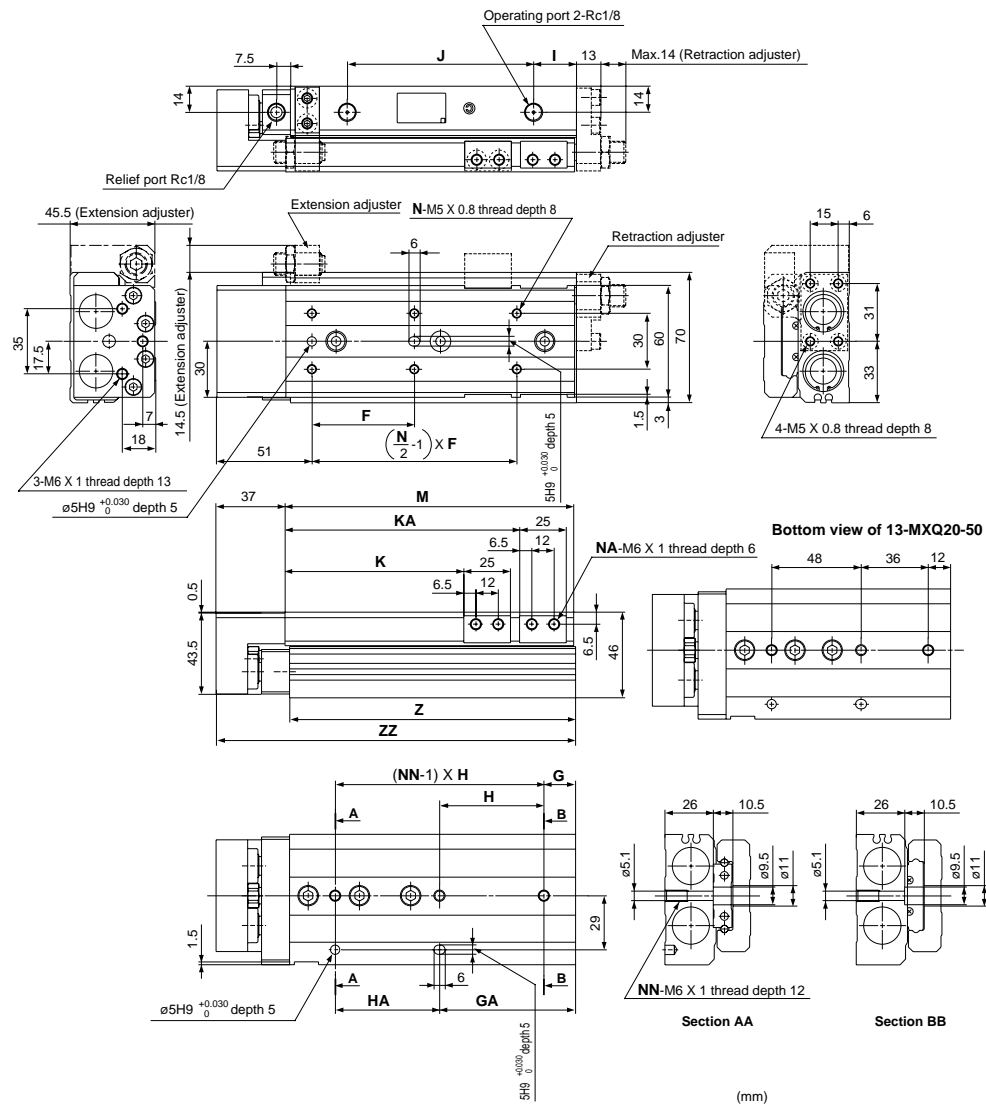
Axial Piping (ø16) 13-MXQ16L-□□P



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ20**

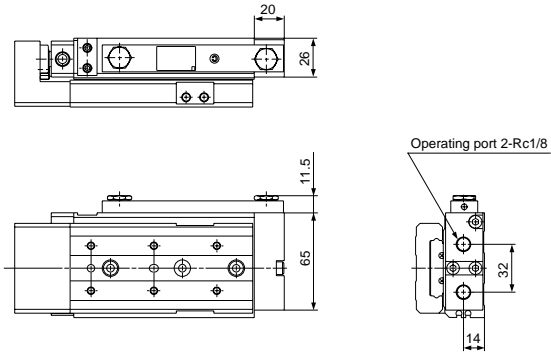
Basic



Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ20- 10	45	4	22	46	2	18	50	16	46	31	—	4	94	92.5	132
13-MXQ20- 20	40	4	22	46	2	18	50	16	46	41	—	4	94	92.5	132
13-MXQ20- 30	48	4	22	46	2	18	50	16	46	51	—	4	94	92.5	132
13-MXQ20- 40	58	4	22	56	2	22	56	16	56	61	—	4	104	102.5	142
13-MXQ20- 50	42	6	<sup>Note</sup> 17	<sup>Note</sup> 56	3	48	48	18	72	71	—	4	122	120.5	160
13-MXQ20- 75	55	6	17	56	3	73	56	23	100	96	126	8	155	153.5	193
13-MXQ20-100	50	8	18	56	4	74	112	25	155	121	183	8	212	210.5	250
13-MXQ20-125	55	8	37	59	4	96	118	18	190	146	211	8	240	238.5	278
13-MXQ20-150	62	8	56	62	4	118	124	21	215	171	239	8	268	266.5	306

Note) Refer to the bottom drawing of 13-MXQ20-50.

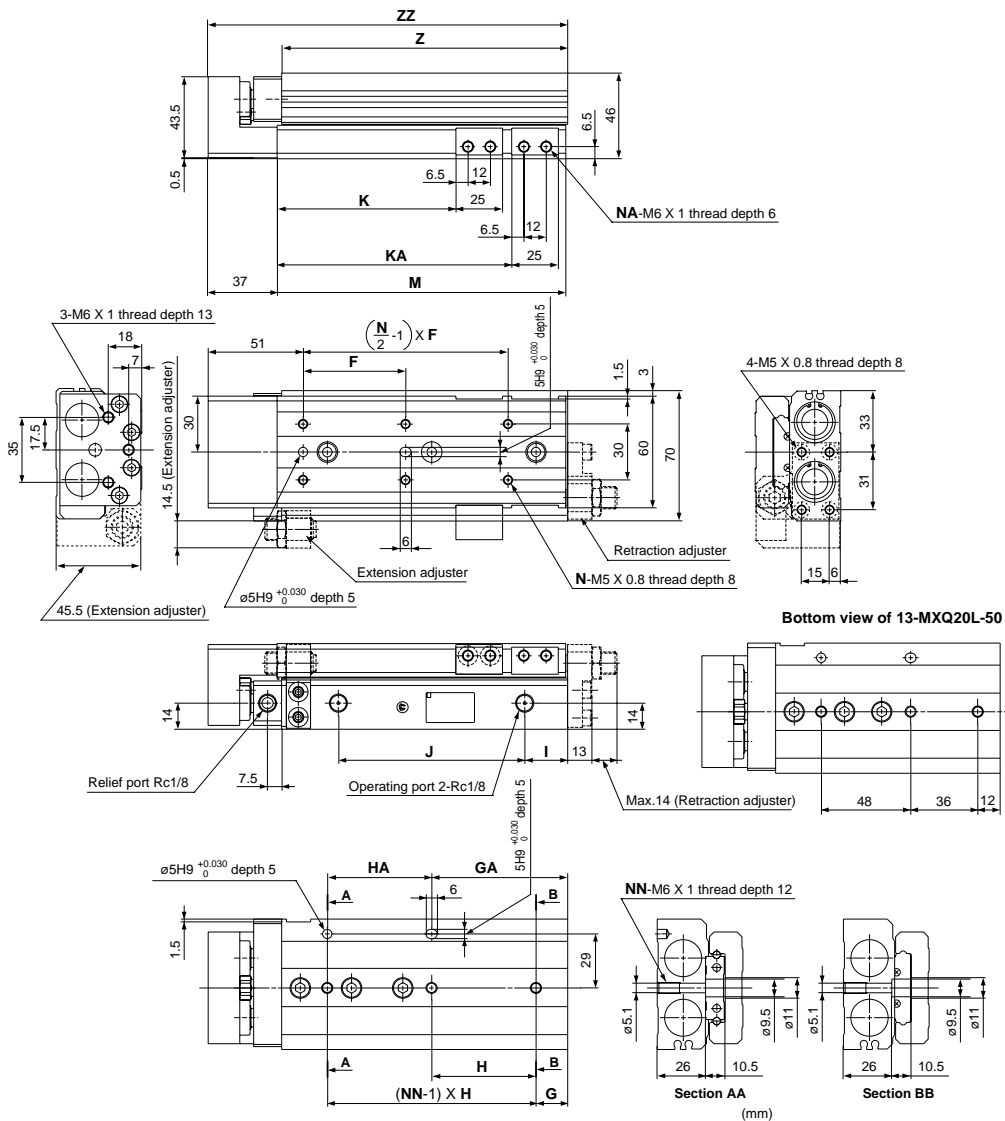


**Dimensions/13-MXQ20**Axial Piping ( $\varnothing 20$ ) 13-MXQ20-□□P

\*Dimensions not indicated are same as those of the standard type.

Dimensions/13-MXQ20L/Symmetric Style

Basic

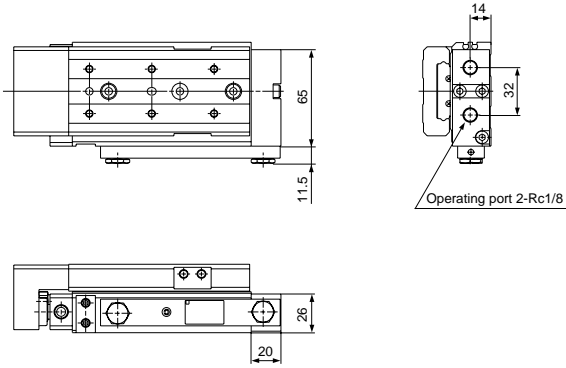


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ20L- 10	45	4	22	46	2	18	50	16	46	31	—	4	94	92.5	132
13-MXQ20L- 20	40	4	22	46	2	18	50	16	46	41	—	4	94	92.5	132
13-MXQ20L- 30	48	4	22	46	2	18	50	16	46	51	—	4	94	92.5	132
13-MXQ20L- 40	58	4	22	56	2	22	56	16	56	61	—	4	104	102.5	142
13-MXQ20L- 50	42	6	$_{-0.02}^{+0.03}$	$_{-0.02}^{+0.03}$	3	48	48	18	72	71	—	4	122	120.5	160
13-MXQ20L- 75	55	6	17	56	3	73	56	23	100	96	126	8	155	153.5	193
13-MXQ20L-100	50	8	18	56	4	74	112	25	155	121	183	8	212	210.5	250
13-MXQ20L-125	55	8	37	59	4	96	118	18	190	146	211	8	240	238.5	278
13-MXQ20L-150	62	8	56	62	4	118	124	21	215	171	239	8	268	266.5	306

Note) Refer to the bottom drawing of 13-MXQ20L-50.

**Dimensions/13-MXQ20L/Symmetric Style**

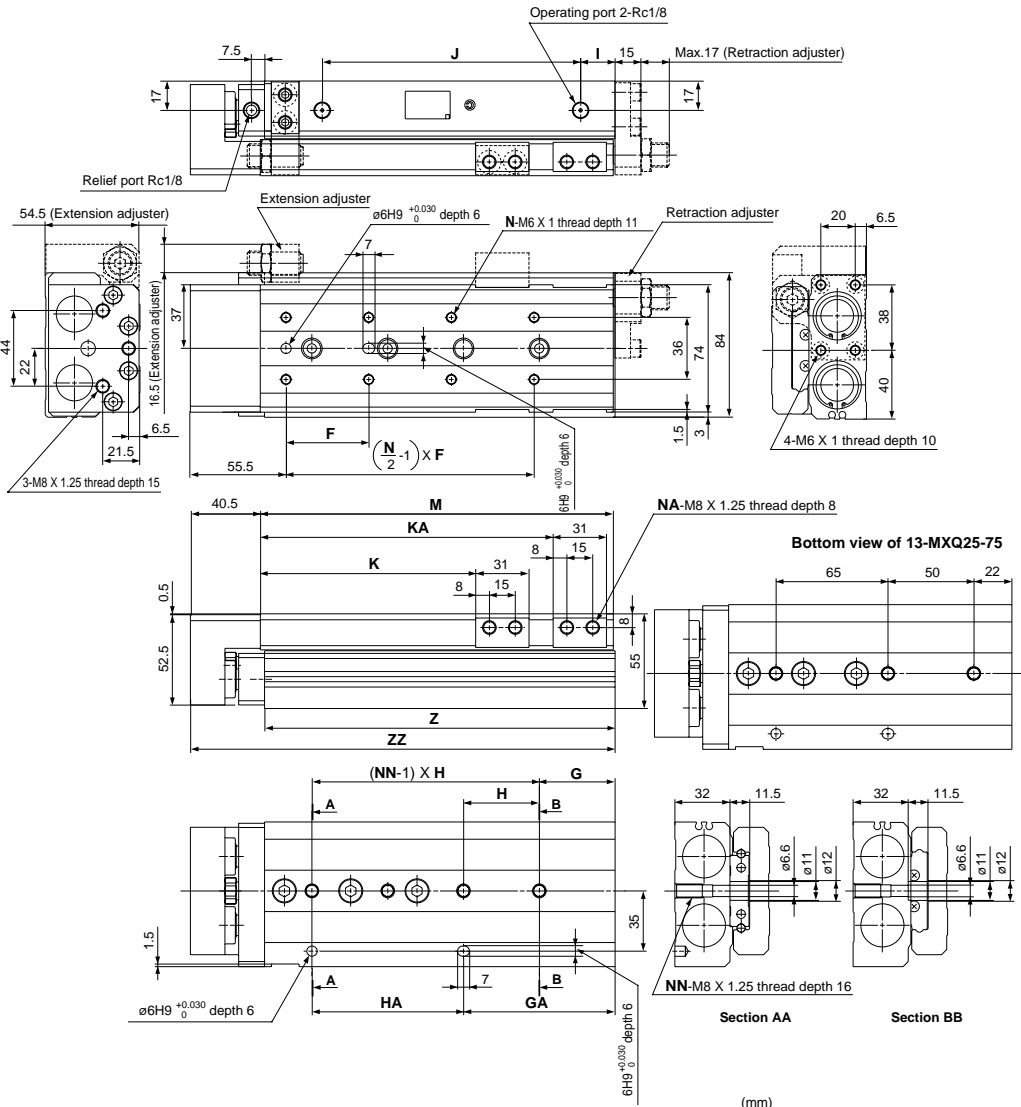
Axial Piping (ø20) 13-MXQ20L-□□P



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ25**

**Basic**

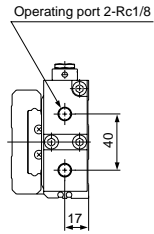
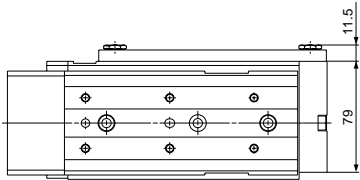
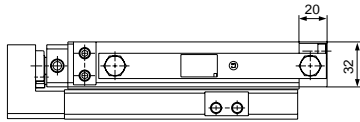


Model	F	N	G	H	NN	GA	HA	I	J	K	NA	M	Z	ZZ	
13-MXQ25- 10	55	4	23	55	2	23	55	16	56	35	—	4	107	105.5	148.5
13-MXQ25- 20	46	4	23	55	2	23	55	16	56	45	—	4	107	105.5	148.5
13-MXQ25- 30	55	4	23	55	2	23	55	16	56	55	—	4	107	105.5	148.5
13-MXQ25- 40	65	4	23	65	2	23	65	16	66	65	—	4	117	115.5	158.5
13-MXQ25- 50	75	4	32	80	2	32	80	16	90	75	—	4	141	139.5	182.5
13-MXQ25- 75	60	6	$\frac{N(30)}$	$\frac{H(30)}$	3	72	65	31	100	100	—	4	166	164.5	207.5
13-MXQ25-100	48	8	44	44	4	88	88	20	150	125	170	8	205	203.5	246.5
13-MXQ25-125	60	8	31	66	4	97	132	18	205	150	223	8	258	256.5	299.5
13-MXQ25-150	65	8	56	66	4	122	132	18	230	175	248	8	283	281.5	342.5

Note) Refer to the bottom drawing of 13-MXQ25-75.

**Dimensions/13-MXQ25**

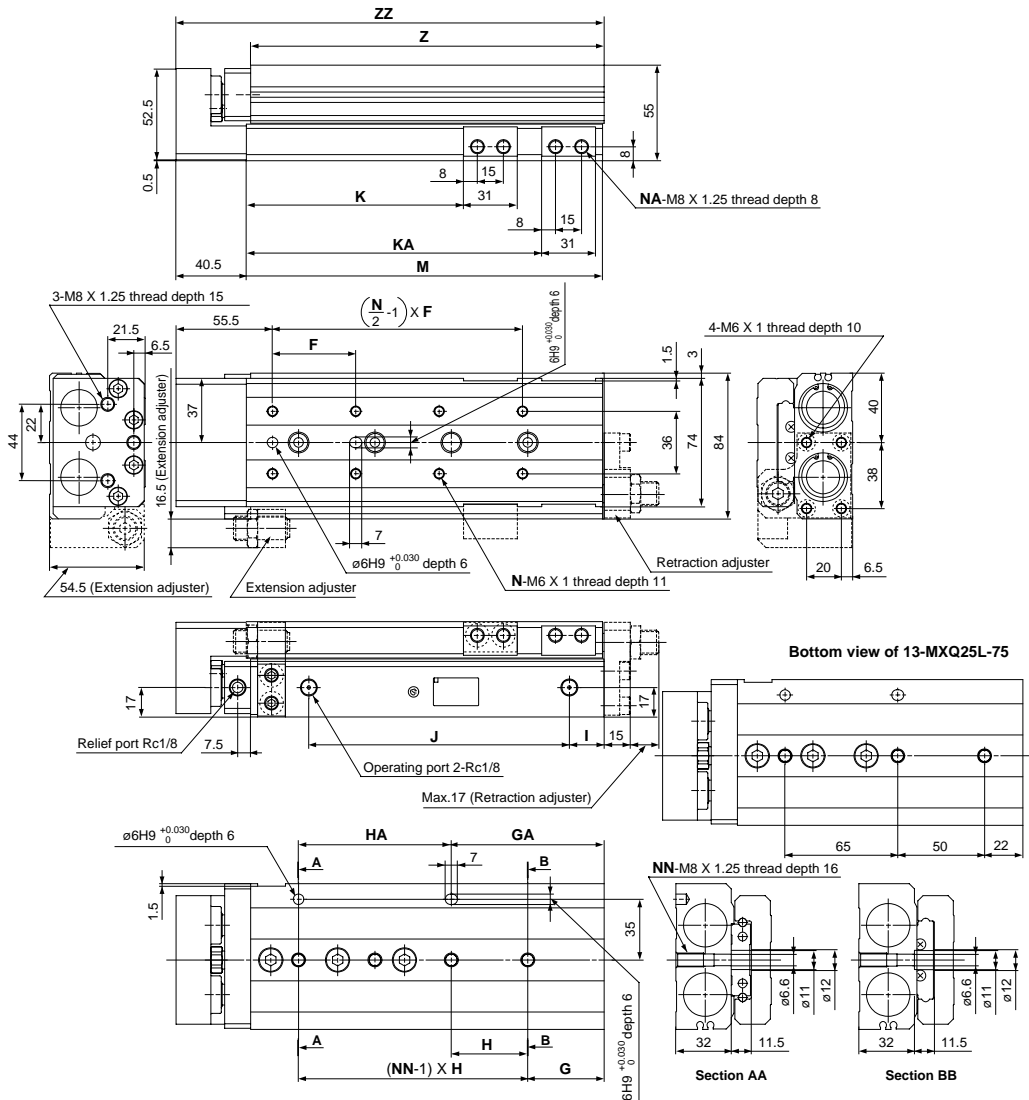
Axial Piping (ø25) 13-MXQ25-□□P



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXQ25L/Symmetric Style**

Basic

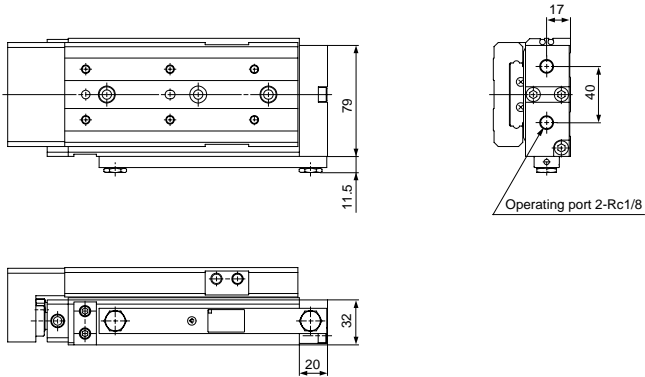


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXQ25L- 10	55	4	23	55	2	23	55	16	56	35	—	4	107	105.5	148.5
13-MXQ25L- 20	46	4	23	55	2	23	55	16	56	45	—	4	107	105.5	148.5
13-MXQ25L- 30	55	4	23	55	2	23	55	16	56	55	—	4	107	105.5	148.5
13-MXQ25L- 40	65	4	23	65	2	23	65	16	66	65	—	4	117	115.5	158.5
13-MXQ25L- 50	75	4	32	80	2	32	80	16	90	75	—	4	141	139.5	182.5
13-MXQ25L- 75	60	6	$20_{(0.05)}$	$100_{(0.05)}$	3	72	65	31	100	100	—	4	166	164.5	207.5
13-MXQ25L-100	48	8	44	44	4	88	88	20	150	125	170	8	205	203.5	246.5
13-MXQ25L-125	60	8	31	66	4	97	132	18	205	150	223	8	258	256.5	299.5
13-MXQ25L-150	65	8	56	66	4	122	132	18	230	175	248	8	283	281.5	342.5

Note) Refer to the bottom drawing of 13-MXQ25L-75.

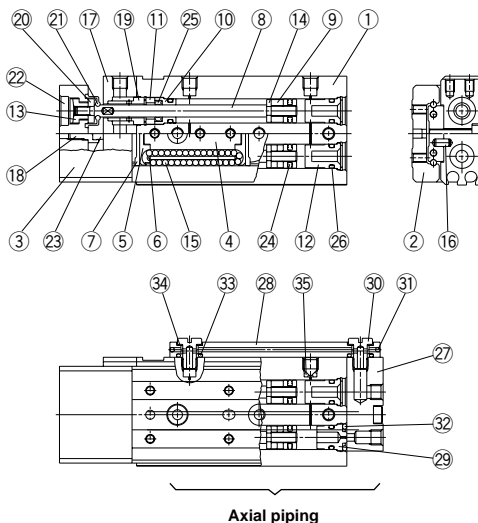
**Dimensions/13-MXQ25L/Symmetric Style**

Axial Piping (ø25) 13-MXQ25L-□□P



\*Dimensions not indicated are same as those of the standard type.

**Construction**



**Component Parts**

No.	Description	Material	Note
①	Body	Aluminium alloy	Hard anodized
②	Table	Stainless steel	Heat treated
③	End plate	Aluminium alloy	Hard anodized
④	Guide block	Stainless steel	Heat treated
⑤	Cover	Delrin	
⑥	Return guide	Delrin	
⑦	Scraper	Stainless steel, NBR	
⑧	Rod	Stainless steel	
⑨	Piston Ass'y		With one side magnet
⑩	Rod cover	Aluminium alloy	Hard anodized
⑪	Seal support	Brass	Electroless nickel plated
⑫	Head cap	Resin	
⑬	Floating bushing	Stainless steel	
⑭	Rod bumper	Polyurethane	
⑮	Steel balls	High carbon chromium bearing steel	
⑯	Parallel pin	Stainless steel	
⑰	Relief plate	Aluminium alloy	Hard anodized
⑱	Bumper holder	Stainless steel	
⑲	Relief bush	Brass	Electroless nickel plated
⑳	Floating collar	Stainless steel	
㉑	Dust cover	Silicone rubber	
㉒	Dust plug	Silicone rubber	
㉓	Adjustment bumper	Polyurethane	
㉔	Piston seal	NBR	
㉕	Rod seal	NBR	
㉖	O-ring	NBR	

**Axial Piping/Component Parts**

No.	Description	Material	Note
㉗	Plate for axial piping	Aluminium alloy	Hard anodized
㉘	Pipe	Aluminium alloy	Hard anodized
㉙	Bushing	Aluminium alloy	Chromate treatment
㉚	Stad	Brass	Electroless nickel plated
㉛	Steel balls	Stainless steel	
㉜	O-ring	NBR	
㉝	O-ring	NBR	
㉞	Gasket	NBR, Stainless steel	
㉟	O-ring	NBR	



**Made to Order****① Anti Corrosion Treatment on Guide -X42**

**13-MXQ** Refer to How to Order on p. 116 for Standard Products -X42

Although martensitic stainless steel is used for the table and guide blocks, these specifications can be used in case even further anti-corrosion measures are required.

Anticorrosive treatment is applied to the table and the guide lock.

Note 1) Dimensions are same as those of the standard type.

Note 2) The color of the body, table and guide blocks will be black due to special anticorrosive treatment.

**② Use of Fluororesin for Dust Cover and Dust Plug -X52**

**13-MXQ** Refer to How to Order on P. 116 for Standard Products -X52

Fluoro rubber is used for the dust cover and the dust plug replacing silicone rubber used for standard objects.

Note 1) Dimensions are same as those of the standard type.

**⚠ Specific Product Precautions**

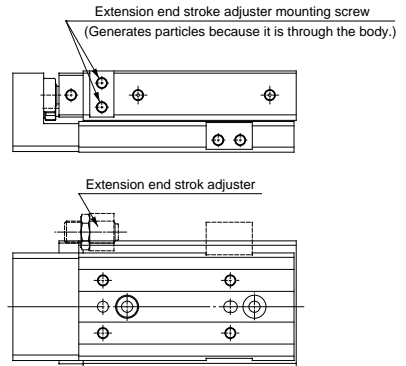
Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

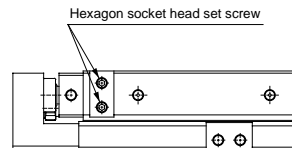
**Precautions****⚠ Caution**

In case the extension end stroke adjuster of the following type is removed after purchase, particle generation may occur because the bottom hole of the mounting screw penetrates the body. Use a hexagon socket head screw identical in size with the mounting screw to plug the hole. Consult SMC for more information.

Model	Cylinder bore size (mm)
<b>13-MXQ (L)</b>	12, 16, 20, 25



In case of types without extension end adjuster, the hole is plugged with a hexagon socket head set screw at the time of shipment.



# Series 13-MXS Air Slide Table

ø6, ø8, ø12, ø16, ø20, ø25

## How to Order

**13—MXS** **12** **50** **F9N**

**Clean series**  
13-Vacuum suction type  
(Special treatment on guide)

**Symmetric style**

Nil	Standard
Note 2) L	Symmetric

**Number of auto switches**

Nil	2
S	1
n	n

**Bore size — Stroke mm**

6	10, 20, 30, 40, 50
8	10, 20, 30, 40, 50, 75
12	10, 20, 30, 40, 50, 75, 100
16	10, 20, 30, 40, 50, 75, 100, 125
20	10, 20, 30, 40, 50, 75, 100, 125, 150
25	10, 20, 30, 40, 50, 75, 100, 125, 150

**Adjuster options**

Nil	Without adjuster	
AS	Rubber stopper	Extension
AT		Retraction
A		Both ends

**Type of auto switch**


Nil	Without auto switch
-----	---------------------

\*Refer to the table below for auto switch model numbers.

**Functional option**

Nil	Standard
Note 1) P	Axial piping

Note 1) Axial piping is not available with adjusters at both ends or one at the retraction end.  
Note 2) Axial piping is not available with symmetric types.



## Auto Switch Specifications (Refer to page 3.11-6 of Best Pneumatics ② for detailed specifications and auto switches not in the following table.)

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage			Switch model	*Lead wire length (m)		Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)		
								Horizontal				
<b>Reed switch</b>	—	Grommet	Yes	2-wire	24V	12V	100V	<b>A93</b>	●	●	—	Relay, PLC
<b>Solid state switch</b>	—	Grommet	Yes	3-wire (NPN)	24V	12V	—	<b>F9N</b>	●	●	—	Relay, PLC
								<b>F9B</b>	●	●	—	

\*Lead wire length symbols: 0.5m..... Nil (Example) A93  
3m..... L A93L

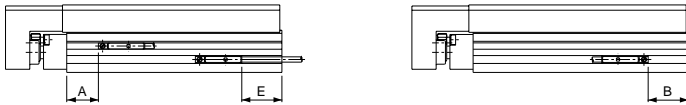
### Specifications

Cylinder bore size (mm)	6	8	12	16	20	25
Fluid	Air					
Action	Double acting					
Operating pressure	0.15 to 0.7MPa					
Proof pressure	1.05MPa					
Ambient and fluid temperature	-10 to 60°C (With no condensation)					
Piston speed	50 to 300mm/s					
Cushion	Rubber bumper (Standard, Stroke adjuster)					
Lubrication	Non-lube					
Stroke length tolerance	+1 <sub>0</sub> mm					

### Adjuster Option Stroke Adjustment Range

Stroke adjuster	Extension (AS)	Stroke adjustment range 0 to 5mm
	Retraction (AT)	
	Both ends (A)	

### Auto Switch/Proper Mounting Positions for Stroke End Detection



#### Feed Switch: D-A93

Model	A	B Stroke									E Stroke									Auto switch operation range
		10	20	30	40	50	75	100	125	150	10	20	30	40	50	75	100	125	150	
<b>MXS6 (L)</b>	5.9	5.6	5.6	5.6	17.6	23.6	—	—	—	—	1.1	1.1	1.1	13.1	19.1	—	—	—	—	4.5
<b>MXS8 (L)</b>	7.6	10.9	5.9	6.9	14.9	22.9	47.9	—	—	—	6.4	1.4	2.4	10.4	18.4	43.4	—	—	—	5
<b>MXS12 (L)</b>	11.6	28.4	18.4	8.4	10.4	20.4	41.4	70.4	—	—	23.9	13.9	3.9	5.9	15.9	36.9	65.9	—	—	6
<b>MXS16 (L)</b>	16.3	28.7	18.7	8.7	8.7	13.7	38.7	61.7	86.7	—	24.2	14.2	4.2	4.2	9.2	34.2	57.2	82.2	—	7
<b>MXS20 (L)</b>	18.9	32.6	22.6	12.6	12.6	17.6	31.6	59.6	88.6	115.6	28.1	18.1	8.1	8.1	13.1	27.1	55.1	84.1	111.1	8
<b>MXS25 (L)</b>	23	37.5	27.5	17.5	17.5	20.5	36.5	52.5	85.5	100.5	33	23	13	13	16	32	48	81	96	8

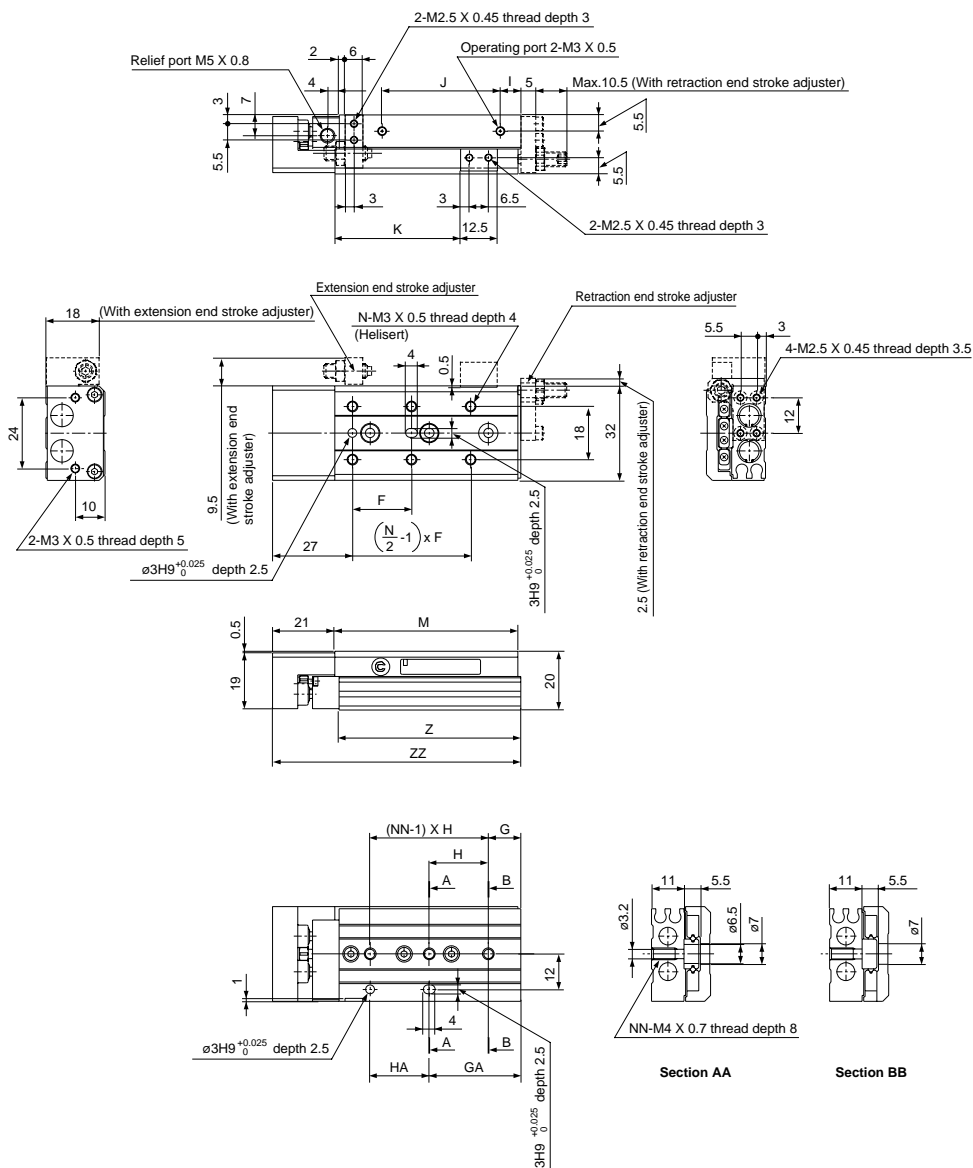
Descriptions in parentheses are for D-A93

#### Solid State Switch: D-F9B,D-F9N

Model	A	B Stroke									E Stroke									Auto switch operation range
		10	20	30	40	50	75	100	125	150	10	20	30	40	50	75	100	125	150	
<b>MXS6 (L)</b>	10	9.6	9.6	9.6	21.6	27.6	—	—	—	—	-0.4	-0.4	-0.4	11.6	17.5	—	—	—	—	2
<b>MXS8 (L)</b>	11.6	14.9	9.9	10.9	18.9	26.9	51.9	—	—	—	4.9	-0.1	0.9	8.9	16.9	41.9	—	—	—	2.5
<b>MXS12 (L)</b>	15.6	32.4	22.4	12.4	14.4	24.4	45.4	74.4	—	—	22.4	12.4	2.4	4.4	14.4	35.4	64.4	—	—	3
<b>MXS16 (L)</b>	20.3	32.7	22.7	12.7	12.7	17.7	42.7	65.7	90.7	—	22.7	12.7	2.7	2.7	7.7	32.7	55.7	80.7	—	4
<b>MXS20 (L)</b>	22.9	36.6	26.6	16.6	16.6	21.6	35.6	63.6	92.6	119.6	26.6	16.6	6.6	6.6	11.6	25.6	53.6	82.6	109.6	6
<b>MXS25 (L)</b>	27	41.5	31.5	21.5	21.5	24.5	40.5	56.5	89.5	104.5	31.5	21.5	11.5	11.5	14.5	30.5	46.5	79.5	94.5	6

**Dimensions/13-MXS6**

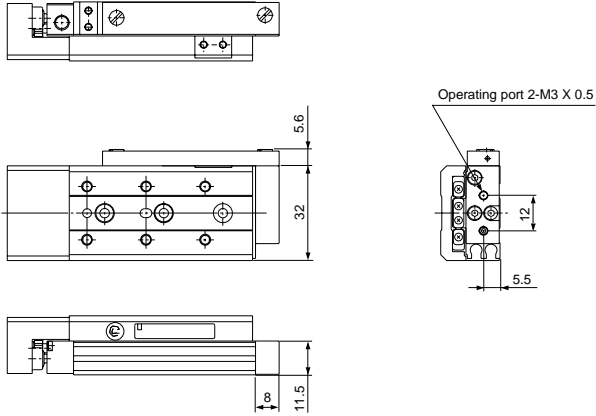
Standard



Model	F	N	G	H	NN	GA	HA	I	J	K	M	Z	ZZ
13-MXS6-10	20	4	6	25	2	11	20	10	17	22.5	42	41.5	64
13-MXS6-20	30	4	6	35	2	21	20	10	27	32.5	52	51.5	74
13-MXS6-30	20	6	11	20	3	31	20	7	40	42.5	62	61.5	84
13-MXS6-40	28	6	13	30	3	43	30	19	50	52.5	84	83.5	106
13-MXS6-50	38	6	17	24	4	41	48	25	60	62.5	100	99.5	122

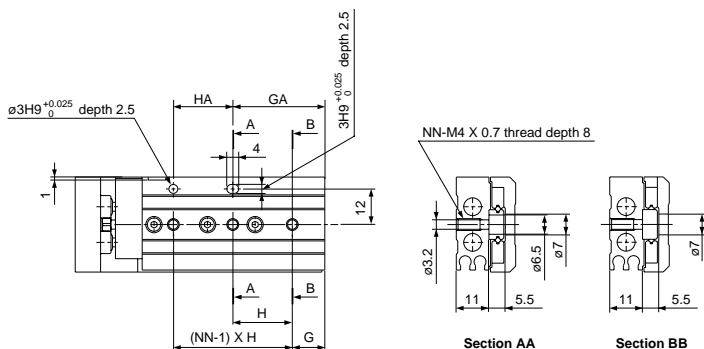
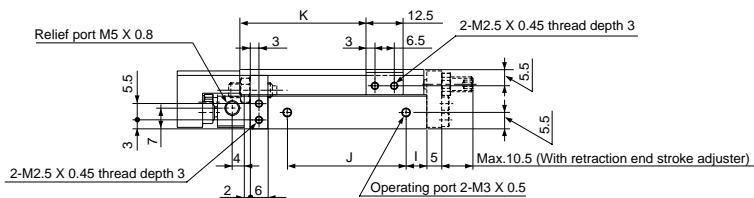
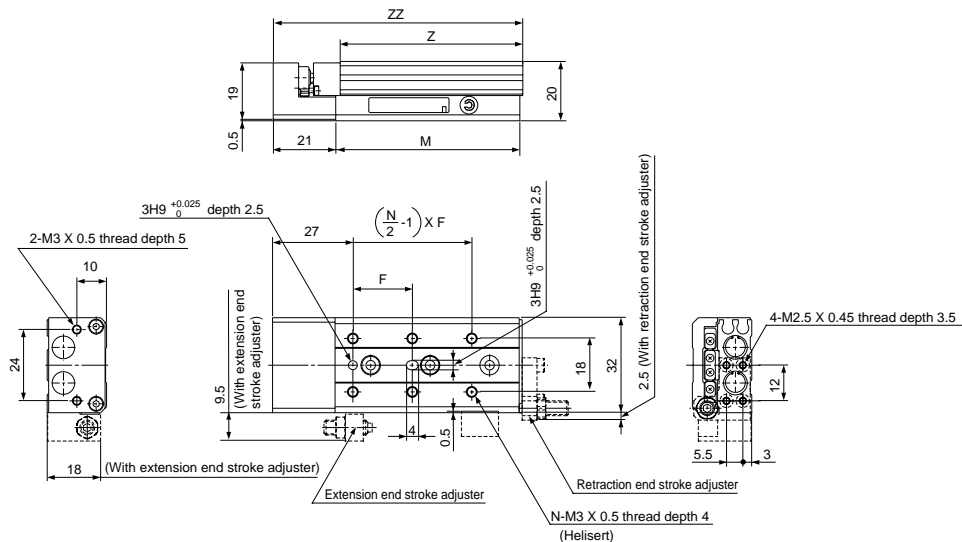
**Dimensions/13-MXS6**

Axial Piping (ø6) 13-MXS6-□□P



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXS6L/Symmetric Style**

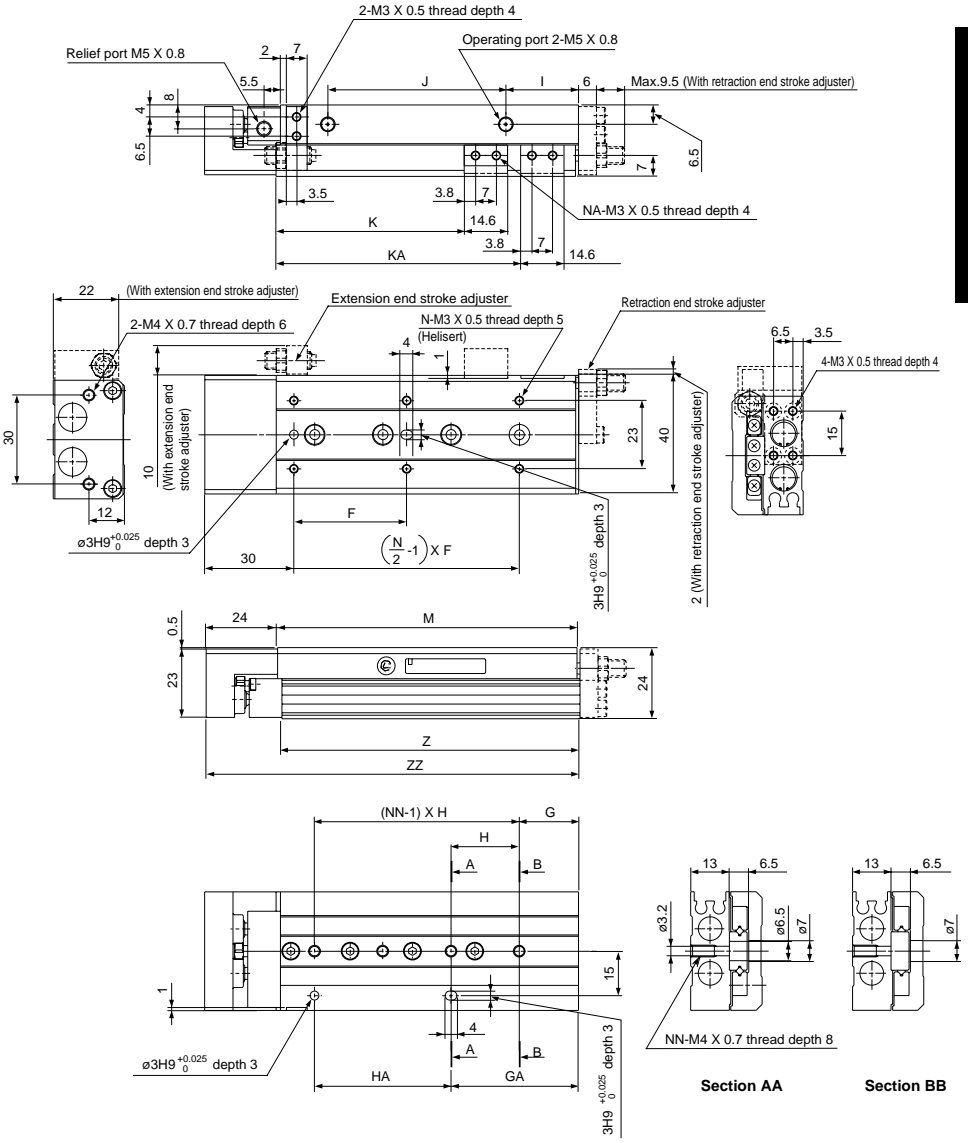


											(mm)		
Model	F	N	G	H	NN	GA	HA	I	J	K	M	Z	ZZ
<b>13-MXS6L-10</b>	20	4	6	25	2	11	20	10	17	22.5	42	41.5	64
<b>13-MXS6L-20</b>	30	4	6	35	2	21	20	10	27	32.5	52	51.5	74
<b>13-MXS6L-30</b>	20	6	11	20	3	31	20	7	40	42.5	62	61.5	84
<b>13-MXS6L-40</b>	28	6	13	30	3	43	30	19	50	52.5	84	83.5	106
<b>13-MXS6L-50</b>	38	6	17	24	4	41	48	25	60	62.5	100	99.5	122

**Dimensions/13-MXS8**

Standard

Actuator

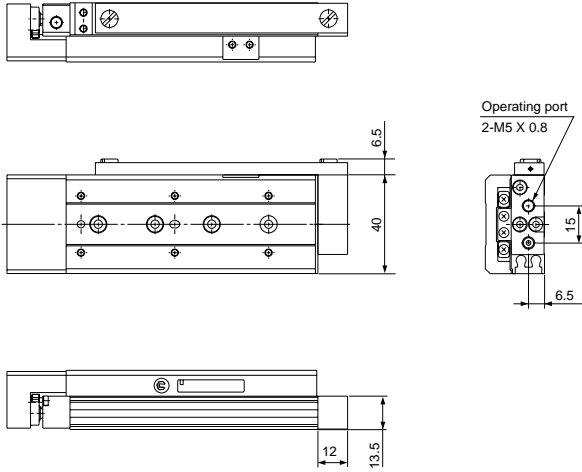


Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS8-10	25	4	9	28	2	17	20	13	19.5	23.5	—	2	49	48.5	74
13-MXS8-20	25	4	12	30	2	12	30	8.5	29	33.5	—	2	54	53.5	79
13-MXS8-30	40	4	13	20	3	33	20	9.5	39	43.5	—	2	65	64.5	90
13-MXS8-40	50	4	15	28	3	43	28	10.5	56	53.5	—	2	83	82.5	108
13-MXS8-50	38	6	20	23	4	43	46	24.5	60	63.5	82.5	4	101	100.5	126
13-MXS8-75	50	6	27	28	5	83	56	38.5	96	88.5	132.5	4	151	150.5	176

(mm)

## Dimensions/13-MXS8

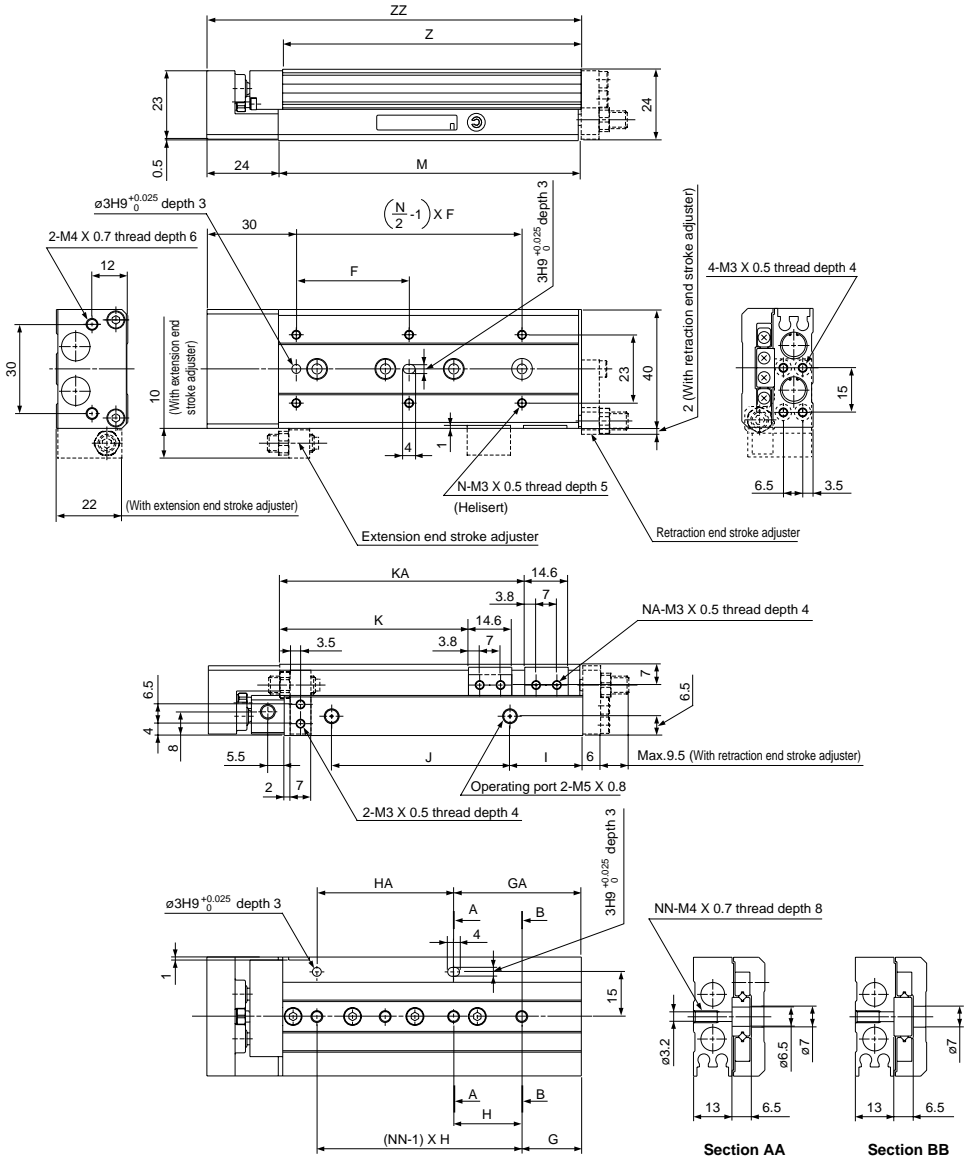
Axial Piping (ø8) 13-MXS8-□□P



\*Dimensions not indicated are same as those of the standard type.



**Dimensions/13-MXS8L/Symmetric Style**

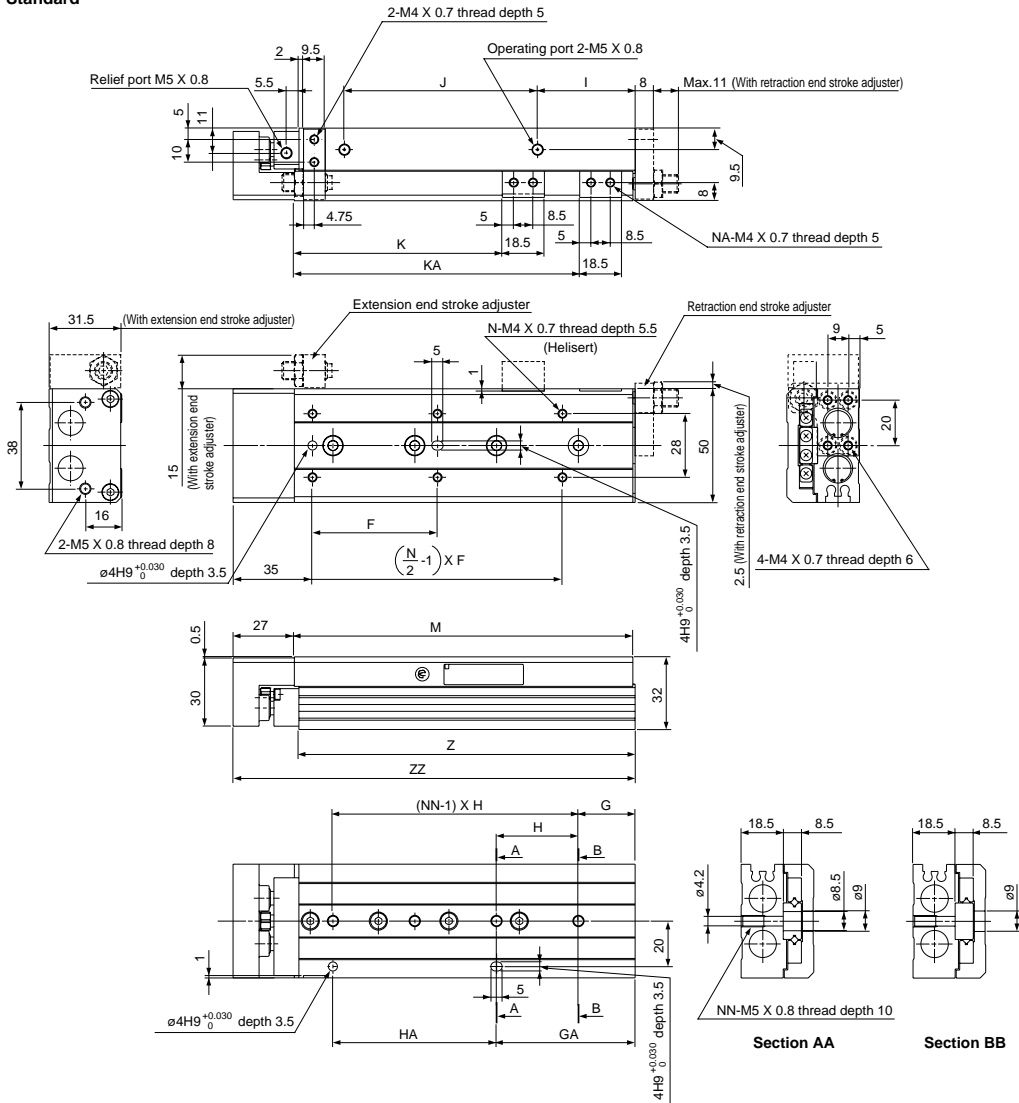


(mm)

Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS8L-10	25	4	9	28	2	17	20	13	19.5	23.5	—	2	49	48.5	74
13-MXS8L-20	25	4	12	30	2	12	30	8.5	29	33.5	—	2	54	53.5	79
13-MXS8L-30	40	4	13	20	3	33	20	9.5	39	43.5	—	2	65	64.5	90
13-MXS8L-40	50	4	15	28	3	43	28	10.5	56	53.5	—	2	83	82.5	108
13-MXS8L-50	38	6	20	23	4	43	46	24.5	60	63.5	82.5	4	101	100.5	126
13-MXS8L-75	50	6	27	28	5	83	56	38.5	96	88.5	132.5	4	151	150.5	176

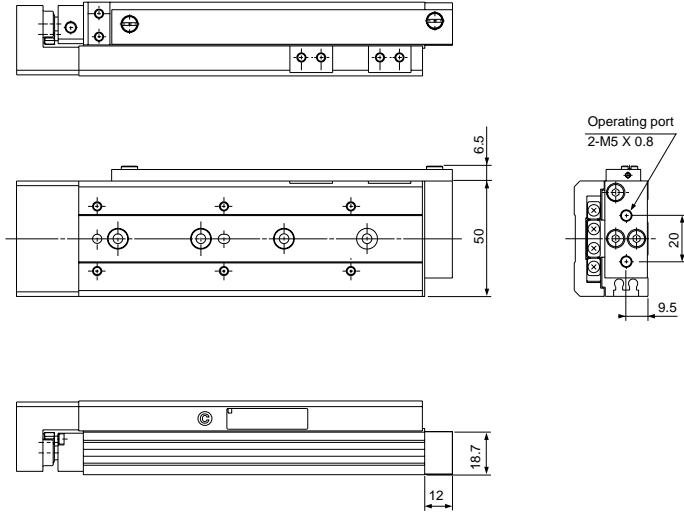
**Dimensions/13-MXS12**

Standard



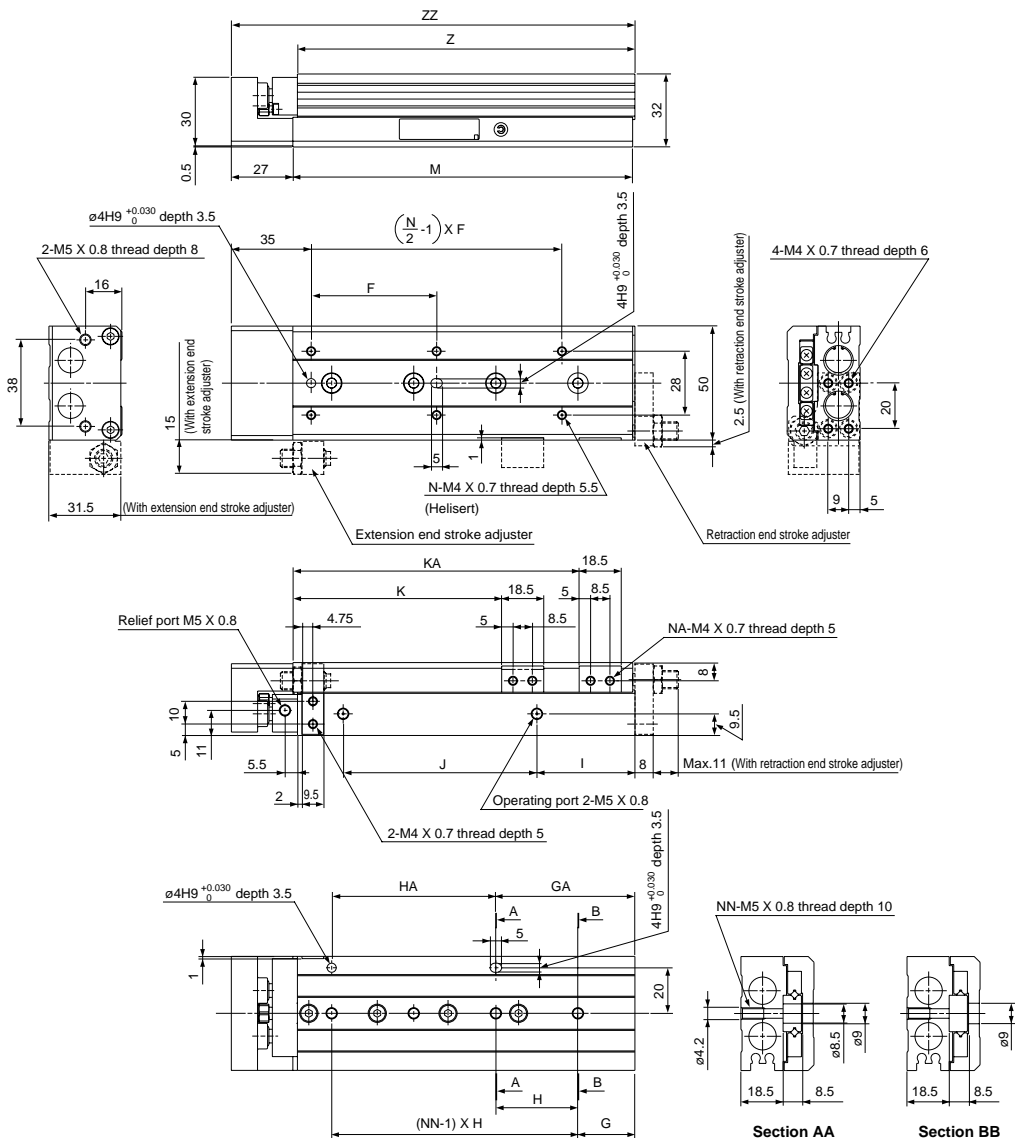
(mm)

Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS12-10	35	4	15	40	2	15	40	10	40	26.5	—	2	71	70	99
13-MXS12-20	35	4	15	40	2	15	40	10	40	36.5	—	2	71	70	99
13-MXS12-30	35	4	15	40	2	15	40	10	40	46.5	—	2	71	70	99
13-MXS12-40	50	4	17	25	3	42	25	10	52	56.5	—	2	83	82	111
13-MXS12-50	35	6	15	36	3	51	36	22	60	66.5	—	2	103	102	131
13-MXS12-75	55	6	25	36	4	61	72	43	85	91.5	125.5	4	149	148	177
13-MXS12-100	65	6	35	38	5	111	76	52	130	116.5	179.5	4	203	202	231

**Dimensions/13-MXS12**Axial Piping ( $\varnothing 12$ ) 13-MXS12-□□P

\*Dimensions not indicated are same as those of the standard type.

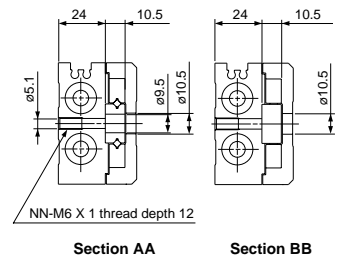
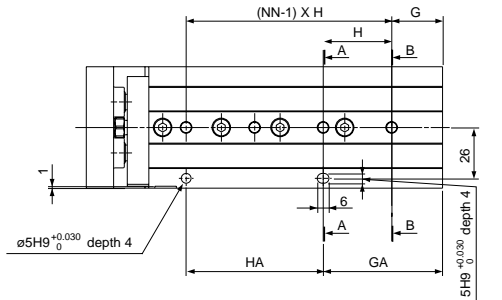
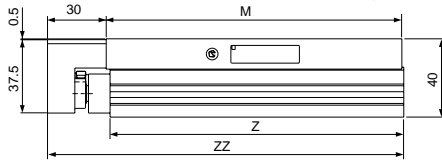
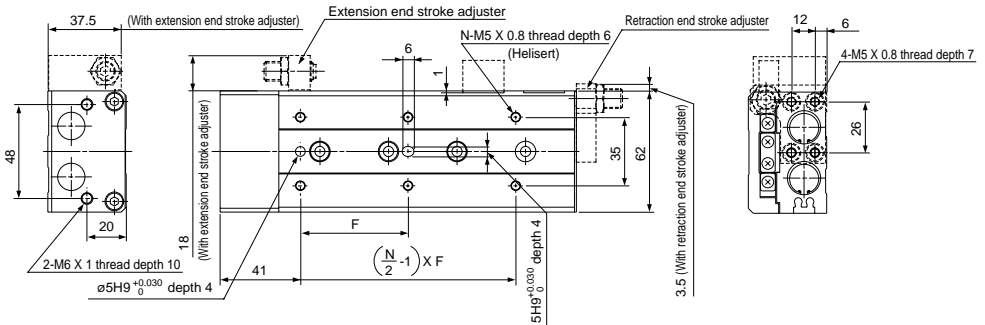
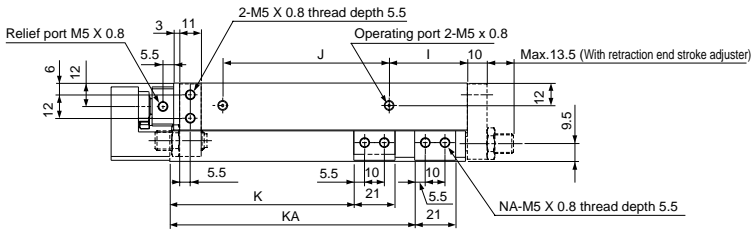
**Dimensions/13-MXS12L/Symmetric Style**



Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS12L-10	35	4	15	40	2	15	40	10	40	26.5	—	2	71	70	99
13-MXS12L-20	35	4	15	40	2	15	40	10	40	36.5	—	2	71	70	99
13-MXS12L-30	35	4	15	40	2	15	40	10	40	46.5	—	2	71	70	99
13-MXS12L-40	50	4	17	25	3	42	25	10	52	56.5	—	2	83	82	111
13-MXS12L-50	35	6	15	36	3	51	36	22	60	66.5	—	2	103	102	131
13-MXS12L-75	55	6	25	36	4	61	72	43	85	91.5	125.5	4	149	148	177
13-MXS12L-100	65	6	35	38	5	111	76	52	130	116.5	179.5	4	203	202	231

**Dimensions/13-MXS16**

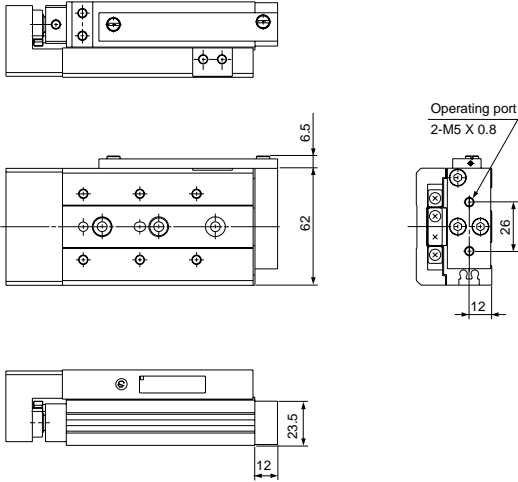
Standard



Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS16-10	35	4	16	40	2	16	40	10	40	29	—	2	76	75	107
13-MXS16-20	35	4	16	40	2	16	40	10	40	39	—	2	76	75	107
13-MXS16-30	35	4	16	40	2	16	40	10	40	49	—	2	76	75	107
13-MXS16-40	40	4	16	50	2	16	50	10	50	59	—	2	86	85	117
13-MXS16-50	30	6	21	30	3	51	30	15	60	69	—	2	101	100	132
13-MXS16-75	55	6	26	35	4	61	70	40	85	94	125	4	151	150	182
13-MXS16-100	65	6	39	35	5	109	70	55	118	119	173	4	199	198	230
13-MXS16-125	70	8	19	35	7	159	70	68	155	144	223	4	249	248	280

**Dimensions/13-MXS16**

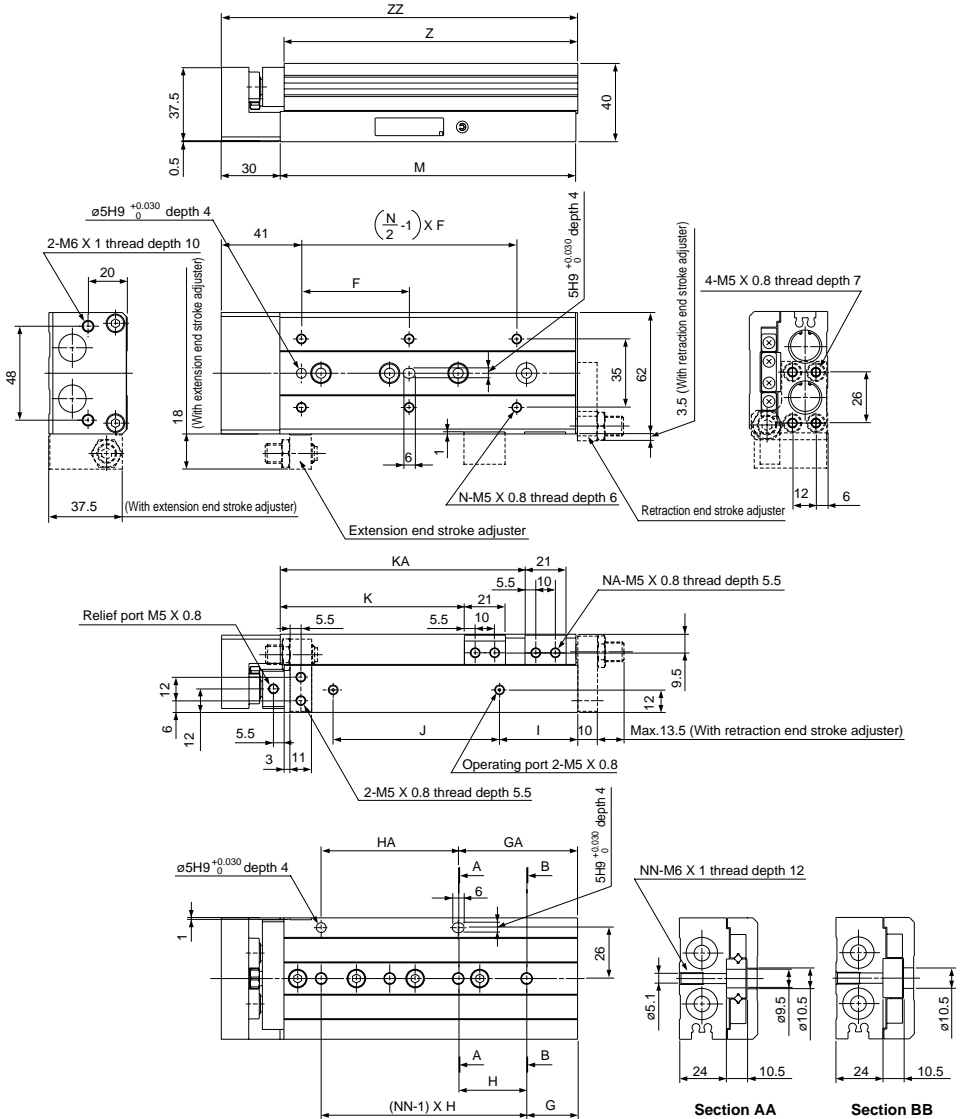
Axial Piping (∅16)13-MXS16-□□P



\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXS16L/Symmetric Style**

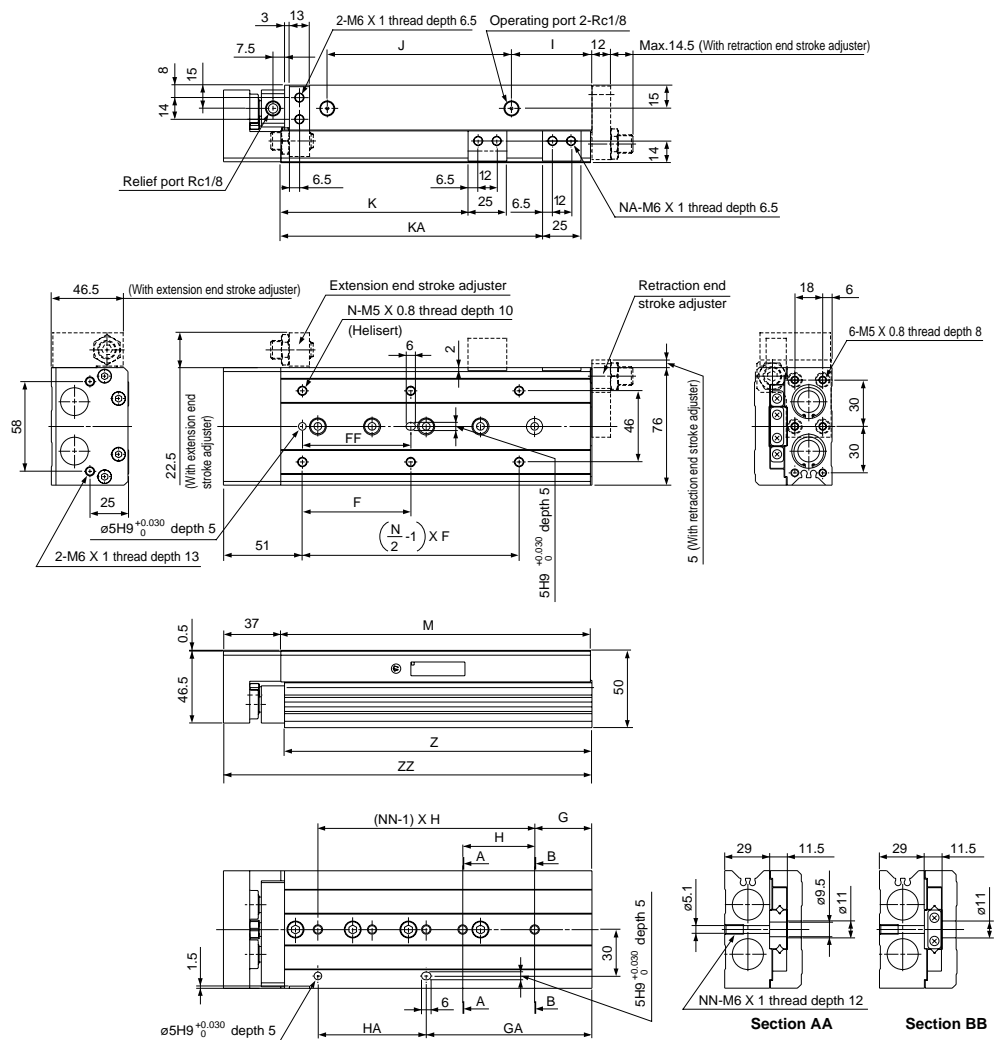
Actuator



Model	F	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS16L-10	35	4	16	40	2	16	40	10	40	29	—	2	76	75	107
13-MXS16L-20	35	4	16	40	2	16	40	10	40	39	—	2	76	75	107
13-MXS16L-30	35	4	16	40	2	16	40	10	40	49	—	2	76	75	107
13-MXS16L-40	40	4	16	50	2	16	50	10	50	59	—	2	86	85	117
13-MXS16L-50	30	6	21	30	3	51	30	15	60	69	—	2	101	100	132
13-MXS16L-75	55	6	26	35	4	61	70	40	85	94	125	4	151	150	182
13-MXS16L-100	65	6	39	35	5	109	70	55	118	119	173	4	199	198	230
13-MXS16L-125	70	8	19	35	7	159	70	68	155	144	223	4	249	248	280

**Dimensions/13-MXS20**

Standard

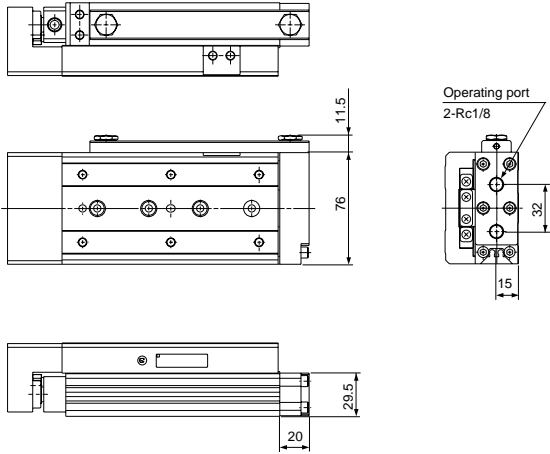


Model	F	FF	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS20-10	50	40	4	15	45	2	25	35	10	44	31	—	2	83	81.5	121
13-MXS20-20	50	40	4	15	45	2	25	35	10	44	41	—	2	83	81.5	121
13-MXS20-30	50	40	4	15	45	2	25	35	10	44	51	—	2	83	81.5	121
13-MXS20-40	60	50	4	15	55	2	35	35	10	54	61	—	2	93	91.5	131
13-MXS20-50	35	35	6	15	35	3	50	35	10	69	71	—	2	108	106.5	146
13-MXS20-75	60	60	6	19	35	4	54	70	10	108	96	—	2	147	145.5	185
13-MXS20-100	70	70	6	37	35	5	107	70	58	113	121	169	4	200	198.5	238
13-MXS20-125	70	70	8	41	38	6	155	76	70	155	146	223	4	254	252.5	292
13-MXS20-150	80	80	8	19	44	7	195	88	87	190	171	275	4	306	304.5	344



**Dimensions/13-MXS20**

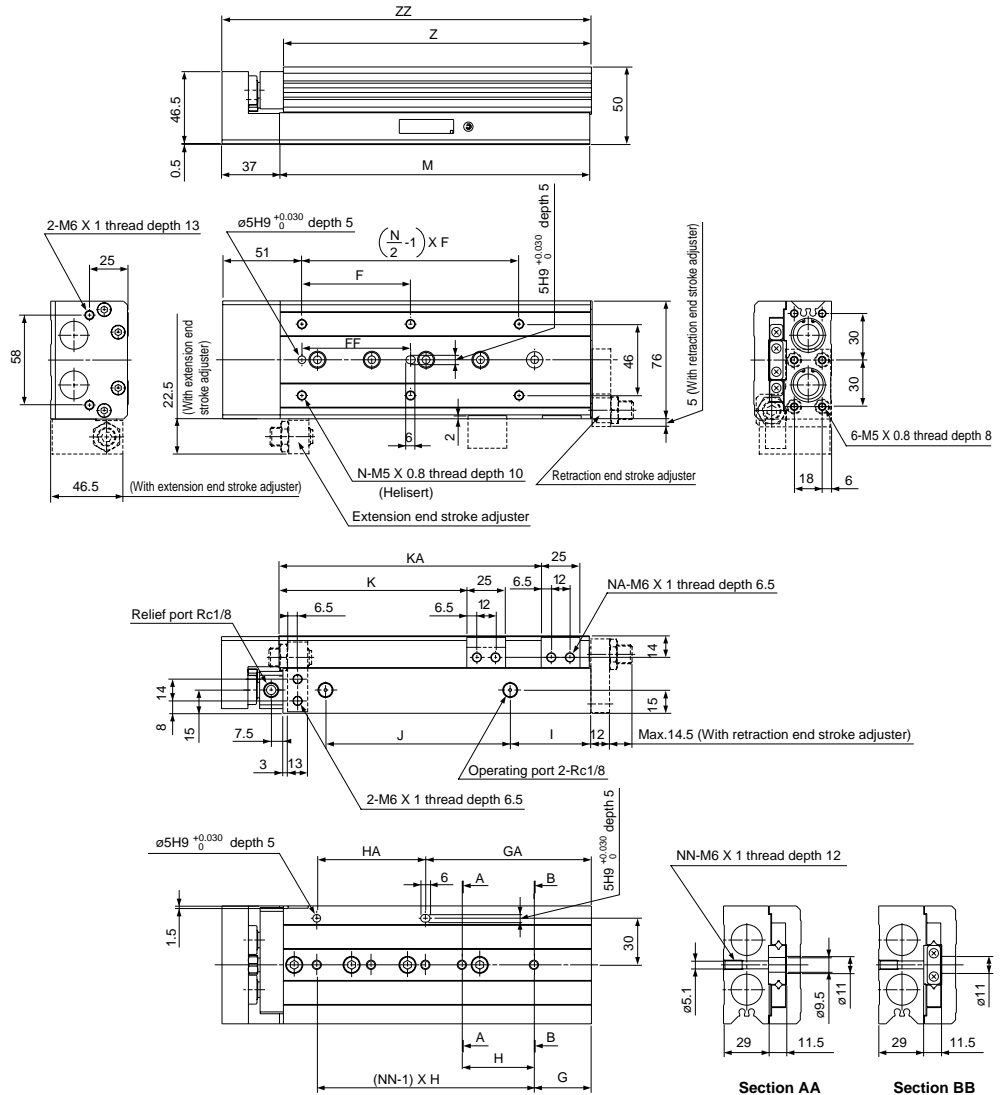
Axial Piping (ø20) 13-MXS20-□□P



\*Dimensions not indicated are same as those of the standard type.

Actuator

Dimensions/13-MXS20L/Symmetric Style

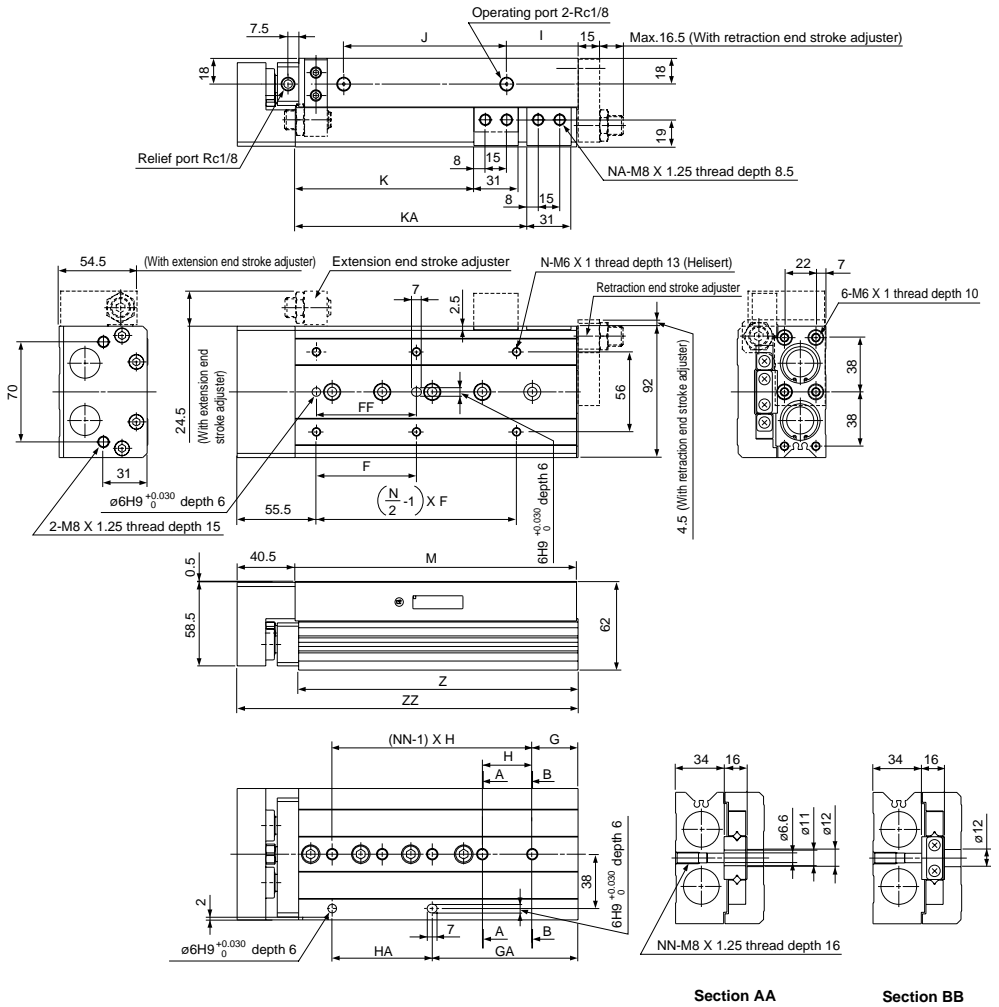


Model	F	FF	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS20L-10	50	40	4	15	45	2	25	35	10	44	31	—	2	83	81.5	121
13-MXS20L-20	50	40	4	15	45	2	25	35	10	44	41	—	2	83	81.5	121
13-MXS20L-30	50	40	4	15	45	2	25	35	10	44	51	—	2	83	81.5	121
13-MXS20L-40	60	50	4	15	55	2	35	35	10	54	61	—	2	93	91.5	131
13-MXS20L-50	35	35	6	15	35	3	50	35	10	69	71	—	2	108	106.5	146
13-MXS20L-75	60	60	6	19	35	4	54	70	10	108	96	—	2	147	145.5	185
13-MXS20L-100	70	70	6	37	35	5	107	70	58	113	121	169	4	200	198.5	238
13-MXS20L-125	70	70	8	41	38	6	155	76	70	155	146	223	4	254	252.5	292
13-MXS20L-150	80	80	8	19	44	7	195	88	87	190	171	275	4	306	304.5	344

**Dimensions/13-MXS25**

Standard

Actuator



Section AA

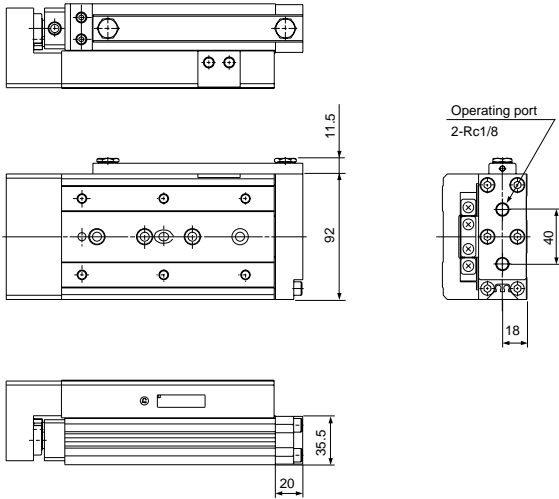
Section BB

(mm)

Model	F	FF	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS25-10	50	40	4	22	45	2	22	45	12	47	35	—	2	92	90.5	133.5
13-MXS25-20	50	40	4	22	45	2	22	45	12	47	45	—	2	92	90.5	133.5
13-MXS25-30	50	40	4	22	45	2	22	45	12	47	55	—	2	92	90.5	133.5
13-MXS25-40	60	50	4	22	55	2	22	55	12	57	65	—	2	102	100.5	143.5
13-MXS25-50	35	35	6	20	35	3	55	35	12	70	75	—	2	115	113.5	156.5
13-MXS25-75	60	60	6	26	35	4	61	70	33	90	100	—	2	156	154.5	197.5
13-MXS25-100	70	70	6	32	35	5	102	70	50	114	125	162	4	197	195.5	238.5
13-MXS25-125	75	75	8	40	38	6	154	76	67	155	150	218	4	255	253.5	296.5
13-MXS25-150	80	80	8	30	40	7	190	80	82	180	175	258	4	295	293.5	336.5

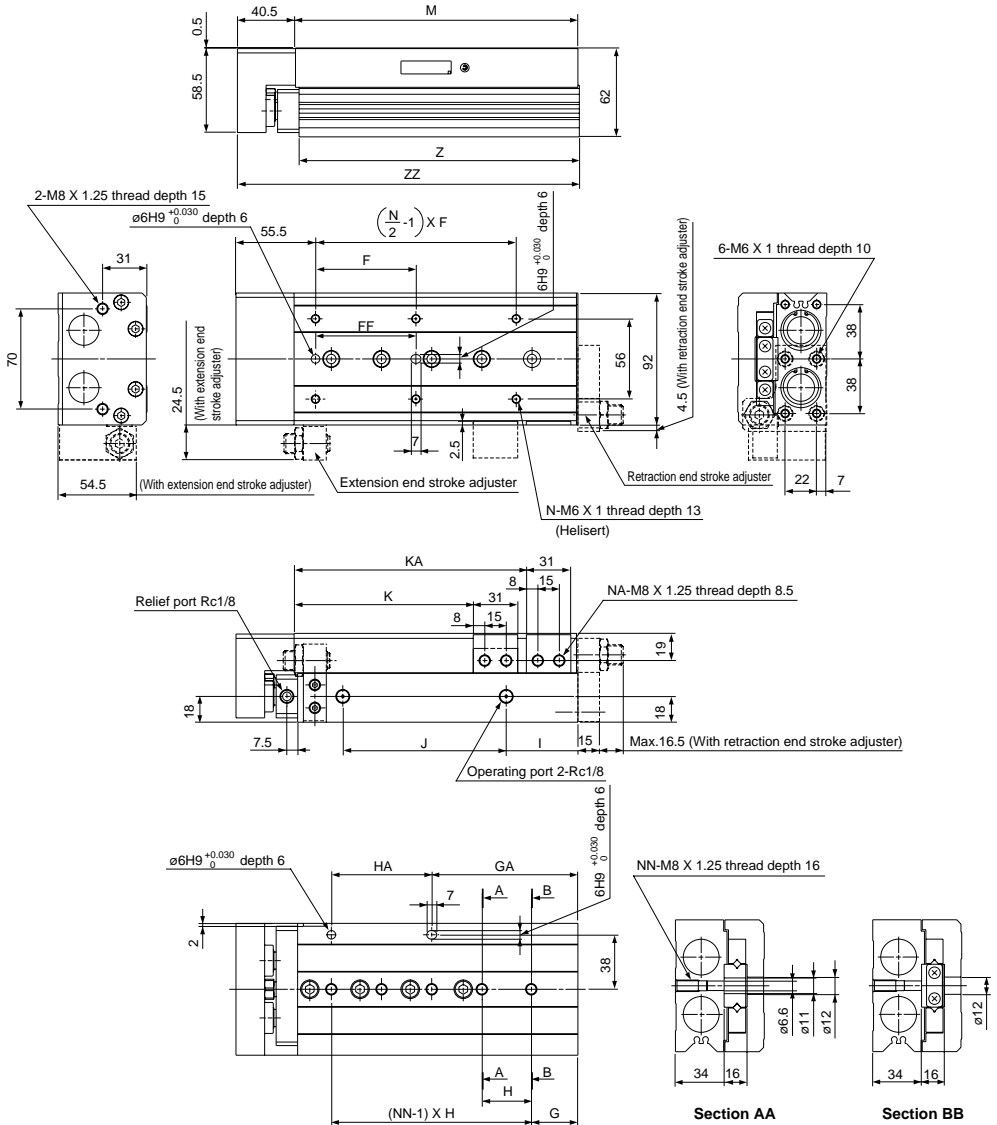
**Dimensions/13-MXS25**

Axial Piping (∅25) 13-MXS25-□□P



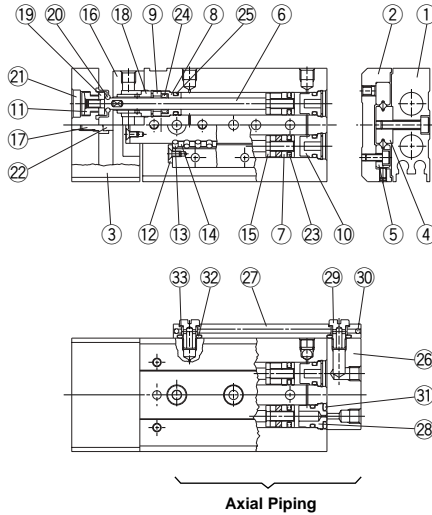
\*Dimensions not indicated are same as those of the standard type.

**Dimensions/13-MXS25L/Symmetric Style**



Model	F	FF	N	G	H	NN	GA	HA	I	J	K	KA	NA	M	Z	ZZ
13-MXS25L-10	50	40	4	22	45	2	22	45	12	47	35	—	2	92	90.5	133.5
13-MXS25L-20	50	40	4	22	45	2	22	45	12	47	45	—	2	92	90.5	133.5
13-MXS25L-30	50	40	4	22	45	2	22	45	12	47	55	—	2	92	90.5	133.5
13-MXS25L-40	60	50	4	22	55	2	22	55	12	57	65	—	2	102	100.5	143.5
13-MXS25L-50	35	35	6	20	35	3	55	35	12	70	75	—	2	115	113.5	156.5
13-MXS25L-75	60	60	6	26	35	4	61	70	33	90	100	—	2	156	154.5	197.5
13-MXS25L-100	70	70	6	32	35	5	102	70	50	114	125	162	4	197	195.5	238.5
13-MXS25L-125	75	75	8	40	38	6	154	76	67	155	150	218	4	255	253.5	296.5
13-MXS25L-150	80	80	8	30	40	7	190	80	82	180	175	258	4	295	293.5	336.5

Construction



Component Parts

No.	Description	Material	Note
①	Body	Aluminium alloy	Hard anodized
②	Table	Aluminium alloy	Hard anodized
③	End plate	Aluminium alloy	Hard anodized
④	Rail	Carbon tool steel	Heat treatment, anticorrosive treatment
⑤	Guide	Carbon tool steel	Heat treatment, anticorrosive treatment
⑥	Rod	Stainless steel	
⑦	Piston Ass'y		With one side magnet
⑧	Rod cover	Aluminium alloy	Hard anodized
⑨	Seal support	Brass	Electroless nickel plated
⑩	Head cap	Resin	
⑪	Floating bushing	Stainless steel	
⑫	Roller stopper	Stainless steel	
⑬	Cylindrical roller	High carbon chromium bearing steel	
⑭	Roller spacer	Resin	
⑮	Rod bumper	Polyurethane	
⑯	Relief plate	Aluminium alloy	Hard anodized
⑰	Bumper holder	Stainless steel	
⑱	Relief bush	Brass	Electroless nickel plated
⑲	Floating collar	Stainless steel	
⑳	Dust cover	Silicone rubber	
㉑	Dust plug	Silicone rubber	
㉒	Adjustment bumper	Polyurethane	
㉓	Piston seal	NBR	
㉔	Rod seal	NBR	
㉕	O-ring	NBR	

Axial Piping/Component Parts

No.	Description	Material	Note
㉖	Plate for axial piping	Aluminium alloy	Hard anodized
㉗	Pipe	Aluminium alloy	Hard anodized
㉘	Bushing	Aluminium alloy	Chromate treatment
㉙	Stad	Brass	Electroless nickel plated
㉚	Steel balls	Stainless steel	
㉛	O-ring	NBR	
㉜	O-ring	NBR	
㉝	Gasket	NBR, stainless steel	

**Made to Order****Dust Cover, Dust Plug Fluoro Rubber Specifications -X52****13-MXS** Refer to How to Order on P. 144 for standard products. -X52

Fluoro rubber is used for the dust cover and the dust plug replacing silicone rubber used for standard objects.

Note 1) Dimensions are same as those of the standard type.

**⚠ Specific Product Precautions**

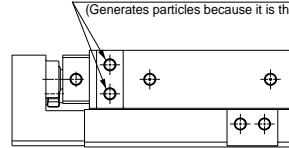
Be sure to read before handling.  
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

**Precautions****⚠ Caution**

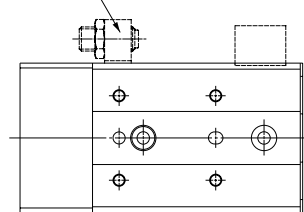
In case the extension end stroke adjuster of the following type is removed after purchase, particle generation may occur because the bottom hole of the mounting screw penetrates the body. Use a hexagon socket head screw identical in size with the mounting screw to plug the hole. Consult SMC for more information.

Model	Cylinder bore size (mm)
<b>13-MXS (L)</b>	25

Extension end stroke adjuster mounting screw  
(Generates particles because it is through the body)

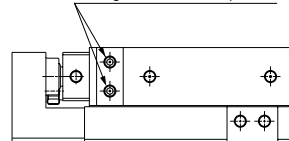


Extension end stroke adjuster



In case of types without extension end adjuster, the hole is plugged with a hexagon socket head screw at the time of shipment.

Hexagon socket head cap screw



# Series CYP Clean Rodless Cylinder

ø15, ø32

## How to Order

**CYP 15 200 Z73**

Clean rodless cylinder

**Bore size**

15	15mm
32	32mm

**Standard stroke**

Bore size (mm)	Standard stroke (mm)
15, 32	100, 150, 200, 250, 300, 350 400, 450, 500, 600, 700

Note 1) Consult SMC if the maximum stroke is exceeded.  
Note 2) Intermediate strokes are available upon request.

**Number of auto switches**

Nil	2
S	1
n	n


**Type of auto switch**

Nil	Without auto switch
-----	---------------------

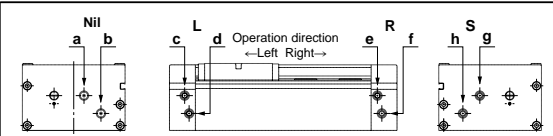
Select an appropriate model of auto switch from the table below.

**Piping port location**

Nil	a	Operation direction right
	b	Operation direction left
L	c	Operation direction right
	d	Operation direction left
R	e	Operation direction right
	f	Operation direction left
S	g	Operation direction right
	h	Operation direction left



**Piping port location**



Note) Ports other than those specified will be plugged.

## Auto Switch Specifications

(Refer to CAT.ES20-148 for detailed specifications and auto switches not in the following table.)

Style	Special function	Electrical entry	Indicator	Wiring (Output)	Load voltage			Switch model	*Lead wire length (m)			Applicable load
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)	
<b>Reed switch</b>	—	Grommet	Yes	2-wire	24V	12V	100V	<b>Z73</b>	●	●	●	—
<b>Solid state switch</b>	—	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	<b>Y59A</b>	●	●	○	IC circuit
				2-wire		12V		<b>Y59B</b>	●	●	○	—

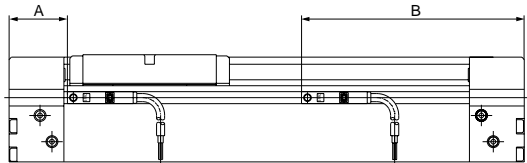
\*Lead wire length symbols: 0.5m.....Nil (Example) Y59B  
3m.....L Y59BL  
5m.....Z Y59BZ

\*\*Solid state switches marked with a "○" symbol are produced upon receipt of order.



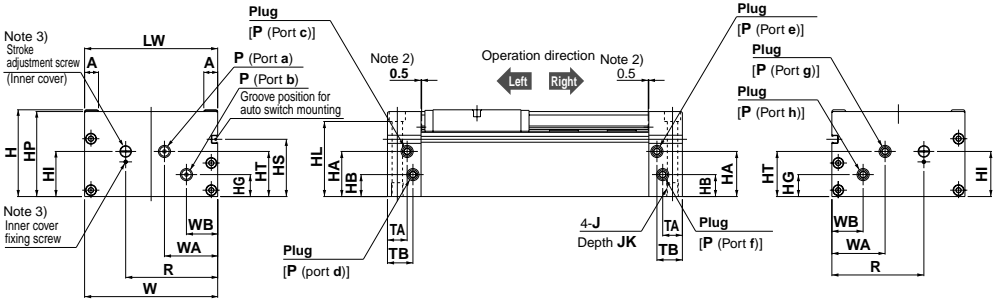
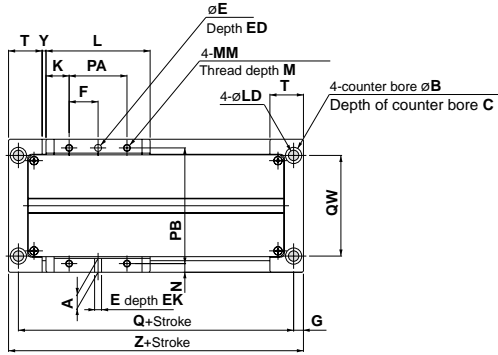
**Specifications**

<b>Bore size (mm)</b>	<b>15</b>	<b>32</b>
<b>Fluid</b>	Air and inert gas	
<b>Action</b>	Double acting	
<b>Proof pressure</b>	0.5MPa	
<b>Operating pressure range</b>	0.05 to 0.3MPa	
<b>Ambient and fluid temperature</b>	-10 to 60°C	
<b>Piston speed</b>	50 to 300mm/s	
<b>Lubrication</b>	Non-lube	
<b>Stroke adjustable range</b>	On each side $\pm 1$ mm ( $\pm 2$ mm, total)	
<b>Cushion</b>	Sine cushion (Air cushion)	
<b>Port size</b>	M5 X 0.8	Rc1/8

**Auto Switch/Proper Mounting Positions for Stroke End Detection****Proper Auto Switch Mounting Position**

Auto switch model Cylinder model	A		B	
	D-Z73	D-Y5□	D-Z73	D-Y5□
<b>CYP15</b>	24.5		93.5	
<b>CYP32</b>	33		122	

**Dimensions**



(mm)

Model	A	B	C	E	ED	EK	F	G	H	HA	HB	HG	HI	HL	HP	HS	HT	J	JK	K
<b>CYP15</b>	8	9.5	5.4	4H9 <sup>+0.030</sup> <sub>0</sub>	9.5	4	12.5	6.5	45	19.5	8.5	8.5	23	38.6	44	27	19.5	M 6 X 1	10	21
<b>CYP32</b>	12	14	8.6	6H9 <sup>+0.030</sup> <sub>0</sub>	13	6	25	8.5	75	39	19	19	39	64.9	73.5	49.5	39	M10 X 1.5	12	20

Model	L	LD	LW	MM	M	N	P	PA	PB	Q	QW	R	T	TA	TB	W	WA	WB	Y	Z
<b>CYP15</b>	67	5.6	69	M4 X 0.7	6	4.5	M5 X 0.8	25	60	105	48	45	23	13	18	69	32	17	2.5	118
<b>CYP32</b>	90	8.6	115	M6 X 1	8	7.5	Rc1/8	50	100	138	87	79.5	29	17	22	115	46	27	3.5	155

Note 1) These dimension drawings illustrate the case of piping port position "Nil".  
 Note 2) These dimensions are for the protruding portion of the bumper.  
 Note 3) Refer to specific product precautions (Stroke adjustment and cushion effect (sine cushion)).

## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### Handling

#### ⚠ Caution

- ① Open the inner package of the double packaged clean series inside a clean room or other clean environment.
- ② Perform parts replacement and disassembly work in a clean room after exhausting compressed air in the piping outside the clean room.

### Mounting

#### ⚠ Caution

- ① Take care to avoid striking the cylinder tube with other objects or handling it in a way that could cause deformation.  
The cylinder tube and slider units comprise a non-contact construction. For this reason, even a slight deformation or slippage of position may cause malfunction and loss of durability, as well as danger of degradation in the particle generation characteristics.
- ② Do not scratch or gouge the linear guide by striking it with other objects.  
Since the linear guide is specially treated for maximum suppression of particle generation due to sliding, even a slight scratch can cause malfunction and loss of durability, as well as degradation in the particle generation characteristics.
- ③ Since the slide table is supported by precision bearings, do not apply strong impacts or excessive moment when mounting work pieces.
- ④ Be sure to secure the plates on both sides before operating the cylinder.  
Avoid applications in which the slide table or only one plate is secured.
- ⑤ When changing the ports to be used, be sure that unused ports are securely sealed.  
Take special precautions in sealing unused ports. If ports are not properly sealed, air leakage can cause degradation in particle generation characteristics.

### Operation

#### ⚠ Caution

- ① The max. operating pressure of the clean rodless cylinder is 0.3MPa.  
If pressure beyond the max. operating pressure of 0.3MPa enters the clean rodless cylinder, the magnet coupling could be uncoupled, resulting in malfunction and decline in particle generation characteristics.
- ② Although the product can be used with a load applied directly within the allowable range, sufficient alignment is required when connecting to a load having an external guide mechanism.  
The axial deviation increases as the stroke becomes longer. Devise a connection method that can absorb deviations and take measures to control particle generation as required.

### Operation

#### ⚠ Caution

- ③ In vertical operation, be careful not to let the magnet coupling drop down due to uncoupling.  
Take special precautions when operating the cylinder in the vertical direction. If a load exceeding the allowable value is applied, there is possibility that the magnet coupling will be uncoupled, causing the load to drop down.
- ④ Do not operate with the magnetic coupling out of position.  
Take special precautions in sealing unused ports. If ports are not properly sealed, air leakage can cause degradation in particle generation characteristics.
- ⑤ Do not supply lubrication, as this is a nonlube product.  
The interior of the cylinder is lubricated at the factory, and lubrication with turbine oil, etc., will not satisfy the product's specifications.
- ⑥ Never reapply lubricant.  
Never reapply lubricant as it can lead to degradation of particle generation characteristics or operation characteristics.

### Speed Adjustment

#### ⚠ Caution

- ① A throttle valve for clean room use is recommended for speed adjustment. (Consult SMC regarding equipment and methods to be used).  
Although speed adjustment is possible with a meter-in or meter-out type speed controller for clean room use, smooth start and stop may not be obtained.

Recommended Speed Controlling Throttle Valve for CYP Cylinder, Dual Speed Controller

Throttle valve	Series	Model	
		CYP15	CYP32
Metal body piping type	Elbow type	10-AS1200-M5-X216	10-AS2200-01-X214
		10-AS1000-M5-X214	10-AS2000-01-X209
	In-line type	10-AS1201F-M5-04-X214	10-AS2201F-01-04-X214
		10-AS1201F-M5-06-X214	10-AS2201F-01-06-X214
Resin body with one-touch fitting	Universal type (Throttle valve)	10-AS1301F-M5-04-X214	10-AS2301F-01-04-X214
		10-AS1301F-M5-06-X214	10-AS2301F-01-06-X214
	In-line type (Throttle valve)	10-AS1001F-04-X214	10-AS2001F-04-X214
		10-AS1001F-06-X214	10-AS2001F-06-X214
Dual type (Speed controller)	10-ASD230F-M5-04	10-ASD330F-01-06	
	10-ASD230F-M5-06	10-ASD330F-01-08	

Note 1) For the selection method of the metal body piping type and the resin body type with one-touch fittings, refer to SMC catalog Pneumatic Clean Series (3. How to Use Clean Series on Front page 14).

Note 2) For fittings used with the metal body piping type, refer to SMC catalog Pneumatic Clean Series (Air Line Equipment — Fittings).

- ② In case of vertical mounting, a system with a reduced pressure supply circuit installed on the down side is recommended. (It is also effective to shorten start-up delay in rising and for energy conservation.)

## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Form matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

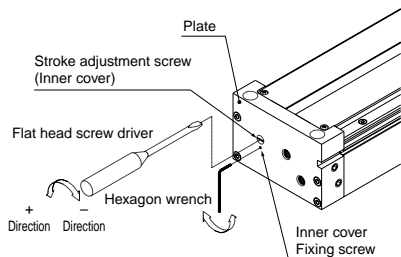
### Stroke Adjustment and Cushion Effect (Sine Cushion)

#### ⚠ Caution

- ① A sine cushion function (for smooth start and soft stop) is included in the standard specifications. Due to the nature of a sine cushion, adjustment of the cushion effect is not possible. There is no cushion needle adjustment as in the case of conventional cushion mechanisms.
- ② The stroke adjustment is a mechanism to align the slide table's stroke end position with a mechanical stopper on other equipment, etc. (Adjustable range:  $\pm 2\text{mm}$ , totaling both sides)  
**To ensure safety, perform adjustment after shutting off the drive air, exhausting the residual pressure and implementing drop prevention measures.**
  - 1) Loosen the inner cover fixing screws with a hexagon wrench.
  - 2) To align the position with a mechanical stopper on other equipment, rotate the stroke adjustment screw (inner cover) to the left or right with a flat head screw driver to move the inner cover back and force. Approximately 1mm of adjustment is possible with one rotation.
  - 3) The maximum adjustment is  $\pm 1\text{mm}$  on each side. A total adjustment of approximately  $\pm 2\text{mm}$  is possible using both sides.
  - 4) After completing the stroke end adjustment, tighten the inner cover holding screw with a hexagon wrench, etc.

#### Inner Cover Fixing Screw Tightening Torque [Nm]

Model	Thread size	Tightening torque
<b>CYP15</b>	M3 X 0.5	0.3
<b>CYP32</b>	M6 X 1	2.45



### Particle Generation Characteristics

#### ⚠ Caution

- ① In order to maintain the particle generation grade, set a standard limit of 500 thousand cycles of operation or approximately 400km of travel distance. (Refer to Table 1 below.)  
 If operation goes on at values exceeding the recommended values, lubrication failure of the linear guide and loss of particle generation characteristics may occur.

Table 1

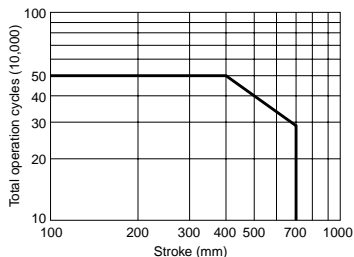
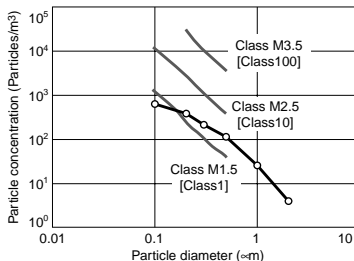


Table 2



- Note 1) This chart shows the level of cleanliness inside the measurement chamber.  
 Note 2) The vertical axis shows the number of particles per unit volume ( $1\text{m}^3$ ) of air which are no smaller than the particle size shown on the axis of abscissas.  
 Note 3) The gray lines show the upper concentration limit of the cleanliness class based on Fed.Std.209E-1992.  
 Note 4) The plots indicate a 95% upper reliability limit value for time series data up to 500 thousand operation cycles. (Cylinder: CYP32-200, Work piece weight: 5kg, Average speed: 200mm/s)  
 Note 5) The data above provides a guide for selection but is not guaranteed.

### Maintenance

#### ⚠ Caution

- ① Never disassemble the cylinder tube or linear guide, etc.  
 If disassembled, the slide table may touch the external surface of the cylinder tube resulting in degradation of particle generation characteristics.
- ② Consult SMC when replacing seals and bearings (wear rings).



# Series 12-CY1B Magnetically Coupled Rodless Cylinder

ø6, ø10, ø15, ø20, ø25, ø32, ø40, ø50, ø63

## How to Order



Clean series  
12 — Special treatment on sliding part

Bore size (mm)

Magnetic holding force  
Please refer to the table of magnetic holding force.

12 - CY1B 10 H - 300

Cylinder stroke (mm)

## Model

Model	Bore size (mm)	Port size	Lubrication	Standard stroke mm	Cushion	
					Rubber	Air
12-CY1B6	6	M5 X 0.8	Non-lube	50, 100, 150, 200	Available (Both sides)	Not available
12-CY1B10	10			50, 100, 150, 200, 250, 300		
12-CY1B15	15			50, 100, 150, 200, 250, 300, 350, 400, 450, 500		
12-CY1B20	20	Rc1/8		200, 250, 300, 350, 400, 450, 500, 600, 700, 800		
12-CY1B25	25					
12-CY1B32	32					
12-CY1B40	40	Rc1/4	200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000			
12-CY1B50	50					
12-CY1B63	63					

Note 1) Consult SMC for strokes exceeding the standard stroke.

Note 2) Intermediate strokes are available in 1mm increments.

## Specifications

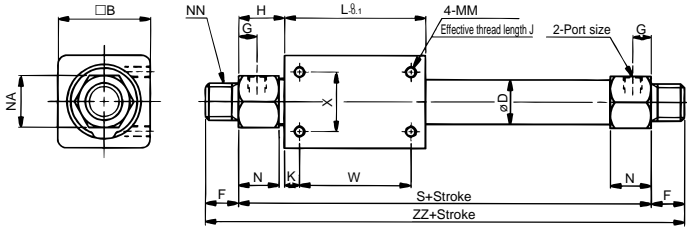
Bore size (mm)	6, 10, 15, 20, 25, 32, 40, 50, 63
Item	
Proof pressure	1.05MPa
Max. operating pressure	0.7MPa
Min. operating pressure	0.18MPa
Ambient and fluid temperature	-10°C to 60°C (With no condensation)
Piston speed	50 to 400mm/s
Stroke length tolerance	0 to 250st: $^{+1.0}_0$ , 251 to 1000st: $^{+1.4}_0$ , 1001st to: $^{+1.8}_0$
Mounting bracket	2 mounting nuts (Standard accessory)

## Magnetic Holding Force (N)

Bore size (mm)	6	10	15	20	25	32	40	50	63
Type of holding force									
H style	19.6	54	137	231	363	588	922	1471	2256
L style	—	—	81	154	221	358	569	863	1373

**Basic**

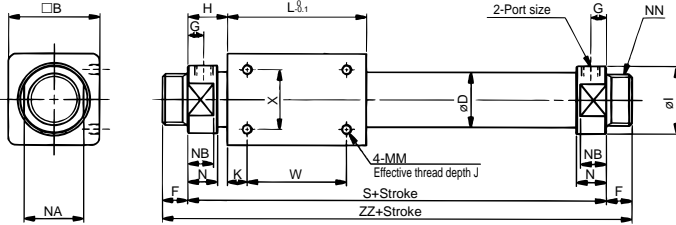
**12-CY1B 6 to 15**



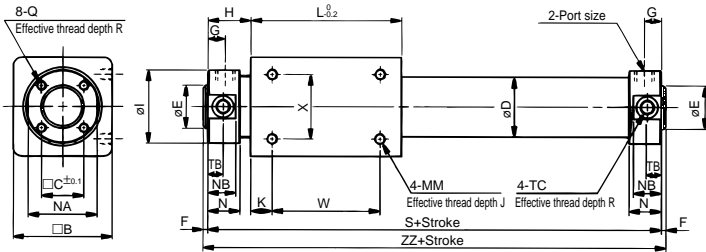
(mm)

Model	Port size	D	B	F	G	H	K	L	N	NA	MM X J	NN	S	W	X	ZZ
12-CY1B6	M5 X 0.8	7.6	17	9	5	14	5	35	10	14	M3 X 0.5 X 4.5	M10 X 1.0	63	25	10	81
12-CY1B10	M5 X 0.8	12	25	9	5	12.5	4	38	11	14	M3 X 0.5 X 4.5	M10 X 1.0	63	30	16	81
12-CY1B15	M5 X 0.8	17	35	10	5.5	13	11	57	11	17	M4 X 0.7 X 6	M10 X 1.0	83	35	19	103

**12-CY1B 20 to 40**



**12-CY1B 50 to 63**



(mm)

Model	Port size	B	C	D	E (h8)	F	G	H	I	K	L	MM X J	N	NA	NB	NN
12-CY1B20	Rc1/8	36	—	22.8	—	13	8	20	28	8	66	M4 X 0.7 X 6	15	24	13	M20 X 1.5
12-CY1B25	Rc1/8	46	—	27.8	—	13	8	20.5	34	10	70	M5 X 0.8 X 8	15	30	13	M26 X 1.5
12-CY1B32	Rc1/8	60	—	35	—	16	9	22	40	15	80	M6 X 1.0 X 8	17	36	15	M26 X 1.5
12-CY1B40	Rc1/4	70	—	43	—	16	11	29	50	16	92	M6 X 1.0 X 10	21	46	19	M32 X 2.0
12-CY1B50	Rc1/4	86	32	53	30 <sup>-0.033</sup>	2	14	33	58.2	25	110	M8 X 1.25 X 12	25	55	23	—
12-CY1B63	Rc1/4	100	38	66	32 <sup>-0.039</sup>	2	14	33	72.2	26	122	M8 X 1.25 X 12	25	69	23	—

Model	Q X R	S	TB	TC X R	W	X	ZZ
12-CY1B20	—	106	—	—	50	25	132
12-CY1B25	—	111	—	—	50	30	137
12-CY1B32	—	124	—	—	50	40	156
12-CY1B40	—	150	—	—	60	40	182
12-CY1B50	M8 X 1.25 X 16	176	14	M12 X 1.25 X 7.5	60	60	180
12-CY1B63	M10 X 1.5 X 16	188	14	M14 X 1.5 X 11.5	70	70	192

## ⚠ Specific Product Precautions

**Be sure to read before handling.**

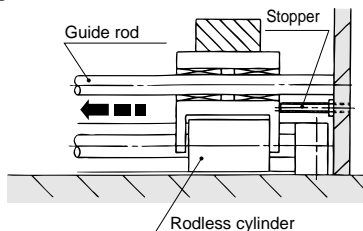
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

### 12-CY1B/CY1R/REA Common Precautions

#### ⚠ Caution

- ① **Be careful about rotation of the external slider.**  
Rotation should be controlled by connecting the external slider to another shaft (linear guide, etc.).
- ② **Do not operate with the magnetic coupling out of position.**  
In case the magnetic coupling is out of position, push the external slider back to the correct position by hand at the end of the stroke (or push the piston slider with air pressure).
- ③ **Do not apply a lateral load to the external slider.**  
When a load is directly mounted on the cylinder, deviations in alignment of their axial centers cannot be offset and will result in a lateral load that can cause increase in particle generation and malfunction. Employ a connection method which can absorb deviations in axial alignment and deflection due to the cylinder's own weight. Figure 1 illustrates a recommended mounting method.

Figure 1



- ④ **Be careful about the allowable load when operating the cylinder in the vertical direction.**  
The allowable load weight for vertical operation is indicated in the model selection method. However, if a load exceeding the allowable value is applied, there is possibility that the magnet coupling will be uncoupled, causing the load to drop down. When employing this type of application, contact SMC regarding the operating conditions (pressure, load, speed, stroke, frequency, etc.).
- ⑤ **Do not scratch or gouge the external surface of the cylinder.**  
It can damage the wear ring, increase particle generation and cause malfunction.
- ⑥ **Do not use the cylinder with its body fixed.**  
Be sure to secure both head covers (or end covers in case of CY1R) before using the cylinder. Operation of the cylinder with its body fixed will damage the wear ring, resulting in increase of particle generation or malfunction.

### 12-CY1R

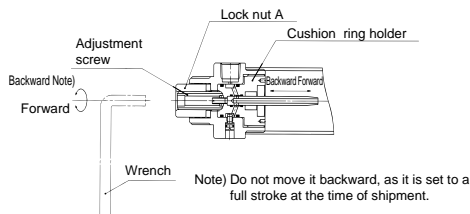
#### ⚠ Caution

- ① **Pay attention to the cylinder mounting surface.**  
If there is any clearance between the end covers on both ends and the mounting surfaces, adjust the shim with a spacer for secure installation.

### 12-REA

#### ⚠ Caution

- ① **Stroke adjustment is for positional alignment.**  
It is not provided to control the cushioning effect (for smooth start and soft stop) but to align the stroke end position of the cylinder with the mechanical stopper of other equipment.
- ② **Conduct stroke adjustment while pressure is not applied.**  
Conduct stroke adjustment to ensure safety while pressure is not applied. Before adjustment, exhaust driving air and take measures against residual pressure and dropping.
  - 1) Insert a wrench into the hexagon hole of the adjustment screw to loosen lock nut A.
  - 2) Rotate the adjustment screw to right and left and move the cushion ring holder (stroke end) forward and backward to align the position with that of the external stopper.
  - 3) After the stroke end adjustment is completed, retighten lock nut A.



●Hexagon hole of adjustment screw		●Lock nut A tightening torque	
Model	Width across flats (mm)	Model	Tightening torque (Nm)
12-REA25	5	12-REA25	1.2
12-REA32	5	12-REA32	1.2
12-REA40	6	12-REA40	2.1
12-REA50	8	12-REA50	3.4
12-REA63	8	12-REA63	3.4

- ③ **"Throttle" type speed controllers are recommended for speed adjustment, as shown in the table below.**

●Recommended speed controllers

Model	Model		
	Elbow type	Straight union type	In-line type
12-REA25	10-AS2201F-01-06-X214	10-AS2301F-01-06-X214	10-AS2001F-06-X214
12-REA32	10-AS2201F-02-06-X214	10-AS2301F-02-06-X214	10-AS2001F-06-X214
12-REA40	10-AS2201F-02-06-X214	10-AS2301F-02-06-X214	10-AS2001F-06-X214
12-REA50	10-AS3201F-02-08-X214	10-AS3301F-02-08-X214	10-AS3001F-08-X214
12-REA63	10-AS3201F-02-08-X214	10-AS3301F-02-08-X214	10-AS3001F-08-X214

Although speed adjustment is possible with meter-in and meter-out speed controllers, smooth acceleration and deceleration may not be achieved. In case the mounting orientation is not horizontal, a system with a pressure regulating circuit on the lower side is recommended. (It is also effective to shorten start-up delay in rising and for energy conservation.)

- ④ **Cushion adjustment is not necessary.**  
The fixed cushion mechanism does not require the conventional cushion adjustment.



12-CY1B

12-CY1R

## Warning

① **Be careful the magnet has a strong attraction.**

Take special precautions when the external slider and piston slider are removed from the cylinder tube for maintenance. The magnets installed on each slider have very strong attraction.

## Caution

① **Be careful if a slider is removed in the normal condition, it will directly absorb the piston.**

When removing either an external slider or piston slider, first force the external slider and the piston slider to go off the position to disable the holding power and then remove them separately. Be careful if they are removed in the normal condition, the magnets will directly attract each other and will not go apart.

② **Pay attention to the directions of the external slider and piston slider.**

The external slider and piston slider of F6 and F10 holding L type have polarity. See the figure below for disassembly and maintenance. Suction the external slider and piston slider and insert them into the cylinder tube so that they will be positioned properly. Insert only the piston slider by rotating it by 180° in the reverse direction when they are positioned as in figure 3.

With wrong directions, the specified holding force cannot be achieved.

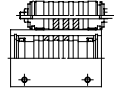
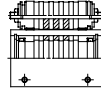


Figure 2. Correct positioning      Figure 3. Positioning with wrong directions  
Typical example of ø20 to ø63 with L type holding force

③ **Never disassemble the magnetic components (piston slider and external slider).**

It can reduce the holding power and cause malfunction.

④ **The holding power of the magnet can be changed (from H type to L type). Consult SMC in this regard.**

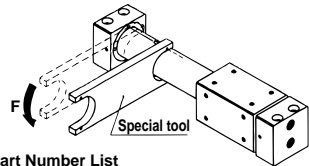
⑤ **In addition to this catalog, refer to the disassembly instructions when replacing a seal or wear ring.**

## Caution

⑥ **Apply additional tightening when remounting the head cover after disassembly.**

In disassembling, clamp one head cover by applying a vise to its two chamfered surfaces and remove the other cover by applying a wrench or an adjustable spanner to its two chamfered surfaces. When re-tightening, first apply locktight (No. 542, Red) and rotate further by 3° to 5° from the original position before removal.

⑥ **Special tools are needed for disassembly.**



**Special Tool Part Number List**

Part no.	Applicable bore size (mm)
CYRZ-V	6, 10, 15, 20
CYRZ-W	25, 32, 40
CYRZ-X	50
CYRZ-Y	63

12-REA

## Warning

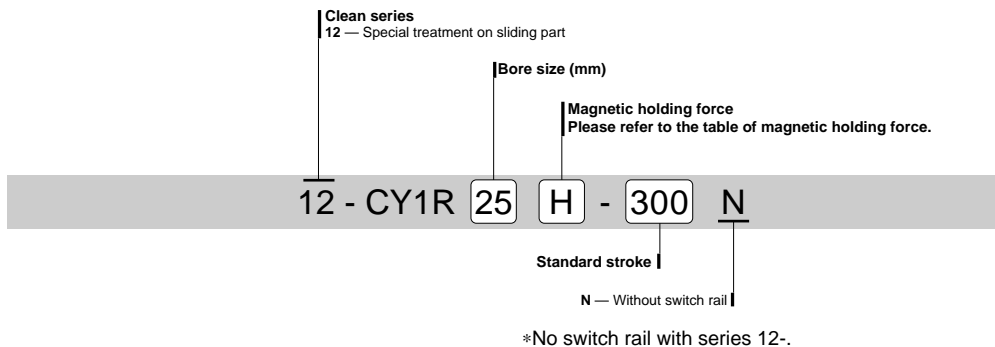
① **Do not disassemble the product because it may damage the air cushion mechanism.**

Contact SMC if disassembly or an overhaul is required.

# Series 12-CY1R Magnetically Coupled Rodless Cylinder (Direct Mount Type)

ø6,ø10,ø15,ø20,ø25,ø32,ø40,ø50,ø63

## How to Order



## Model

Model	Bore size (mm)	Port size	Lubrication	Standard stroke (mm)	Cushion	
					Rubber	Air
12-CY1R6	6	M5 X 0.8	Non-lube	50, 100,150, 200	Available (Both sides)	Not available
12-CY1R10	10			50, 100,150, 200,250,300		
12-CY1R15	15			50, 100,150, 200,250,300,350,400,450,500		
12-CY1R20	20	200,250,300,350,400,450,500,600 700,800				
12-CY1R25	25					
12-CY1R32	32	Rc1/4		200,250,300,350,400,450,500,600 700,800,900,1000		
12-CY1R40	40					
12-CY1R50	50					
12-CY1R63	63					

Note 1) Consult SMC for strokes exceeding the standard stroke.

Note 2) Intermediate strokes are available in 1mm increments.

## Specifications

Item	Bore size (mm)
	6,10,15,20,25,32,40,50,63
Proof pressure	1.05MPa
Max. operating pressure	0.7MPa
Min. operating pressure	0.18MPa
Ambient and fluid temperature	-10°C to 60°C (With no condensation)
Piston speed	50 to 400mm/s
Stroke length tolerance	0 to 250st: $^{+1.0}_0$ , 251 to 1000st: $^{+1.4}_0$ , 1001st to $^{+1.8}_0$
Mounting	Direct mount type

## Magnetic Holding Force (N)

Type of holding force	Bore size (mm)									
	6	10	15	20	25	32	40	50	63	
H type	19.6	54	137	231	363	588	922	1471	2256	
L type	—	—	—	154	221	358	569	863	1373	

## Specific Product Precautions

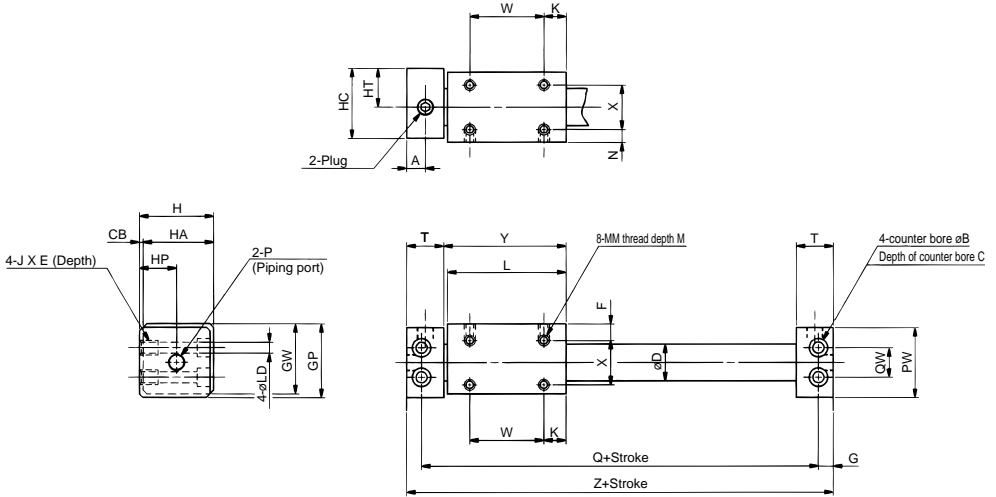
Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

Refer to pages 174 to 175 for product specific precautions.

**Dimensions**

**12-CY1R**



(mm)

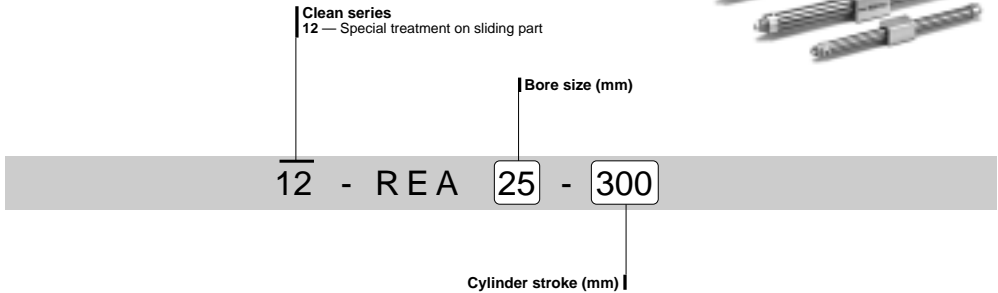
Model	A	B	C	CB	CR	D	F	G	GP	GW	H	HA	HC	HP	HR	HS	HT	J X E	K
12-CY1R6	9	6.5	3.2	2	0.5	7.6	5.5	4	20	18.5	19	17	18	9	17	6	7	M4 X 0.7 X 6	7
12-CY1R10	9	6.5	3.2	2	0.5	12	6.5	4	27	25.5	26	24	25	14	24	5	14	M4 X 0.7 X 6	9
12-CY1R15	10.5	8	4.2	2	0.5	17	8	5	33	31.5	32	30	31	17	30	8.5	17	M5 X 0.8 X 7	14
12-CY1R20	9	9.5	5.2	3	1	22.8	9	6	39	37.5	39	36	38	24	36	7.5	24	M6 X 1 X 8	11
12-CY1R25	8.5	9.5	5.2	3	1	27.8	8.5	6	44	42.5	44	41	43	23.5	41	6.5	23.5	M6 X 1 X 8	15
12-CY1R32	10.5	11	6.5	3	1.5	35	10.5	7	55	53.5	55	52	54	29	51	7	29	M8 X 1.25 X 10	13
12-CY1R40	10	11	6.5	5	2	43	13	7	65	63.5	67	62	66	36	62	8	36	M8 X 1.25 X 10	15
12-CY1R50	14	14	8.2	5	2	53	17	8.5	83	81.5	85	80	84	45	80	9	45	M10 X 1.5 X 15	25
12-CY1R63	15	14	8.2	5	3	66	18	8.5	95	93.5	97	92	96	51	90	9.5	51	M10 X 1.5 X 5	24

Model	L	LD	M	MM	N	P	PW	Q	QW	T	W	WS	X	Y	Z
12-CY1R6	34	3.5	3.5	M3 X 0.5	3.5	M5 X 0.8	19	64	10	17.5	20	6	10	35.5	72
12-CY1R10	38	3.5	4	M3 X 0.5	4.5	M5 X 0.8	26	68	14	17.5	20	8	15	39.5	76
12-CY1R15	53	4.3	5	M4 X 0.7	6	M5 X 0.8	32	84	18	19	25	7	18	54.5	94
12-CY1R20	62	5.6	5	M4 X 0.7	7	Rc1/8	38	95	17	20.5	40	7	22	64	107
12-CY1R25	70	5.6	6	M5 X 0.8	6.5	Rc1/8	43	105	20	21.5	40	7	28	72	117
12-CY1R32	76	7	7	M6 X 1	8.5	Rc1/8	54	116	26	24	50	7	35	79	130
12-CY1R40	90	7	8	M6 X 1	11	Rc1/4	64	134	34	26	60	7	40	93	148
12-CY1R50	110	8.6	10	M8 X 1.25	15	Rc1/4	82	159	48	30	60	10	50	113	176
12-CY1R63	118	8.6	10	M8 X 1.25	16	Rc1/4	94	171	60	32	70	10	60	121	188

# Series 12-REA

Sine Rodless Cylinder  
 ø25, ø32, ø40, ø50, ø63

## How to Order



## Model

Model	Bore size (mm)	Port size	Lubrication	Standard stroke (mm)
12-REA25	25	Rc1/8	Non-lube	200, 250, 300, 350, 400, 450, 500, 600, 700, 800
12-REA32	32			
12-REA40	40	Rc1/4	Non-lube	200, 250, 300, 350, 400, 450, 500, 600, 700, 800, 900, 1000
12-REA50	50			
12-REA63	63			

Note 1) Consult SMC for strokes exceeding the standard stroke.

Note 2) Intermediate strokes are available in 1mm increments.

## Specifications

Bore size (mm)	
Item	25,32,40,50,63
Proof pressure	1.05MPa
Max. operating pressure	0.7MPa
Min. operating pressure	0.18MPa
Ambient and fluid temperature	-10 to 60°C (With no condensation)
Piston speed	50 to 300mm/s
Stroke length tolerance	0 to 250st: $+1.0$ , 251 to 1000st: $+1.4$ , 1001st to $+1.8$

## Magnetic Holding Force

Bore size (mm)	25	32	40	50	63
Holding force N	363	588	922	1471	2256

## ⚠ Specific Product Precautions

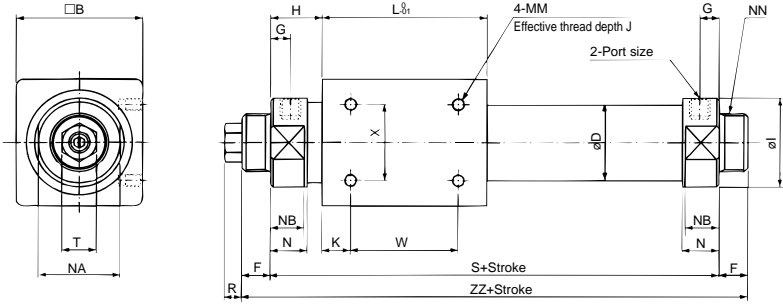
Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

Refer to pages 174 to 175 for product specific precautions.

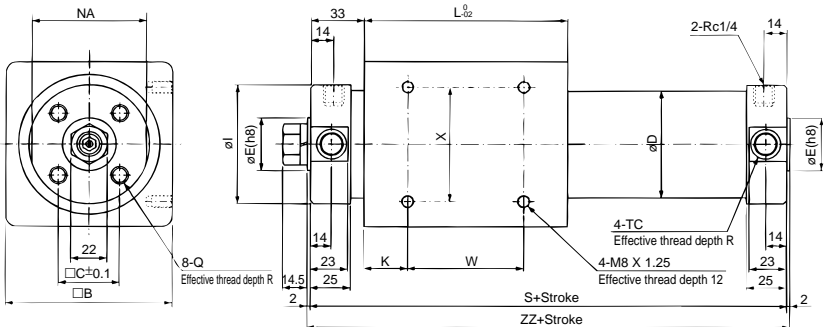
## Dimensions

### 12-REA 25 to 40



Model	Port size	B	D	F	G	H	I	K	L	MM X J	N	NA	NB	NN	S	W	X	ZZ	R	T
12-REA25	Rc1/8	46	27.8	13	8	20.5	34	10	70	M5 X 0.8 X 8	15	30	13	M26 X 1.5	111	50	30	137	8	17
12-REA32	Rc1/8	60	35	16	9	22	40	15	80	M6 X 1.0 X 8	17	36	15	M26 X 1.5	124	50	40	156	8	17
12-REA40	Rc1/4	70	43	16	11	29	50	16	92	M6 X 1.0 X 10	21	46	19	M32 X 2.0	150	60	40	182	10	19

### 12- REA 50/63



Model	B	C	D	E(h8)	I	K	L	NA	Q X R	S	TC X R	W	X	ZZ
12-REA50	86	32	53	30 <sup>0</sup> <sub>0.033</sub>	58.2	25	110	55	M8 X 1.25 X 16	176	M12 X 1.25 X 7.5	60	60	180
12-REA63	100	38	66	32 <sup>0</sup> <sub>0.039</sub>	72.2	26	122	69	M10 X 1.5 X 16	188	M14 X 1.5 X 11.5	70	70	192

# Series 10-11-CQSX Low Speed Cylinder

ø12, ø16, ø20, ø25

## How to Order

● Clean series

10	Relief type
11	Vacuum suction type

10 — C(D)QSX B 20 — 30 D [ ] — A93 [ ]

● With auto switch (Built-in magnet)

● Low speed cylinder

● Mounting

B	Through-hole/Both ends tapped (Standard)
---	--

● Bore size

12	12mm
16	16mm
20	20mm
25	25mm

● Cylinder stroke (mm)

Bore size (mm)	Standard stroke (mm)
12, 16	5, 10, 15, 20, 25, 30
20	5, 10, 15, 20, 25, 30, 35, 40, 45, 50
25	30, 35, 40, 45, 50

● Manufacturing of intermediate stroke  
Intermediate strokes can be manufactured in 1mm increments by attaching a spacer to a standard stroke cylinder. The total length of the cylinder in this case is identical to that of a standard model with a larger stroke.  
Example) 10-CQSB25-47D is a model with a 3mm width spacer installed inside the standard stroke cylinder 10-CQSB25-50D.

● Number of auto switches

Nil	2
S	1
n	n

● Type of auto switch

Nil	Without auto switch (Built-in magnet)
-----	---------------------------------------


\*Refer to the table below for auto switch model numbers.

● Rod end thread

Nil	Standard (Rod end female thread)
M	Rod end male thread

● Action

D	Double acting
---	---------------



## Auto Switch Specifications


(Refer to EP97-2-C for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-A93	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-F9B	24VDC (10 to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system D-F9N	28VDC or less	40mA or less	Yes	24VDC relay, PLC

## Specifications

Bore size (mm)		10- (Relief type)			
		12	16	20	25
Fluid		Air			
Proof pressure		1.5MPa			
Max. operating pressure		1.0MPa			
Min. operating pressure		0.04MPa		0.035MPa	
Ambient and fluid temperature		Without auto switch: -10 to 70°C			
		With auto switch: -10 to 60°C			
Piston speed		1 to 200mm/s			
Piston rod diameter		ø6	ø8	ø10	ø12
Rod end thread	Female thread	M3 X 0.5	M4 X 0.7	M5 X 0.8	M6 X 1.0
	Male thread	M5 X 0.8	M6 X 1.0	M8 X 1.25	M10 X 1.25
Rod end thread tolerance		JIS Class 2			
Stroke tolerance		+1.0 0 mm			
Port size		M5 X 0.8			
Vacuum port, Relief port		M5 X 0.8			

Bore size (mm)		11- (Vacuum suction type)			
		12	16	20	25
Fluid		Air			
Proof pressure		1.5MPa			
Max. operating pressure		1.0MPa			
Min. operating pressure		0.03MPa		0.025MPa	
Ambient and fluid temperature		Without auto switch: -10 to 70°C			
		With auto switch: -10 to 60°C			
Piston speed		1 to 200mm/s		0.5 to 200mm/s	
Piston rod diameter		ø6	ø8	ø10	ø12
Rod end thread	Female thread	M3 X 0.5	M4 X 0.7	M5 X 0.8	M6 X 1.0
	Male thread	M5 X 0.8	M6 X 1.0	M8 X 1.25	M10 X 1.25
Rod end thread tolerance		JIS Class 2			
Stroke tolerance		+1.0 0 mm			
Port size		M5 X 0.8			
Vacuum port, Relief port		M5 X 0.8			

 External dimensions and applicable auto switches are same as those of the standard clean series products. Refer to P.56 in this regard.

## Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

# Series 10-11-CQ2X Low Speed Cylinder

ø32, ø40

## How to Order

**Clean series**

10	Relief type
11	Vacuum suction type

10 — C(D)Q2XB 40 — 30 D [ ] — A73 [ ]

**With auto switch**  
(Built-in magnet)  
**Low speed cylinder**

**Bore size**

32	32mm
40	40mm

**Cylinder stroke (mm)**

**Standard strokes**

Bore size (mm)	Standard stroke (mm)
32, 40	5, 10, 15, 20, 25, 30,
	35, 40, 45, 50, 75, 100

●Manufacturing of intermediate stroke  
Intermediate strokes can be manufactured in 1mm increments by attaching a spacer to a standard stroke cylinder. The total length of the cylinder in this case is identical to that of a standard model with a larger stroke.  
Example) 10-CQ2XB40-57D is a model with a 18mm width spacer installed inside the standard stroke cylinder 10-CQ2XB40-75D.

**Number of auto switches**

Nil	2
S	1
n	n

**Type of auto switch**

Nil	Without auto switch/Built-in magnet)
-----	--------------------------------------


\*Refer to the table below for auto switch model numbers.

**Rod end thread**

Nil	Standard (Rod end female thread)
M	Rod end male thread

**Action**

D	Double acting
---	---------------



## Auto Switch Specifications


(Refer to EP.97-2-C for detailed specifications and auto switches not in the following table.)

Style	Auto switch part No.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-A73, D-A93	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-J79, F9B	24VDC (10 to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system D-F79, F9N	28VDC or less	40mA or less	Yes	IC circuit, Relay, PLC



### Specifications

Bore size (mm)	10- (Relief type)		11- (Vacuum suction type)	
	32	40	32	40
Fluid	Air			
Proof pressure	1.5MPa			
Max. operating pressure	1.0MPa			
Min. operating pressure	0.035MPa		0.025MPa	
Ambient and fluid temperature	Without auto switch: -10 to 70°C			
	With auto switch: -10 to 60°C			
Piston speed	1 to 200mm/s		0.5 to 200mm/s	
Piston rod diameter	ø16			
Rod end thread	Female thread	M8 X 1.25		
	Male thread	M14 X 1.5		
Rod end thread tolerance	JIS Class 2			
Stroke tolerance	+1.0 0 mm			
Port size	M5 X 0.8, Rc1/8			
Vacuum port, Relief port	M5 X 0.8			

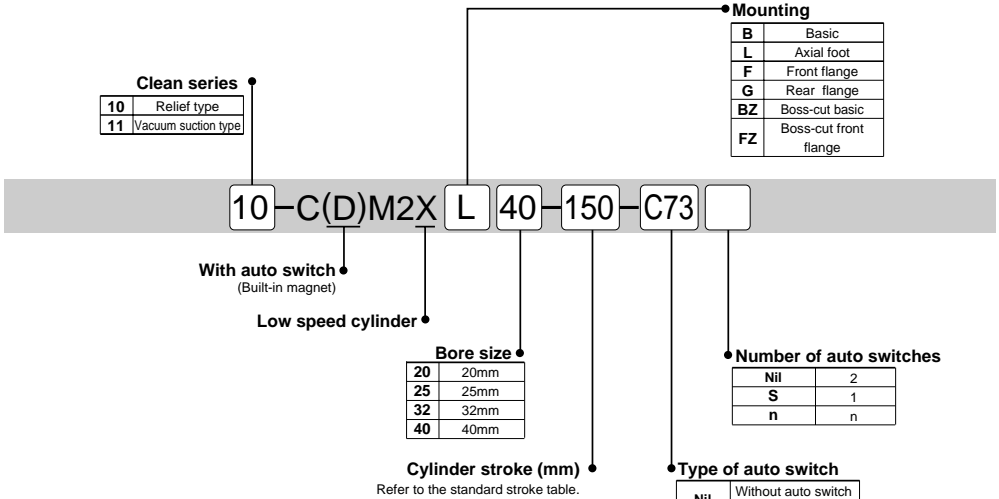
 External dimensions and applicable auto switches are same as those of the standard clean series products. Refer to P.64 in this regard.

### Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.

# Series 10-11-**CM2X** Low Speed Cylinder Double Acting Single Rod/ø12, ø16, ø20, ø25

## How to Order



### Stroke Table

Clean series	Bore size (mm)	Standard stroke (mm)
10- (Relief type)	20	25, 50, 75, 100, 125, 150, 175, 200, 250, 300
	25	
	32	
	40	
11- (Vacuum suction type)	20	
	25	
	32	
	40	




## Auto Switch Specifications

(Refer to EP.97-2-C for detailed specifications and auto switches not in the following table.)

Style	Auto switch part No.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-C73	24VDC, 100VAC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC
Solid state switch	2-wire system D-H7B	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
	3-wire system D-H7A1	28VDC or less	150mA or less	Yes	IC circuit, Relay, PLC

## Specifications

Bore size (mm)	10- (Relief type)				11-(Vacuum suction type)			
	20	25	32	40	20	25	32	40
Fluid	Air							
Proof pressure	1.5MPa							
Max. operating pressure	1.0MPa							
Min. operating pressure	0.035MPa				0.025MPa			
Ambient and fluid temperature	Without auto switch: -10 to 70°C With auto switch: -10 to 60°C							
Cushion	Rubber bumper							
Piston speed	1 to 200mm/s				0.5 to 200mm/s			
Piston rod diameter	ø8	ø10	ø12	ø14	ø8	ø10	ø12	ø14
Rod end thread	M8 X 1.25	M10 X 1.25		M14 X 1.5	M8 X 1.25	M10 X 1.25		M14 X 1.5
Rod end thread tolerance	JIS class 2							
Stroke tolerance	+1.4 0 mm							
Port size	Rc1/8			Rc1/4	Rc1/8			Rc1/4
Vacuum port, Relief port	M5 X 0.8							

 External dimensions and applicable auto switches are same as those of the standard clean series products. Refer to P. 20 in this regard.

## ⚠ Specific Product Precautions

**Be sure to read before handling.**

**Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 2 to 7 for common precautions for actuators.**

### Precautions

#### ⚠ Warning

- ① **Do not rotate the cover.**
  - When installing a cylinder or screwing a pipe fitting into the port, the coupling portion of the cover could break if the cover is rotated.

#### ⚠ Caution

- ① **Be careful not to allow the snap ring to pop out.**
  - When replacing the rod seal, take special precautions not to allow the snap ring to pop out.

### Maintenance

#### ⚠ Caution

- ① Grease pack
  - Use the following part number to order grease for maintenance.
  - GR-X-005 (5g)



# Clean series Rotary Actuator

**10-  
CRB1** Vane Style  
Series CRB1  
P.192

**11-  
CRA1** Rack Pinion Style  
Series CRA1  
P.204

**11-  
MSQ** Rotary Table/Rack Pinion Style  
Series MSQ  
P.210

Rotary Actuator



# Rotary Actuator/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Design

### Warning

- 1 If the operation involves load fluctuations, ascending or descending movement or changes in frictional resistance, devise a safety design considering these factors.**  
Rise in temperature may cause injury to humans or damage to equipment and machinery.
- 2 Install a protective cover to minimize the risk of injury in case it is especially likely that human injury may be caused.**  
If there is any possibility of human injury or damage to machinery and equipment caused by the driven object or the movable part of the product, adopt a construction that will not allow direct contact with that part.
- 3 Securely tighten all stationary parts and joints so that they will not go loose.**  
In case the product is operated at a high frequency or in a place with a lot of vibration, adopt a reliable securing method.
- 4 Deceleration circuits or shock absorbers may be necessary.**  
If the driven object moves at a high speed or has a heavy weight, it is difficult to absorb the impact with the rotary actuator cushion alone. Install a deceleration circuit to reduce the speed before cushioning or install an external shock absorber to moderate the impact. In this case, the rigidity of the machinery should also be considered.
- 5 Consider possible drops circuit pressure due to power failure or some other factors.**  
In case the cylinder is used in a clamping mechanism, a drop in circuit pressure may result in a decrease of the clamping force and consequently dropping of the work piece.  
Install safety equipment to protect the human body or machinery against injury or damage.
- 6 Consider a possible loss of power source.**  
If the product is controlled by pneumatic pressure, electricity or hydraulic pressure, take measures against possible failure of the power source so that the failure will cause no human injury or damage to equipment.
- 7 When the speed controller is arranged for meter-out control, take the residual pressure into account for safety design.**  
If pressure is applied to the supply side with no residual pressure on the exhaust side, it can cause injury to humans or damage to machinery and equipment.
- 8 Consider the behavior at an emergency stop.**  
Design a system that will prevent human injury or equipment damage caused by the rotary actuator movement when the machine is halted by a manual emergency stop or by a safety device detecting abnormality such as power failure.
- 9 Consider the behavior on restart after an emergency stop or abnormal stop.**  
Design a system so that no damage to human or equipment will be caused on restart of operation.  
When the rotary actuator has to be reset at the starting position, install manual safety equipment.
- 10 Do not use the product as a shock absorber.**  
If an abnormal pressure is generated or air leakage occurs, the rotary actuator's speed reduction capability could be severely affected, which could cause injury to humans or damage to machinery and equipment.

## Selection

### Warning

- 1 Select the speed within the product's allowable energy value.**  
If the product is operated with a kinetic energy exceeding the allowable value, it may cause injury to humans or damage to machinery and equipment.
- 2 Provide a shock absorbing mechanism if the kinetic energy applied to the product exceeds the allowable value.**  
If the product is used in a state in which the kinetic energy exceeds the allowable value, it could damage the product, causing injury to humans or damage to machinery and equipment.
- 3 Do not perform an intermediate stop or retention by containing air inside the product.**  
In case the product is not provided with an external stop mechanism, stopping the product at an intermediate position by containing air inside may result in air leakage, making it impossible to hold the stop position. It can lead to injury to humans or damage to machinery and equipment.

### Caution

- 1 Do not operate the product in a low speed range below the specified speed adjustment range.**  
If the product is used in a low speed range below the specified speed adjustment range, it could cause a stickslip phenomenon or operation stop.
- 2 Do not apply external torque exceeding the rated output to the product.**  
The product may be damaged if an external force exceeding the rated output is applied.
- 3 The holding torque of the rotation end of the double piston style.**  
With a double piston product, if the internal piston is stopped by coming into contact with the angle adjustment screw or the cover, the holding torque at the rotating end is one-half that of the actual product.
- 4 If repeatability of the rotation angle is required, stop the load directly with external force.**  
The initial rotation angle may vary even with a product equipped with an angle adjuster.
- 5 Do not operate the product with hydraulic pressure.**  
Use of hydraulic pressure will lead to product damage.
- 6 If it is necessary to ensure a rotation angle with a vane style product, be sure to operate at a pressure not smaller than 0.3MPa.**



# Rotary Actuator/Common Precautions 2

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Mounting

### Warning

- Before adjusting the angle by supplying air pressure, take appropriate measures to prevent the equipment from unnecessary rotation.**

When an adjustment is preformed under air pressure, the equipment could rotate and fall during the adjustment, depending on the mounted posture of the equipment. As a result, it could cause injury to humans or damage to machinery and equipment.

- Do not loosen the angle adjustment screw beyond the allowable adjustment range.**

If loosened to exceed the proper adjustment range, the angle adjustment screw may fall out, causing injury to humans or damage to machinery and equipment.

- Do not bring an magnetic object into close proximity with the product.**

Because the auto switch is sensitive to magnetism, malfunction may result if it comes to close proximity with external magnetism, causing injury to humans or damage to machinery and equipment.

- Do not modify the product.**

Modifying the product will affect its strength, which could cause the product to break. As a result, it could pose a hazard to humans or damage to machinery and equipment.

- Do not enlarge the fixed orifice on the piping port by reworking, etc.**

If the hole diameter is enlarged, the product's rotation speed will grow faster, increasing the shock force that could damage the product. As a result, it could cause human injury or damage to machinery and equipment.

- If shaft couplings are to be used, use those with angular freedom.**

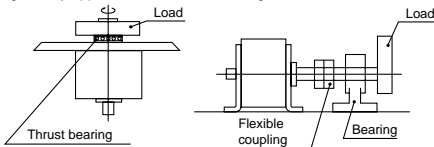
If shaft couplings lacking angular freedom are used, they could be twisted by eccentricity, leading to malfunction and damage to the product. As a result, it could cause human injury or damage to machinery and equipment.

- Do not apply to the shaft a load exceeding the indicated values.**

If a load that exceeds the allowable value is applied to the product, it could cause the equipment to malfunction and product to fracture. As a result, it could pose a hazard to humans or damage the machinery and equipment.

Although a load up to the allowable radial thrust load can be applied in an environment where no dynamic load is generated, avoid operation involving direct application of the load to the axis wherever possible.

To further improve the operating conditions, prevent the load from being directly applied to the axis as in the figure below.

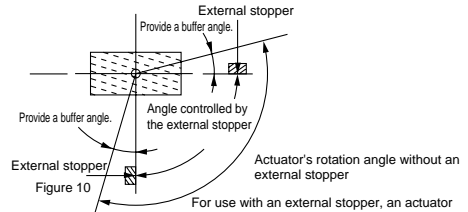


- Keeps a certain distance between the external stopper and the rotating shaft.**

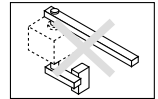
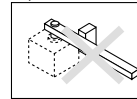
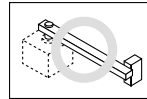
If the stopper is placed near the rotating shaft, the torque generated by the product itself will cause a reactive force acting on the stopper, which will be applied to the rotating shaft, possibly causing the rotating shaft and the bearing to fracture. As a result, it could pose a hazard to humans or damage to the machinery and equipment.

### Precautions for using an external stopper

If the kinetic energy generated by the load exceeds the actuator's threshold value, an external dampening function must be provided to absorb the energy. Furthermore, with series CRA1, which is a single rack pinion type, there is a backlash (within 1° at the rotation end) of the rack pinion mechanism. Thus, an external stopper is required in order to determine the correct angle. The figure below illustrates the correct installation of an external stopper.



For use with an external stopper, an actuator with rotation angles of 100°, 190° and 280° are provided for some models.



The external stopper acts as the fulcrum, causing the load's inertia to be applied to the shaft in the form of bending moment.

If an external stopper is placed against the shaft that is on the opposite side of the load, the inertia that is generated by the load is applied directly to the shaft.

### Caution

- Do not use organic solvent to wipe the surface of the nameplate indicating the model.**  
It will erase the indication on the plate.
- Do not fix the body and hit the axis of rotation or fix the axis of rotation and hit the body.**  
It can bend the rotating shaft or damage the bearing. Secure the rotation axis when a load must be coupled to the rotating shaft.
- Do not step directly on the shaft of or on the equipment coupled to the shaft.**  
Stepping directly on the rotating shaft will cause the rotating shaft or the bearing to fracture.
- If a product is equipped with an angle adjustment function, use it within the specified adjustment range.**

If the product is operated at an angle exceeding the adjustment range, it may malfunction or fracture. Refer to the specifications of each product for the proper adjustment range.



# Rotary Actuator/Common Precautions 3

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions with clean series. Refer to the main text for precautions for each series.

## Air Supply

### Warning

#### ① Use clean air.

Do not use compressed air that contains synthetic oil, salt, and corrosive gases in which chemicals and organic solvents are present, because it could cause equipment damage or malfunction.

### Caution

#### ① Install an air filter.

Install an air filter close to and upstream of the valve. Select a filtering degree of 5- $\mu$ m or smaller

#### ② Take measures such as installation of after cooler, air dryer or drain catch.

Compressed air containing a large amount of drainage could cause the rotary actuator or other types of pneumatic equipment to malfunction. Therefore, take appropriate measures to ensure air quality, for example, by installing an after cooler, air dryer or drain catch.

#### ③ Use the product within the specified range of fluid and ambient temperature.

Take freeze proof measures when the temperature is 5°C or below. Otherwise the moisture in the circuit may freeze to cause damage to the packing or malfunction.

For detailed information regarding the quality of the compressed air described above, refer to pages 8 to 9 of Front matter.

## Environment

### Warning

#### ① Do not use in environments where there is danger of corrosion.

Refer to the respective construction diagram for details on the materials used in the rotary actuator.

## Speed and Cushion Adjustment

### Warning

#### ① In speed adjustment, start from the low speed end and gradually move to higher values.

If the speed adjustment is performed from the high speed end, it could damage the product. As a result, it could cause human injury or damage to machinery and equipment.

#### ② The cushion needle is not factory adjusted. Please adjust it according to the operation speed and the moment of inertia of the load.

The absorption of kinetic energy by the cushion is determined by the needle adjustment. If the adjustment is incorrect, it can damage products and equipment or even cause injury to personnel.

#### ③ Do not operate the product with its cushion needle fully closed.

If it could tear up the seal, causing human injury or damage to machinery and equipment.

#### ④ Do not apply excessive force to loosen the cushion needle.

The needle itself is provided with a pull stop, which could be damaged by application of excessive force to loosen the needle. As a result, it could pose a hazard to humans or damage the machinery and equipment.

## Maintenance

### Warning

#### ① Follow the procedures given in the operation manual to perform maintenance and inspection. Improper handling could lead to malfunction or damage the machinery and equipment.

#### ② In the course of maintenance, do not disassemble the product with its power on or with air pressure applied.

#### ③ When the product is overhauled, be sure to perform an appropriate functionality inspection.

Failure to perform functionality inspection will lead to the product's inability to meet the specifications.

### Caution

#### ① For lubrication, use the type of grease that is used for the respective product.

Use of a lubricant out of the specifications could damage the seals.

### Caution

Refer to pages 5 to 7 for common precautions on auto switches.





# Series 10-CRB1 Vane Style Rotary Actuator/Size 10, 15, 20, 30

## How to Order



**Clean series**  
10-Relief type

**Auto switch**  
Nil — Without switch unit  
D — With switch unit

**Size**  
10  
15

**Auto switch**  
**Reed switch**  
90  
**Solid state switch**  
S99  
T99

**Lead wire length**  
Nil — Grommet  
With 0.5m lead wire  
L — Grommet  
With 3m lead wire

**Size**  
10/15

10 - C D R B 1 F W 10 - 180 S - 90 L

**Size**  
20/30

10 - C D R B 1 B W 20 - 180 S - R73 L

**Mounting**  
B — Basic  
F — Flange

**Size**  
20  
30

**Rotation angle**

Application	Symbol	Rotation angle
Single vane	90	90°
	180	180°
	270	270°
Double vane	90	90°
	100	100°

**Vane style**  
S — Single vane  
D — Double vane  
\* The double vane is not available with size 10.

**Auto switch**  
**Reed switch**  
R73  
**Solid state switch**  
S79  
T79

**Lead wire length**  
Nil — Grommet/With 0.5m lead wire  
L — Grommet/With 3m lead wire  
C — Connector/With 0.5m lead wire  
CL — Connector/With 3m lead wire  
CN — Connector/Without lead wire  
\*The connector type is not available with S79.

## Specifications

### Single Vane

Model	10-CRB1BW10-□S	10-CRB1BW15-□S	10-CRB1BW20-□S	10-CRB1BW30-□S
Rotation angle	90°, 180°, 270°			
Proof pressure <b>MPa</b>	1.05			1.5
Max. operating pressure <b>MPa</b>	0.7			1.0
Min. operating pressure <b>MPa</b>	0.2	0.15		
Ambient and fluid temperature <b>°C</b>	5 to 60			
Note1) Speed adjustable range <b>s/90°</b>	0.03 to 0.3			0.04 to 0.3
Note2) Allowable kinetic energy <b>J</b>	0.00015	0.001	0.003	0.0087
Shaft load <b>N</b>	Allowable radial load	14.7	14.7	29.4
	Allowable thrust load	9.8	9.8	19.6
Bearing	Ball bearing			
Port position	On the body side or in the axial direction			
Size	Body side	M3 X 0.5	M3 X 0.5	M5 X 0.8
	Axial direction	M3 X 0.5	M3 X 0.5	M5 X 0.8
Shaft type	Double shaft (With one flat chamfer to each shaft)			
Mounting	Basic, Flange			
Auto switch	Mountable (Port: Body side)			

Note 1) Be sure to operate within the adjustable speed range. A speed exceeding the upper limit (0.3s/90°) could cause a stick phenomenon or malfunction.

Note 2) In the chart, the values represent the energy factor when the rubber bumper is used (at the end of rotation).

### Double Vane

Model	10-CRB1BW15-□D	10-CRB1BW20-□D	10-CRB1BW30-□D
Rotation angle	90°, 100°		
Proof pressure <b>MPa</b>	1.05		1.5
Max. operating pressure <b>MPa</b>	0.7		1.0
Min. operating pressure <b>MPa</b>	0.15		
Ambient and fluid temperature <b>°C</b>	5 to 60		
Note1) Speed adjustable range <b>s/90°</b>	0.03 to 0.3		0.04 to 0.3
Note2) Allowable kinetic energy <b>J</b>	0.001	0.003	0.0087
Shaft load <b>N</b>	Allowable radial load	14.7	24.5
	Allowable thrust load	9.8	19.6
Bearing	Ball bearing		
Port position	On the body side or in the axial direction		
Size: Body side, Axial direction	M3 X 0.5	M5 X 0.8	
Shaft type	Double shaft (With one flat chamfer to each shaft)		
Mounting	Basic, Flange		
Auto switch	Mountable (Port: Body side)		

Note 1) Be sure to operate within the adjustable speed range. A speed exceeding the upper limit (0.3s/90°) could cause a stick phenomenon or malfunction.

Note 2) In the chart, the values represent the energy factor when the rubber bumper is used (at the end of rotation).

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety precautions and common precautions for clean series. Refer to pages 188 to 190 for common precautions for rotary actuators.

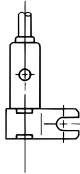
**Auto Switch Specifications** (Refer to page 1.1-11 of Best Pneumatics ③ for detailed specifications and auto switches not in the following table.)

	Style	Auto switch part No.	Load voltage	Load current range	Indicator light	Application
10	Reed switch	D-90	24V <sup>AC</sup> or less	50mA	—	Relay, PLC, IC circuit
15	Solid state switch	D-T991/T992	24VDC	5 to 150mA	Yes	
	3-wire system	D-S991/S992	28VDC or less	150mA or less	Yes	
20	Reed switch	D-R731/R732	100VAC	5 to 20mA	Yes	Relay, PLC
30	Solid state switch	D-T791/T792	24VDC	5 to 150mA	Yes	Relay, PLC, IC circuit
	3-wire system	D-S791/S792	28VDC or less	150mA or less	Yes	Relay, PLC

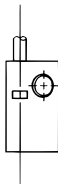
**Classification of Auto Switch Styles/Right-hand Style and Left-hand Style**

**Right-hand style**

D-□□□1

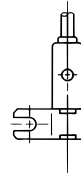


D-□991

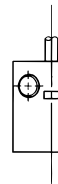


**Left-hand style**

D-□□□2

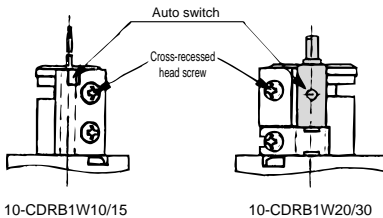


D-□992



**How to Move The Auto Switch Detection Position**

To set the detection position, slightly loosen the round head Phillips screw, move the switch to the desired position and secure it by tightening the set screw. Do not overtighten the screw because once its threads are stripped, the switch cannot be secured. The proper tightening torque is approximately 0.5 Nm.



**Operating Range and Hysteresis Range of Auto Switch**

Model	Operating range	Hysteresis range
10-CDRB1BW10/15	110°	10°
10-CDRB1BW20/30	90°	10°

**Option**

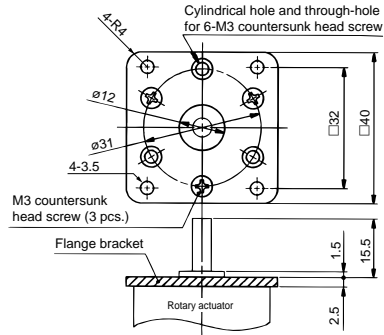
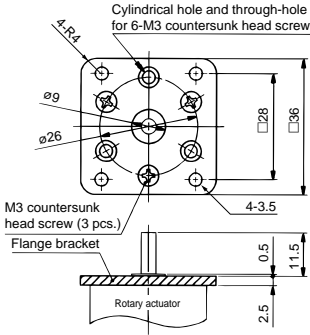
**Flange bracket**

- \* The flange (with countersunk head screws) is not included at the time of shipment
- \* The mounting angle between the body of the rotary actuator and the flange can be set in 60° increments.

Model		Flange ass'y part no.
Basic	With auto switch	
10-CRB1FW10	10-CDRB1FW10	P414070-2
10-CRB1FW15	10-CDRB1FW15	P414090-2
10-CRB1FW20	10-CDRB1FW20	P414060-2
10-CRB1FW30	10-CDRB1FW30	P414080-2

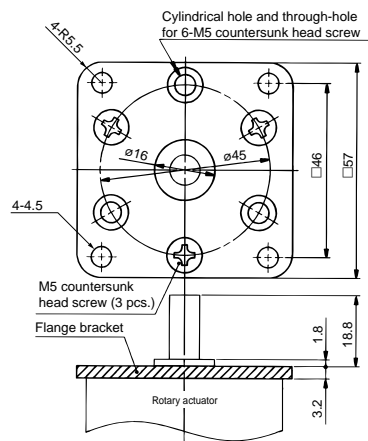
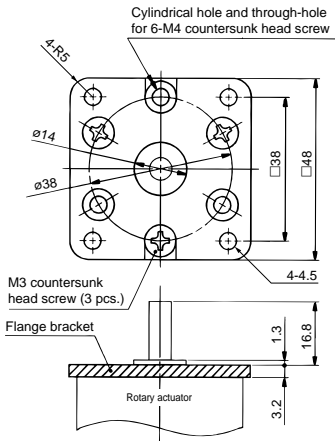
**Assembly part No.: P414070-2 (For 10-CRB1FW10)**

**Assembly part No.: P414090-2 (For 10-CRB1FW15)**



**Assembly part No.: P414060-2 (For 10-CRB1FW20)**

**Assembly part No.: P414080-2 (For 10-CRB1FW30)**



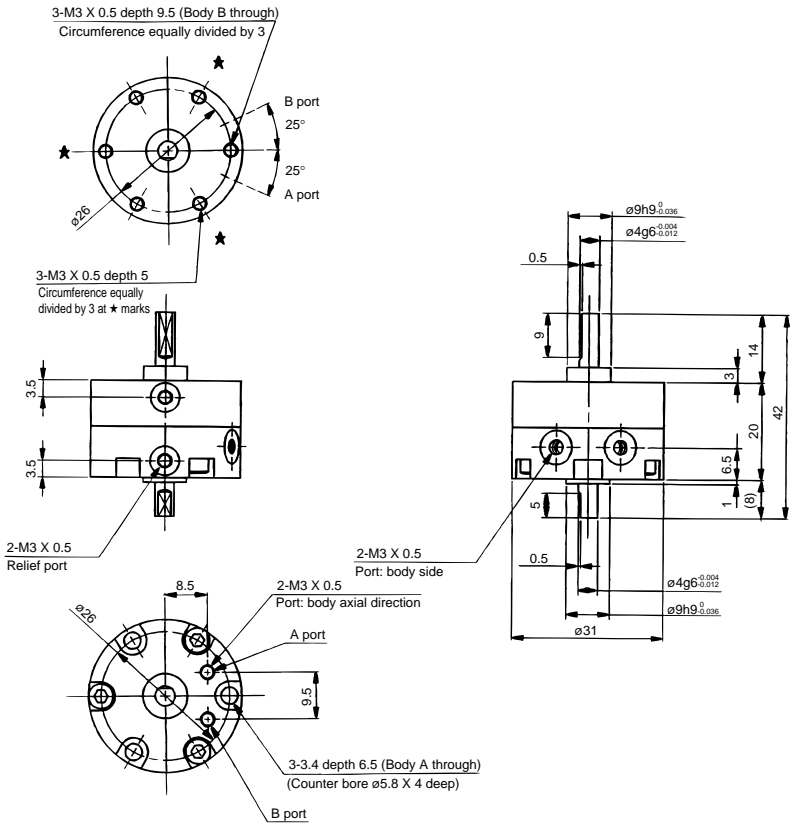
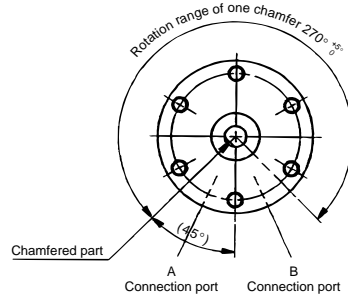
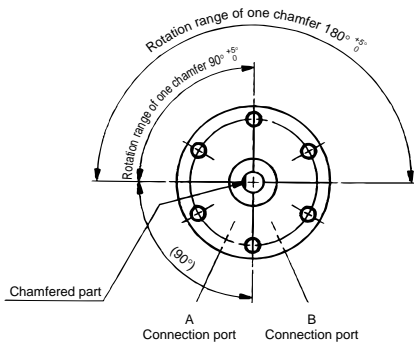
Rotary Actuator

**Without Auto Switch/10-CRB1BW10**

\*The double vane is not available with size 10.

**Size 10**

Rotation range (The chamfer positions below are for pressurization at B port.)

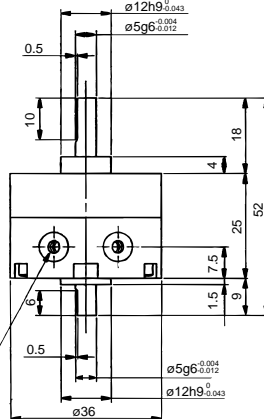
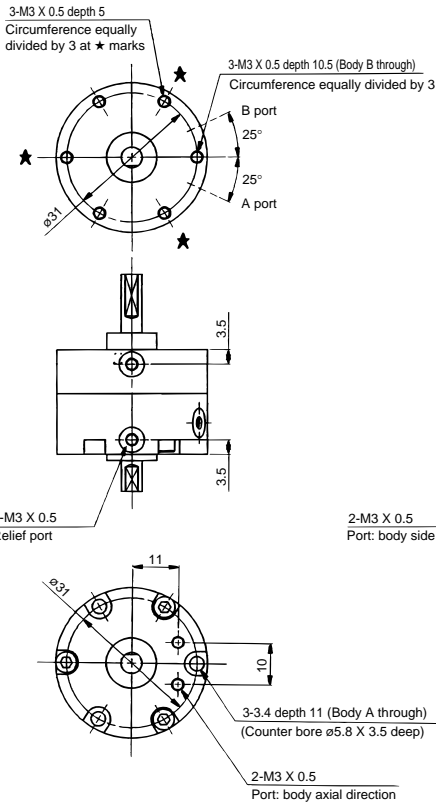
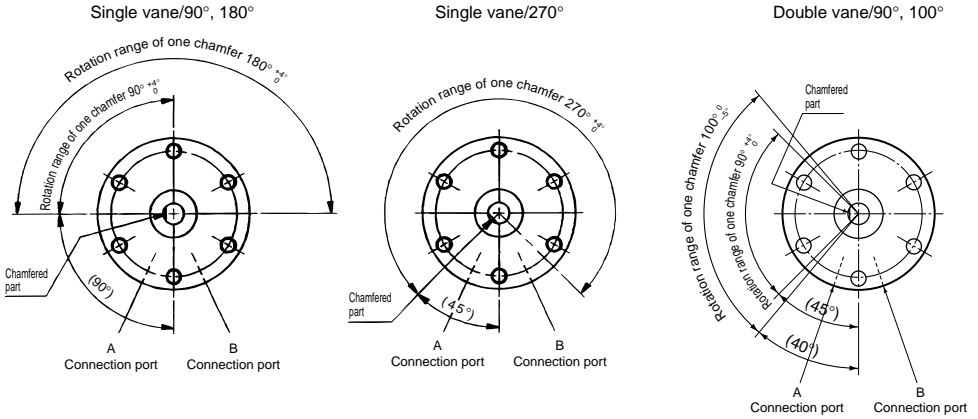


Without Auto Switch/10-CRB1BW15 (Dimensions are common to single vane and double vane)

Size 15

Rotation range of single vane (The chamfer positions below are for pressurization at B port.)

Rotation range of double vane (The chamfer positions below are those in the middle of rotation with pressurization at A port or B port.)



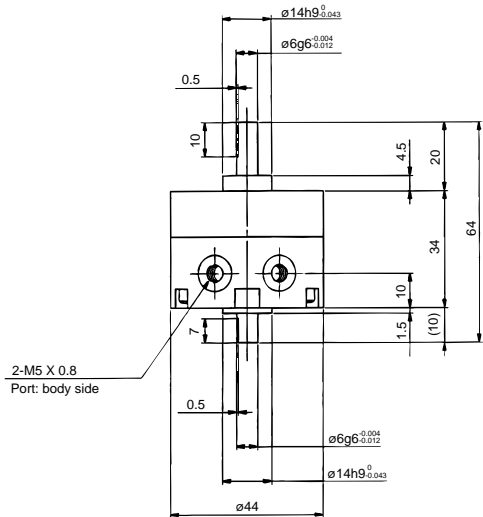
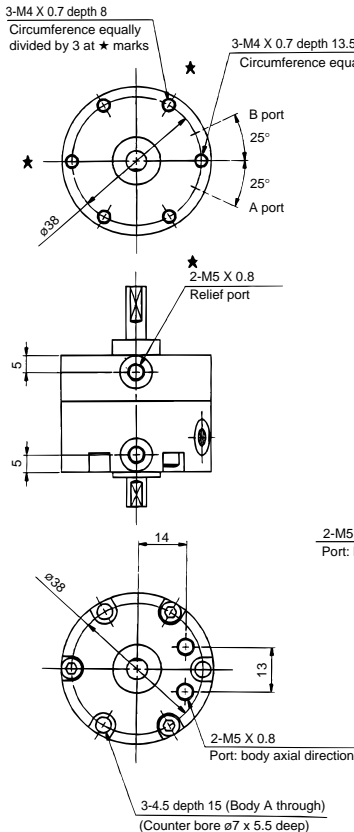
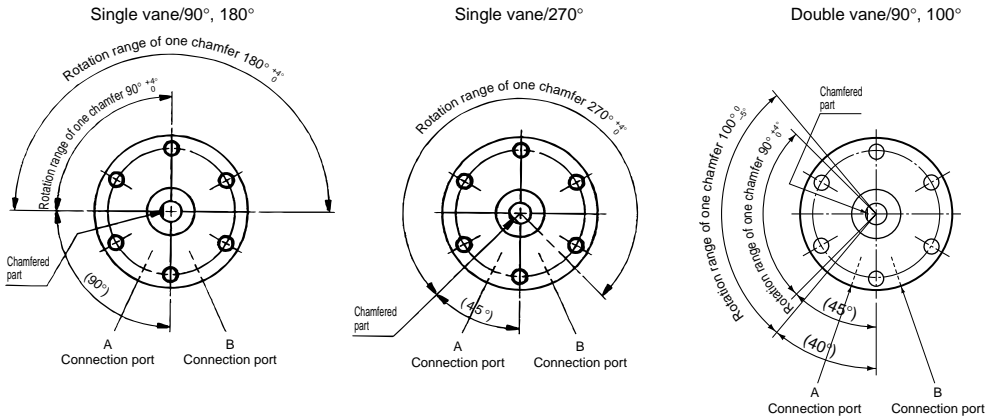
Rotary Actuator

**Without Auto Switch/10-CRB1BW20** (Dimensions are common to single vane and double vane)

**Size 20**

Rotation range of single vane (The chamfer positions below are for pressurization at B port.)

Rotation range of double vane (The chamfer positions below are those in the middle of rotation with pressurization at A port or B port.)



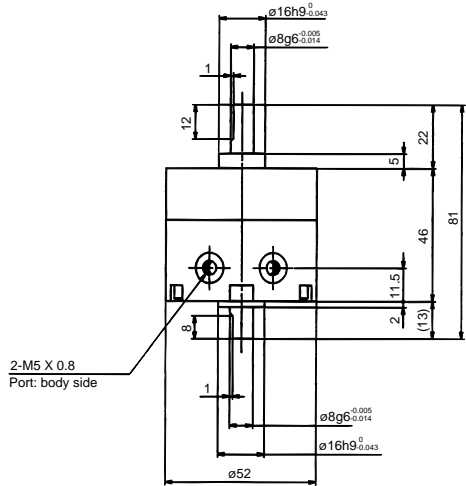
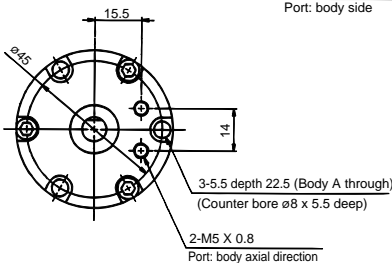
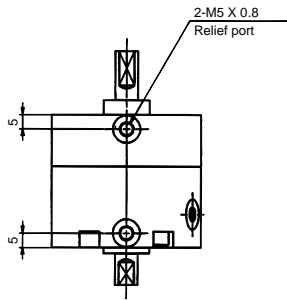
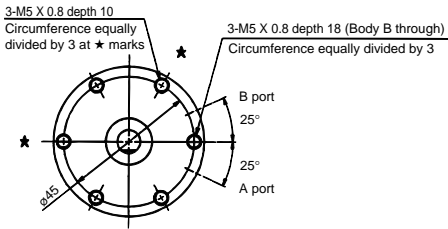
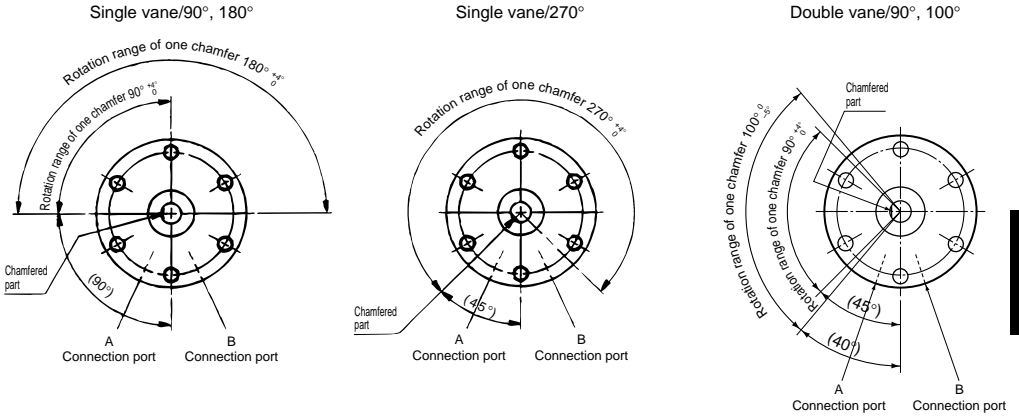


**Without Auto Switch/10-CRB1BW30** (Dimensions are common to single vane and double vane)

**Size 30**

Rotation range of single vane (The chamfer positions below are for pressurization at B port.)

Rotation range of double vane (The chamfer positions below are those in the middle of rotation with pressurization at A port or B port.)



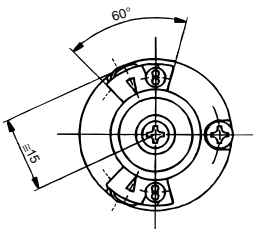
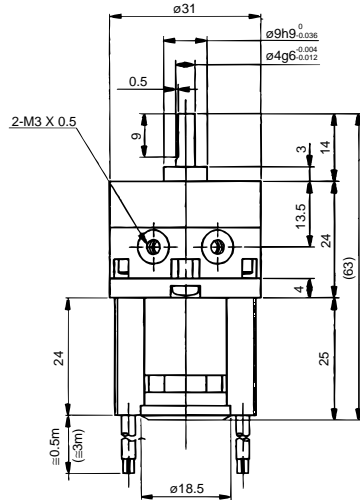
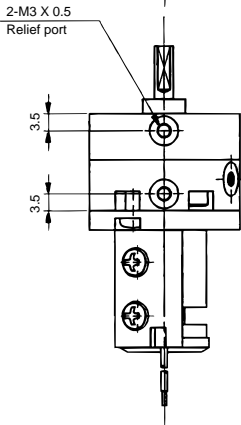
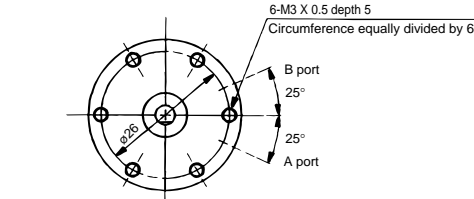
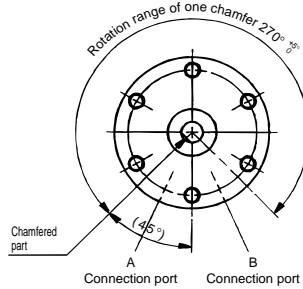
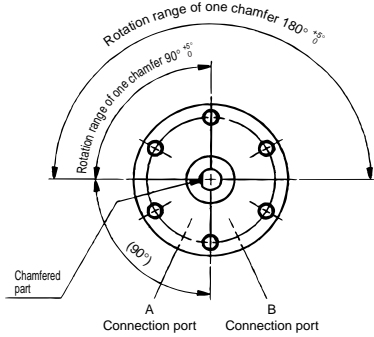
# Rotary Actuator 10-CRB1

## With Auto Switch/10-CDRB1BW10

\*The double vane is not available with size 10.

### Size10

Rotation range (The chamfer positions below are for pressurization at B port.)



**With Auto Switch/10-CDRB1BW15** (Dimensions are common to single vane and double vane)

**Size15**

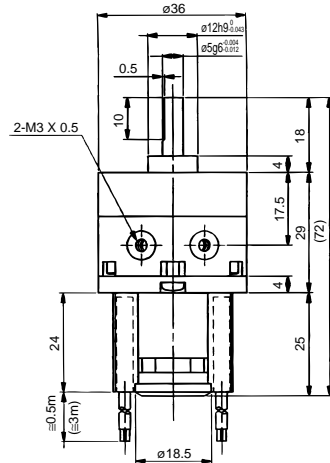
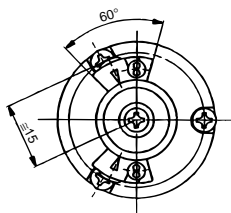
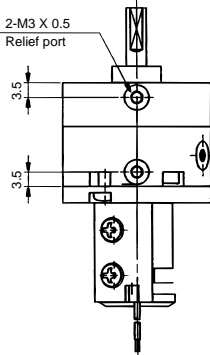
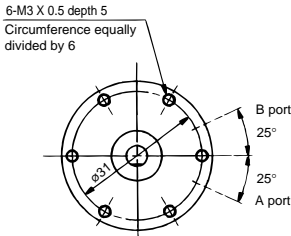
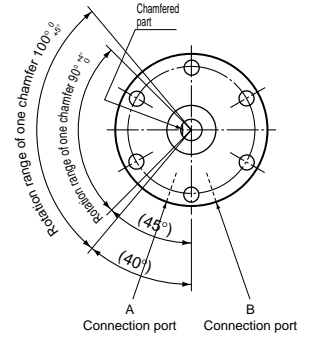
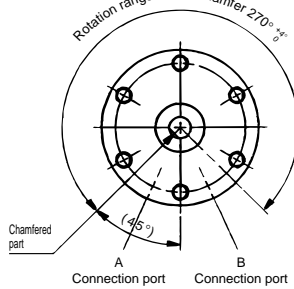
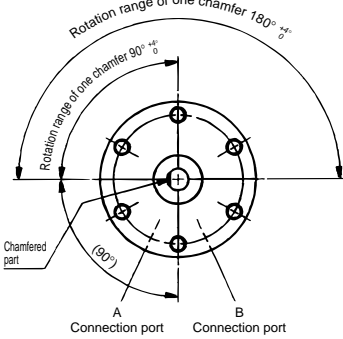
Rotation range of single vane (The chamfer positions below are for pressurization at B port.)

Rotation range of double vane (The chamfer positions below are those in the middle of rotation with pressurization at A port or B port.)

Single vane/90°, 180°

Single vane/270°

Double vane/90°, 100°



# Rotary Actuator 10-CRB1

With Auto Switch/10-CDRB1BW20 (Dimensions are common to single vane and double vane)

## Size20

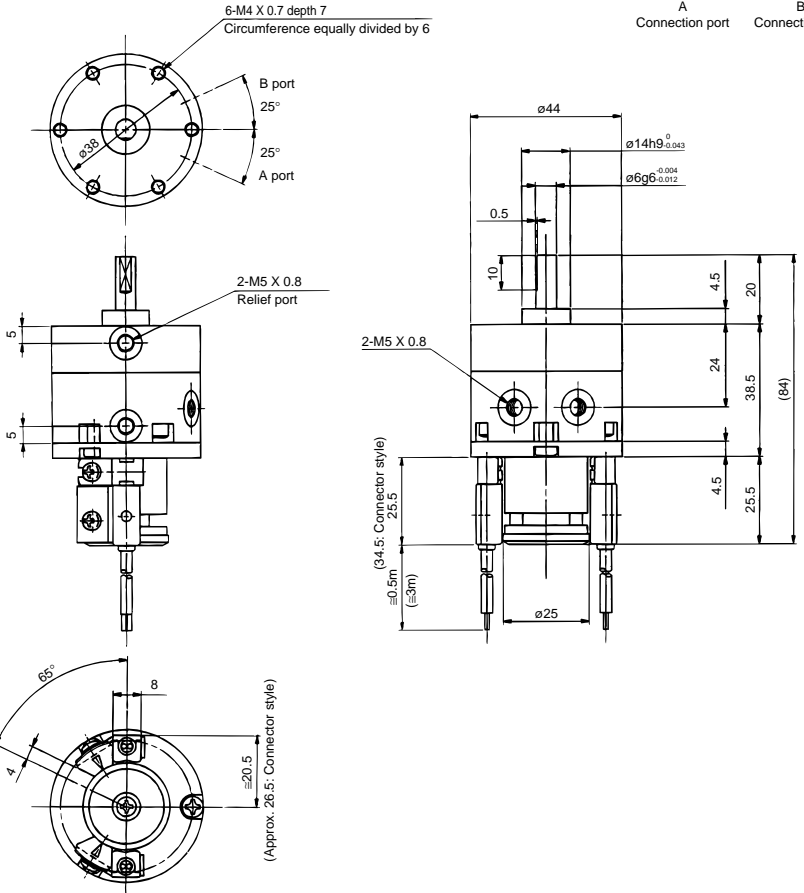
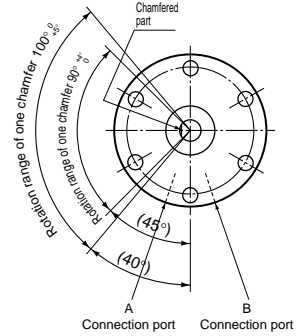
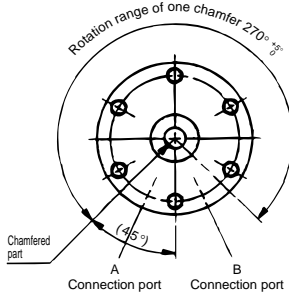
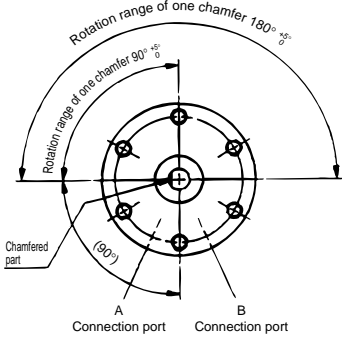
Rotation range of single vane (The chamfer positions below are for pressurization at B port.)

Rotation range of double vane (The chamfer positions below are those in the middle of rotation with pressurization at A port or B port.)

Single vane/90°, 180°

Single vane/270°

Double vane/90°, 100°

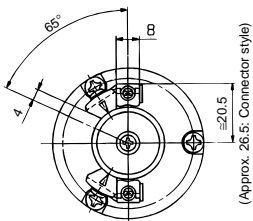
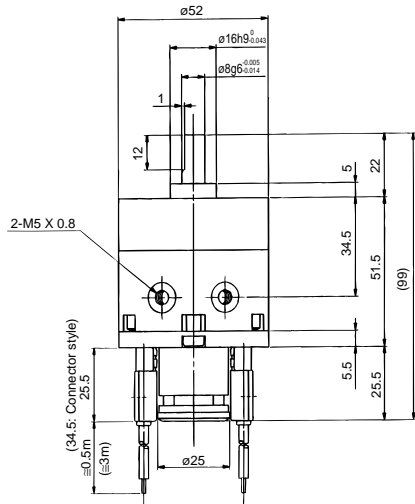
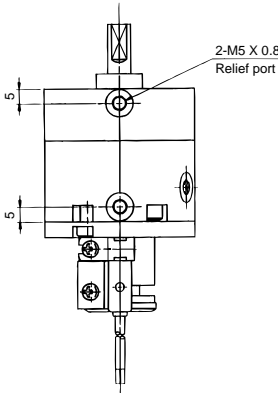
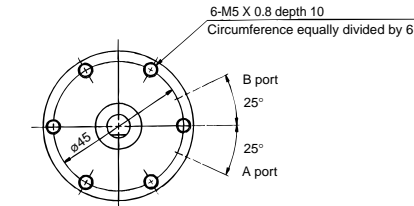
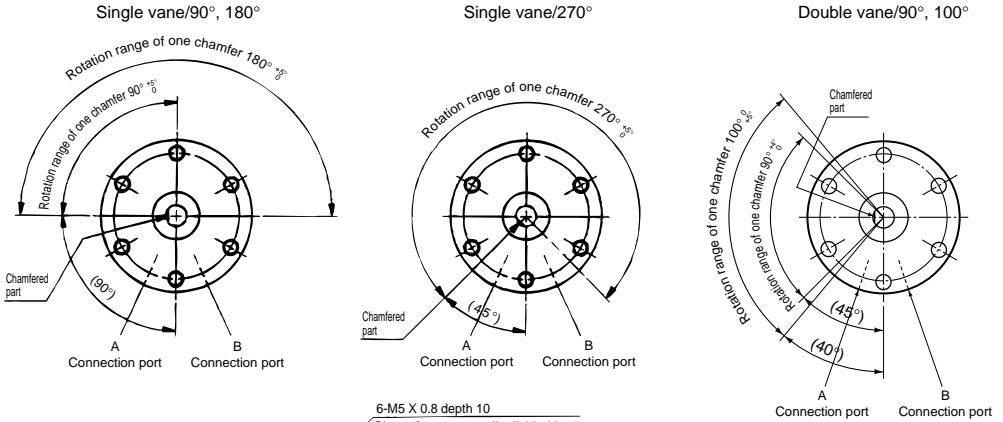


**With Auto Switch/10-CDRB1BW30** (Dimensions are common to single vane and double vane)

**Size30**

Rotation range of single vane (The chamfer positions below are for pressurization at B port.)

Rotation range of double vane (The chamfer positions below are those in the middle of rotation with pressurization at A port or B port.)



# Series 11-CRA1 Rack Pinion Type Rotary Actuator/Size 30,50

## How to Order

**Clean series**  
11-Vacuum suction type

**Auto switch**  
Nil — No  
D — With auto switch

**Mounting**  
B — Basic  
L — Foot


**Shaft**  
S — Single shaft \*Not available on ø30  
W — Double shaft

**Size**  
30  
50

**Rotation angle**  
Standard  
90 — 90°  
180 — 180°  
Optional  
100 — ±100°  
190 — ±190°  
\*Not available on ø30

**Suffix**  
Nil — Without air cushion  
\*C — Cushion on both ends  
\*Not available on ø30

**Type of auto switch**  
ø30—A73, J79, F79  
ø50—A54, J59, F59



11 - C D R A 1 B S 50 - 90 C - A53

## Model

● Standard specifications ○ Options

Model	Size	Rotation angle				Mounting		Shaft		With cushion	With auto switch
		90°	180°	100° (Note 1)	190° (Note 1)	Basic	Foot	Single shaft	Double shaft		
11-CRA1□30	30	●	●	○	○	●	●	—	●	—	○
11-CRA1□50	50	●	●	○	○	●	●	●	●	○	○

Note 1) By removing the angle adjustment screw of ø30, it is possible to enlarge the angle from 90° to 110° or from 180° to 200°.

Note 2) All models of the ø30 type has an angle adjustment mechanism as standard.

## Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	0 to 60°C (With no condensation)
<b>Cushion</b>	Without cushion, Air cushion
<b>Mounting</b>	Basic, Foot

## Allowable Kinetic Energy

Model	Allowable kinetic energy (J)		Cushion angle
	Without cushion	With cushion	
11-CRA1□W30	0.01	—	—
11-CRA1□□50	0.05	0.98	35°

\*The allowable kinetic energy of type with cushion represents the maximum absorption energy when cushion needle is properly adjusted.

## Output

Nm

Size	Operating pressure (MPa)										
	0.10	0.15	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
30	0.38	0.57	0.76	1.14	1.53	1.91	2.29	2.67	3.05	3.44	3.82
50	1.85	2.78	3.71	5.57	7.43	9.27	11.2	13.0	14.9	16.7	18.5

## Safe Range of Rotation Time

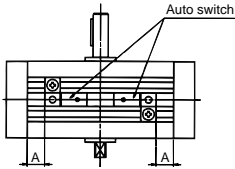
Model	Rotation time (s/90°)
11-CRA1□W30	0.2 to 1
11-CRA1□□50	0.2 to 2

**Auto Switch Specifications** (Refer to page 125 of Best Pneumatics ③ for detailed Specifications and auto switches not in the following table)

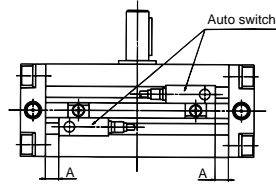
	Style	Auto switch part No.	Load voltage	Load current range	Indicator light	Application	
ø30	Reed switch	D-A73	24VAC or DC	5 to 40mA, 5 to 20mA	Yes	Relay, PLC	
	Solid state switch	2-wire system	D-J79	24VDC(10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
		3-wire system	D-F79	28VDC or less	150mA or less	Yes	Relay, PLC, IC circuit
ø50	Reed switch	D-A54	24VDC,100VAC,200VAC	5 to 50mA, 5 to 25mA, 5 to 12.5mA	Yes	Relay, PLC	
	Solid state switch	2-wire system	D-J59	24VDC (10 to 28VDC)	5 to 150mA	Yes	24VDC relay, PLC
		3-wire system	D-F59	28VDC or less	150mA or less	Yes	Relay, PLC, IC circuit

**Proper Mounting Positions for Auto Switch**

ø30



ø50



Model	A (mm)	Operating range	Hysteresis range
11-CDRA1□W30-90/180	9 (19)	95°	20°
11-CDRA1□□50-90/180	9 (26)	65°	20°

\*Dimensions in parentheses are for 180°.

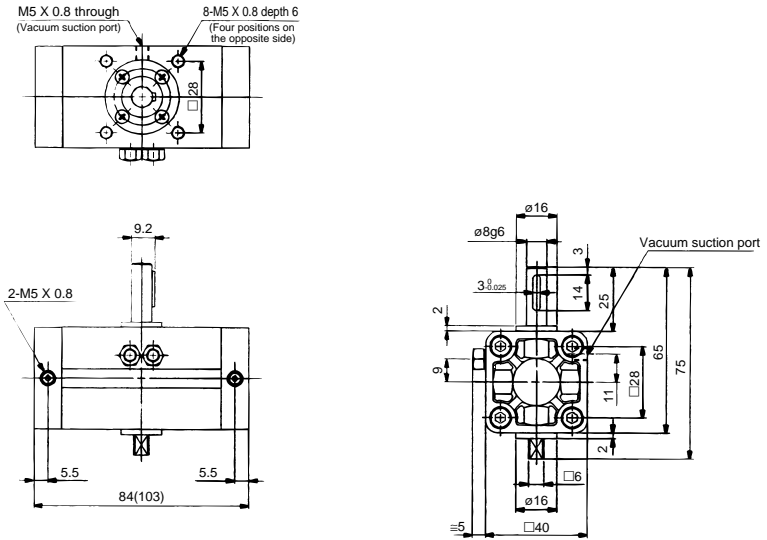
\*\*Up to 2 auto switches can be mounted on 1 actuator.

**Caution**

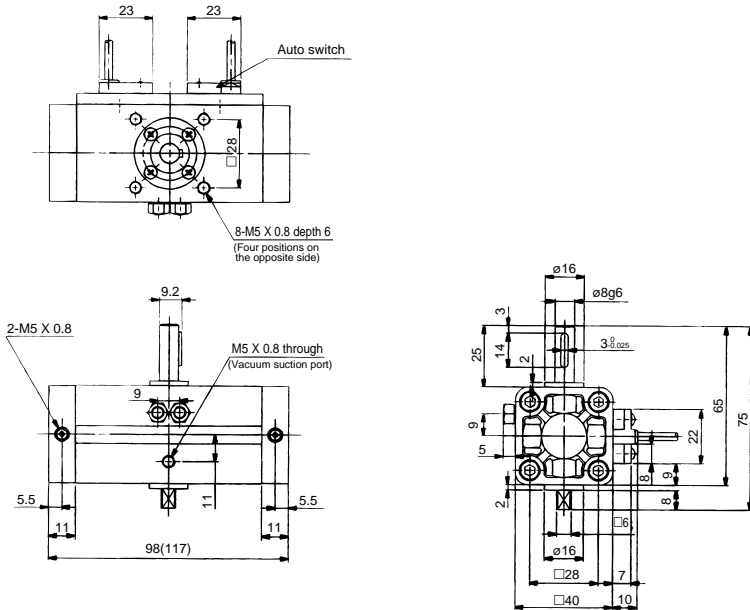
Refer to pages 7 to 16 of Front matter for safety precautions and common precautions for clean series. Refer to pages 188 to 190 for common precautions for rotary actuators.

Rotary Actuator

**Double Shaft (Without Auto Switch) /11-CRA1□W30**

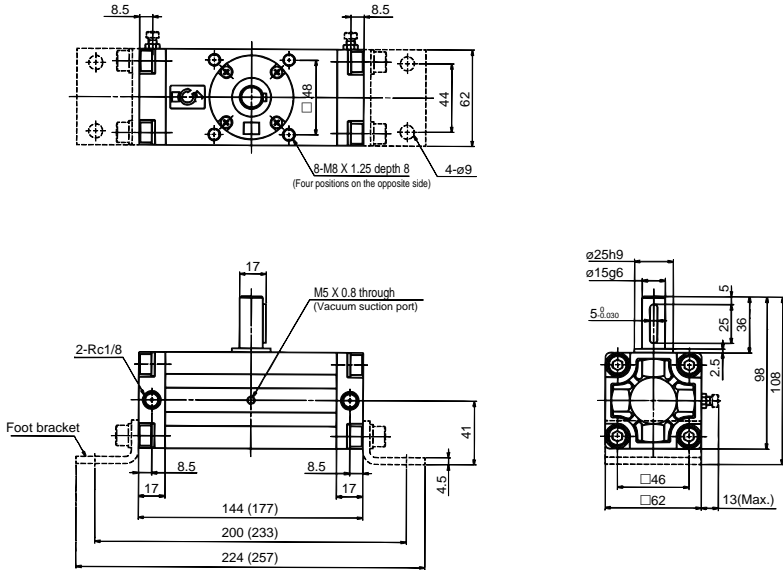


**Double Shaft (With Auto Switch) /11-CDRA1□W30**



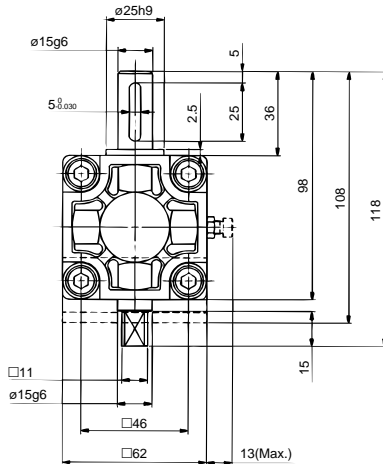


**Single Shaft (Without Auto Switch) /11-CRA1□S50**

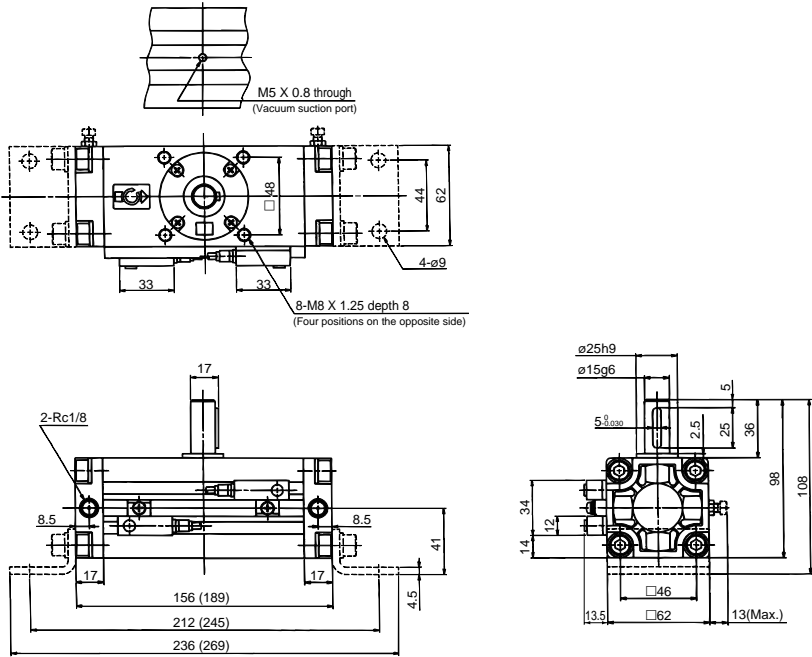


Rotary Actuator

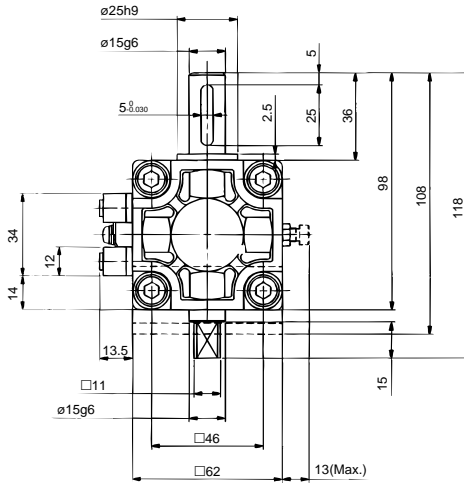
**Double Shaft (Without Auto Switch) /11-CRA1□W50**



**Single Shaft (With Auto Switch) /11-CDRA1□S50**



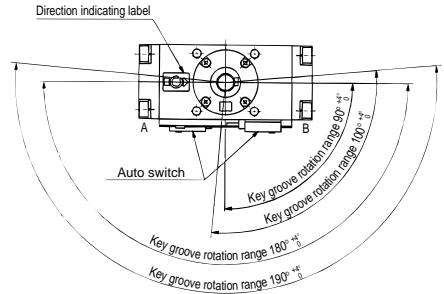
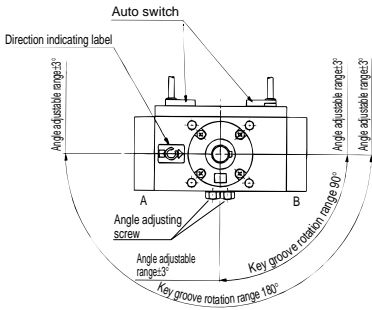
**Double Shaft (With Auto Switch) /11-CDRA1□W50**



**Rotation Range of Key Grooves/Switch Mounting Positions**

11-CDRA1□W30

11-CDRA1□□50



Rotary Actuator

# Series 11-MSQ Rotary Table/Rack Pinion Type

## Size 10,20,30,50

### How to Order

Clean series  
11-Vacuum suction type

A — High precision  
B — Basic


Size  
10  
20  
30  
50

11 - MSQ B 10 A - A90 S

A — With adjustment bolt  
R — With shock absorber

Type of auto switch  
Reed switch  
A90  
Solid state switch  
F9N  
F9B

Number of auto switches  
Nil — 2  
S — 1  
n — n



### Model

Model	Size	Lubrication	Auto switch mounting	With cushion	
				Rubber	Shock absorber
11-MSQ□10□	10	Non-lube	Available	Available (Adjustment bolt)	Available
11-MSQ□20□	20				
11-MSQ□30□	30				
11-MSQ□50□	50				

### Specifications

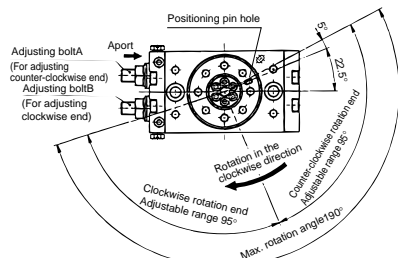
Bore size		10	20	30	50
Fluid		Air (Non-lube)			
Max. operating pressure	With adjustment bolt	1MPa			
	With shock absorber	0.6MPa *			
Min. operating pressure	MSQA10□	0.1MPa			
		0.2MPa			
Ambient and fluid temperature		0 to 60°C (With no condensation)			
Cushion	With adjustment bolt	Rubber bumper			
	With shock absorber	Shock absorber			
Absorber model		RBA0805-X692	RBA1006-X692	RBA1411-X692	
Allowable kinetic energy	With adjustment bolt	0.007J	0.025J	0.048J	0.081J
	With shock absorber	0.039J	0.116J	0.294J	
Angle adjustable range		0 to 190°			
Max. rotation angle		190°			
Stable rotation time regulation range	With adjustment bolt	0.2 to 1.0s/90°			
	With shock absorber	0.2 to 0.7s/90°			
Piston diameter		ø15	ø18	ø21	ø25
Port size		M5 X 0.8		Rc1/8, M5 X 0.8	

\*Maximum operating pressure of actuator is limited to the maximum allowable thrust of absorber.

### Direction and Angle of Rotation

When the cylinder is pressurized from A port, the table rotates clockwise. To obtain the desired rotation angle, the rotation ends can be set within the range shown in the diagram by regulating the adjustment bolt.

Models with shock absorber can also have an adjustable rotation range.



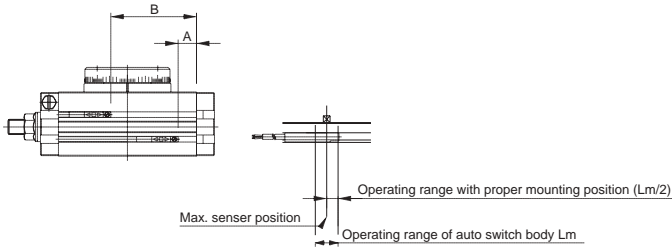
- Note) • The diagram indicates the rotation range of the positioning pin hole.  
• The pin hole position in the diagram indicates the end of a counterclockwise rotation when adjustment bolts A and B are screwed in equally to adjust the rotation angle to 180°.

**Auto Switch Specifications**

(Refer to CAT.ES20-92 for detailed specifications and auto switches not in the following table.)

Style	Auto switch part No.	Load voltage	Load current range	Indicator light	Application
Reed switch	D-A90	24V <sup>AC</sup> / <sub>DC</sub> or less, 48V <sup>AC</sup> / <sub>DC</sub> or less, 100V <sup>AC</sup> / <sub>DC</sub> or less,	50mA,40mA,20mA	No	IC circuit, Relay, PLC
Solid state switch	2-wire system	24VDC (10 to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system	28VDC or less	40mA or less	Yes	24VDC relay, PLC

**Auto Switch Operating Range/Hysteresis/Most Sensitive Position**



Operating angle  $\theta_m$ : Converts the operating range (Lm) of the auto switch into the rotation angle.  
 Actuation angle : Calculated by converting operating range (L m) of auto switch into rotation angle of the rod.

(mm)

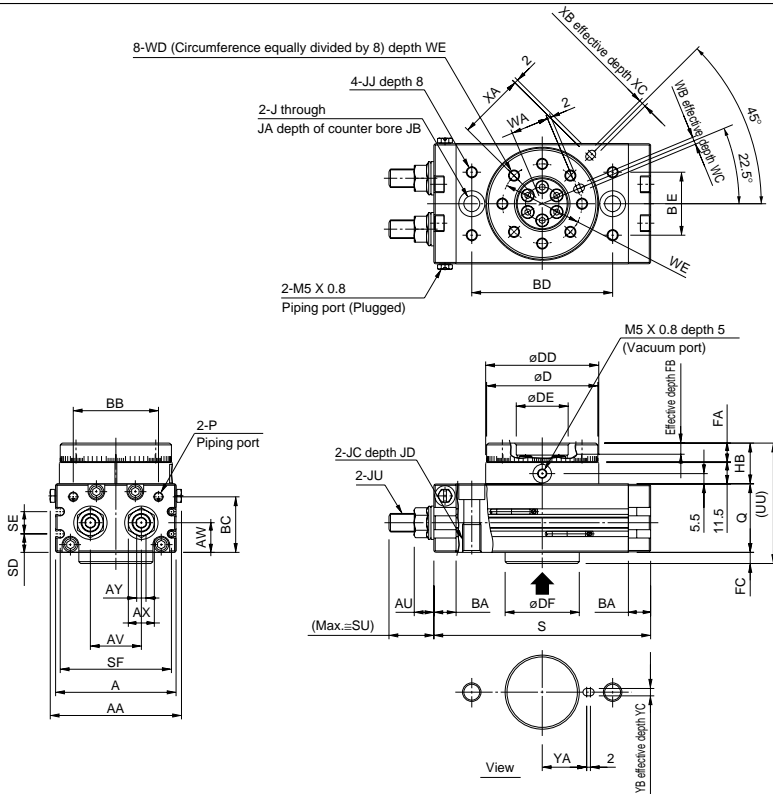
Size	Rotation angle	Reed switch				Solid state switch			
		A	B	Operating angle $\theta_m$	Actuation angle	A	B	Operating angle $\theta_m$	Actuation angle
10	190°	17	36	90°	10°	21	40	90°	10°
20	190°	23	50	80°	10°	27	54	80°	10°
30	190°	27	56	65°	10°	31	60	65°	10°
50	190°	33	68	50°	10°	37	72	50°	10°

**⚠ Caution**

Refer to pages 7 to 16 of Front matter for safety precautions and common precautions with clean series. Refer to pages 188 to 190 for common precautions with rotary actuators.

Rotary Actuator

Basic/11-MSQB□A



**With shock absorber**  
 11-MSQA□□R  
 11-MSQB□□R

(mm)

Size	FU
10	31.5
20	34.7
30	34.7
50	51.7

**High precision**  
 11-MSQA□□A  
 11-MSQA□□R

(mm)

Size	DG	DH	DI	DJ	FD	FE	HA	UV
10	45h8	46h8	20H8	35h8	15.5	9.5	24	63
20	60h8	61h8	28H8	40h8	19.5	13.5	30	73
30	65h8	67h8	32H8	48h8	19.5	13.5	30	76
50	75h8	77h8	36H8	54h8	21.5	15.5	34	87

(mm)

Size	AA	A	AU	AV	AW	AX	AY	BA	BB	BC	BD	BE	D	DD	DE	DF	FA	FB	FC	HB	J	JA	JB	JC	JD
10	55.4	50	8.6	20	15.5	12	4	9.5	34.5	27.8	60	27	45h9	46h9	20H9	35h9	8	4	5	20	6.8	11	6.5	M8 X 1.25	12
20	70.8	65	10.6	27.5	16	14	5	12	46	30	76	34	60h9	61h9	28H9	40h9	10	6	6	22	8.6	14	8.5	M10 X 1.5	15
30	75.4	70	10.6	29	18.5	14	5	12	50	32	84	37	65h9	67h9	32H9	48h9	10	4.5	6	22	8.6	14	8.5	M10 X 1.5	15
50	85.4	80	14	38	22	19	6	15.5	63	37.5	100	50	75h9	77h9	35H9	54h9	12	5	7	24	10.5	18	10.5	M12 X 1.75	18

Size	JJ	JU	P	Q	S	SD	SE	SF	SU	UU	WA	WB	WC	WD	WE	WF	XA	XB	XC	YA	YB	YC
10	M5 X 0.8	M8 X 1	M5 X 0.8	34	92	9	13	45	17.7	59	15	3H9	3.5	M5 X 0.8	8	32	27	3H9	3.5	19	3H9	3.5
20	M6 X 1	M10 X 1	M5 X 0.8	37	117	10	12	60	25	65	20.5	4H9	4.5	M6 X 1	10	43	36	4H9	4.5	24	4H9	4.5
30	M6 X 1	M10 X 1	Rc1/8	40	127	11.5	14	65	25	68	23	4H9	4.5	M6 X 1	10	48	39	4H9	4.5	28	4H9	4.5
50	M8 X 1.25	M14 X 1.5	Rc1/8	46	152	14.5	15	75	31.4	77	26.5	5H9	5.5	M8 X 1.25	12	55	45	5H9	5.5	33	5H9	5.5

# Clean series Air Gripper

**11-  
MHZ2** Parallel Type  
Series MHZ2  
P.216

**11-  
MHR2** Rotary Actuated  
Series MHR2  
P.220

**11-  
MHR3** Rotary Actuated  
Series MHR3  
P.226

**11-  
MHL2** Wide Opening Parallel Type  
Series MHL2  
P.230



# Air Gripper/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions with clean series. Refer to the main text for precautions for each series.

## Design

### Warning

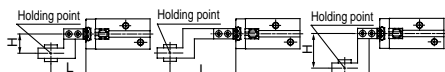
- In case the moving work piece can pose a danger to personnel, or there is a danger of fingers being caught in a gripper, etc., implement safety measures such as installation of protective covers.
- If the circuit pressure drops due to a power failure or trouble with air supply, etc., there is a danger of work piece dropping because of reduced holding force. Implement drop prevention measures to avoid human injury and equipment damage.

## Selection

### Warning

- Keep the holding point within the specified range of the holding distance.

When the holding point distance becomes large, the finger attachment applies an excessively large load to the cross roller section. Refer to the graph of the specified range of the holding distance for each series.

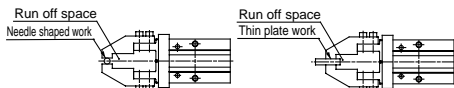


○ "L" and "H" are appropriate distance.    ✕ "L" is too long.    ✕ "H" is too long.

- Attachment should be designed as light and short as possible.
  - A long and heavy attachment will increase the inertia force to open or close the fingers. It may cause rattling of the fingers and have an adverse effect on the life.
  - Even if the holding point stays within the appropriate range, make the attachment as light and short as possible.
  - Select a gripper of a larger size or use more than one gripper to handle a long and large work piece.

- Provide a runoff space on the attachment when the work piece is extremely small or thin.

With no runoff space, the holding will be unstable, sometimes resulting in dislocation or slipping.



- Select a model which has a sufficient holding force for the work piece weight.

Incorrect selection may lead to dropping of the work piece, etc. Refer to the model selection criteria for each series pertaining to effective holding force and work piece weight.

- Do not use in applications where excessive external force or impact force may be applied to the gripper. It may cause malfunction. Consult SMC with regard to any other applications.

- Select a model with a sufficient finger opening width for the work piece.

<Without sufficient opening width>

- The dispersion of air chuck opening width and work piece diameters may make holding unstable.
- It can cause errors in detection when an auto switch is used. Confirm the auto switch hysteresis for each series to accommodate an extra stroke length for the hysteresis.

## Mounting

### Warning

- Do not scratch or gouge the escapement by dropping or bumping it when mounting. Even a slight deformation can cause inaccuracy or malfunction.
- Tighten the screw within the specified torque range when mounting the attachment. Tightening with a torque exceeding the limit can cause malfunction while insufficient tightening torque can allow positioning errors or dropping of the work piece.

### Caution

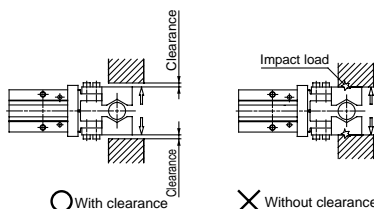
- Be careful not to twist the finger when mounting it on the attachment.

Otherwise rattling or decrease in precision may result.

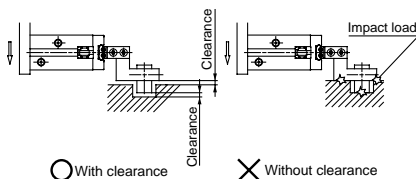
- Avoid external force to fingers.

Fingers may be rattled or damaged by continual lateral or impact loads. Provide clearance to prevent the work piece or the attachment from striking against any object at the stroke end.

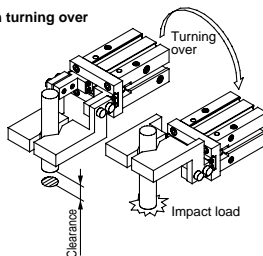
- Stroke end when fingers are open



- Stroke end when gripper is moving



- When turning over







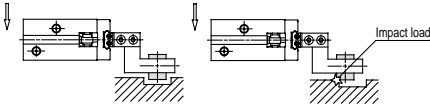
# Air Gripper/Common Precautions 2

Be sure to read before handling. Refer to pages 7 to 16 for safety instructions and common precautions with clean series. Refer to the main text for precautions for each series.

## Mounting

- ③ When the gripper is used for work piece insertion, align the centers carefully so that no excessive force will be applied to the finger.

In a test run, confirm safety by conducting manual operation or operating the cylinder at a lower pressure to ensure there is no danger of impact force.



○ Hoding point is adjusted      × Hoding point is not adjusted

- ④ Control the opening/closing speed with the speed controller to avoid excessive high-speed operation.

Continuous opening and closing of the fingers at an excessive speed will increase the impact force acting on the fingers, which may cause degradation of repeatability in work piece holding or have an adverse effect on the product's life time.

### How to control opening/closing speed of the finger Example using SMC speed controllers

Double acting	Connect 2 speed controllers and adjust the speed by meter-out control.
---------------	--

Applicable speed controller

Air gripper mounted type — AS1200-M3/M5

AS2200-01, etc.

Piping type — Series AS1000

AS1001F, AS2051F, etc.

## Maintenance

### Warning

- ① Keep off the air chuck transfer route from personnel or objects.  
It may cause injury or accident.
- ② Do not put hand between air chuck fingers and attachments.  
It will cause injury or accident.
- ③ Before removing the air chuck, confirm that it is not holding a work piece and exhaust compressed air.  
If there is a remaining work piece, it may drop to cause danger.

### Caution

Refer to pages 5 to 7 for common precautions on auto switches.

# Series 11-MHZ2 Parallel Type Air Gripper

ø10,ø16,ø20,ø25

## How to Order

11 — MHZ2 — 16 D — F9N

**Clean series**  
11-Vacuum suction type

**Cylinder bore**

10	10mm
16	16mm
20	20mm
25	25mm

**Action**

D	Double acting
---	---------------

**Finger position/Option**

Standard type	Nil: Basic	1: Side tap mounting	2: Through holes in open/ close direction	3: Flat finger
	N: Basic	N1: Side tap mounting	N2: Through holes in open/ close direction	
Narrow type				


**Number of auto switches**

Nil	2
S	1

**Auto switch type**

Nil	Without auto switch (Built-in magnet)
-----	---------------------------------------

\* Select an applicable auto switch model from the table below.



### Applicable Auto Switch Models (Refer to page 296 of Best Pneumatics ③ for detailed specifications and auto switches not in the following table.)

Style	Auto switch part no.	Load voltage	Load current range	Indicator light	Application
Solid state switch	2-wire system D-F9B	24VDC (10V to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system D-F9N	28VDC or less	40mA or less	Yes	
	2-wire system D-F8B	24VDC (10V to 28VDC)	2.5 to 40mA or less	Yes	
	3-wire system D-F8N	28VDC or less	40mA or less	Yes	

\*Lead wire symbol 0.5m..... Nil (Example) F9N  
3m..... L F9NL

(Note)When using D-F8□, keep at least 10 mm of distance from magnetic objects such as iron.

### Specifications

Fluid	Air
Operating pressure	ø10:0.2 to 0.7MPa ø16 to ø25:0.1 to 0.7MPa
Ambient and fluid temperature	-10 to 60 C
Repeat ability	±0.01
Max. operating frequency	180 c.p.m.
Lubrication	Non required
Action	Double acting
Particle generation grade	Grade 2
Auto switch (Option)	Solid state switch (3-wire system, 2-wire system)

### Protrusion of Auto Switch from Body End

- The protrusions of auto switches from the body end are shown in the table below.
- Use this as a standard when mounting, etc.
- D-F8□ does not have any protrusion from body.

Model	Lead wire type Explanatory drawing Auto switch Finger position	In-line entry
		D-F9□/D-F8□
11-MHZ2-10□	Open	8
	Close	10
11-MHZ2-16□	Open	4
	Close	7
11-MHZ2-20□	Open	—
	Close	5
11-MHZ2-25□	Open	—
	Close	2

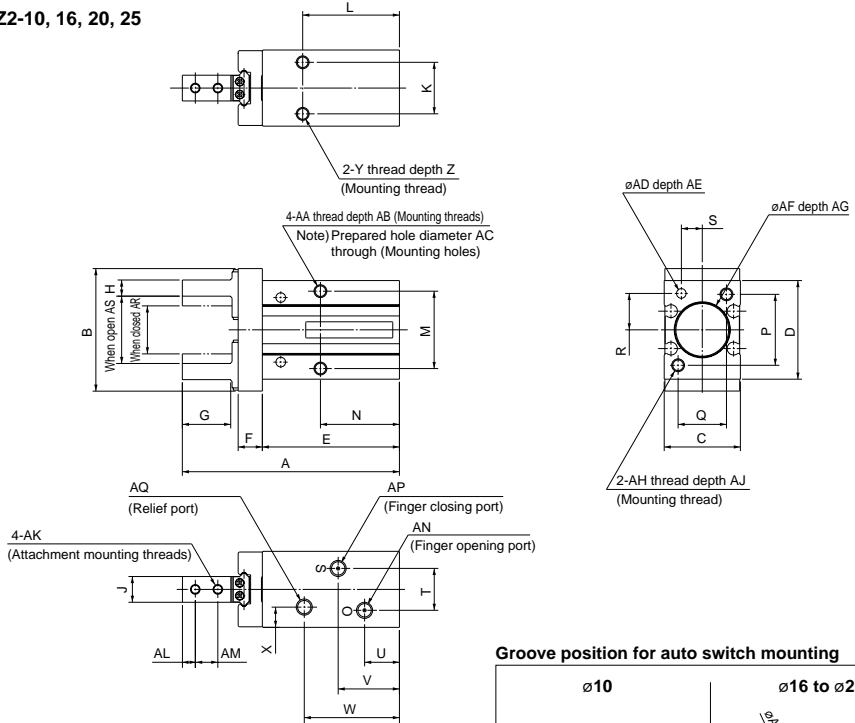
Air Gripper

### Caution

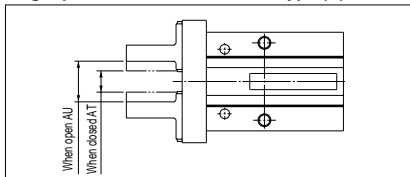
Refer to pages 7 to 16 of Front matter for common precautions for clean series. Refer to pages 214 to 215 for common precautions for air grippers.

**Dimensions**

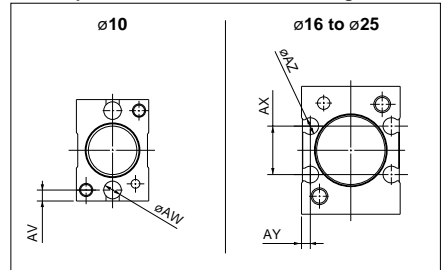
11-MHZ2-10, 16, 20, 25



**Finger position/In case of narrow type (N)**



**Groove position for auto switch mounting**



Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
11-MHZ2-10D□	57	29	16.4±0.05	23	37.8	6	12	4 <sup>0</sup> <sub>-0.1</sub>	5 <sup>0</sup> <sub>-0.05</sub>	11.4	27	16	23	18	12	7.6±0.02	5.2±0.02	10
11-MHZ2-16D□	67.3	38	23.6±0.05	30.6	42.5	7.5	15	5 <sup>0</sup> <sub>-0.1</sub>	8 <sup>0</sup> <sub>-0.05</sub>	16	30	24	24.5	22	15	11±0.02	6.5±0.02	13
11-MHZ2-20D□	84.8	50	27.6±0.05	42	52.8	9.5	20	8 <sup>0</sup> <sub>-0.1</sub>	10 <sup>0</sup> <sub>-0.05</sub>	18.6	35	30	29	32	18	16.8±0.02	7.5±0.02	15
11-MHZ2-25D□	102.7	63	33.6±0.05	52	63.6	11	25	10 <sup>0</sup> <sub>-0.1</sub>	12 <sup>0</sup> <sub>-0.05</sub>	22	36.5	36	30	40	22	21.8±0.02	10±0.02	20

Model	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AJ	AK
11-MHZ2-10D□	12	19.5	28.2	5.5	M3 X 0.5	6	M3 X 0.5	5.5	2.6	2H9 <sup>+0.025</sup> <sub>0</sub>	3	12.4H9 <sup>+0.043</sup> <sub>0</sub>	1.5	M3 X 0.5	6	M2.5 X 0.45
11-MHZ2-16D□	10.8	19	29.5	6.5	M4 X 0.7	4.5	M4 X 0.7	8	3.4	3H9 <sup>+0.025</sup> <sub>0</sub>	3	17.4H9 <sup>+0.043</sup> <sub>0</sub>	1.5	M4 X 0.7	8	M3 X 0.5
11-MHZ2-20D□	12	23	39.8	8.3	M5 X 0.8	8	M5 X 0.8	10	4.3	4H9 <sup>+0.030</sup> <sub>0</sub>	4	22.4H9 <sup>+0.052</sup> <sub>0</sub>	2	M5 X 0.8	10	M4 X 0.7
11-MHZ2-25D□	13	37	49.7	10.8	M6 X 1	10	M6 X 1	12	5.1	4H9 <sup>+0.030</sup> <sub>0</sub>	4	27.4H9 <sup>+0.052</sup> <sub>0</sub>	3	M6 X 1	12	M5 X 0.8

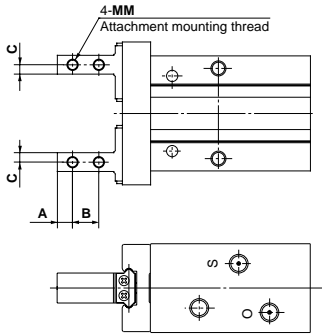
Model	AL	AM	AN	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ
11-MHZ2-10D□	3	5.7	M3 X 0.5	M3 X 0.5	M3 X 0.5	11.2 <sup>+0.5</sup> <sub>-0.2</sub>	15.2 <sup>+2.2</sup> <sub>0</sub>	5.7 <sup>+0.5</sup> <sub>+0.1</sub>	9.7 <sup>+2.2</sup> <sub>0</sub>	2.5	4	—	—	—
11-MHZ2-16D□	4	7	M5 X 0.8	M5 X 0.8	M5 X 0.8	14.9 <sup>+0.5</sup> <sub>-0.2</sub>	20.9 <sup>+2.2</sup> <sub>-0.2</sub>	6.6 <sup>+0.5</sup> <sub>+0.1</sub>	12.6 <sup>+2.2</sup> <sub>0</sub>	—	—	11.6	2.1	4
11-MHZ2-20D□	5	9	M5 X 0.8	M5 X 0.8	M5 X 0.8	16.3 <sup>+0.5</sup> <sub>-0.2</sub>	26.3 <sup>+2.2</sup> <sub>-0.2</sub>	7.2 <sup>+0.5</sup> <sub>+0.1</sub>	17.2 <sup>+2.2</sup> <sub>0</sub>	—	—	14	2.1	4
11-MHZ2-25D□	6	12	M5 X 0.8	M5 X 0.8	M5 X 0.8	19.3 <sup>+0.5</sup> <sub>-0.3</sub>	33.3 <sup>+2.5</sup> <sub>-0.2</sub>	8.8 <sup>+0.5</sup> <sub>+0.1</sub>	22.8 <sup>+2.5</sup> <sub>0</sub>	—	—	19	3.5	4

Note) Only in case of ø10, mounting with body through holes is unavailable when an auto switch is used.

# Standard/Series 11-MHZ2

## Finger Position/Options

### Side Tap Mounting [1/N1]

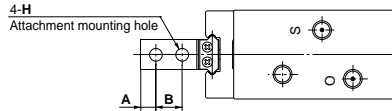
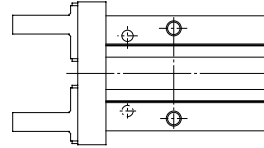


Unit: mm

Model	A	B	C	MM
11-MHZ2-10D <sup>1</sup> <sub>N1</sub>	3	5.7	2	M2.5 X 0.45
11-MHZ2-16D <sup>1</sup> <sub>N1</sub>	4	7	2.5	M3 X 0.5
11-MHZ2-20D <sup>1</sup> <sub>N1</sub>	5	9	4	M4 X 0.7
11-MHZ2-25D <sup>1</sup> <sub>N1</sub>	6	12	5	M5 X 0.8

\* The specifications and dimensions not in the above table are identical with those of the basic type (Including the narrow type).

### Through Holes in Open/Close Direction [2/N2]

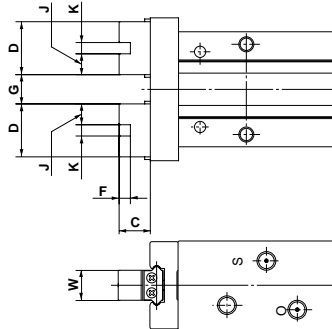
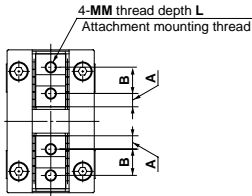


Unit: mm

Model	A	B	H
11-MHZ2-10D <sup>2</sup> <sub>N2</sub>	3	5.7	2.9
11-MHZ2-16D <sup>2</sup> <sub>N2</sub>	4	7	3.4
11-MHZ2-20D <sup>2</sup> <sub>N2</sub>	5	9	4.5
11-MHZ2-25D <sup>2</sup> <sub>N2</sub>	6	12	5.5

\* The specifications and dimensions not in the above table are identical with those of the basic type (Including the narrow type).

### Flat Finger [3]



Unit: mm

Model	A	B	C	D	F	G		J	K	MM	L	W	Weight g
						Open	Closed						
11-MHZ2-10D3 <sup>+2), +3)</sup>	2.45	6	5.2	10.9	2	5.4 <sup>+2.2</sup> <sub>0</sub>	1.4 <sup>+0.5</sup> <sub>0</sub>	4.45	2H9 <sup>+0.025</sup> <sub>0</sub>	M2.5 X 0.45	5	5 <sup>0</sup> <sub>0.05</sub>	60
11-MHZ2-16D3 <sup>+2), +3)</sup>	3.05	8	8.3	14.1	2.5	7.4 <sup>+2.2</sup> <sub>0</sub>	1.4 <sup>+0.5</sup> <sub>0</sub>	5.8	2.5H9 <sup>+0.025</sup> <sub>0</sub>	M3 X 0.5	6	8 <sup>0</sup> <sub>0.05</sub>	125
11-MHZ2-20D3 <sup>+2), +3)</sup>	3.95	10	10.5	17.9	3	11.6 <sup>+2.3</sup> <sub>0</sub>	1.6 <sup>+0.5</sup> <sub>0</sub>	7.45	3H9 <sup>+0.025</sup> <sub>0</sub>	M4 X 0.7	8	10 <sup>0</sup> <sub>0.05</sub>	250
11-MHZ2-25D3 <sup>+2), +3)</sup>	4.9	12	13.1	21.8	4	16 <sup>+2.5</sup> <sub>0</sub>	2 <sup>+0.5</sup> <sub>0</sub>	8.9	4H9 <sup>+0.030</sup> <sub>0</sub>	M5 X 0.8	10	12 <sup>0</sup> <sub>0.05</sub>	450

\*1) The specifications and dimensions not in the above table are identical with those of the basic type (Including the narrow type).

\*2) The overall length is identical with that of a MHQ (G) flat finger type.

# Series 11-MHR2 Rotary Actuated Air Gripper 2 Finger/ø10,ø15,ø20,ø30

## How to Order

**Clean series**  
11 — Vacuum suction type

**Built-in magnet**  
Nil — No  
D — With magnet (For auto switch)

**Number of fingers**  
2 — 2 fingers


**Nominal size**  
10  
15  
20  
30

**Port location**  
R: Body side  
E: Axial side

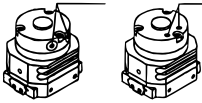
**Type of auto switch**  
Solid state switch  
F9B  
F9N  
F8B  
F8N

**Lead wire length**  
Nil — 0.5m (Standard)  
L — 3m

**Number of auto switches**  
Nil — 2  
S — 1



11 - M **D** HR 2 - 10 R - F9B L S



## Model

Vacuum suction type	Model	Nominal size	Port size	Lubrication	Action	*Effective holding force (N) at 0.5 (MPa)		Opening stroke (Double side)		
						External holding force	Internal holding force	Finger close width (mm)	Finger open width (mm)	Stroke (mm)
Vacuum suction type	11-MHR2-10	10	M3 X 0.5	Not required	Double acting	12	12	10	16	6
	11-MHR2-15	15				24	25	14	22	8
	11-MHR2-20	20	M5 X 0.8			33	34	16	28	12
	11-MHR2-30	30				58	59	19	37	18

\* Refer to data on page 2.3-5 of Best Pneumatics ③ for the holding force at each holding point. The effective holding force is that in the middle of the opening and closing stroke.

## Specifications

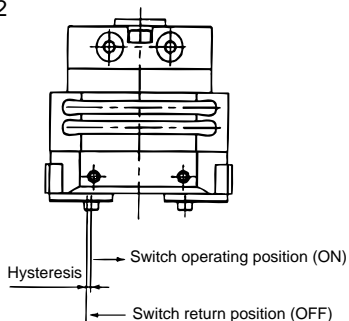
Item	Nominal size	10	15,20,30
Operating pressure		0.2 to 0.6MPa	0.15 to 0.6MPa
Ambient and fluid temperature			0 to 60°C
Repeat ability			±0.01mm
Max. operating frequency			180 c.p.m.

**Auto Switch Specifications** (Refer to page 2.3-3 of Best Pneumatics ③ for detailed specifications and auto switches not in the following table.)

State	Auto switch part No.	Load voltage	Load current range	Indicator light	Application
Solid state switch	2-wire system D-F9B	24VDC (10V to 28VDC)	5 to 40mA	Yes	24VDC relay, PLC
	3-wire system D-F9N	28VDC or less	40mA or less	Yes	
	2-wire system D-F8B	24VDC (10V to 28VDC)	2.5 to 40mA or less	Yes	
	3-wire system D-F8N	28VDC or less	40mA or less	Yes	

**Auto Switch Hysteresis**

11-MDHR2



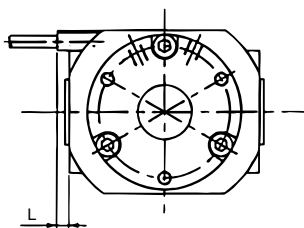
The hysteresis of an auto switch is shown in the table below. Use it as a guideline when adjusting the switch position.

Model	Hysteresis (Max. value) mm
11-MDHR2-10	0.6
11-MDHR2-15	
11-MDHR2-20	
11-MDHR2-30	0.9

**Protrusion of Auto Switch from Body End**

- The maximum amounts of protrusions (With fingers full open) of auto switches are shown in the table below. Use them as guide lines for mounting.
- D-F8□ does not have any protrusion from body.

11-MDHR2-10,15



When auto switch D-F9N,D-F9B is used.

**Max. auto switch protrusion: L**

Unit: mm

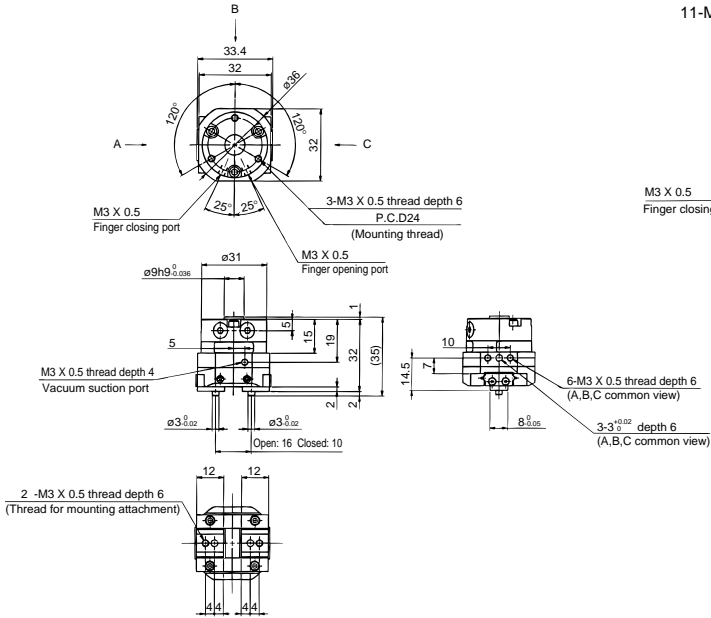
Auto switch part No.		D-F9N	D-F9B
Air gripper model No.			
11-MDHR2-10	L	2.6	7.1
11-MDHR2-15	L	—	2.6
11-MDHR2-20		No auto switch protrusion	
11-MDHR2-30			

**Caution**

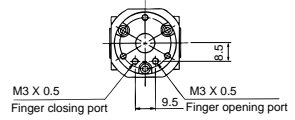
Refer to pages 7 to 16 of Front matter for common precautions for clean series. Refer to pages 214 to 215 for common precautions for air grippers.

# Rotary Actuated Air Gripper 11-MHR2

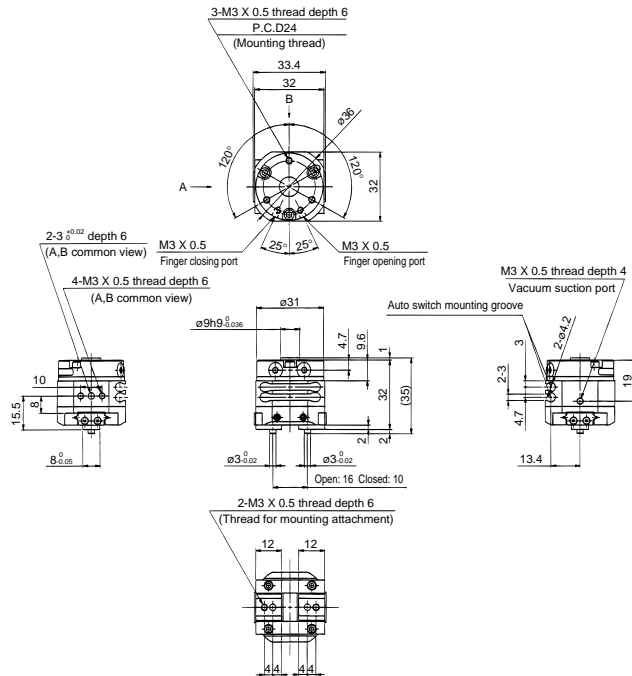
## Without Auto Switch/11-MHR2 -10R



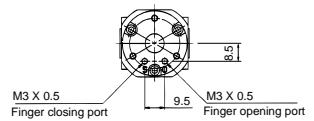
11-MHR2-10E Port position



## With Auto Switch/11-MDHR2-10R



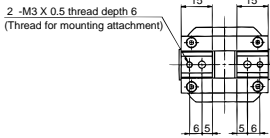
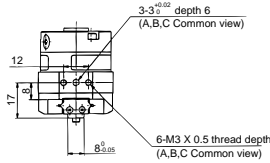
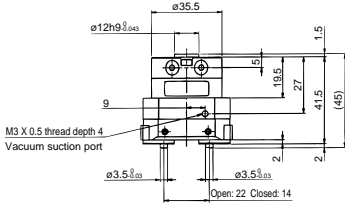
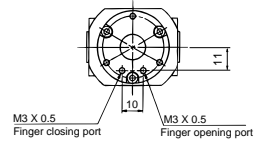
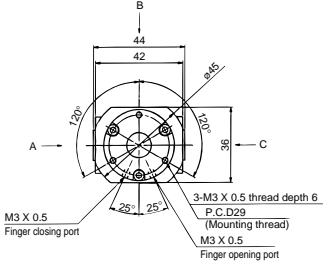
11-MDHR2-10E Port position





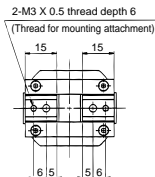
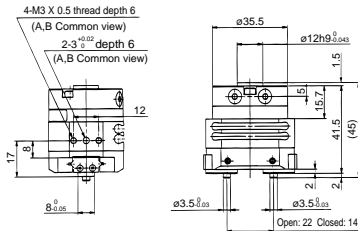
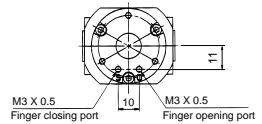
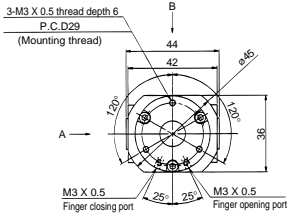
**Without Auto Switch/11-MHR2 -15R**

11-MHR2-15E Port position



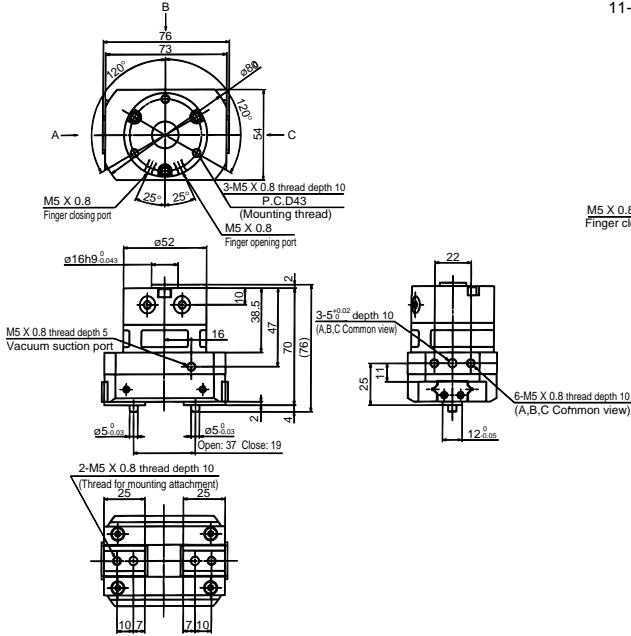
**With Auto Switch/11-MDHR2-15R**

11-MDHR2-15E Port position

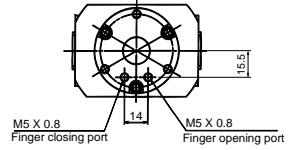




**Without Auto Switch/11-MHR2-30R**

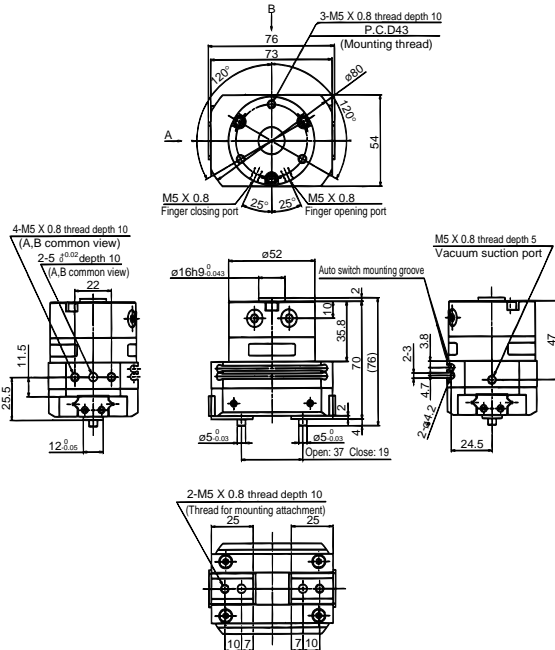


11-MHR2-30E Port position



**With Auto Switch/11-MDHR2-30R**

11-MDHR2-30E Port position




Air Gripper

# Series 11-MHR3 Rotary Actuated Air Gripper

3 Finger/ø10,ø15

## How to Order



**Clean series**  
11 — Vacuum suction type

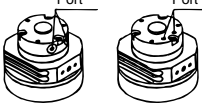
**Built-in magnet**  
Nil — No  
D — With magnet (For auto switch)

**Number of fingers**  
3 — 3 fingers

**Nominal size**  
10  
15

**11 - M** **D** **H** **R** **3 -** **10** **R -** **F9B** **L** **S**

**Port location**  
R: Body side  
E: Axial side



\* Only the R type is available with types without auto switch.

**Auto switch**  
Solid state switch  
F9B  
F9N  
F8B  
F8N

**Lead wire length**  
Nil — 0.5m (standard)  
L — 3m

**Number of auto switches**  
Nil — 2  
S — 1

## Model

Vacuum suction type	Model	Nominal size	Port size	Lubrication	Action	*Effective holding force (N) at 0.5 (MPa)		Opening stroke (Diameter)		
						External holding force	Internal holding force	Finger close width (mm)	Finger open width (mm)	Stroke (mm)
	11-MHR3-10	10	M3 X 0.5	Not required	Double acting	7	6.5	16	22	6
	11-MHR3-15	15				13	12	19	27	8

\* Refer to data on page 2.3-19 of Best Pneumatics ③ for the holding force at each holding point. The effective holding force is that in the middle of the opening and closing stroke.

## Specifications

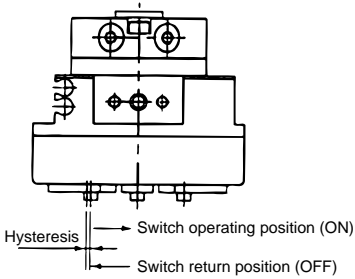
Item	Nominal size	
	10	15
Operating pressure	0.2 to 0.6MPa	
Ambient and fluid temperature	0 to 60°C	
Repeat ability	±0.01mm	
Max. operating frequency	180 c.p.m.	

**Auto Switch Specifications** (Refer to page 2.3-17 of Best Pneumatics ③ for detailed specifications and auto switches not in the following table.)

Style	Auto switch part No.	Load voltage	Load current range	Indicator light	Application
Solid state switch	2-wire system	D-F9B	24VDC (10V to 28VDC)	5 to 30mA	Yes
	3-wire system	D-F9N	28VDC or less	50mA or less	Yes
	2-wire system	D-F8B	24VDC (10VDC to 28V)	2.5 to 40mA	Yes
	3-wire system	D-F8N	28VDC or less	40mA or less	Yes

**Auto Switch Hysteresis**

11-MDHR3



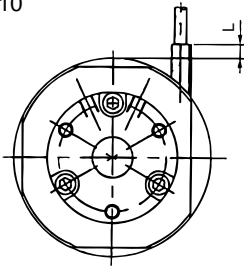
The hysteresis of an auto switch is shown in the table below. Use it as a guideline when adjusting the switch position.

Model	Hysteresis (Max. valve) mm
11-MDHR3-10	0.6
11-MDHR3-15	

**Protrusion of Auto Switch from Body End**

- The maximum amounts of protrusions (With fingers full open) of auto switches are shown in the table below. Use them as guide lines for mounting.
- D-F8□ does not have any protrusion from body.

11-MDHR3-10



When auto switch D-F9N,D-F9B is used.

**Max. auto switch protrusion: L**

Auto switch part No.	D-F9N	D-F9B
L	—	3.1

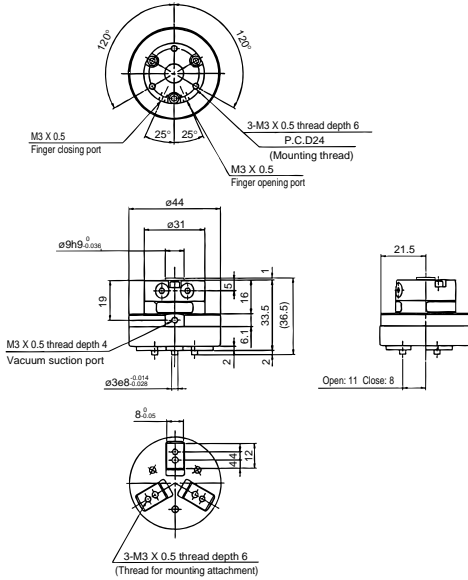
\*No auto switch protrusion on 11-MDHR3-15 and D-F9N D-F9B.

**⚠ Caution**

Refer to pages 7 to 16 of Front matter for common precautions for clean series. Refer to pages 214 to 215 for common precautions for air grippers.

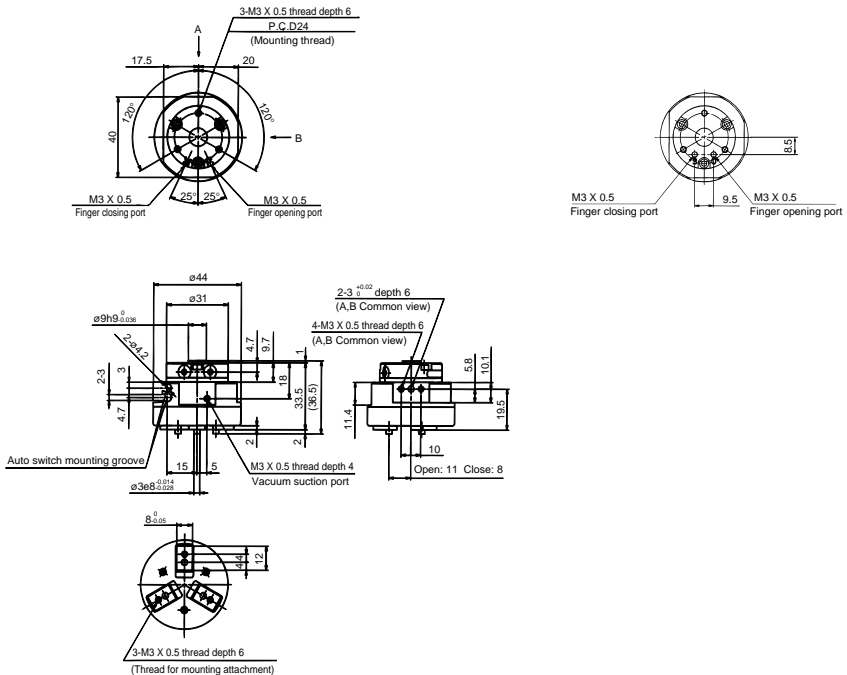
# Rotary Actuated Air Gripper 11-MHR3

## Without Auto Switch/11-MHR3-10R

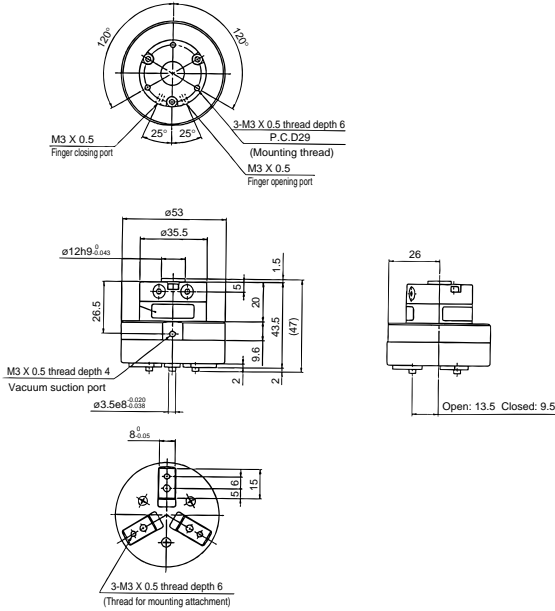


## With Auto Switch/11-MDHR3-10R

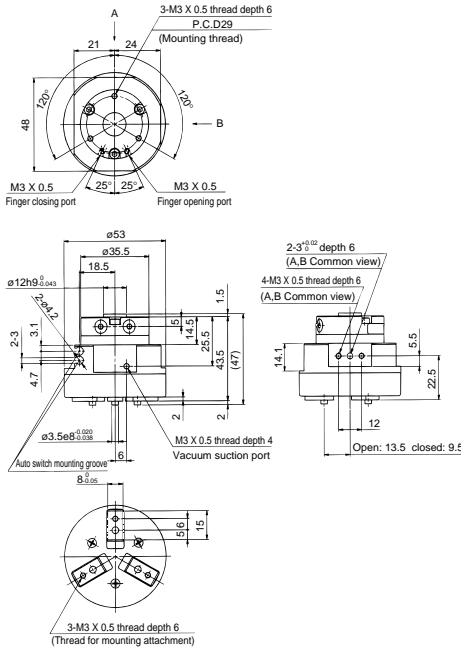
11-MDHR3-10E Port position



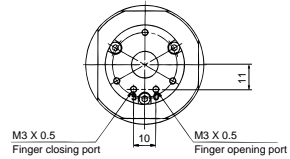
**Without Auto Switch/11-MHR3-15R**



**With Auto Switch/11-MDHR3-15R**



11-MDHR3-15E Port position



# Series 11-MHL2 Wide Opening Parallel Type Air Gripper

## How to Order



Clean series  
11-Vacuum suction type

11—MHL 2—16 D 1—Y59A S

Wide opening

Number of fingers

2 | 2 fingers

Bore size

10	10 mm
16	16 mm
20	20 mm
25	25 mm
32	32 mm

Action

D | Double acting

Number of auto switches

Nil	2
S	1
n	n

Auto switch type

Nil | Without auto switch (Built-in magnet)

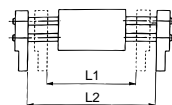
Auto switch specifications

Symbol	Opening/Closing stroke mm					Style	Special function	Electrical entry	Indicating light	Wiring (Output)	Load voltage		Auto switch part no.		Lead wire length (m)		Applicable load	
	ø10	ø16	ø20	ø25	ø32						DC	AC	Perpendicular	In-line	0.5 (Nil)	3 (L)		
Nil	20	30	40	50	70	Solid state (Switch)	—	Grommet	With	3-wire (NPN)	24V	5V, 12V	—	Y69A	Y59A	●	●	IC circuit Relay PLC
1	40	60	80	100	120					2-wire	12V	—	Y69B	Y59B	●	●		
2	60	80	100	120	160													

\*Ead wire length symbol, mark: 0.5m..... Nil (Example) Y59B  
3 m..... L (Example) Y59BL

## Model/Stroke Table

Model	Bore size (mm)	Max. operating frequency (c.p.m)	Opening/Closing stroke (mm) (L2-L1)	Width at closing (mm) (L1)	Width at opening (mm) (L2)	Weight (g)
11-MHL2-10D	10	60	20	72	92	340
11-MHL2-10D1			40	94	134	405
11-MHL2-10D2		60	112	172	485	
11-MHL2-16D	16	60	30	84	114	660
11-MHL2-16D1			60	126	186	870
11-MHL2-16D2		40	80	146	226	1010
11-MHL2-20D	20	60	40	98	138	1175
11-MHL2-20D1			80	158	238	1645
11-MHL2-20D2		40	100	178	278	1840
11-MHL2-25D	25	60	50	116	166	1850
11-MHL2-25D1			100	198	298	2720
11-MHL2-25D2		40	120	216	336	2935
11-MHL2-32D	32	30	70	150	220	3070
11-MHL2-32D1			120	198	318	3985
11-MHL2-32D2		20	160	242	402	4820



Note) The open and close time spans represent the valve when the exterior of the workpiece is being held.



**Specifications**

<b>Bore size (mm)</b>	10	16	20	25	32
<b>Fluid</b>	Air				
<b>Action</b>	Double acting				
<b>Operating pressure MPa</b>	0.15 to 0.6		0.1 to 0.6		
<b>Ambient and fluid temperature</b>	-10 to 60°C				
<b>Repeatability</b>	±0.1				
<b>Lubrication</b>	Not required				
<b>(Note) Effective holding force (N) at 0.5 MPa</b>	14	45	74	131	228

Note) The holding position is 40 mm with a cylinder inside diameter of 10, 16, 20 or 25 and 80 mm with a cylinder inside diameter of 32.

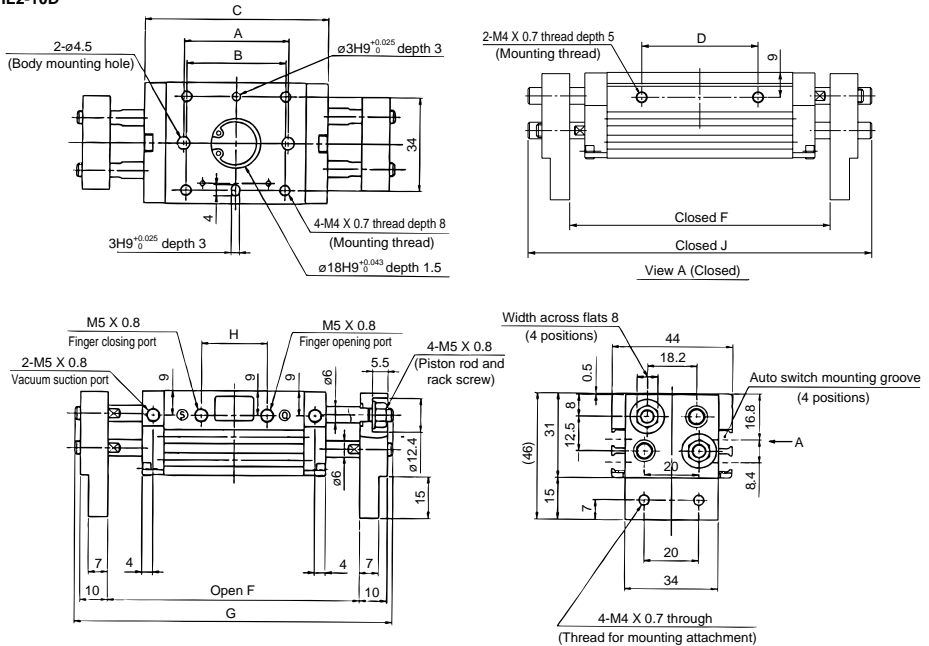
\*Refer to data on page 2.2-3 of Best Pneumatics ③ for the holding force at each holding point.

**Auto Switch Specifications** (Refer to Page 2.2-1 of Best Pneumatics ③ for detailed specifications and auto switches not in the following table.)

State	Auto switch part No.	Load voltage	Load current range	Indicator light	Application	
Solid state switch	2-wire system	D-Y59B	24VDC (10 to 28VDC)	5 to 40mA	○	24VDC relay, PLC
	3-wire system	D-Y59A	28VDC or less	40mA or less	○	24VDC relay, PLC

**⚠ Caution**

Refer to pages 7 to 16 of Front matter for common precautions for clean series. Refer to pages 214 to 215 for common precautions for air grippers.

**Dimensions****11-MHL2-10D**

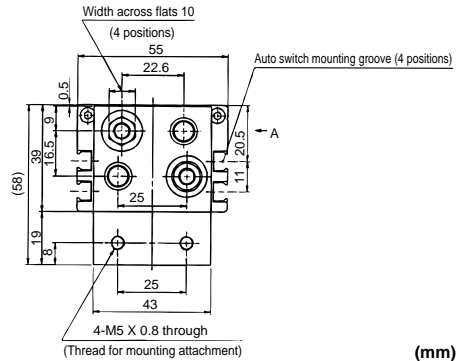
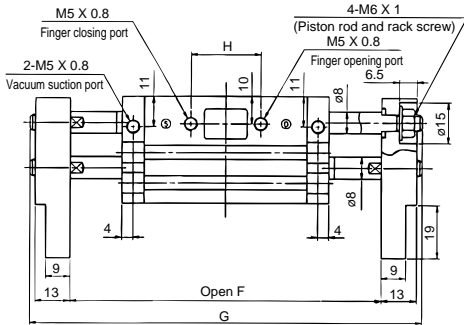
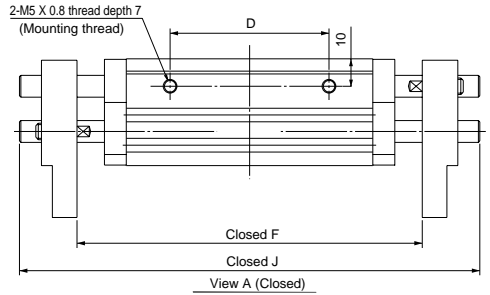
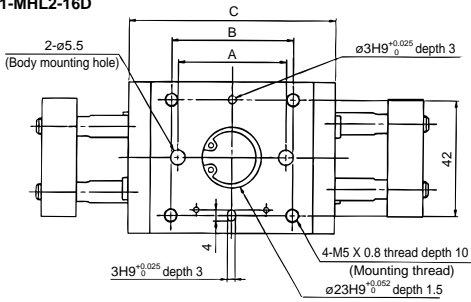
(mm)

	A	B	C	D	E	F	G	H	J
<b>11-MHL2-10D</b>	38	36	67	26	72	92	116	24	96
<b>11-MHL2-10D1</b>	54	52	83	42	94	134	158	39	124
<b>11-MHL2-10D2</b>	72	70	101	60	112	172	196	57	162

# Wide Opening Parallel Type Air Gripper **11-MHL2**

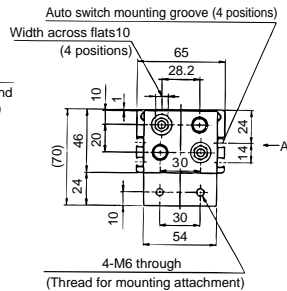
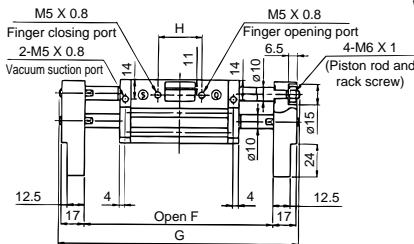
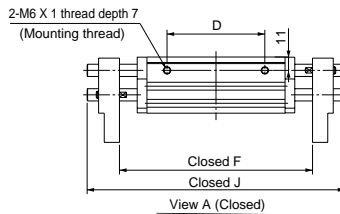
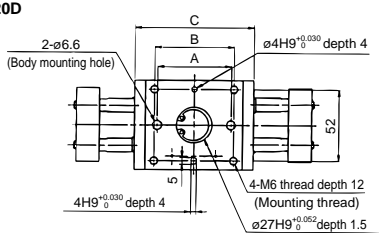
## Dimensions

### 11-MHL2-16D



	A	B	C	D	E	F	G	H	J
<b>11-MHL2-16D</b>	40	45	76	28	84	114	144	26	114
<b>11-MHL2-16D1</b>	70	75	106	58	126	186	216	50	168
<b>11-MHL2-16D2</b>	90	95	126	78	146	226	256	70	208

### 11-MHL2-20D



	A	B	C	D	E	F	G	H	J
<b>11-MHL2-20D</b>	54	58	87	38	98	138	176	32	136
<b>11-MHL2-20D1</b>	96	100	129	80	158	238	276	68	211
<b>11-MHL2-20D2</b>	116	120	149	100	178	278	316	88	251





# Clean series Directional Control Valve

**10-  
SZ**

5 Port  
SZ3000  
P.240

**10-  
SQ**

5 Port  
SQ1000/2000  
P.254

**10-  
SY**

5 Port  
SY3000/5000/7000  
P.270

**10-  
SYJ**

4/5 Port  
SYJ3000/5000  
P.310

**10-  
SY**

3 Port  
SY100  
P.344

**10-  
SYJ**

3 Port  
SYJ300/500  
P.352

**10-  
VQ**

5 Port  
VQ1000/2000  
P.368

**10-  
VQ**

3 Port  
VQ100  
P.418

**10-  
VQD**

4 Port  
VQD1000  
P.428



# 3/4/5 Port Solenoid Valve/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Design

### Warning

#### 1 Actuator driving

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

#### 2 Intermediate stop

When the cylinder piston is stopped at an intermediate position with a 3 position closed center valve or a perfect valve, it is difficult, due to air compressibility, to achieve precise and accurate stop positioning.

Since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold the stopped position for an extended period of time.

Consult SMC if it is necessary to hold the stopped position for an extended period of time.

#### 3 Effect of back pressure when using a manifold

Take precautions when valves are used on a manifold, as actuator may malfunction due to back-pressure.

Special caution is necessary when using a 3 position exhaust center valve, or when driving a single acting cylinder, etc. In cases where there is a danger of this kind of malfunction, take countermeasures by using an individual EXH spacer assembly, or an individual exhaust type manifold, etc.

#### 4 Holding of pressure (including vacuum)

Since valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a pressure vessel.

#### 5 Cannot be used as an emergency shut-off valve.

The valves presented in this catalog are not designed for safety applications such as an emergency shut-off valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

#### 6 Maintenance space

Provide enough space for maintenance and inspection.

#### 7 Release of residual pressure

Provide a residual pressure release function for maintenance purposes. Special consideration should be given to the release of residual pressure between the valve and cylinder in the case of a 3 position closed center type valve.

#### 8 Operation under vacuum pressure

When a valve is used for vacuum switching, etc., take measures against suction of external dust or other contaminants from vacuum pads or exhaust ports, etc. An external pilot type valve should be used in this case. Contact SMC in case of an internal pilot type or air operated valve, etc.

## Selection

### Warning

#### 1 Confirm the specifications.

The products presented in this catalog are designed only for use in compressed air systems (including vacuum). Do not operate at pressures or temperatures out of the specified range, as it can cause damage or malfunction. (Refer to specifications.)

Contact SMC if valves will be continuously energized for extended periods of time.

#### 2 Extended periods of continuous energization

Contact SMC if valves will be continuously energized for extended periods of time.

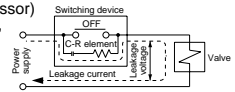
### Caution

#### 1 Instantaneous energization

If a double solenoid valve will be operated with momentary energization, it should be energized for at least 0.1 second.

#### 2 Leakage voltage

Particularly when using a C-R element (surge voltage suppressor) to protect the switching device, take note that leakage voltage will increase due to leakage current flowing through the C-R element.



Suppressor residual voltage leakage should be as follows.

#### In case of DC coil

- SZ/SY/SYJ: 3% or less of rated voltage
- SQ/VQ/VQZ/VQD: 2% or less of rated voltage

#### In case of AC coil

- SQ: 12.5% or less of rated voltage
- SZ/SY/SYJ: 8% or less of rated voltage
- VQ/VQZ/VQD: 2% or less of rated voltage

#### 3 Low temperature operation

Unless otherwise specified, valves can be used at temperature extremes to -10°C. Take appropriate measures to avoid freezing, drainage of condensation.

#### 4 Operation for air blowing

When using solenoid valves for air blowing, an external pilot type or direct solenoid operated type should be used. Also, supply to the external pilot port compressed air within the pressure range prescribed in the specifications.

#### 5 Mounting orientation

Rubber seal: Refer to the specifications of each series.  
Metal seal: Mounting orientation of single solenoid is universal. In the case of double solenoid or 3 position valves, mount so that the spool valve is horizontal.

## Mounting

### Warning

#### 1 If air leakage increases or equipment does not operate properly, stop using the valve.

After mounting or maintenance, connect compressed air and power supplies and perform appropriate function and leakage inspections to confirm that the unit has been mounted properly.

#### 2 Instruction manuals

Mount and operate the product after reading the manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

#### 3 Coating

Warnings or specifications indicated on the product should not be erased, removed, or covered up. If paint is applied to resin parts, it may have an adverse effect due to the paint solvent.



# 3/4/5 Port Solenoid Valve/Common Precautions 2

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Piping

### ⚠ Caution

- When closed center or perfect valve style is used.**  
When using a closed center or perfect valve style, be sure to confirm that there is no air leakage from the piping between the valve and cylinder.
- Strictly observe the specified tightening torque.**  
When installing fittings onto a valve, follow the given torque levels below.

#### Tightening torque

Connection thread	Appropriate tightening torque Nm
M3	0.3 to 0.5
M5	1.5 to 2
Rc1/8	7 to 9
Rc1/4	12 to 14
Rc3/8	22 to 24
Rc1/2	28 to 30
Rc3/4	28 to 30
Rc1	36 to 38
Rc1 1/4	40 to 42
Rc1 1/2	48 to 50
Rc2	48 to 50

- Piping to product**  
When piping products, refer to operation manual to avoid any mistakes.

## Wiring

### ⚠ Caution

- Polarity**  
When DC power is connected to a solenoid valve equipped with light and/or surge suppressor, check for polarity indications.  
If the circuit has polarity, note the following issues.  
Without diode to protect polarity  
If connected for wrong polarity, the diode inside the valve, the switching device on the control equipment or power supply equipment may be burnt.  
With diode to protect polarity  
If connected for wrong polarity, the valve will not switch.
- Applied voltage**  
When electricity is applied to the solenoid valve, be careful to apply the correct power voltage.  
Improper voltage may cause malfunction or coil damage.
- Confirmation of connections**  
After wiring, make sure there is no improper wiring.

## Air Supply

### ⚠ Warning

- Use clean air.**  
Do not use compressed air that contains synthetic oil, salt, and corrosive gases in which chemicals and organic solvents are present, because it could cause equipment damage or malfunction.

### ⚠ Caution

- Install an air filter.**  
Install an air filter close to and upstream of the valve. Select a filtering degree of 5- $\mu$ m or smaller.
- Take measures by installing an after cooler, air dryer or drain catch.**  
Compressed air containing excessive condensate may cause the valve or other pneumatic equipment to malfunction. Take countermeasures such as installation of an after cooler, air dryer or drain catch.
- In case a large amount of carbon dust is generated, install a mist separator upstream of the valve to eliminate dust**  
If a large amount of carbon dust is generated from the compressor, it may form a deposit on the internal surface of the valve and cause malfunction.  
For detailed information regarding the quality of the compressed air described above, refer to pages 8 to 9 of Front matter.

## Environment

### ⚠ Warning

- Do not use in an atmosphere where the valve is in direct contact with corrosive gases or chemicals.**
- Do not use in an explosive atmosphere.**
- Do not use in a place subject to heavy vibrations and/or shocks.** Confirm the specifications of each series.
- Install a protection cover if the product is exposed to direct sunlight.**
- Block off heat radiation with a cover if a heat source is at a close distance.**
- If the solenoid valve is mounted on a control valve or is energized for an extended period of time, take measures to radiate excess heat so that the ambient temperature will stay within the valve specification range.**

## Maintenance

### ⚠ Warning

- Maintenance should be conducted according to procedures described in the operation manual.**  
Improper handling may result in malfunction and damage of machinery or equipment.
- Machine maintenance and supply/exhaust of compressed air.**  
When machine is to be serviced, first check for removal of work pieces and run-away of equipment, etc. Then, shut off the supply pressure and power and exhaust compressed air in the system through residual pressure release mechanism.  
In case of a 3 position closed center or perfect valve style, exhaust the residual pressure between the valve and the cylinder. When the machine is restarted after re-installation or replacement, check first that lurch prevention measures for the actuator are taken, then confirm that the equipment operates normally.
- Low frequency operation**  
Valves should be switched at least once every 30 days to avoid malfunctions. (Pay attention to the supply air.)
- Manual override**  
When the manual override is engaged, the connected equipment starts operation.  
Confirm safety before operation.

### ⚠ Caution

- Drain**  
Remove condensate from air filters regularly.

Directional Control Valve

# Flow Characteristics of Solenoid Valve

## (How to Express Flow Characteristics)

### 1. Express of Flow Characteristics

Table 1 shows the applicable International designation of flow characteristics in the specification section of a solenoid valve or any other types of equipment.

Table 1 Designation of flow characteristics

Equipment	Designation based on international standards	Other designation	Applicable standards
Pneumatics equipment	C, b		ISO 6358: 1989 JIS B 8390: 2000
		S	JIS B 8390: 2000 Equipment: JIS B 8373, 8374, 8375, 8379, 8381
	Cv		ANSI/(NFPA)T3.21.3: 1990

### 2. Pneumatic Equipment

2-1 Calculating flow rate according to International Standards

(1) Flow rate calculation formula

The flow rate calculation formula is defined as follows:

If  $\frac{P_2+0.1}{P_1+0.1} \leq b$ , a choke flow results.

$$Q=600XC(P_1+0.1)\sqrt{\frac{293}{273+t}}$$

If  $\frac{P_2+0.1}{P_1+0.1} > b$ , a subsonic flow results.

$$Q=600XC(P_1+0.1)\sqrt{1-\left[\frac{\frac{P_2+0.1}{P_1+0.1}b}{1-b}\right]^2}\sqrt{\frac{293}{273+t}}$$

Q: Air flow rate [dm<sup>3</sup>/min(ANR)].

The dm<sup>3</sup> (cubic decimeter) in the SI system may be expressed by L(liter). 1dm<sup>3</sup>=1L.

Standard condition: Air under condition temperature 20°C, absolute pressure 0.1MPa (=100kPa=1bar), relative humidity 65%.

C: Sonic conductance [dm<sup>3</sup>/(s·bar)]

b: Critical pressure ratio [-]

P<sub>1</sub>: Upstream pressure [MPa]

P<sub>2</sub>: Downstream pressure [MPa]

t: Temperature [°C]

Note) The formula for subsonic flow is that of an elliptic approximate curve.

Figure 1 is the flow characteristic diagram. For more information, please see Energy Saving Programs by SMC.

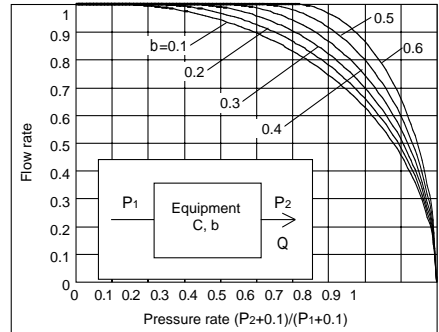


Figure 1 Flow rate characteristic diagram

#### (2) Test method

Pipe the test equipment to the test circuit shown in Figure 2. Keep the upstream pressure at a certain constant level above 0.3MPa. First measure the maximum flow rate in saturation. Then, measure the flow rate, upstream pressure and downstream pressure each at 80%, 60%, 40% and 20% points of the flow rate. Calculate the sonic conductance C from the maximum flow rate. Also, substitute other data for variables in the formula for subsonic flow and obtain the critical pressure rate b by averaging the critical pressure rates at those points.

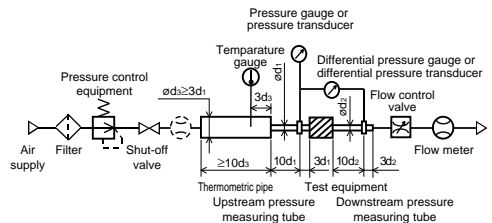


Figure 2 Test circuit of ISO 6358 and JIS B 8390



# Flow Characteristics of Solenoid Valve

## (How to Express Flow Characteristics)

### 2-2 Effective sectional area S

(1) Calculation with subsonic conductance C:

$$S = 5.0 \times C$$

(2) Test method

Pipe the test equipment to the test circuit shown in Figure 3. Fill the air tank with compressed air and keep the pressure at a constant level above 0.6MPa. Then discharge the air until the pressure in the tank drops to 0.25MPa. Measure the time required to discharge the air and the residual pressure in the air tank after leaving it until the pressure becomes stable in order to calculate the effective sectional area S by the following formula. Select the capacity of the air tank according to the effective sectional area of the test equipment.

$$S = 12.1 \frac{V}{t} \log_{10} \left( \frac{P_s + 0.1}{P + 0.1} \right) \sqrt{\frac{293}{T}}$$

S: Effective sectional area [mm<sup>2</sup>]

V: Air tank capacity [dm<sup>3</sup>]

t: Discharge time [s]

P<sub>s</sub>: Pressure in the air tank before discharge [MPa]

P: Residual pressure in the air tank after discharge [MPa]

T: Temperature in the air tank before discharge [K]

### 2-3 Flow coefficient Cv factor

The flow coefficient Cv factor is defined with the following formula in the U.S. standard ANSI/(NFPA)T3.21.3: 1990: Pneumatic fluid power - Flow rating test procedure and reporting method - For fixed orifice components

$$Cv = \frac{Q}{114.5 \sqrt{\frac{\Delta P (P_2 + P_a)}{T_1}}}$$

$\Delta P$ : Pressure drop between static pressure output ports [bar]

P<sub>1</sub>: Pressure at upstream output port [bar gauge]

P<sub>2</sub>: Pressure at downstream output port [bar gauge]; P<sub>2</sub> - P<sub>1</sub> =  $\Delta P$

Q: Flow rate [dm<sup>3</sup>/s standard atmosphere]

P<sub>a</sub>: Atmospheric pressure [bar absolute]

T<sub>1</sub>: Upstream absolute temperature [K]

Test conditions are P<sub>1</sub>+P<sub>a</sub>=6.5±0.2 bar absolute, T<sub>1</sub>=297±5K, 0.07bar≤ $\Delta P$ ≤0.14 bar.

This concept is similar to the effective area in ISO 6358, which is described to be applicable only if the pressure drop is so small compared with the upstream pressure that air compression is negligible.

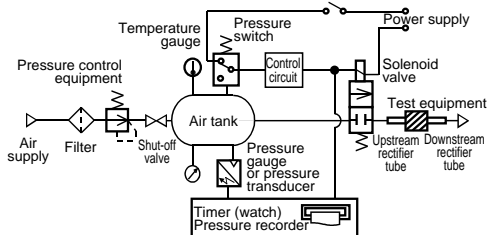


Figure 3. Test circuit of JIS B 8390

# Series 10-SZ3000 5 Port Solenoid Valve Plug-in Type

## How to Order

### ● Plug-in manifold with power supply terminals

10- SS5Z3—60 **F** **D** **1**—**05** **U** **□** **□** **P** **□**

● **Connector type**

<b>F:</b> D-sub connector (25 pins)	<b>P:</b> Flat ribbon cable (26 pins)
<b>PG:</b> Flat ribbon cable (20 pins)	<b>PH:</b> Flat ribbon cable (10 pins)

● **Supply/Exhaust block mounting position**

<b>U</b>	U side (2 to 10 stations)
<b>D</b>	D side (2 to 10 stations)
<b>B</b>	Double side (2 to 20 stations)
<b>M</b>	Special specifications

\* In the case of special specifications, indicate separately on a manifold specification sheet.  
 Note) Up to 3 supply/exhaust blocks in total can be mounted.  
 Contact SMC if 4 or more are to be mounted.

● **Power supply terminal specifications**

Symbol	Specifications
<b>P</b>	24VDC, Plus common
<b>P12</b>	12VDC, Plus common
<b>N</b>	24VDC, Negative common
<b>N12</b>	12VDC, Negative common

● **Option**  
 When a DIN rail longer than the specified stations is necessary, indicate the number of required stations.

● **Supply/Exhaust block fitting specifications**

<b>Nil</b>	Straight union
<b>L</b>	Elbow fitting (Upward direction)
<b>B</b>	Elbow fitting (Downward direction)

● **Pilot specifications**

<b>Nil</b>	Internal pilot specifications
<b>R</b>	External pilot specifications

● **Valve Stations**

**F: D-sub connector**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Note 1) Double wiring specifications
⋮	⋮	
<b>10</b>	10 stations	
<b>02</b>	2 stations	Note 2) Specified wiring (Up to 21 solenoids possible)
⋮	⋮	
<b>20</b>	20 stations	

**P: Flat ribbon cable connector (26 pins)**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Double wiring specifications
⋮	⋮	
<b>11</b>	11 stations	
<b>02</b>	2 stations	Specified wiring (Up to 22 solenoids possible)
⋮	⋮	
<b>20</b>	20 stations	

**PG: Flat ribbon cable connector (20 pins)**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Double wiring specifications
⋮	⋮	
<b>08</b>	8 stations	
<b>02</b>	2 stations	Specified wiring (Up to 16 solenoids possible)
⋮	⋮	
<b>16</b>	16 stations	

**PH: Flat ribbon cable connector (10 pins)**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Double wiring specifications
⋮	⋮	
<b>04</b>	4 stations	
<b>02</b>	2 stations	Specified wiring (Up to 8 solenoids possible)
⋮	⋮	
<b>08</b>	8 stations	

● **Connector mounting position**

Symbol	Mounting position
<b>D</b>	D side

● **Connector entry**

1: Top entry  
 2: Side entry

● **Caution**

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

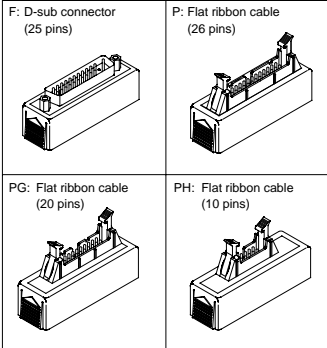
Note 1) Double wiring specifications: A single, double or 3 position/4 position solenoid valve can be used on any station of the manifold.  
 Note 2) Confirm the wiring specifications in the manifold specifications:  
 (Note that use of a double or 3 position /4 position valve will be impossible in a position specified for single solenoid wiring.)

**How to Order**

● **Plug-in manifold [Without power supply terminals]**

10-SS5Z3—60 **F** **D** **1**—**05** **U**         

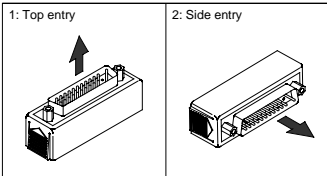
● **Connector type**



● **Connector mounting position**

Symbol	Mounting position
<b>D</b>	D side

● **Connector entry**



● **Option**

When a DIN rail longer than the specified stations is necessary, indicate the number of required stations.

● **Supply/Exhaust block fitting specifications**

<b>Nil</b>	Straight union
<b>L</b>	Elbow fitting (Upward direction)
<b>B</b>	Elbow fitting (Downward direction)

● **Pilot specifications**

<b>Nil</b>	Internal pilot specifications
<b>R</b>	External pilot specifications

● **Supply/Exhaust block mounting position**

<b>U</b>	U side (2 to 10 stations)
<b>D</b>	D side (2 to 10 stations)
<b>B</b>	Double side (2 to 20 stations)
<b>*M</b>	Special specifications

※ In the case of special specifications, indicate separately on a manifold specification sheet.  
 (Note) Up to 3 supply/exhaust blocks in total can be mounted.  
 Contact SMC if 4 or more are to be mounted.

● **Valve Stations**

**F: D-sub connector**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Note1) Double wiring specifications
⋮	⋮	
<b>12</b>	12 stations	Note2) Specified wiring (Up to 24 solenoids possible)
⋮	⋮	
<b>13</b>	13 stations	Note2) Specified wiring (Up to 24 solenoids possible)
⋮	⋮	
<b>20</b>	20 stations	

**P: Flat ribbon cable connector (26 pins)**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Double wiring specifications
⋮	⋮	
<b>12</b>	12 stations	Specified wiring (Up to 25 solenoids possible)
⋮	⋮	
<b>13</b>	13 stations	Specified wiring (Up to 25 solenoids possible)
⋮	⋮	
<b>20</b>	20 stations	

**PG: Flat ribbon cable connector (20 pins)**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Double wiring specifications
⋮	⋮	
<b>09</b>	9 stations	Specified wiring (Up to 19 solenoids possible)
⋮	⋮	
<b>10</b>	10 stations	Specified wiring (Up to 19 solenoids possible)
⋮	⋮	
<b>19</b>	19 stations	

**PH: Flat ribbon cable connector (10 pins)**

Symbol	Stations	Remark (s)
<b>02</b>	2 stations	Double wiring specifications
⋮	⋮	
<b>04</b>	4 stations	Specified wiring (Up to 9 solenoids possible)
⋮	⋮	
<b>05</b>	5 stations	Specified wiring (Up to 9 solenoids possible)
⋮	⋮	
<b>09</b>	9 stations	

Note 1) Double wiring specifications: A single, double or 3 position/4 position solenoid valve can be used on any station of the manifold.

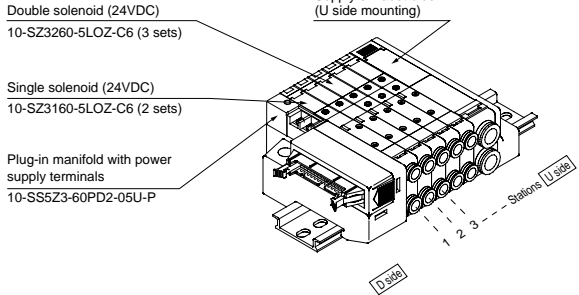
Note 2) Confirm the wiring specifications in the manifold specifications.

(Note that use of a double or 3 position /4 position valve will be impossible in a position specified for single solenoid wiring.)



## How to Order for Manifold Assemblies (Example)

Example (SZ3000, positive common with power supply terminals)



- 10-SS5Z3-60PD2-05U-P ..... 1 set (Manifold part No.)
- \* 10-SZ3160-5LOZ-C6 ..... 2 sets (Single solenoid part No.)
- \* 10-SZ3260-5LOZ-C6 ..... 3 sets (Double solenoid part No.)

\* To order valves and options mounted onto the manifold at the factory, prefix the part number of the solenoid valve and other equipment with an asterisk (\*).

- The layout of valves starts with station **1 on the D side**.
- Specify the valves to be installed below the manifold part number, starting from station 1 and proceeding in order as shown in the drawing. If the layout is complicated, give descriptions on a manifold specification sheet.

## Manifold Specifications

Model	D-sub connector Type 60F	Flat ribbon cable type Type 60P□		
		Type 60P	Type 60PG	Type 60PH
Manifold model	Plug-in type			
P(SUP), R(EXH) system	Common supply/exhaust			
Valve stations (with power terminal)	2 to 20 stations	2 to 16 stations	2 to 8 stations	
Piping specifications of A and B ports	Location	Valve		
	Direction	Side, Top, Down		
Port size	P/R ports	C8		
	A/B ports	C4, C6, M5		
Applicable connector	D-sub connector MIL-C-24308 JIS-X-5101 compliant	Flat ribbon cable connector Socket: 26 Pin MIL type with strain relief MIL-C-83503 compliant	Flat ribbon cable connector Socket: 20 Pin MIL type with strain relief MIL-C-83503 compliant	Flat ribbon cable connector Socket: 10 Pin MIL type with strain relief MIL-C-83503 compliant
		+COM, -COM		
Internal wiring				
Weight W (g) Note 3) (n1: Stations n2: Number of supply/ exhaust blocks m: DIN rail weight)	W=3.2n1+53n2+m+126.5			

Note 1) In case many valves are operated simultaneously, use type B (Double side supply/exhaust), applying pressure to the P ports on both sides and exhausting from the R ports on both sides.  
 Note 2) The weight W is the value for the D-SUB connector manifold with power supply terminals only. To obtain the weight with solenoid valves attached, add the solenoid valve weights given on page 244 for the appropriate number of stations.

## Flow Characteristics

Port size (P,EA,EB)	4,2 (A,B)	Flow characteristics					
		1→2/4 (P→A/B)			4/2→3 (A/B→R)		
		C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv
C8	C4	0.58[0.49]	0.26[0.36]	0.14[0.13]	0.76[0.65]	0.15[0.20]	0.18[0.15]
	C6	0.73[0.64]	0.24[0.27]	0.18[0.16]	0.77[0.74]	0.19[0.16]	0.19[0.19]
	M5	0.60[0.57]	0.38[0.35]	0.17[0.15]	0.67[0.58]	0.16[0.39]	0.16[0.16]

Note) Value is for manifold base with 5 stations and individually operated 2 position type.  
 [ ] : 4 position dual 3 port valve.

## Solenoid Valve Specifications

<b>Series</b>		<b>10-SZ3000</b>	
<b>Fluid</b>		Air	
<b>Internal pilot operating pressure range MPa</b>	<b>2 position single</b>	0.15 to 0.7	
	<b>2 position double</b>	0.1 to 0.7	
	<b>3 position</b>	0.2 to 0.7	
	<b>4 position dual 3 port valve</b>	0.15 to 0.7	
<b>External pilot operating pressure range MPa</b>	<b>Operating pressure range</b>		-100kPa to 0.7
	<b>Pilot pressure range</b>	<b>2 position single</b>	0.25 to 0.7
		<b>2 position double</b>	0.25 to 0.7
	<b>3 position</b>	0.25 to 0.7	
<b>Ambient and fluid temperature °C</b>		Max. 50	
<b>Max. operating frequency Hz</b>	<b>2 position single, double</b>		10
	<b>4 position dual 3 port valve</b>		
	<b>3 position</b>		3
<b>Manual override</b>		Non-locking push type, Push-turn locking slotted type	
<b>Pilot system</b>		Main valve, Common exhaust (Pilot and main valve)	
<b>Lubrication</b>		Not required	
<b>Mounting orientation</b>		Free	
<b>Impact/Vibration resistance m/s<sup>2</sup> (Note)</b>		150/30 (8.3 to 2000Hz)	
<b>Enclosure</b>		Dust proof	

Note) Impact resistance: No malfunction when tested with a drop tester in the axial direction and at a right angle to the main valve and armature one time each in both an energized and deenergized condition. (initial value)

Vibration resistance: No malfunction when tested with oe sweep of 8.3 to 2000Hz in the axial direction and at a right angle to the main valve and armature one time each in both an energized and deenergized condition. (initial value)

## Solenoid Specifications

<b>Rated coil voltage V (Note)</b>	24, 12 DC
<b>Allowable voltage fluctuation</b>	±10% of rated voltage
<b>Power consumption W</b>	0.6 (With light: 0.65)
<b>Surge voltage suppressor</b>	Diode
<b>Indicator light</b>	LED

## Response Time

Note) According to JISB8375-1981 dynamic performance test (With coil temperature of 20°C and at rated voltage)

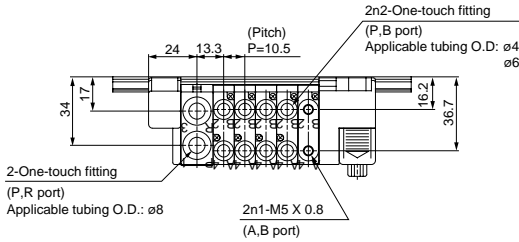
Actuation	Response times (For 0.5MPa)	
	With surge voltage suppressor	
	S,Z style	
<b>2 position single</b>	15 or less	
<b>2 position double</b>	13 or less	
<b>3 position</b>	20 or less	
<b>4 position dual 3 port valve</b>	35 or less	

## Weight Table

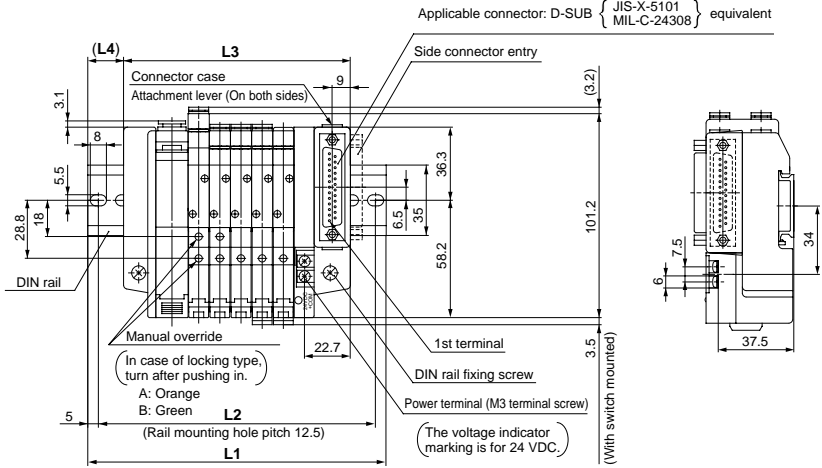
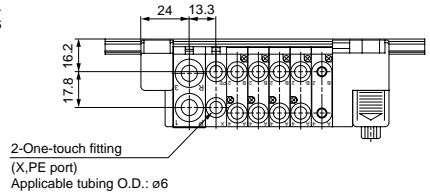
Valve model	Actuation		Port size	Weight g	
			A, B		
<b>10-SZ3□60-□-C4</b>	2 position	Single	C4 (ø4 One-touch fitting)	78	
		Double		84	
	3 position	Closed center		C6 (ø6 One-touch fitting)	88
		Exhaust center			
	4 position	Pressure center			84
		Dual 3 port valve			
<b>10-SZ3□60-□-C6</b>	2 position	Single	C6 (ø6 One-touch fitting)	74	
		Double		81	
	3 position	Closed center		C6 (ø6 One-touch fitting)	85
		Exhaust center			
	4 position	Pressure center			81
		Dual 3 port valve			
<b>10-SZ3□60-□-M5</b>	2 position	Single	M5 X 0.8	69	
		Double		75	
	3 position	Closed center		M5 X 0.8	79
		Exhaust center			
	4 position	Pressure center			75
		Dual 3 port valve			

**Dimensions/10-SZ3000: Plug-in**

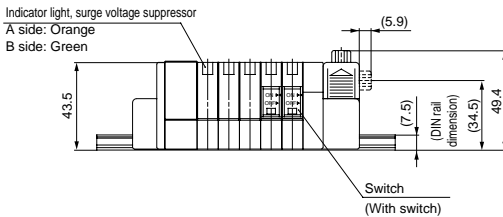
10-SS5Z3-60FD<sub>2</sub> -[Stations] U-□



**[With external pilot]**



(Station n) ..... (Station 1)



Note) Please refer to page 249 for manifold dimensions of the elbow fitting.

**Internal Pilot Manifold L: Dimensions**

n: Stations (n1+n2)

n	2	3	4	5	6	7	8	9	10
L1	110.5	123	135.5	148	148	160.5	173	185.5	198
L2	100	112.5	125	137.5	137.5	150	162.5	175	187.5
L3	81	91.5	102	112.5	123	133.5	144	154.5	165
L4	15	16	17	18	12.5	13.5	14.5	15.5	16.5

**External Pilot Manifold L: Dimensions**

n: Stations (n1+n2)

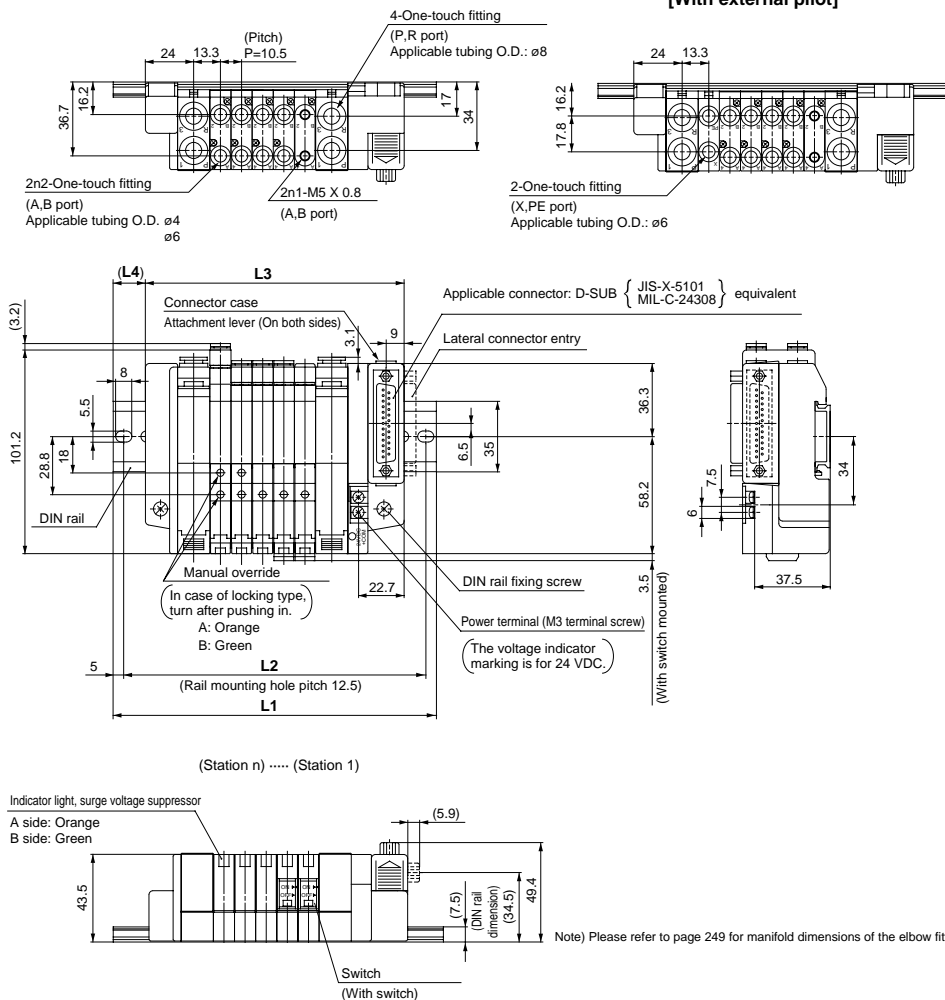
n	2	3	4	5	6	7	8	9	10
L1	123	135.5	148	148	160.5	173	185.5	198	210.5
L2	112.5	125	137.5	137.5	150	162.5	175	187.5	200
L3	91.5	102	112.5	123	133.5	144	154.5	165	175.5
L4	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5

# Solenoid Valve 10-SZ3000

## Dimensions/10-SZ3000: Plug-in

10-SS5Z3-60FD<sub>2</sub> - [Stations] B-□

[With external pilot]



### Internal Pilot Manifold L: Dimensions

L \ n	n: Stations (n1+n2)																			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	123	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	
L2	112.5	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	
L3	97	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286	
L4	13	14	15	16	17	12	13	14	15	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5	12.5	

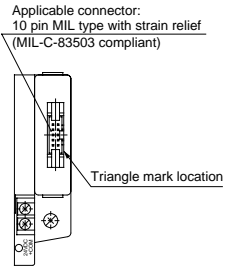
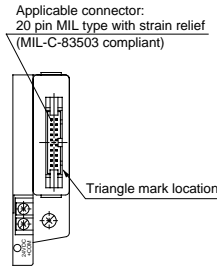
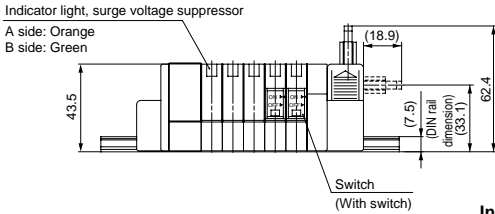
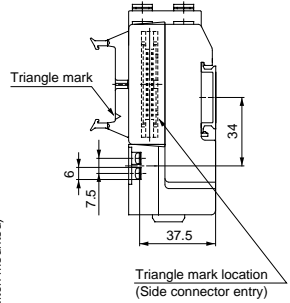
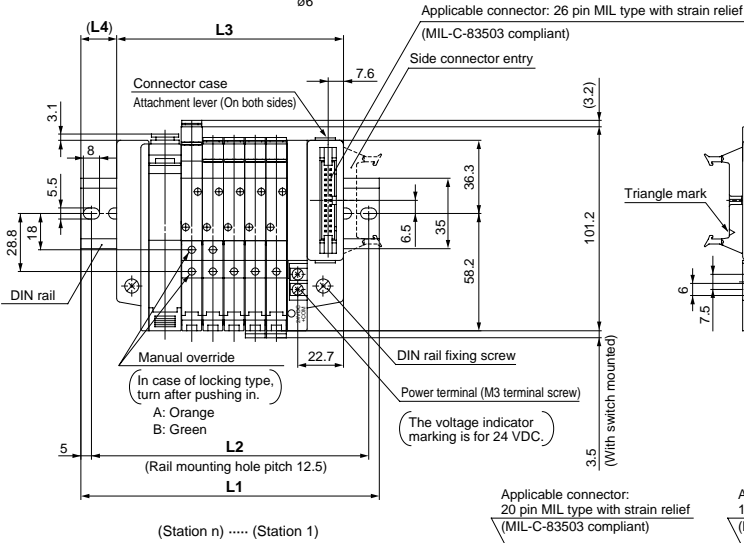
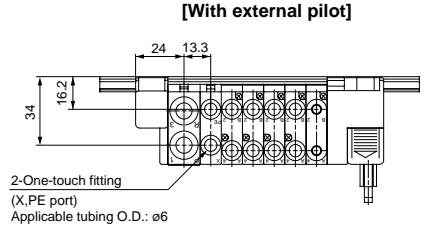
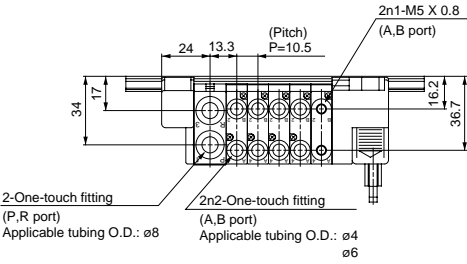
### External Pilot Manifold L: Dimensions

L \ n	n: Stations (n1+n2)																			
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
L1	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	323	
L2	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	312.5	
L3	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286	296.5	
L4	14	15	16	17	12	13	14	15	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5	12.5	13.5	



**Dimensions/10-SZ3000: Plug-in**

10-SS5Z3-60PD<sub>2</sub> - [Stations] U-□ (26 pins)



**In case of 60PG (20 poles)    In case of 60PH (10 poles)**

Note 1) 60PG and 60PH types are only different in connectors.  
 The dimensions L1 to L4 are same as those of 60P type.  
 Note 2) Please refer to page 249 for manifold dimensions of the elbow fitting.

**Internal Pilot Manifold L: Dimensions**

n: Stations (n1+n2)

L/n	2	3	4	5	6	7	8	9	10
L1	110.5	123	135.5	148	148	160.5	173	185.5	198
L2	100	112.5	125	137.5	137.5	150	162.5	175	187.5
L3	81	91.5	102	112.5	123	133.5	144	154.5	165
L4	15	16	17	18	12.5	13.5	14.5	15.5	16.5

**External Pilot Manifold L: Dimensions**

n: Stations (n1+n2)

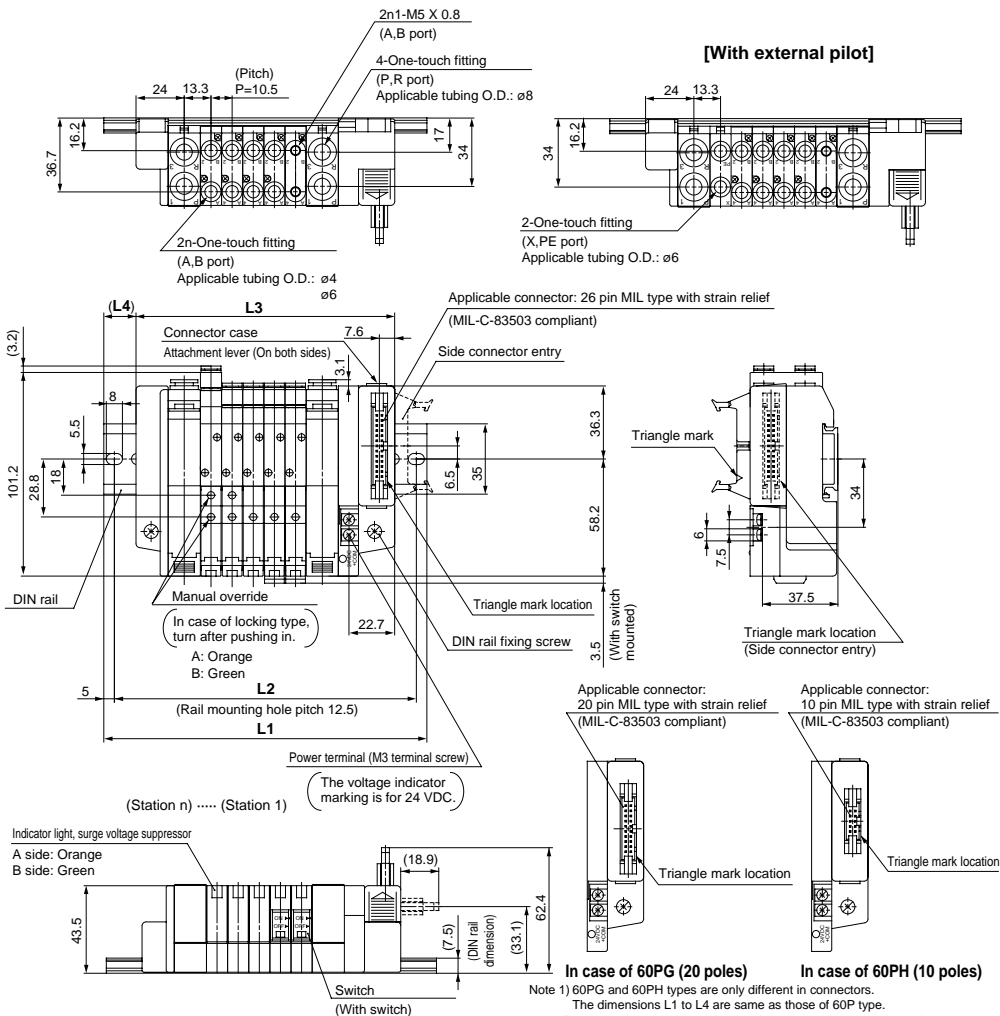
L/n	2	3	4	5	6	7	8	9	10
L1	123	135.5	148	148	160.5	173	185.5	198	210.5
L2	112.5	125	137.5	137.5	150	162.5	175	187.5	200
L3	91.5	102	112.5	123	133.5	144	154.5	165	175.5
L4	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5

Directional Control Valve

# Solenoid Valve 10-SZ3000

## Dimensions/10-SZ3000: Plug-in

10-SS5Z3-60PD $\frac{1}{2}$  - [Stations] B-□ (26 pins)



### Internal Pilot Manifold L: Dimensions

L \ n	n: Stations (n1+n2)																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	123	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5
L2	112.5	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300
L3	97	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286
L4	13	14	15	16	17	12	13	14	15	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5	12.3

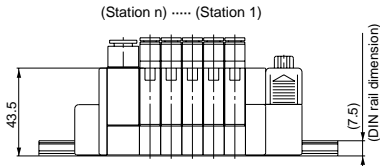
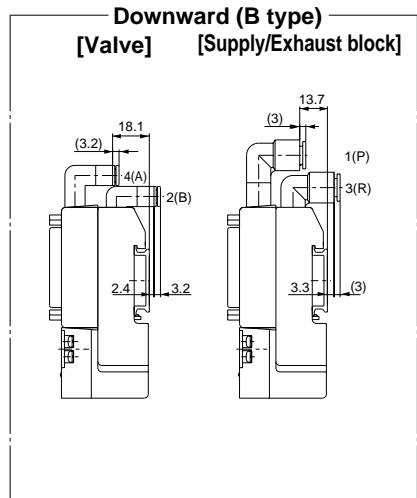
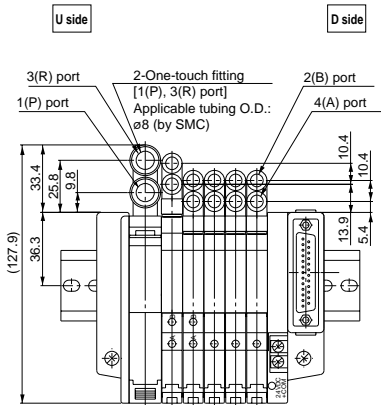
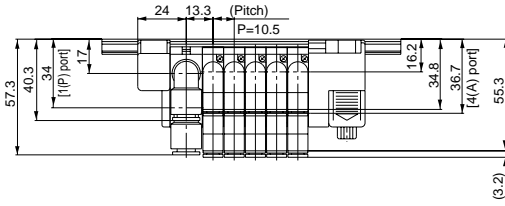
### External Pilot Manifold L: Dimensions

L \ n	n: Stations (n1+n2)																		
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5	310.5	323
L2	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300	300	312.5
L3	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286	296.5
L4	14	15	16	17	12	13	14	15	16	17	18	12.5	13.5	14.5	15.5	16.5	17.5	12.5	13.5

**Dimensions with Elbow Fitting/10-SZ3000: Plug-in, D-sub Connector**

10-SS5Z3-60F1D- [Stations] D<sub>g</sub> -□

[The flat ribbon cable type and non-plug-in type have fittings of the same dimensions.]



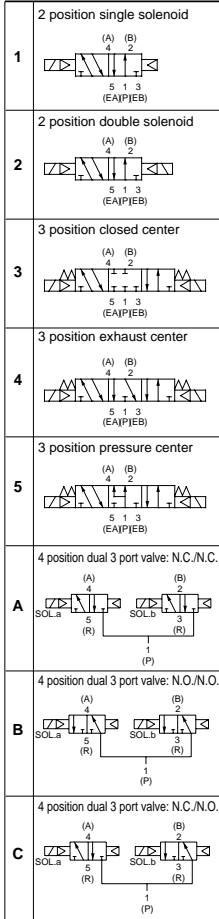
Directional Control Valve



**How to Order**

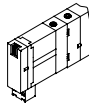
10- SZ3 1 60     — 5LOZ     — C6

● **Actuation**

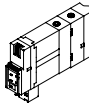


● **Auto switch specifications**

**NII:** Without switch

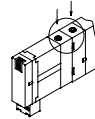


**J:** With switch

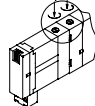


● **Manual override**

**NII:** Non-locking push type



**D:** Push-turn locking slotted type



● **Back pressure check valve**

<b>NII</b>	—
<b>K</b>	Built-in

● **Pilot specifications**

<b>NII</b>	Internal pilot
<b>R</b>	External pilot

● The dual 3 port valve is not available with external pilot specifications.

● **Port sizes of A and B ports**

**C4:** ø4 One-touch fitting  
**C6:** ø6 One-touch fitting



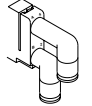
**M5:** M5 X 0.5



Elbow fitting (Upward direction)  
**L4:** ø4 Elbow fitting assembly  
**L6:** ø6 Elbow fitting assembly



Elbow fitting (Downward direction)  
**B4:** ø4 Elbow fitting assembly  
**B6:** ø6 Elbow fitting assembly



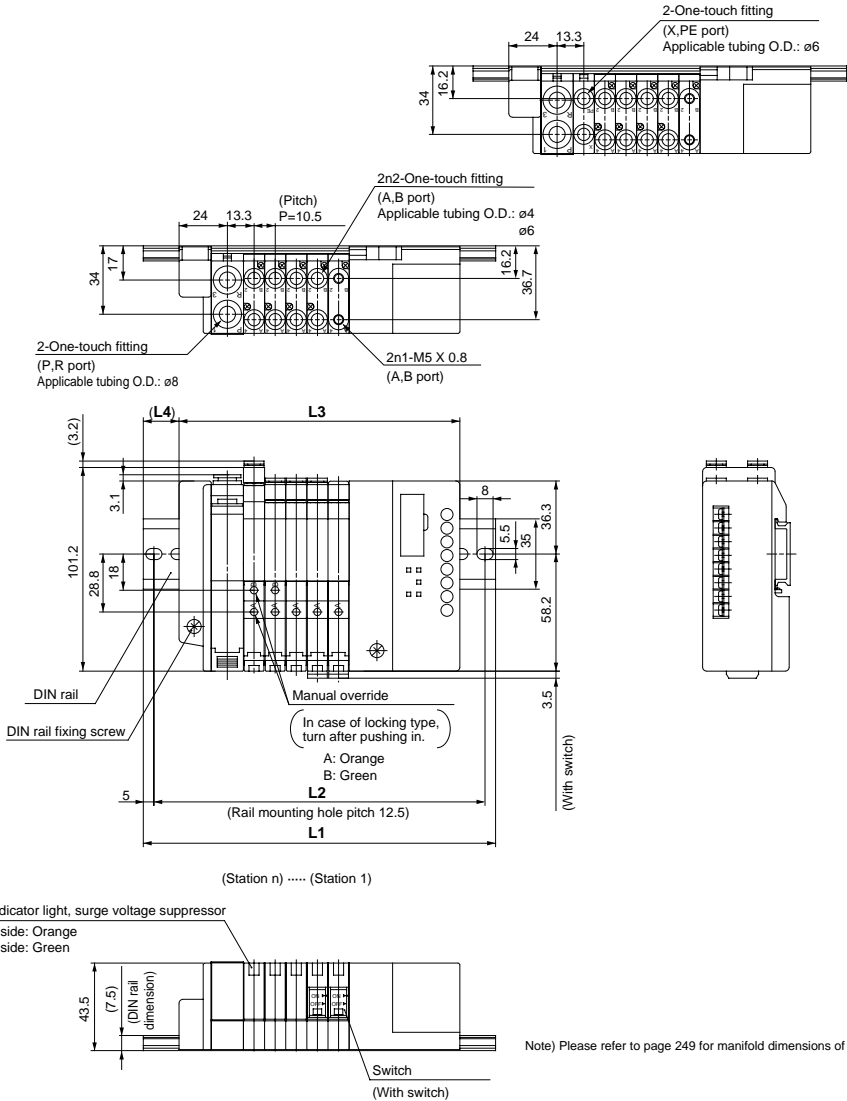
Directional Control Valve

# Solenoid Valve 10-SZ3000

## Dimensions/10-SZ3000: Serial Transmission Type

10-SS5Z3-60S□D- [Stations] U

[With external pilot]



### Internal Pilot Manifold L: Dimensions

n: Stations (n1+n2)

n	2	3	4	5	6	7	8	9	10
<b>L1</b>	135.5	148	160.5	173	185.5	185.5	198	210.5	223
<b>L2</b>	125	137.5	150	162.5	175	175	187.5	200	212.5
<b>L3</b>	108	118.5	129	139.5	150	160.5	171	181.5	192
<b>L4</b>	14	15	16	17	18	12.5	13.5	14.5	15.5

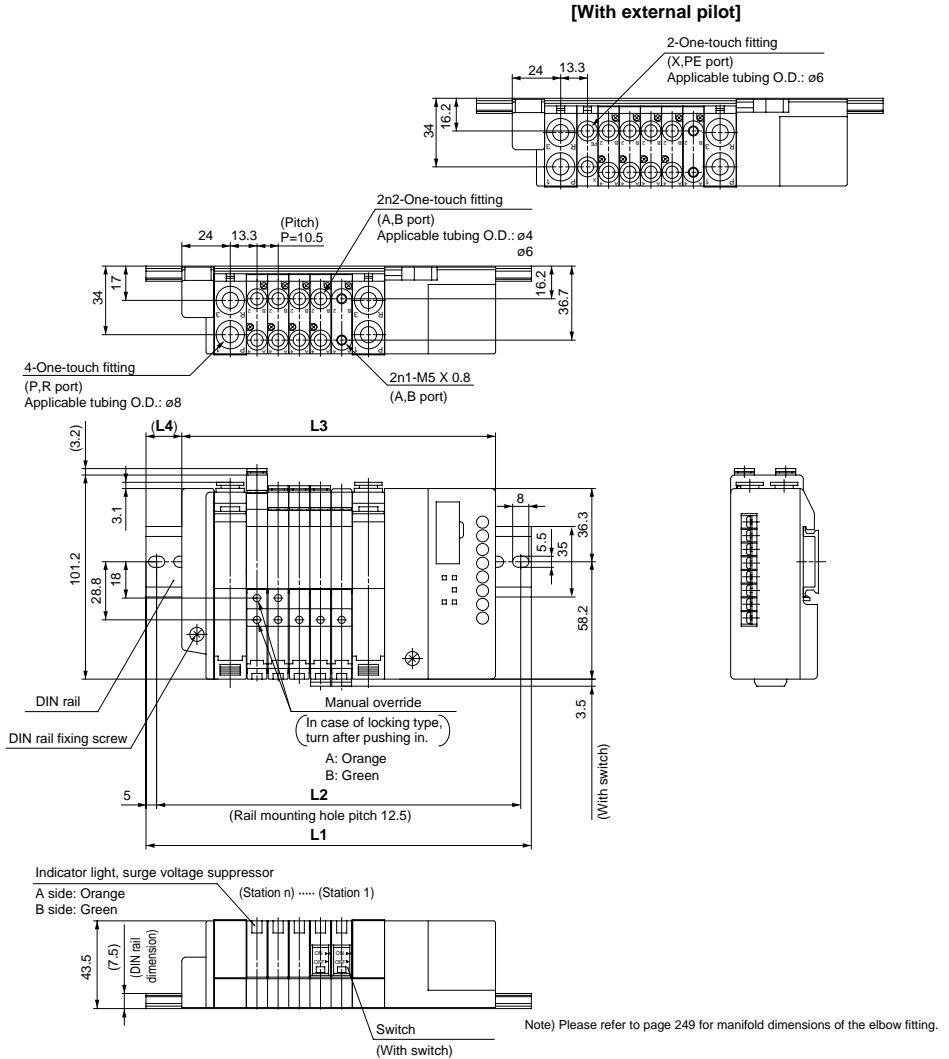
### External Pilot Manifold L: Dimensions

n: Stations (n1+n2)

n	2	3	4	5	6	7	8	9	10
<b>L1</b>	148	160.5	173	185.5	185.5	198	210.5	223	235.5
<b>L2</b>	137.5	150	162.5	175	175	187.5	200	212.5	225
<b>L3</b>	118.5	129	139.5	150	160.5	171	181.5	192	202.5
<b>L4</b>	15	16	17	18	12.5	13.5	14.5	15.5	16.5

**Dimensions/10-SZ3000: Serial Transmission Type**

10-SS5Z3-60S □ D- [Stations] B



Directional Control Valve

**Internal Pilot Manifold L: Dimensions**

		n: Stations								
L \ n	2	3	4	5	6	7	8	9		
L1	148	160.5	173	185.5	198	210.5	210.5	223		
L2	137.5	150	162.5	175	187.5	200	200	212.5		
L3	124	134.5	145	155.5	166	176.5	187	197.5		
L4	12	13	14	15	16	17	18	13		

		n: Stations					
L \ n	10	11	12	13	14	15	16
L1	235.5	248	260.5	273	285.5	285.5	298
L2	225	237.5	250	262.5	275	275	287.5
L3	208	218.5	229	239.5	250	260.5	271
L4	14	15	16	17	18	12.5	13.5

**External Pilot Manifold L: Dimensions**

		n: Stations								
L \ n	2	3	4	5	6	7	8	9		
L1	160.5	173	185.5	198	210.5	210.5	223	235.5		
L2	150	162.5	175	187.5	200	200	212.5	225		
L3	134.5	145	155.5	166	176.5	187	197.5	208		
L4	13	14	15	16	17	18	13	14		

		n: Stations					
L \ n	10	11	12	13	14	15	16
L1	248	260.5	273	285.5	285.5	298	310.5
L2	237.5	250	262.5	275	275	287.5	300
L3	218.5	229	239.5	250	260.5	271	281.5
L4	15	16	17	18	12.5	13.5	14.5

# Series 10-SQ1000

## 5 Port Solenoid Valve Plug-in Type

### How to Order for Manifolds

10—SS5Q13—08 FD2—D

#### Valve stations

01	1 station
⋮	⋮
Note) 24	24 stations

Note) The maximum number of stations depends on the type of electrical entries.

#### Option

Nil	—
02 to 24	DIN rail length specification (Note1)
B	Back pressure check valve
K	Special wiring specification (Except double wiring) (Note2)
N	With name plate (For side ported type only)
R	External pilot specifications

Note 1) When a DIN rail longer than the standard types is required, specify the number of stations such as "D08".

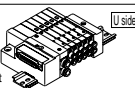
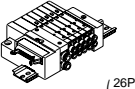
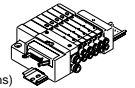
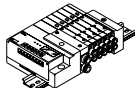
Note 2) The standard wiring specification is for double wiring. Indicate wiring specifications for single wiring or mixed single and double wiring, or when the number of stations exceeds the standard maximum value (Except for L kit).

Note 3) When more than one option is specified, list them in alphabetical order (e.g. -BKN).

#### Manifold mounting

D	DIN rail mount type
E	Direct mount type

#### Electrical entry

Kit name	Electrical entry	Cable specifications	Standard number of stations	Max. number of stations with special wiring	Max. number of solenoids (Note 2)	
<b>F</b> kit  D-sub connector kit	D side	FD0	D-sub connector (25P) kit without cable	1 to 12 stations	24 stations	
		FD1	D-sub connector (25P) kit with 1.5 m cable			
		FD2	D-sub connector (25P) kit with 3.0 m cable			
		FD3	D-sub connector (25P) kit with 5.0 m cable			
<b>P</b> kit  Flat cable connector kit (26P/20P)	D side	PD0	Flat ribbon cable (26P) kit without cable	1 to 12 stations	24 stations	
		PD1	Flat ribbon cable (26P) kit with 1.5 m cable			
		PD2	Flat ribbon cable (26P) kit with 3.0 m cable			
		PD3	Flat ribbon cable (26P) kit with 5.0 m cable			
<b>PDC</b> (Note 1) Flat ribbon cable (20P) kit without cable			1 to 9 stations	18 stations	18	
<b>J</b> kit  Flat ribbon cable (20 pins) (Compatible with PC wiring system)	D side	JD0	Flat ribbon cable (20P) Compatible with PC wiring system	1 to 8 stations	16 stations	16
<b>S</b> kit  Serial transmission kit	D side	SDF	NKE Corporation: Uni wire system compatible	1 to 8 stations	16 stations	
		SDH	NKE Corporation: Uni wire H system compatible			
		SDJ1	Corporation: S-LINK system (16 outputs) compatible			
		SDJ2	Corporation: S-LINK system (8 outputs) compatible	1 to 4 stations	8 stations	
		SDQ	Compatible with DeviceNet and Omron CompoBus/D	1 to 8 stations	16 stations	
		SDR1	Compatible with CompoBus/S (16 points) by OMRON Co.			
		SDR2	Compatible with CompoBus/S (8 points) by OMRON Co.	1 to 4 stations	8 stations	
SDV	Mitsubishi Electric Corporation: CC-Link compatible	1 to 8 stations	16 stations			

Note 1) The 20P type cable of P kit must be procured by the customer.

Note 2) The maximum number of stations should not exceed the maximum number of solenoids. (The number of solenoids are counted as: 1 for single solenoids and 2 for type 3P and 4P double solenoids.)

### ⚠ Caution






Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.



**How to Order for Valves**

10 — SQ1 1 3 1 5 C6

● **Actuation**

1	2 position single  (A) (B) ø2 (R1) (P1) (R2)
2	2 position double (Latching)  (A) (B) ø2 (R1) (P1) (R2)
3	3 position closed center  (A) (B) ø2 (R1) (P1) (R2)
4	3 position exhaust center  (A) (B) ø2 (R1) (P1) (R2)
5	3 position pressure center  (A) (B) ø2 (R1) (P1) (R2)

● **Seal type**

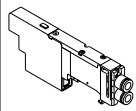
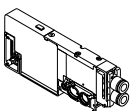
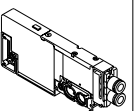
1	Rubber seal
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● **Function**

Nil	Standard (1.0WDC)
N	Negative COM
R	External pilot specifications
Note 1) Y	Low wattage type (0.5WDC)

Note 1) Except double (latching) type.  
Note 2) For specifying two or more functions, enter symbols in alphabetical order.

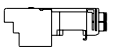

● **Manifold block specification**

Nil	M	MB
Without manifold block 	With manifold block 	With manifold block With built-in back pressure check valve 
· When ordering with manifolds · When only valves are required.	* Lead wire is not included.	* Lead wire is not included.
For adding stations		

● **Port plug mounting port**

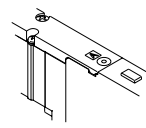
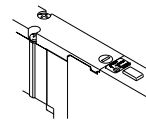
Nil	—
A	A port
B	B port

● **Cylinder port size**

C3	For ø3.2 One-touch fitting	Side ported 
C4	For ø4 One-touch fitting	
C6	For ø6 One-touch fitting	
M5	M5 thread	Note) Top ported 
L3	For ø3.2 One-touch fitting	
L4	For ø4 One-touch fitting	
L6	For ø6 One-touch fitting	
L5	M5 thread	

Note) Can be changed to side ported specification.

● **Manual override**

Nil	Note) B
Non-locking push type (tool required)	Locking type (tool required)
	

Note) Except double (latching) type.

● **Coil voltage**

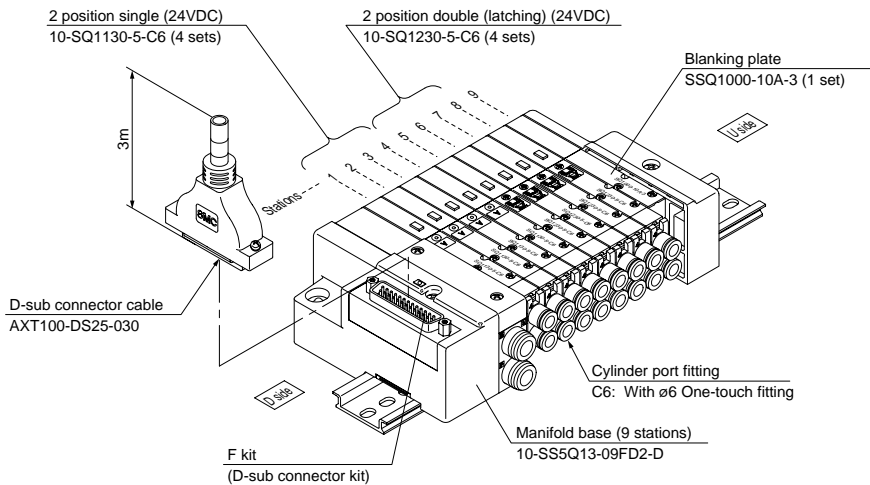
5	24VDC
6	12VDC

Note) Indicator light/surge voltage suppressor is built-in.

## 5 Port Solenoid Valve Plug-in Type **10-SQ1000**

### How to Order Manifold Assemblies (Example)

With D-sub connector kit cable (3m)



**10-SS5Q13-09FD2-D**.....1 set: **F kit 9 station manifold base**

\* **10-SQ1130-5-C6**.....4 sets: **2 position single**

\* **10-SQ1230-5-C6**.....4 sets: **2 position double (latching)**

\* **SSQ1000-10A-3**.....1 set: **Blanking plate**

\* To order valves and options mounted onto the manifold at the factory, list the valve/option with an asterisk (\*) in front of each part number.

Add the valve and option part numbers in order starting from the first station on the D side. When entry of part numbers becomes complicated, indicate on a manifold specification sheet.

**Model**

Series	Number of solenoids	Model		Flow characteristics <sup>Note1)</sup>						Response time <sup>Note2)</sup> ms		Weight (g)	
				1→4/2 (P→A/B)			4/2→5/3 (A/B→R1/R2)			Standard: 1W	Low wattage		
				C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv				
<b>10-SQ1000</b>	2 position	Single	Rubber seal	<b>10-SQ1131</b>	0.79	0.20	0.19	0.80	0.20	0.19	15 or less	20 or less	80
		Double (Latching)	Rubber seal	<b>10-SQ1231</b>	0.79	0.20	0.19	0.80	0.20	0.19	20 or less	—	80
	3 position	Closed center	Rubber seal	<b>10-SQ1331</b>	0.64	0.20	0.15	0.58	0.26	0.16	25 or less	33 or less	100
		Exhaust center	Rubber seal	<b>10-SQ1431</b>	0.64	0.20	0.15	0.80	0.20	0.19	25 or less	33 or less	100
		Pressure center	Rubber seal	<b>10-SQ1531</b>	0.79	0.21	0.19	0.59	0.20	0.14	25 or less	33 or less	100

Note 1) Cylinder port size of C6.

Note 2) According to JISB8375-1981 (At supply pressure of 0.5MPa with light/surge voltage suppressor. The value differs with the pressure and the quality of air.)

**Specifications**



Valve specifications	Valve type		Rubber seal
	Fluid		Air, Inert gas
	Maximum operating pressure		0.7MPa
	Minimum operating pressure	Single	0.15MPa
		Double (latching)	0.18MPa
		3 position	0.2MPa
	Ambient and fluid temperature		<sup>Note1)</sup> -10 to 50°C
	Lubrication		Not required
	Pilot valve manual override		Push type/Locking type (tool required)
	Vibration Impact resistance <sup>Note2)</sup>		30/150 m/s <sup>2</sup>
Enclosure		Dust proof	
Solenoid specifications	Rated coil voltage		12V, 24V DC
	Allowable voltage fluctuation		±10% of rated voltage
	Type of coil insulation		Equivalent to B class
	Power consumption (Current)	24VDC	1W DC (42mA), <sup>Note3)</sup> 0.5W DC (21mA)
		12VDC	1W DC (83mA), <sup>Note3)</sup> 0.5W DC (42mA)

Note 1) Use dry air to prevent condensation when operating at a low temperature.

Note 2) Vibration resistance: No malfunction resulted from a one-sweep test between 8.3 and 2000Hz.

The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states.

Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energized and deenergized states (specification).

Note 3) Values for low wattage (0.5W)

**Manifold Specifications**

Base model	Piping specifications			Applicable solenoid valve	Connection type	Note 3) Applicable stations	Note 4) 5 stations weight (g)	Note 4) Weight increase per station (g)
	Port size <sup>Note 1)</sup>							
	P, R	A, B port size						
10-SS5Q13-□□-□		Side	C3 (For ø3.2)		SQ1□31	F kit: D-sub connector	1 to 12 stations	420
	C4 (For ø4)							
	C6 (For ø6)		J kit: PC wiring system compatible flat ribbon cable	1 to 12 stations		420	20	
	M5 (M5 thread)							
Top	L3 (For ø3.2)		S kit: Serial transmission	1 to 8 stations	420	20		
	L4 (For ø4)							
L6 (For ø6)		L5 (M5 thread)		1 to 8 stations	475	20		

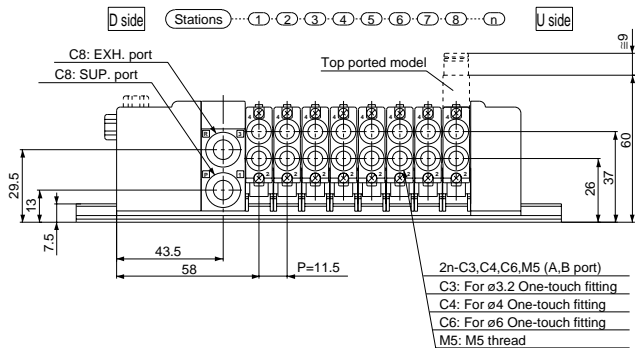
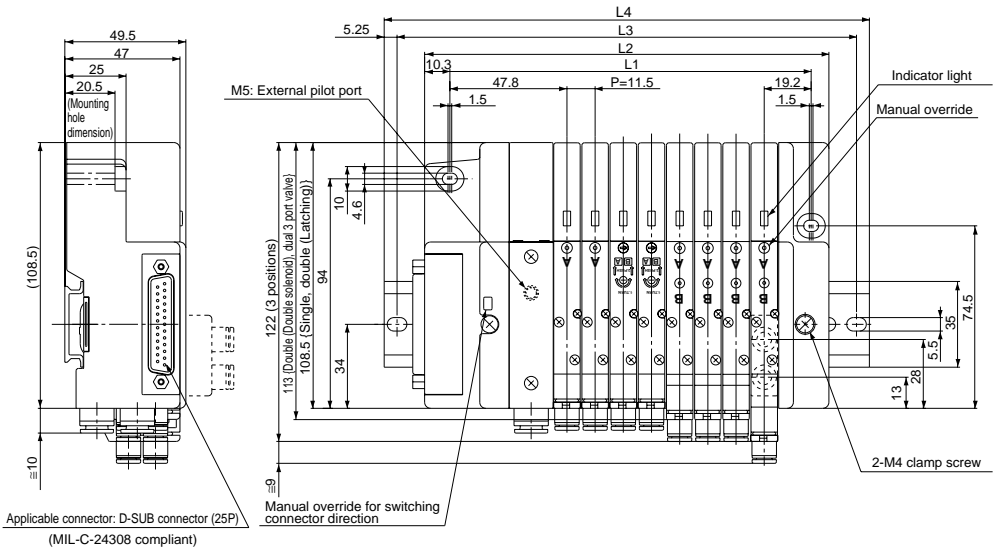
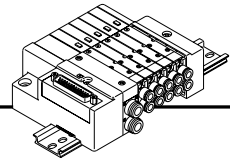
Note 1) The inch size one-touch fittings are also applicable.

Note 2) Can be changed to side ported specification.

Note 3) The maximum number of stations can be increased by adopting an optional special wiring specification.

Note 4) Except valves.

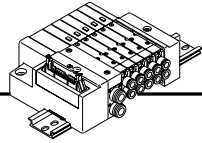
**F** Kit (D-sub Connector Kit)



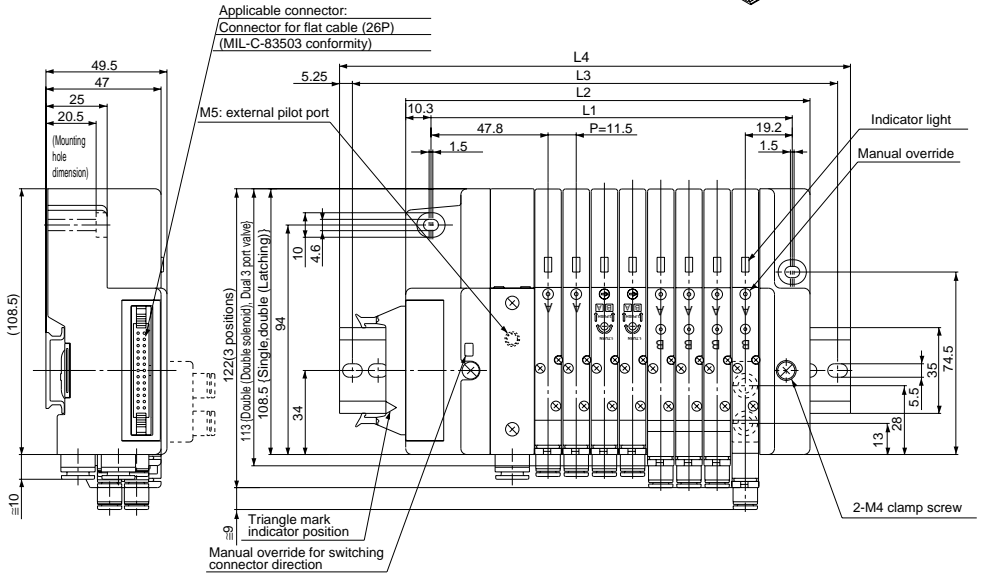
**Dimensions**

Formula L1=11.5n+55.5 L2=11.5n+73 n: stations (Maximum 24 stations)

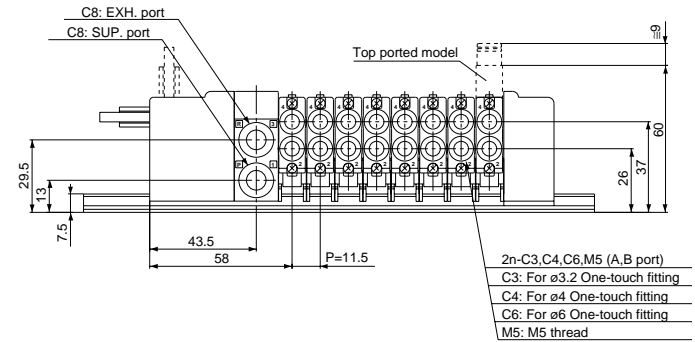
L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1		67	78.5	90	101.5	113	124.5	136	147.5	159	170.5	182	193.5	205	216.5	228	239.5	251	262.5	274	285.5	297	308.5	320	331.5
L2		84.5	96	107.5	119	130.5	142	153.5	165	176.5	188	199.5	211	222.5	234	245.5	257	268.5	280	291.5	303	314.5	326	337.5	349
L3		112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	300	312.5	325	337.5	350	362.5	375	
L4		123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273	285.5	298	310.5	310.5	323	335.5	348	360.5	373	385.5	



**P** Kit (Flat Ribbon Cable Kit)



D side Stations 1 2 3 4 5 6 7 8 n J side



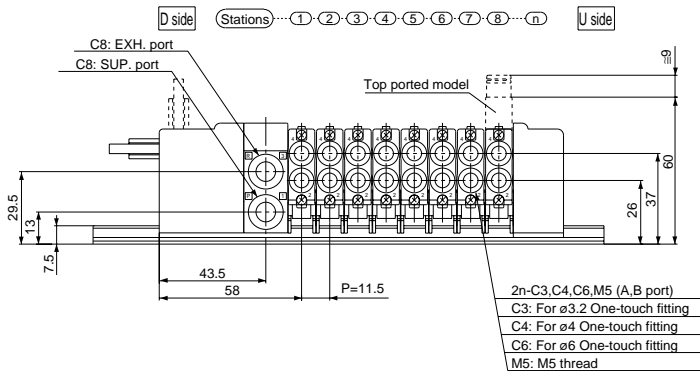
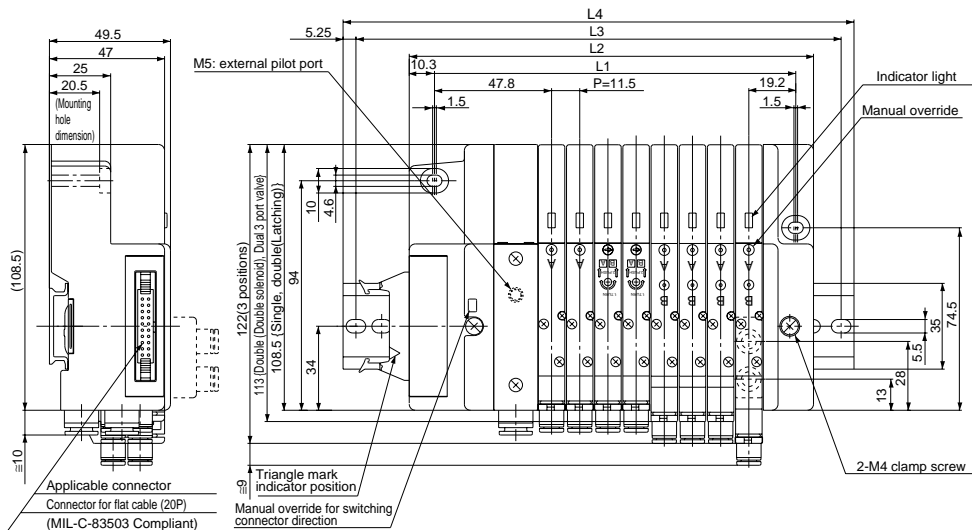
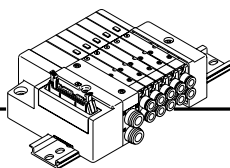
**Dimensions**

Formula  $L1=11.5n+55.5$   $L2=11.5n+73$  n: Stations (Maximum 24 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
L1		67	78.5	90	101.5	113	124.5	136	147.5	159	170.5	182	193.5	205	216.5	228	239.5	251	262.5	274	285.5	297	308.5	320	331.5
L2		84.5	96	107.5	119	130.5	142	153.5	165	176.5	188	199.5	211	222.5	234	245.5	257	268.5	280	291.5	303	314.5	326	337.5	349
L3		112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	300	312.5	325	337.5	350	362.5	375	
L4		123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273	285.5	298	310.5	310.5	323	335.5	348	360.5	373	385.5	

Directional Control Valve

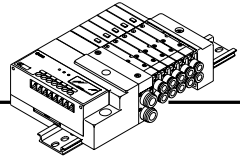
**J** Kit (PC Wiring System Compatible Flat Ribbon Cable Kit)



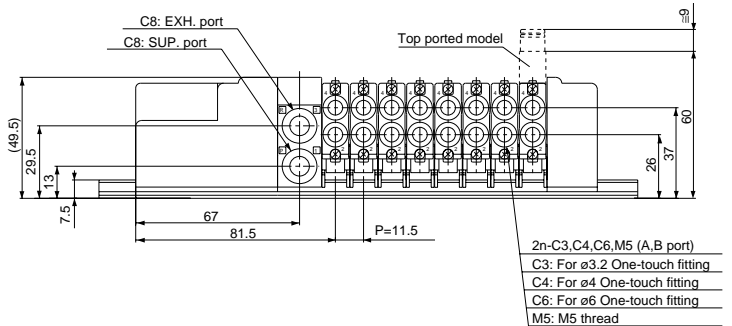
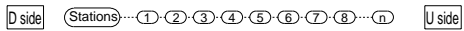
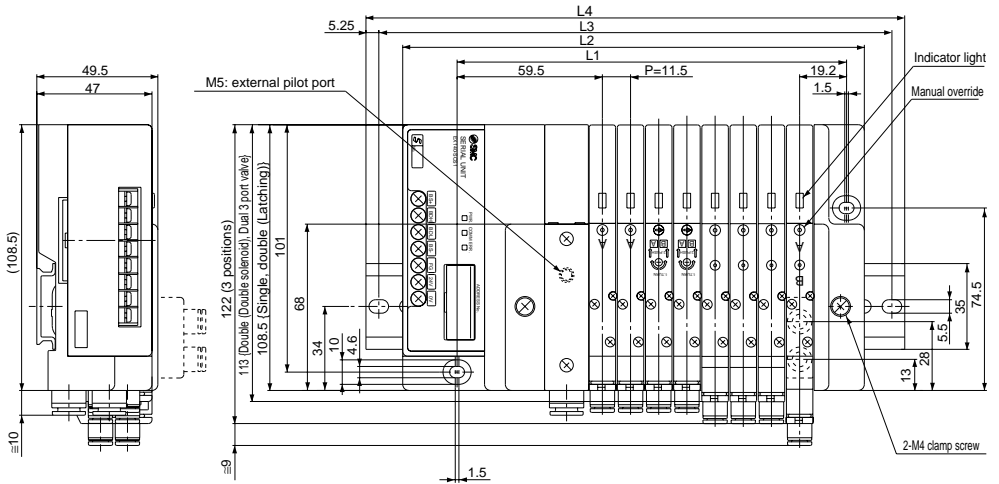
**Dimensions**

Formula  $L1=11.5n+55.5$   $L2=11.5n+73$  n: Stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		67	78.5	90	101.5	113	124.5	136	147.5	159	170.5	182	193.5	205	216.5	228	239.5
L2		84.5	96	107.5	119	130.5	142	153.5	165	176.5	188	199.5	211	222.5	234	245.5	257
L3		112.5	125	137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	
L4		123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273	285.5	298	



**S** Kit (Serial Transmission Kit)



**Dimensions**

Formula  $L1=11.5n+67$   $L2=11.5n+96.5$  n: Stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		78.5	90	101.5	113	124.5	136	147.5	159	170.5	182	193.5	205	216.5	228	239.5	251
L2		108	119.5	131	142.5	154	165.5	177	188.5	200	211.5	223	234.5	246	257.5	269	280.5
L3		137.5	150	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	300	300	
L4		148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273	285.5	298	310.5	310.5	

Directional Control Valve

# Series 10-SQ2000 5 Port Solenoid Valve Plug-in Type

## How to Order for Manifolds

10—SS5Q23—08 FD2—D

### Valve stations

01	1 station
⋮	⋮
Note1) 16	16 stations

Note) The maximum number of stations depends on the type of electrical entries.

### Manifold mounting

D	DIN rail mount type
E	Direct mount type

### Option

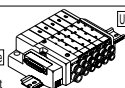
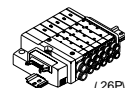
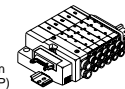
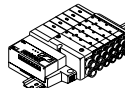
Nil	—
02 to 24	DIN rail length specification Note1)
B	Back pressure check valve
K	Special wiring specification Note2) (Except double wiring)
N	With name plate (For side ported type only)
R	External pilot specifications

Note 1) When a DIN rail longer than the standard types is required, specify the number of stations such as “-D08”.

Note 2) The standard wiring specification is for double wiring. Indicate wiring specifications for single wiring or mixed single and double wiring, or when the number of stations exceeds the standard maximum value (Except for L kit).

Note 3) When more than one option is specified, list them in alphabetical order (e.g. -BDN).

### Electrical entry

Kit name	Electrical entry	Cable specifications	Standard number of stations	Max. number of stations with special wiring	Max. number of solenoids Note 2)	
<b>F kit</b>  D-sub connector kit	D side	FD0	D-sub connector (25P) kit without cable	1 to 12 stations	16 stations	24
		FD1	D-sub connector (25P) kit with 1.5 m cable			
		FD2	D-sub connector (25P) kit with 3.0 m cable			
		FD3	D-sub connector (25P) kit with 5.0 m cable			
<b>P kit</b>  Flat cable connector kit (26P/20P)	D side	PD0	Flat ribbon cable (26P) kit without cable	1 to 12 stations	16 stations	24
		PD1	Flat ribbon cable (26P) kit with 1.5 m cable			
		PD2	Flat ribbon cable (26P) kit with 3.0 m cable			
		PD3	Flat ribbon cable (26P) kit with 5.0 m cable			
	Note1)	PDC	Flat ribbon cable (20P) kit without cable	1 to 9 stations		18
<b>J kit</b>  Flat ribbon cable (20P) (Compatible with PC wiring system)	J side	JD0	Flat ribbon cable (20P) Compatible with PC wiring system	1 to 8 stations	16 stations	16
<b>S kit</b>  Serial transmission kit	D side	SDF	NKE Corporation: Uni wire system compatible	1 to 8 stations	16 stations	16
		SDH	NKE Corporation: Uni wire H system compatible			
		SDJ1	Corporation: S-LINK system (16 outputs) compatible	1 to 4 stations	8 stations	8
		SDJ2	Corporation: S-LINK system (8 outputs) compatible			
		SDQ	Compatible with DeviceNet and Omron CompoBus/D	1 to 8 stations	16 stations	16
		SDR1	Compatible with CompoBus/S (16 points) by OMRON Co.			
		SDR2	Compatible with CompoBus/S (8 points) by OMRON Co.			
SDV	Mitsubishi Electric Corporation: CC-Link compatible	1 to 8 stations	16 stations	16		

Note 1) The 20P type cable of P kit must be procured by the customer.

Note 2) The maximum number of stations should not exceed the maximum number of solenoids. (The number of solenoids are counted as: 1 for single solenoids and 2 for type 3P and 4P double solenoids.)

## ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.



**How to Order for Valves**

**10 — SQ2 1 3 1 5 C6**

**Actuation**

1	2 position single 
2	2 position double (Latching) 
3	3 position closed center 
4	3 position exhaust center 
5	3 position pressure center 

**Manifold block specification**

Nil	M	MB
Without manifold block	With manifold block	With manifold block With built-in back pressure check valve
	 * Lead wire is not included.	 * Lead wire is not included.
· When ordering with manifolds · When only valves are required.		For adding stations

**Port plug mounting port**

Nil	—
A	A port
B	B port

**Seal type**

1	Rubber seal
---	-------------

**Function**

Nil	Standard (1.0WDC)
N	Negative COM
R	External pilot specifications
Note 1) Y	Low wattage type (0.5WDC)

Note 1) Except double (latching) type.  
Note 2) For specifying two or more functions, enter symbols in alphabetical order.

**Cylinder port size**

Port size	Side ported	Top ported
C4	ø4 One-touch fitting	
C6	ø6 One-touch fitting	
C8	ø8 One-touch fitting	
L4	ø4 One-touch fitting (Note)	
L6	ø6 One-touch fitting	
L8	ø8 One-touch fitting	

Note) Can be changed to side ported specification.

**Manual override**

Nil	Note B	Note D
Non-locking push type (tool required)	Locking type (tool required)	Slide locking type (manual type) * Only side ported type applicable

Note) Except double (latching) type.

**Coil voltage**

5	24VDC
6	12VDC

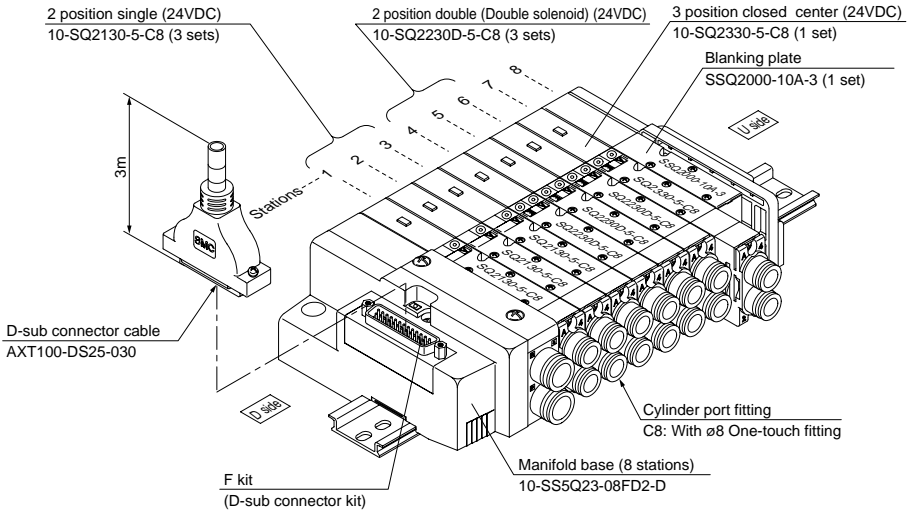
Note) Indicator light/surge voltage suppressor is built-in.

Directional Control Valve

## 5 Port Solenoid Valve Plug-in Type **10-SQ2000**

### How to Order Manifold Assemblies (Example)

With D-sub connector kit cable (3m)



- 10-SS5Q23-08FD2-D** ..... 1 set: **F kit 8 station manifold base**
- \* **10-SQ2130-5-C8** ..... 3 sets: **2 position single**
- \* **10-SQ2230D-5-C8** ..... 3 sets: **2 position double (double solenoid)**
- \* **10-SQ2330-5-C8** ..... 1 set: **3 position closed center**
- \* **SSQ2000-10A-3** ..... 1 set: **Blanking plate**

\* To order valves and options mounted onto the manifold at the factory, list the valve/option with an asterisk (\*) in front of each part number.

Add the valve and option part numbers in order starting from the first station on the D side. When entry of part numbers becomes complicated, indicate on a manifold specification sheet.

**Model**

Series	Number of solenoids	Model		Flow characteristics <sup>Note1)</sup>						Response time <sup>Note2)</sup> ms		Weight (g)	
				1→4/2 (P→A/B)			4/2→5/3 (A/B→R1/R2)			Standard: 1W	Low wattage		
				C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv				
<b>10-SQ2000</b>	2 position	Single	Rubber seal	<b>10-SQ2131</b>	2.3	0.17	0.51	3.1	0.18	0.71	24 or less	31 or less	140
		Double (Latching)	Rubber seal	<b>10-SQ2231</b>	2.3	0.17	0.51	3.1	0.18	0.71	31 or less	—	140
	3 position	Closed center	Rubber seal	<b>10-SQ2331</b>	1.9	0.17	0.46	1.8	0.29	0.47	34 or less	44 or less	175
		Exhaust center	Rubber seal	<b>10-SQ2431</b>	1.9	0.17	0.46	3.1	0.14	0.65	34 or less	44 or less	175
		Pressure center	Rubber seal	<b>10-SQ2531</b>	2.5	0.17	0.56	1.8	0.30	0.47	34 or less	44 or less	175

Note1) Values for the port coded cylinder port size of C8. The side ported type is 10% smaller.  
 Note2) According to JISB8375-1981 (At supply pressure of 0.5MPa with light/surge voltage suppressor.  
 The value differs with the pressure and the quality of air.)

**Specifications**



Valve specifications	Valve type		Rubber seal
	Fluid		Air, Inert gas
	Maximum operating pressure		0.7MPa
	Minimum operating pressure	Single	0.15MPa
		Double (latching)	0.18MPa
		3 position	0.2MPa
	Ambient and fluid temperature		<sup>Note1)</sup> -10 to 50°C
	Lubrication		Not required
	Pilot valve manual override		Push type (tool required)/Locking type (tool required)/Slide locking type (manual type)
	Vibration/Impact resistance <sup>Note2)</sup>		30/150 m/s <sup>2</sup>
Enclosure		Dust proof	
Solenoid specifications	Rated coil voltage		12V, 24VDC
	Allowable voltage fluctuation		±10% of rated voltage
	Type of coil insulation		Equivalent to class B
	Power consumption (Current)	24VDC	1W DC (42mA), <sup>Note3)</sup> 0.5W DC (21mA)
		12VDC	1W DC(83mA), <sup>Note3)</sup> 0.5W DC (42mA)

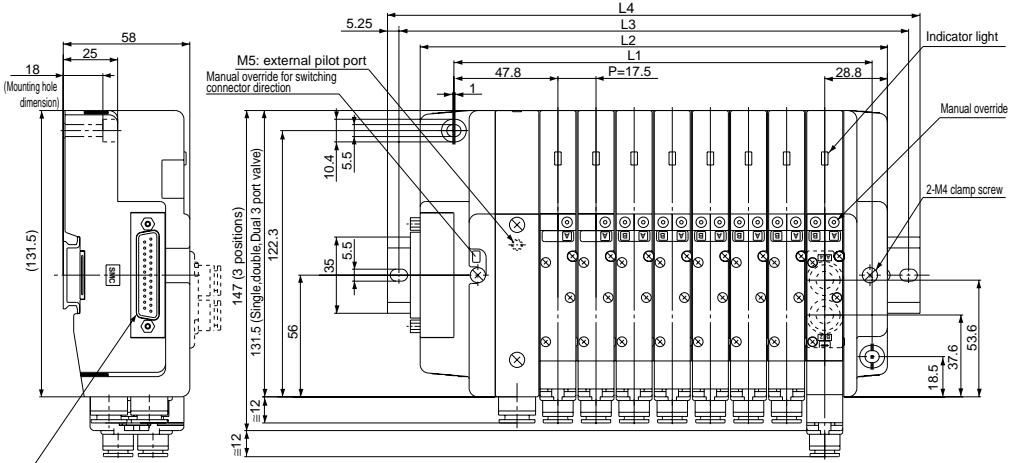
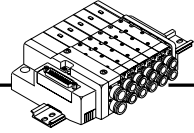
Note 1) Use dry air to prevent condensation when operating at a low temperature.  
 Note 2) Vibration resistance: No malfunction resulted from a one-sweep test between 8.3 and 2000Hz.  
 The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states.  
 Impact resistance: No malfunction resulted in an impact test using a drop impact tester.  
 The test was performed one time each in the axial and right angle directions of the main valve and armature, for both energized and deenergized states (specification).  
 Note 3) Values for low wattage (0.5W)

**Manifold Specifications**

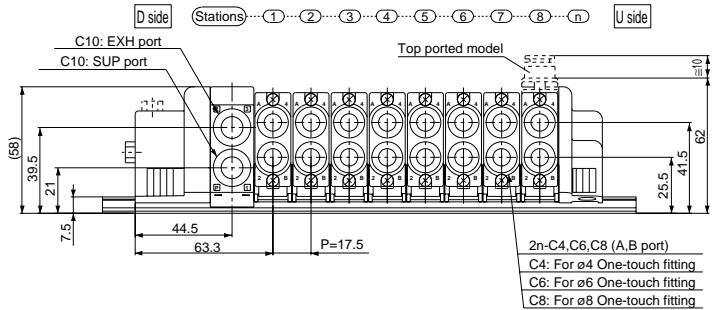
Base model	Piping specifications		Applicable solenoid valve	Connection type	Applicable stations <sup>Note3)</sup>	5 stations weight (g) <sup>Note4)</sup>	Weight increase per station (g) <sup>Note4)</sup>
	Port size <sup>Note1)</sup>						
	P, R	A, B					
10-SQ2000series	Side	C4 (For ø4) C6 (For ø6) C8 (For ø8)	10-SQ2□31	F kit: D-sub connector	1 to 12 stations	580	35
10-SS5Q23-□□-□		Note2) Top		L4 (For ø4) L6 (For ø6) L8 (For ø8)	P kit: Flat ribbon cable	26P 1 to 12 stations 20P 1 to 9 stations	580
	J kit: PC wiring system compatible flat ribbon cable				1 to 8 stations	580	35
	S kit: Serial transmission	1 to 8 stations		650	35		

Note 1) The inch size one-touch fittings are also applicable.  
 Note 2) Can be changed to side ported specification.  
 Note 3) The maximum number of stations can be increased by adopting an optional special wiring specification.  
 Note 4) Except valves.

**F** Kit (D-sub Connector Kit)



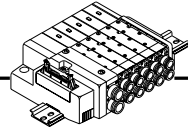
Applicable connector: D-SUB connector (25P)  
(MIL-C-24308 compliant)



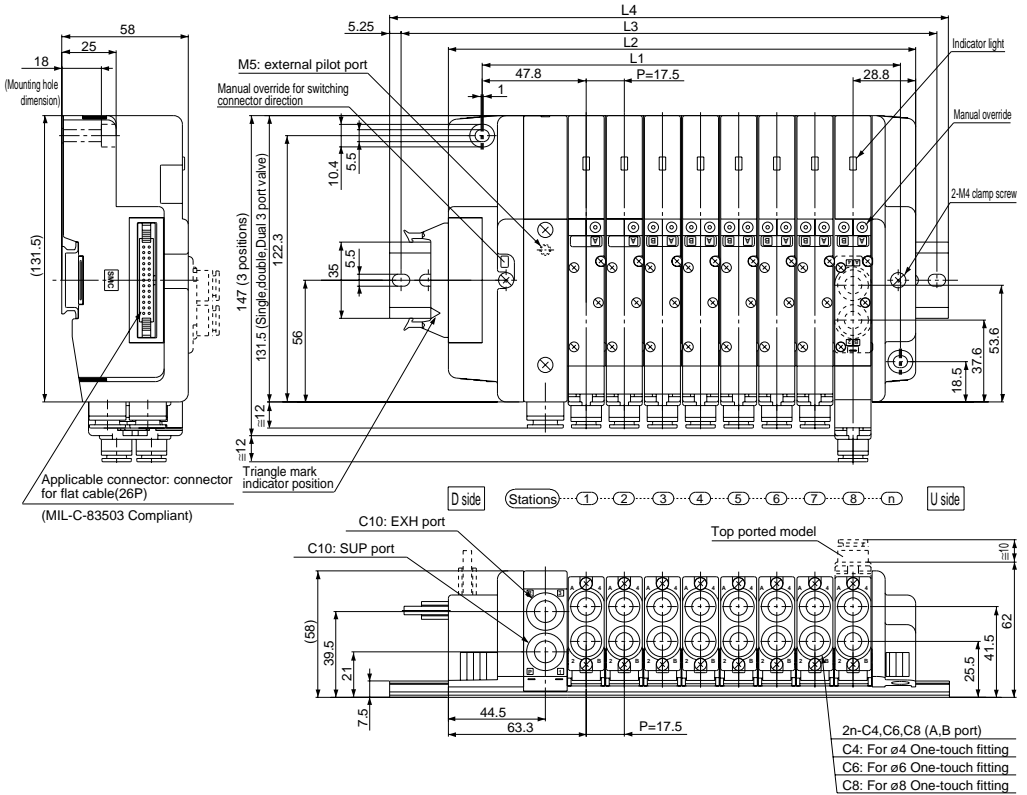
**Dimensions**

Formula  $L1=17.5n+52$   $L2=17.5n+74.5$  n: Stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		69.5	87	104.5	122	139.5	157	174.5	192	209.5	227	244.5	262	279.5	297	314.5	332
L2		92	109.5	127	144.5	162	179.5	197	214.5	232	249.5	267	284.5	302	319.5	337	354.5
L3		112.5	137.5	150	175	187.5	200	225	237.5	262.5	275	287.5	312.5	325	350	362.5	375
L4		123	148	160.5	185.5	198	210.5	235.5	248	273	285.5	298	323	335.5	360.5	373	385.5



**P** Kit (Flat Ribbon Cable Kit)



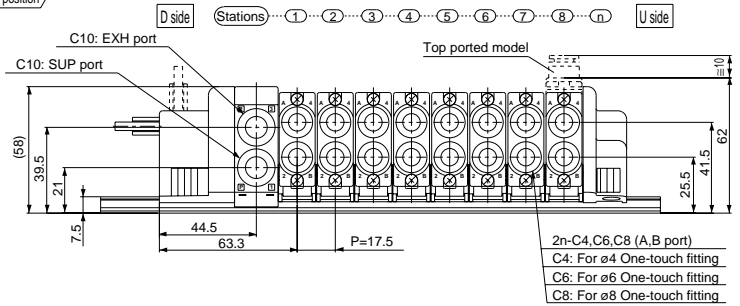
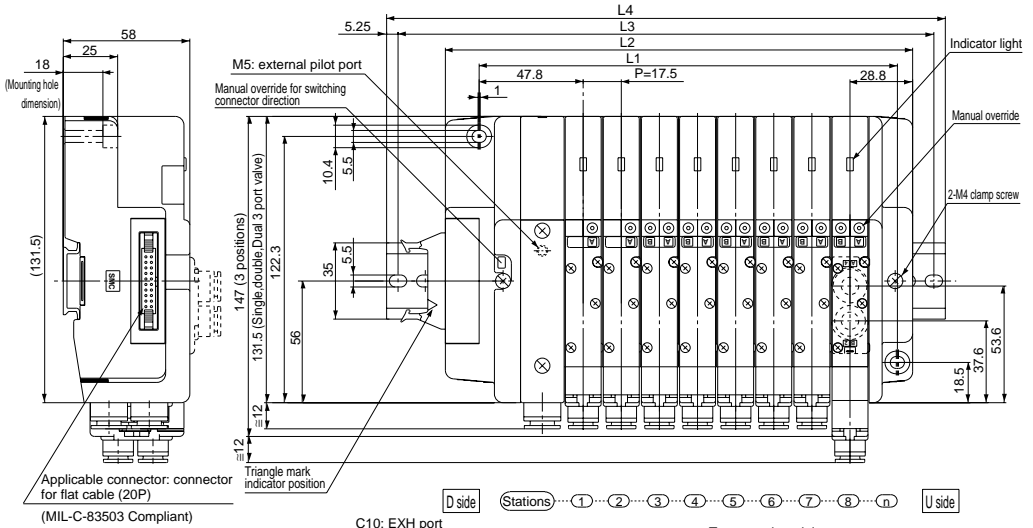
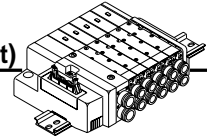
Directional Control Valve

**Dimensions**

Formula L1=17.5n+52 L2=17.5n+74.5 n: Stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		69.5	87	104.5	122	139.5	157	174.5	192	209.5	227	244.5	262	279.5	297	314.5	332
L2		92	109.5	127	144.5	162	179.5	197	214.5	232	249.5	267	284.5	302	319.5	337	354.5
L3		112.5	137.5	150	175	187.5	200	225	237.5	262.5	275	287.5	312.5	325	350	362.5	375
L4		123	148	160.5	185.5	198	210.5	235.5	248	273	285.5	298	323	335.5	360.5	373	385.5

**J** Kit (PC Wiring System Compatible Flat Ribbon Cable Kit)

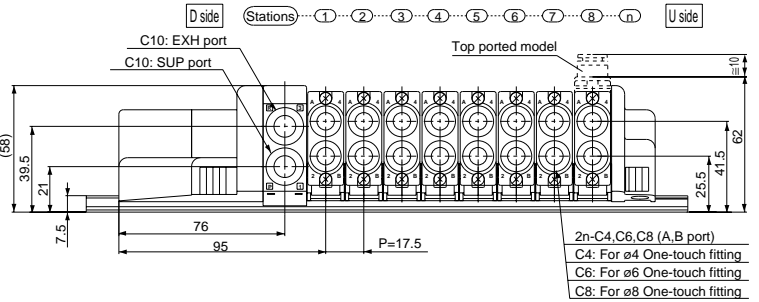
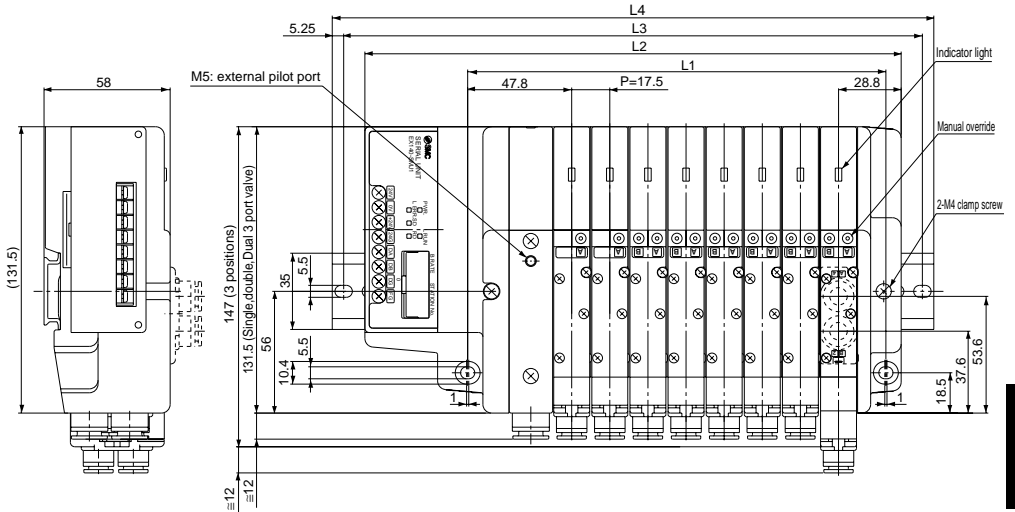
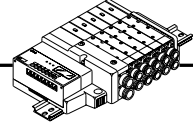


**Dimensions**

Formula  $L1=17.5n+52$   $L2=17.5n+74.5$  n: Stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		69.5	87	104.5	122	139.5	157	174.5	192	209.5	227	244.5	262	279.5	297	314.5	332
L2		92	109.5	127	144.5	162	179.5	197	214.5	232	249.5	267	284.5	302	319.5	337	354.5
L3		112.5	137.5	150	175	187.5	200	225	237.5	262.5	275	287.5	312.5	325	350	362.5	375
L4		123	148	160.5	185.5	198	210.5	235.5	248	273	285.5	298	323	335.5	360.5	373	385.5

**S** Kit (Serial Transmission Kit)



**Dimensions**

Formula L1=17.5n+52 L2=17.5n+106 n: stations (Maximum 16 stations)

L	n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1		69.5	87	104.5	122	139.5	157	174.5	192	209.5	227	244.5	262	279.5	297	314.5	332
L2		123.5	141	158.5	176	193.5	211	228.5	246	263.5	281	298.5	316	333.5	351	368.5	386
L3		150	162.5	187.5	200	225	237.5	250	275	287.5	312.5	325	337.5	362.5	375	400	412.5
L4		160.5	173	198	210.5	235.5	248	260.5	285.5	298	323	335.5	348	373	385.5	410.5	423

# Series 10-SY Base Mounted Type Single Valve

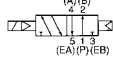
## How to Order

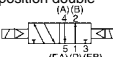
10- SY **5** **2** **40**   **5** **L**      

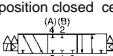
**Series**

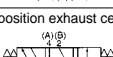
3	10-SY3000
5	10-SY5000
7	10-SY7000

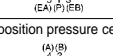
**Actuation**

1 2 position single (A)(B)  
  
 (EA)(P)(EB)

2 2 position double (A)(B)  
  
 (EA)(P)(EB)

3 3 position closed center (A)(B)  
  
 (EA)(P)(EB)

3 3 position exhaust center (A)(B)  
  
 (EA)(P)(EB)

3 3 position pressure center (A)(B)  
  
 (EA)(P)(EB)

**Pilot system**

Nil	Internal pilot
R	External pilot

**Rated voltage**

**DC specifications**

5	24VDC
6	12VDC
V	6VDC
S	5VDC
R	3VDC

**AC specifications (50/60 Hz)**




1	100VAC
2	200VAC
3	110VAC [115VAC]
4	220VAC [230VAC]

\*Only 24 VDC and 12 VDC are available for D and DO types.  
 \*Types D and DO are not available with 10-SY3000.

**Port size**

Symbol	Port size	Applicable series
Nil	Without sub-plate	
01	Rc1/8 Mounted with sub-plate	10-SY3000
02	Rc1/4 Mounted with sub-plate	10-SY5000 10-SY7000
03	Rc3/8 Mounted with sub-plate	10-SY7000

**Manual override**











Nil: Non-locking push type   
 D: Push-turn locking Slotted type   
 E: Push-turn locking lever type 

**Light/surge voltage suppressor**

If the electrical entry is G, H, L or M.		If the electrical entry is D.	
Nil	Without light/surge suppressor	Nil	Without light/surge suppressor
S	With surge suppressor	S	With surge suppressor (Non-polar type)
Z	With light/surge suppressor	Z	With light/surge suppressor (Non-polar type)
R	With surge suppressor (Non-polar type)		*DOZ is not available.
U	With light/surge suppressor (Non-polar type)		*Type "S" is not available with AC, which prevents surge voltage with a rectifier.

\*Type "S" is not available with AC, which prevents surge voltage with a rectifier.  
 \*Only DC is available with R and U.

**Electrical entry**

24V, 12V, 6V, 5V, 3VDC/100V, 110V, 200V, 220VAC				24V, 12VDC 100V, 110V, 200V, 220VAC
<b>Grommet</b>	<b>L plug connector</b>	<b>M plug connector</b>		<b>DIN terminal</b>
G: Lead wire Length 300mm	L: With lead wire (Length 300mm)	M: With lead wire (Length 300mm)	MN: Without lead wire	(Not including 10-SY3000.) D: With connector
				
H: Lead wire Length 600mm	LN: Without lead wire	LO: Without connector	MO: Without connector	DO: Without connector
				

\*Types LN and MN include 2 sockets.  
 \*Types D and DO are not available with 10-SY3000.



**Specifications**



Series		10-SY3000	10-SY5000	10-SY7000
Fluid		Air		
Internal pilot operating pressure range MPa	2 position single	0.15 to 0.7		
	2 position double	0.1 to 0.7		
	3 position	0.2 to 0.7		
External pilot operating pressure range MPa	Operating pressure range		-100kPa to 0.7	
	Pilot pressure range	2 position single	0.25 to 0.7	
		2 position double	0.25 to 0.7	
		3 position	0.25 to 0.7	
Ambient and fluid temperature °C		Max. 50		
Maximum operating frequency Hz	2 position single, double	10	5	5
	3 position	3	3	3
Manual override		Non-locking push type, Push-turn locking push type, Push-turn locking lever type		
Pilot exhaust method	Internal pilot	Common exhaust (Pilot and main valve)		
	External pilot	Individual pilot exhaust		
Lubrication		Not required		
Mounting orientation		Free		
Shock resistance/vibration resistance m/s <sup>2</sup>		150/30		
Enclosure		Dust proof (*DIN connector IP65)		

\*According to IEC529  
 Note) Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed in the axial and right angle directions of the main valve and armature, for both energized and deenergized states. (Value in the initial stage).  
 Vibration resistance: No malfunction resulted in a one-sweep between 8.3 and 2000Hz. The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage)

**Solenoid Specifications**

Electrical entry		Grommet (G)/(H), L plug connector (L), M plug connector (M), *DIN connector (D)	
Rated coil voltage	DC	24, 12, 6, 5, 3	
	50/60 Hz AC	*100, 110, 200, 220	
Allowable voltage fluctuation		±10% of rated voltage	
Power consumption W	DC	0.5 (Lamp absorber: 0.55/DIN connector with lamp: 0.6)	
	AC	100V	0.9 (Lamp absorber: 1.0)
110V		1.0 (Lamp absorber: 1.1)	
[115V]		[1.1 (Lamp absorber: 1.2)]	
200V		1.8 (Lamp absorber: 1.9)	
220V		1.9 (Lamp absorber: 2.0)	
[230V]		[2.2 (Lamp absorber: 2.3)]	
Surge voltage suppressor		Diode (ZNR for DIN terminal, zener diode for G, L or M non-polar type)	
Indicator light		LED (Neon bulb for AC type DIN terminal)	

\*The DIN terminal (D) is not available with 10-SY3000.  
 \*110VAC and 115VAC are common, as are 220VAC and 230VAC.  
 \*Energy saving type [0.22W] type is also available.

**⚠ Caution**

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

**Response Time**

Note) According to JISB8375-1981 dynamic performance test (With coil temperature of 20°C, at rated voltage and without surge voltage suppressor)

**10-SY3000**

Actuation	Response time ms (0.5 MPa)			
	Without light/surge suppressor	With light/surge suppressor		
		S, Z type	R, U type	
2 position single	12 or less	15 or less	12 or less	
2 position double	10 or less	13 or less	10 or less	
3 position	15 or less	20 or less	16 or less	

**10-SY7000**

Actuation	Response time ms (0.5 MPa)			
	Without light/surge suppressor	With light/surge suppressor		
		S, Z type	R, U type	
2 position single	31 or less	38 or less	33 or less	
2 position double	27 or less	30 or less	28 or less	
3 position	50 or less	56 or less	50 or less	

**10-SY5000**

Actuation	Response time ms (0.5 MPa)			
	Without light/surge suppressor	With light/surge suppressor		
		S, Z type	R, U type	
2 position single	19 or less	26 or less	19 or less	
2 position double	18 or less	22 or less	18 or less	
3 position	32 or less	38 or less	32 or less	

**Solenoid Valve 10-SY3000/5000/7000**

**Series 10-SY3000 Dimensions**

**Note) [ ] : For AC, < > : With surge voltage suppressor.**

**2 position single**

Grommet (G),(H): 10-SY3140(R)-□<sub>H</sub><sup>G</sup>□□-01

L plug connector (L): 10-SY3140(R)-□L□□-01

M plug connector (M): 10-SY3140(R)-□M□□-01

Series 10-SY3000 **Dimensions**

Note) [ ] : For AC, < > : With surge voltage suppressor.

2 position double

Grommet (G),(H): 10-SY3240(R)-□<sub>H</sub><sup>G</sup>□□-01

L plug connector (L): 10-SY3240(R)-□L□□-01

M plug connector (M): 10-SY3240(R)-□M□□-01

**Solenoid Valve 10-SY3000/5000/7000**

**Series 10-SY3000 Dimensions**

**Note) [ ] : For AC, < > : With surge voltage suppressor.**

**3 position closed center/Exhaust center/Pressure center**

Grommet (G),(H): 10-SY3 $\frac{3}{4}$ 40(R)-□<sub>H</sub><sup>G</sup>□□-01

L plug connector(L): 10-SY3 $\frac{3}{4}$ 40(R)-□L□□-01

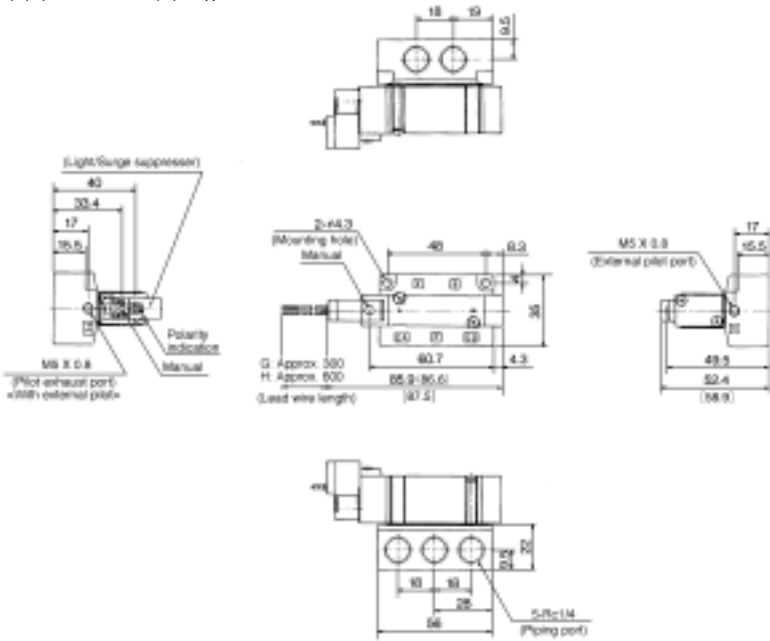
M plug connector (M):10-SY3 $\frac{3}{4}$ 40(R)-□M□□-01

Series 10-SY5000 Dimensions

Note) [ ] : For AC, < > : With surge voltage suppressor.

2 position single

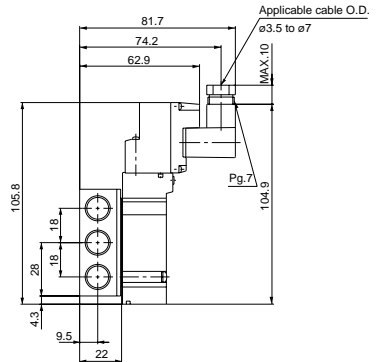
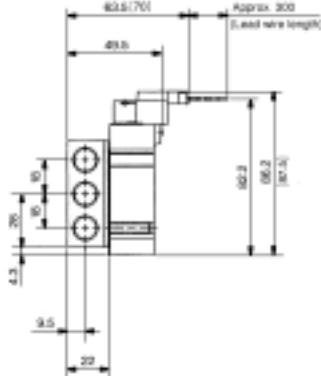
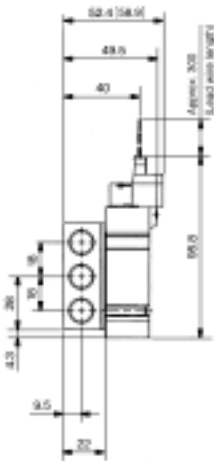
Grommet (G),(H): 10-SY5140(R)-□□□□-02



L plug connector (L):  
10-SY5140(R)-□L□□□-02

M plug connector (M):  
10-SY5140(R)-□M□□□-02

DIN terminal (D):  
10-SY5140(R)-□D□□□-02



Directional Control Valve

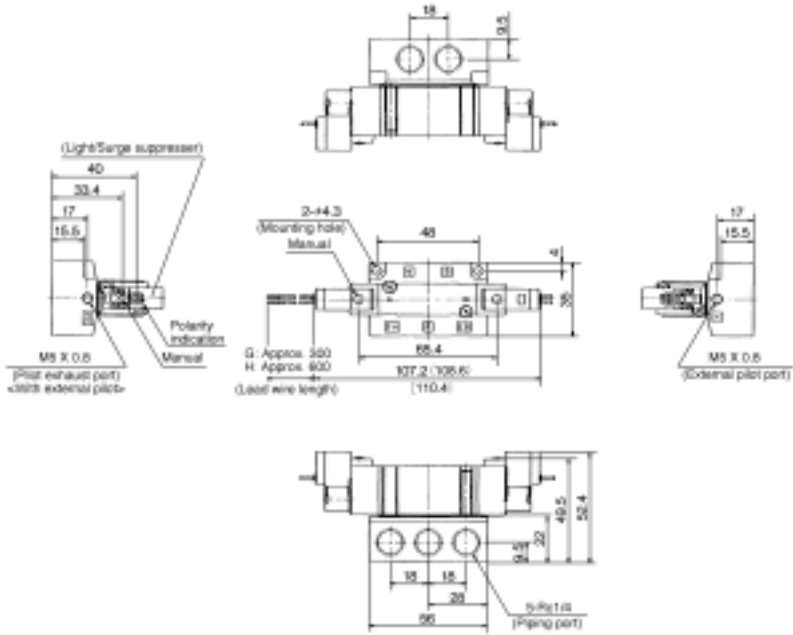
**Solenoid Valve 10-SY3000/5000/7000**

**Series 10-SY5000 Dimensions**

**Note) [ ] : For AC, < > : With surge voltage suppressor.**

**2 position double**

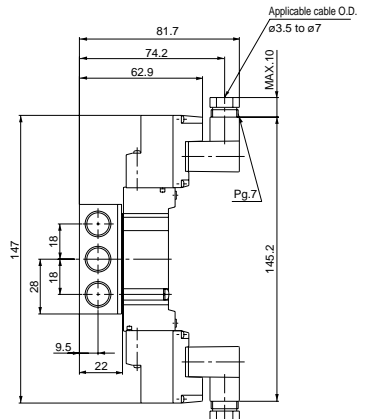
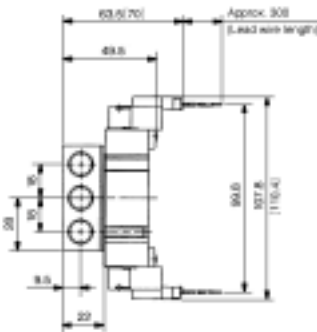
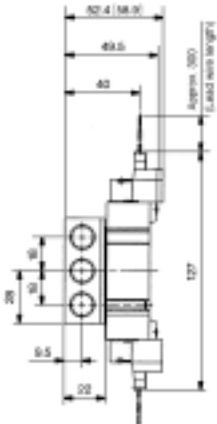
Grommet (G),(H): 10-SY5240(R)-□□□□-02



L plug connector (L):  
10-SY5240(R)-□□□□-02

M plug connector (M):  
10-SY5240(R)-□□□□-02

DIN terminal (D):  
10-SY5240(R)-□□□□-02

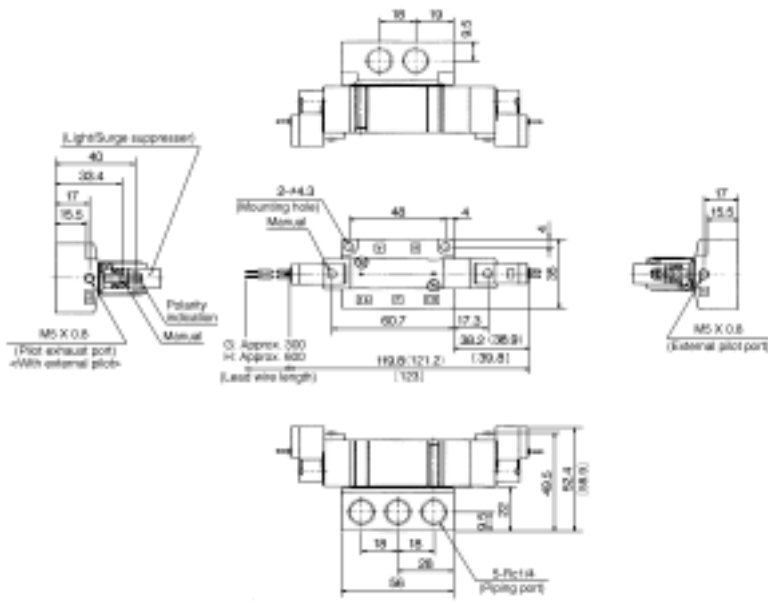


Series 10-SY5000 Dimensions

Note) [ ] : For AC, < > : With surge voltage suppressor.

3 position closed center/Exhaust center/Pressure center

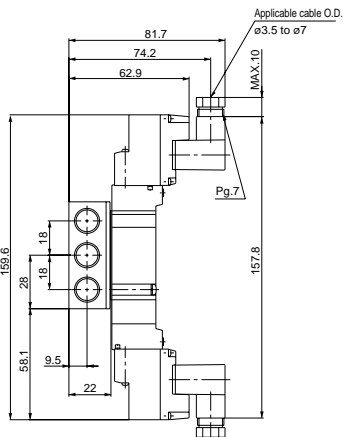
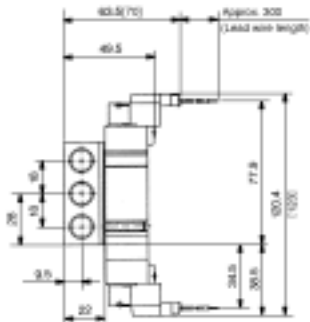
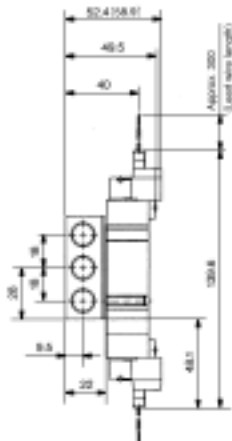
Grommet (G),(H): 10-SY5 $\frac{3}{5}$ 40(R)-□□□□-02



L plug connector (L):  
10-SY5 $\frac{3}{5}$ 40(R)-□□□□-02

M plug connector (M):  
10-SY5 $\frac{3}{5}$ 40(R)-□M□□-02

DIN terminal (D):  
10-SY5 $\frac{3}{5}$ 40(R)-□D□□-02



Directional Control Valve

# Solenoid Valve 10-SY3000/5000/7000

## Series 10-SY7000 Dimensions

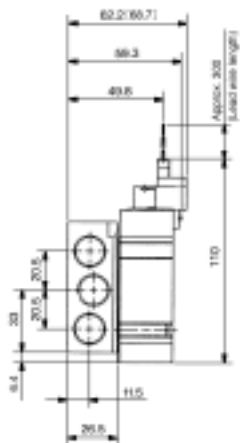
Note) [ ] : For AC, < > : With surge voltage suppressor.

### 2 position single

Grommet (G),(H): 10-SY7140(R)-□□□□-02

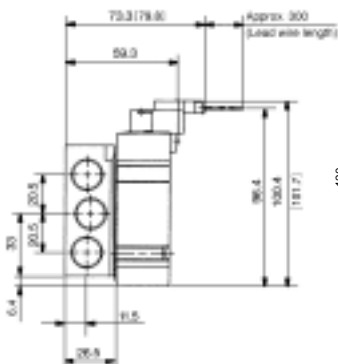
#### L plug connector (L):

10-SY7140(R)-□□□□-02



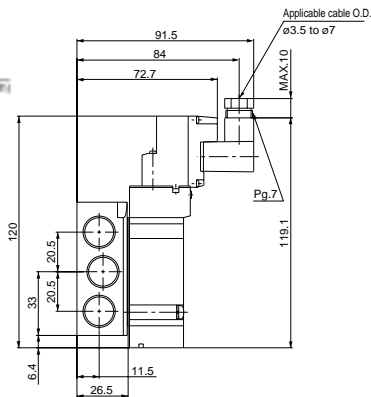
#### M plug connector (M):

10-SY7140(R)-□M□□□□-02



#### DIN terminal (D):

10-SY7140(R)-□D□□□□-02





Series 10-SY7000 Dimensions

Note) [ ] : For AC, < > : With surge voltage suppressor.

2 position double

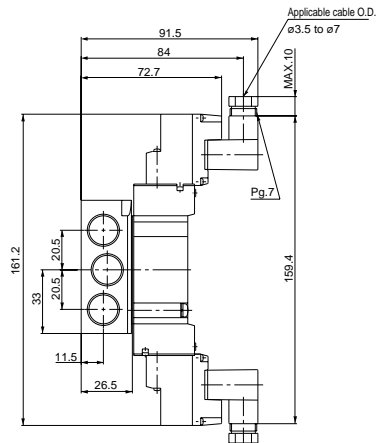
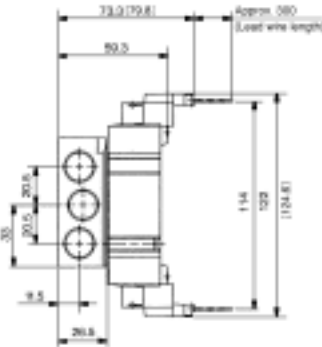
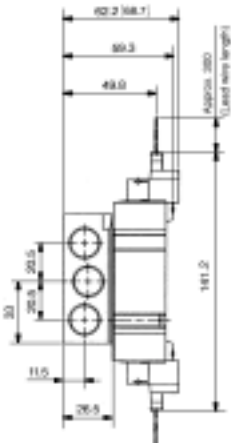
Grommet (G),(H):10-SY7240(R)-□<sub>H</sub>□□<sub>02</sub><sup>03</sup>

Directional Control Valve

L plug connector (L):  
10-SY7240(R)-□□□□<sub>02</sub><sup>03</sup>

M plug connector (M):  
10-SY7240(R)-□M□□□<sub>02</sub><sup>03</sup>

DIN terminal (D):  
10-SY7240(R)-□D□□□<sub>02</sub><sup>03</sup>



# Solenoid Valve 10-SY3000/5000/7000

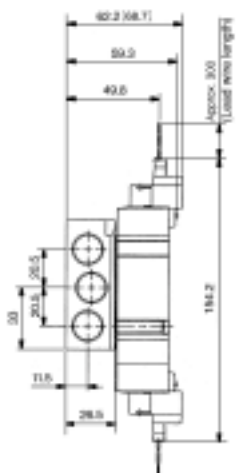
## Series 10-SY7000 Dimensions

Note) [ ] : For AC, < > : With surge voltage suppressor.

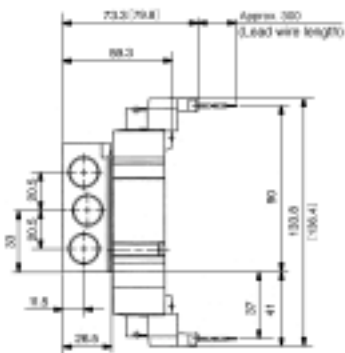
3 position closed center/Exhaust center/Pressure center

Grommet (G),(H): 10-SY7 $\frac{3}{5}$ 40(R)-□□ $\frac{02}{03}$

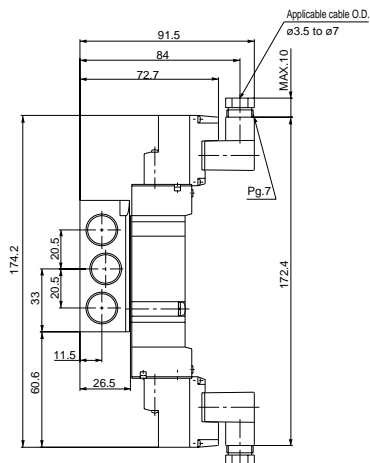
L plug connector (L):  
10-SY7 $\frac{3}{5}$ 40(R)-□□□□ $\frac{02}{03}$



M plug connector (M):  
10-SY7 $\frac{3}{5}$ 40(R)-□M□□□□ $\frac{02}{03}$



DIN terminal (D):  
10-SY7 $\frac{3}{5}$ 40(R)-□□□□□□ $\frac{02}{03}$





## Manifold Specifications

### Base Mounted Type Bar Stock / Individual Wiring

#### How to Order for Manifolds

##### Type 41/Compact type

10-SS5Y 5-41-05-C8

Manifold series	
3	10-SY3000
5	10-SY5000

Stations	
02	2 stations
⋮	⋮
20	20 stations

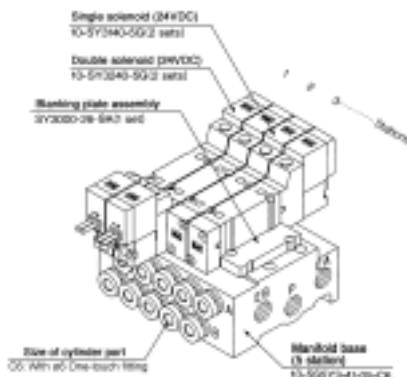


\* Includes the number of blanking plate assemblies.

##### A/B port size

Symbol	Port size	Applicable series
M5	M5 X 0.8	10-SY3000
C4	ø4 One-touch fitting	
C6	ø6 One-touch fitting	
01	Rc1/8	10-SY5000
C6	ø6 One-touch fitting	
C8	ø8 One-touch fitting	

#### How to Order for Manifold Assemblies (Example)



##### Type 42/Common external pilot type

10-SS5Y 5-42-05-C8

Manifold series	
3	10-SY3000
5	10-SY5000
7	10-SY7000

Stations	
02	2 stations
⋮	⋮
20	20 stations

##### A/B port size

Symbol	Port size	Applicable series
01	Rc1/8	10-SY3000
C4	ø4 One-touch fitting	
C6	ø6 One-touch fitting	
02	Rc1/4	10-SY5000
C6	ø6 One-touch fitting	
C8	ø8 One-touch fitting	
02	Rc1/4	10-SY7000
C10	ø10 One-touch fitting	

10-SS5Y3-41-05-C6 .....1 set (Type 41P 5 station manifold base part number.)  
 \* 10-SY3240-5G .....2 sets (Double solenoid part No.)  
 \* 10-SY3140-5G .....2 sets (Single solenoid part No.)  
 \* SY3000-26-9A .....1 set (Blanking plate Ass'y part No.)  
 ↳ To order valves and options mounted onto the manifold at the factory, list the valve/option with an asterisk (\*) in front of each part number.

Add the valve and option part numbers in order starting from the first station as shown above. When entry of part numbers becomes complicated, indicate on a manifold specification sheet.

## How to Order Valves

**10-SY 5 2 40** **5** **L**

**Series**

3	10-SY3000
5	10-SY5000
7	10-SY7000

**Actuation**

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

**Pilot system**

Nil	Internal pilot
R	External pilot

**Rated voltage**

**DC specifications**

5	24VDC
6	12VDC
V	6VDC
S	5VDC
R	3VDC

**AC specifications (50/60 Hz)**

1	100VAC
2	200VAC
3	110VAC [115VAC]
4	220VAC [230VAC]

\* Only 24 VDC and 12 VDC are available for D and DO types.  
\* Types D and DO are not available with 10-SY3000.

**Manual override**

Nil	Non-locking push type
D	Push-turn locking slotted type
E	Push-turn locking lever type

**Light/Surge voltage suppressor**

**If the electrical entry is G, H, L or M.**

Nil	Without light/surge suppressor
S	With surge suppressor
Z	With light/surge suppressor
R	With surge suppressor (Non-polar type)
U	With light/surge suppressor (Non-polar type)

\* Type "S" is not available with AC, which prevents surge voltage with a rectifier.  
\* Only DC is available with R and U.

**If the electrical entry is D.**

Nil	Without light/surge suppressor
S	With surge suppressor (Non-polar type)
Z	With light/surge suppressor (Non-polar type)

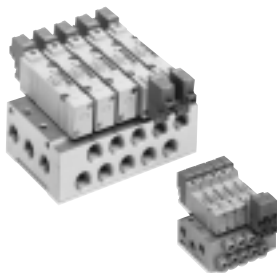
\* DOZ is not available.  
\* Type "S" is not available with AC, which prevents surge voltage with a rectifier.

**Electrical entry**

24V, 12V, 6V, 5V, 3V DC/100V, 110V, 200V, 220VAC			24V, 12VDC 100V, 110VAC, 200V, 220VAC
<b>Grommet</b>	<b>L plug connector</b>	<b>M plug connector</b>	<b>DIN terminal</b>
<b>G: Lead wire</b> Length 300mm	<b>L: With lead wire</b> (Length 300mm)	<b>M: With lead wire</b> (Length 300mm)	(Not including 10-SY3000.)
<b>H: Lead wire</b> Length 600mm	<b>LN: Without lead wire</b> <b>LO: Without connector</b>	<b>MN: Without lead wire</b> <b>MO: Without connector</b>	<b>D: Connector</b> <b>DO: Without connector</b>


\*LN and MN types include 2 sockets.  
\*Types D and DO are not available with 10-SY3000.

Directional Control Valve



### Manifold Specifications

Model	<b>10-SS5Y3-41</b>		<b>10-SS5Y3-42</b>		<b>10-SS5Y5-41</b>		<b>10-SS5Y5-42</b>		<b>10-SS5Y7-42</b>	
Applicable valve	<b>10-SY3□40</b>				<b>10-SY5□40</b>				<b>10-SY7□40</b>	
Manifold type	Single base type/B mount									
P(SUP)/R(EXH) system	Common SUP/EXH									
Stations	2 to 20 stations (Note1)									
A/B port piping specifications	Location	Base								
	Direction	Side								
Port size	P, EA, EB port	Rc1/8			Rc1/4			Rc1/4		
	A, B port	M5 X 0.8 C4 (#4One-touch fitting) C6 (#6One-touch fitting)	Rc1/8 C4 (#4One-touch fitting) C6 (#6One-touch fitting)	Rc1/8 C6 (#6One-touch fitting) C8 (#8One-touch fitting)	Rc1/4 C6 (#6One-touch fitting) C8 (#8One-touch fitting)	Rc1/4 C6 (#6One-touch fitting) C8 (#8One-touch fitting)	Rc1/4 C10 (#10One-touch fitting)			
Manifold base weight W (g) n: Stations	W=30n+50		W=37n+63		W=61n+101		W=79n+127		W=100n+151	

 Note) In case of 10 or more stations (5 or more stations with 10-SS5Y7), supply pressure to P ports on both sides and exhaust from EA and EB ports on both sides.

### Flow Characteristics

Model	Port size		Flow characteristics					
	1,5,3 (P,EA,EB)	4,2 (A,B)	1→4/2 (P→A/B)			4/2→5/3 (A/B→EA/EB)		
			C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv
<b>SS5Y3-41</b>	Rc1/8	C6	0.75	0.19	0.18	0.81	0.23	0.20
<b>SS5Y3-42</b>	Rc1/8	C6	0.75	0.20	0.18	0.82	0.20	0.20
<b>SS5Y5-41</b>	Rc1/4	C8	1.8	0.23	0.44	1.9	0.16	0.45
<b>SS5Y5-42</b>	Rc1/4	C8	1.9	0.20	0.46	1.9	0.12	0.43
<b>SS5Y7-42</b>	Rc1/4	C10	3.0	0.25	0.75	3.0	0.12	0.66

Note) Value is for manifold base with 5 stations and individually operated 2 position type.

10-SY3000:10-SS5Y3-41- Stations -M5, C4, C6 Note) [ ] : For AC, < > : With surge voltage suppressor.  
 Grommet (G)

M5

L plug connector (L)

M plug connector (M)

Directional Control Valve

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>L1</b>	38.5	49	59.5	70	80.5	91	101.5	112	122.5	133	143.5	154	164.5	175	185.5	196	206.5	217	227.5
<b>L2</b>	30.5	41	51.5	62	72.5	83	93.5	104	114.5	125	135.5	146	156.5	167	177.5	188	198.5	209	219.5

**Solenoid Valve 10-SY3000/5000/7000**

10-SY5000: 10-SS5Y5-41- [Stations] -01, C6, C8 Note [ ]: For AC, < > : With surge voltage suppressor.

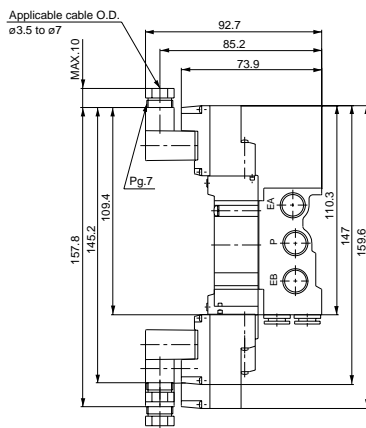
Grommet (G)

Rc1/8

L plug connector (L)

M plug connector (M)

DIN terminal (D)



Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	52.5	68.5	84.5	100.5	116.5	132.5	148.5	164.5	180.5	196.5	212.5	228.5	244.5	260.5	276.5	292.5	308.5	324.5	340.5
L2	42	58	74	90	106	122	138	154	170	186	202	218	234	250	266	282	298	314	330



10-SY3000:10-SS5Y3-42- Stations -C4, C6

Note) [ ] : For AC, < > : With surge voltage suppressor.

Grommet (G)

L plug connector (L)

M plug connector (M)

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>L1</b>	38.5	49	59.5	70	80.5	91	101.5	112	122.5	133	143.5	154	164.5	175	185.5	196	206.5	217	227.5
<b>L2</b>	30.5	41	51.5	62	72.5	83	93.5	104	114.5	125	135.5	146	156.5	167	177.5	188	198.5	209	219.5

**Solenoid Valve 10-SY3000/5000/7000**

10-SY3000: 10-SS5Y3-42- Stations -01

Note) [ ] : For AC, < > : With surge voltage suppressor.

Grommet (G)

L plug connector (L)

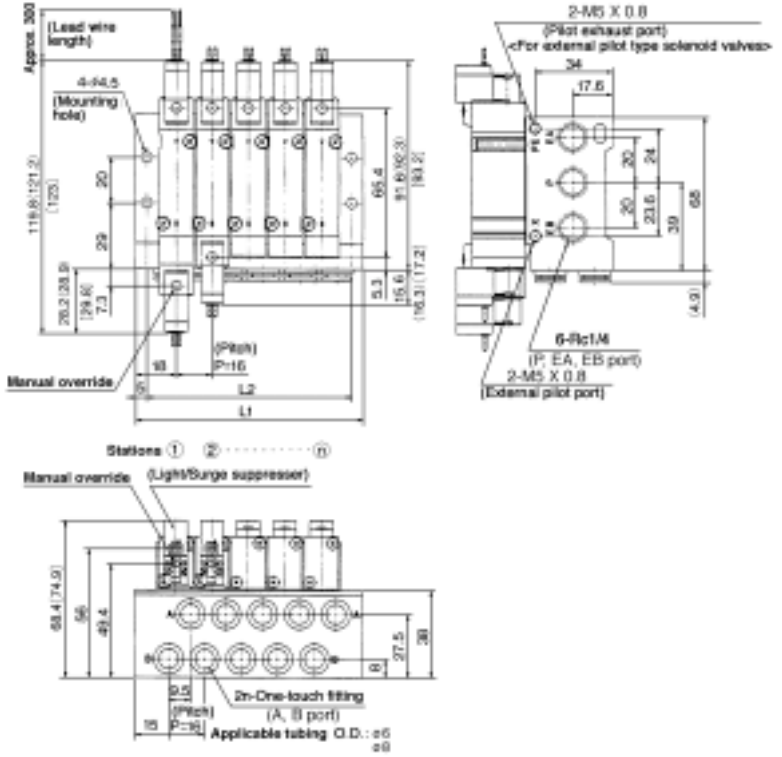
M plug connector (M)

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>L1</b>	47.5	60	72.5	85	97.5	110	122.5	135	147.5	160	172.5	185	197.5	210	222.5	235	247.5	260	272.5
<b>L2</b>	39.5	52	64.5	77	89.5	102	114.5	127	139.5	152	164.5	177	189.5	202	214.5	227	239.5	252	264.5

10-SY5000:10-SS5Y5-42- Stations -C6, C8

Note) [ ] : For AC, < > : With surge voltage suppressor.

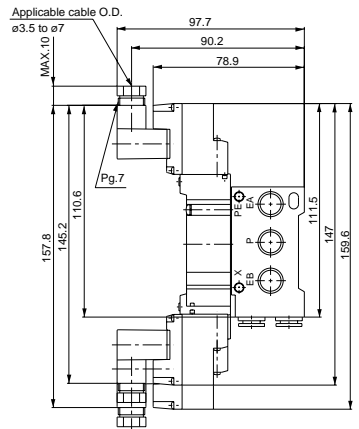
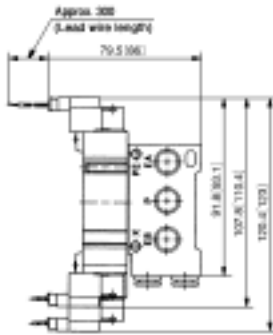
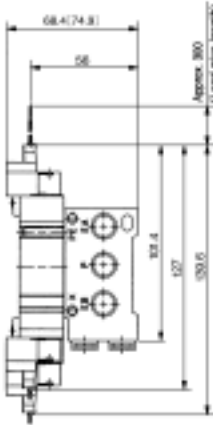
Grommet (G)



L plug connector (L)

M plug connector (M)

DIN terminal (D)



Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276	292	308	324	340
L2	42	58	74	90	106	122	138	154	170	186	202	218	234	250	266	282	298	314	330

# Solenoid Valve 10-SY3000/5000/7000

10-SY5000: 10-SS5Y5-42- Stations -02

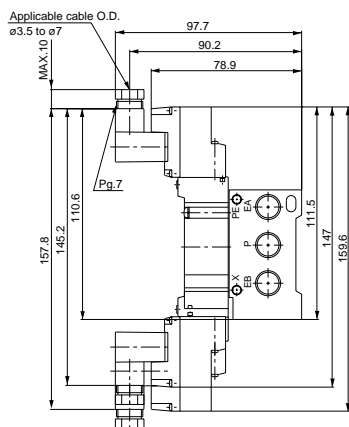
Note) [ ] : For AC, < > : With surge voltage suppressor.

Grommet (G)

L plug connector (L)

M plug connector (M)

DIN terminal (D)



Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	59.5	77	94.5	112	129.5	147	164.5	182	199.5	217	234.5	252	269.5	287	304.5	322	339.5	357	374.5
L2	49.5	67	84.5	102	119.5	137	154.5	172	189.5	207	224.5	242	259.5	277	294.5	312	329.5	347	364.5

10-SY7000: 10-SS5Y7-42- Stations -02, C10

Note) [ ] : For AC, < > : With surge voltage suppressor.

Grommet (G)

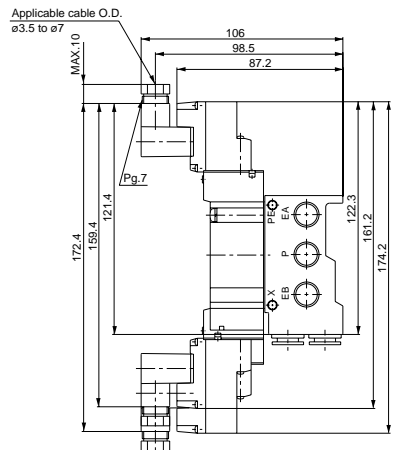
Rc1/4

Directional Control Valve

L plug connector (L)

M plug connector (M)

DIN terminal (D)



Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	61	80	99	118	137	156	175	194	213	232	251	270	289	308	327	346	365	384	403
L2	49	68	87	106	125	144	163	182	201	220	239	258	277	296	315	334	353	372	391

# Manifold Specifications

## Base Mounted Type Bar Stock / Flat Ribbon Cable Type


### How to Order for Manifolds

#### Type 41P/Compact type

**10-SS5Y 5-41P-05-C8**

Manifold series	
3	10-SY3000
5	10-SY5000

Stations	
03	3 stations
:	:
12	12 stations

 Note: 4 to 12 stations in case of 10-SS5Y3.


A,B port size		
Symbol	Port size	Applicable series
M5	M5 X 0.8	
C4	ø4 One-touch fitting	10-SY3000
C6	ø6 One-touch fitting	
01	Rc1/8	
C6	ø6 One-touch fitting	10-SY5000
C8	ø8 One-touch fitting	

#### Type 42P/Common external pilot type

**10-SS5Y 5-42P-05-C8**

Manifold series	
3	10-SY3000
5	10-SY5000
7	10-SY7000

Stations	
03	3 stations
:	:
12	12 stations

 Note: 4 to 12 stations in case of 10-SS5Y3.

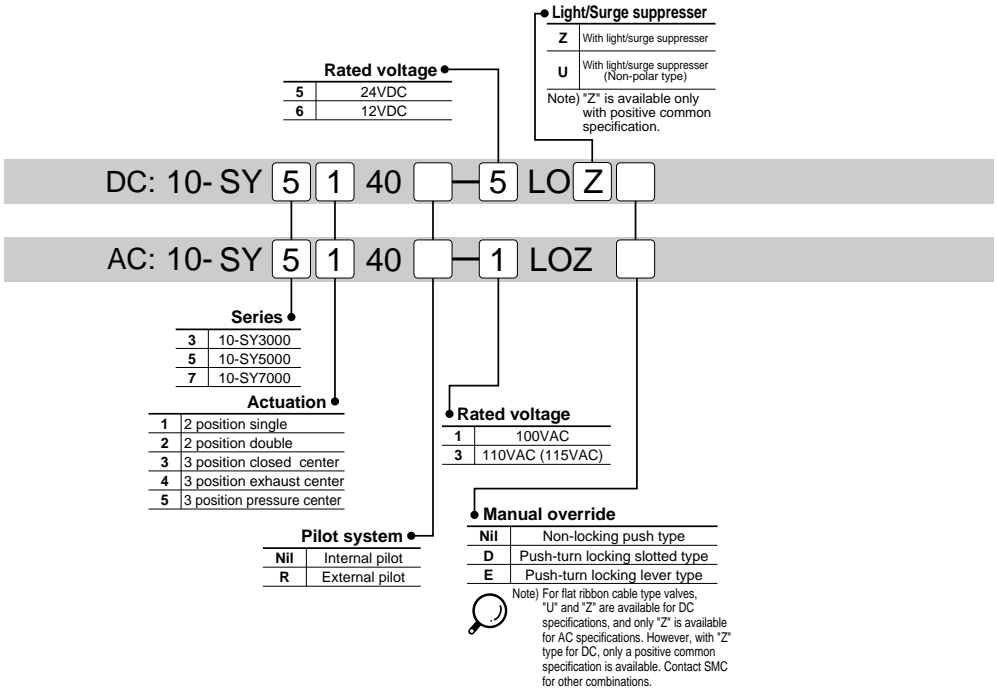
A,B port size		
Symbol	Port size	Applicable series
01	Rc1/8	
C4	ø4 One-touch fitting	10-SY3000
C6	ø6 One-touch fitting	
02	Rc1/4	
C6	ø6 One-touch fitting	10-SY5000
C8	ø8 One-touch fitting	
02	Rc1/4	10-SY7000
C10	ø10 One-touch fitting	

### How to Order for Manifold Assemblies (Example)

10-SS5Y3-41P-06-C6 ..... 1 set (Type 41P 6 station manifold base part number.)  
 \* SY3000-26-10A..... 1 set (Blanking plate Ass'y part No.)  
 \* 10-SY3140-5LOU..... 3 sets (Single solenoid part No.)  
 \* 10-SY3240-5LOU..... 2 sets (Double solenoid part No.)  
 \* SY-3000-37-3A..... 3 sets (Connector Ass'y part No.)  
 \* SY-3000-37-4A..... 2 sets (Connector Ass'y part No.)  
 T \* To order valves and options mounted onto the manifold at the factory, list the valve/option with an asterisk (\*) in front of each part number.

Add the valve and option part numbers in order starting from the first station as shown above. When entry of part numbers becomes complicated, indicate on a manifold specification sheet.

## How to Order Valves



Directional Control Valve

## How to Order Connector Assemblies

### For 12, 24VDC

Specifications	For 10-SY3000	For 10-SY5000/7000
For single solenoid	SY3000-37-3A	SY5000-37-3A
Double solenoid 3 position type	SY3000-37-4A	SY5000-37-4A
Single with spacer assembly	SY5000-37-3A	SY5000-37-5A
Double 3 position with spacer assembly	SY3000-37-6A	SY5000-37-6A

### For 100VAC

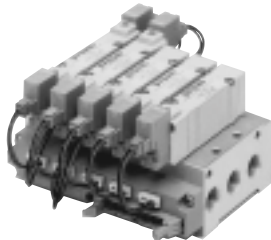
Specifications	For 10-SY3000	For 10-SY5000/7000
For single solenoid	SY3000-37-32A	SY5000-37-15A
Double solenoid 3 position type	SY3000-37-33A	SY5000-37-16A
Single with spacer assembly	SY5000-37-15A	SY5000-37-17A
Double 3 position with spacer assembly	SY3000-37-34A	SY5000-37-18A

### For 110VAC (115VAC)

Specifications	For 10-SY3000	For 10-SY5000/7000
For single solenoid	SY3000-37-35A	SY5000-37-19A
Double solenoid 3 position type	SY3000-37-36A	SY5000-37-20A
Single with spacer assembly	SY5000-37-19A	SY5000-37-21A
Double 3 position with spacer assembly	SY3000-37-37A	SY5000-37-22A

- External wiring is bundled for one-touch wiring
- Clean appearance

With the flat ribbon cable type, each valve is wired to the printed circuit board of the manifold base to allow the external wiring to be bundled with a 26 pin MIL connector for one-touch wiring.



### Manifold Specifications

Model	10-SS5Y3-41P		10-SS5Y3-42P		10-SS5Y5-41P		10-SS5Y5-42P		10-SS5Y7-42P				
Applicable valve	10-SY3□40				10-SY5□40						10-SY7□40		
Manifold type	Single base type/B mount												
P(SUP)/R(EXH) system	Common SUP/EXH												
Stations	4 to 12 stations (Note1)				3 to 12 stations (Note1)								
A/B port piping specifications	Location	Base											
	Direction	Side											
Port size	P, EA, EB port	Rc1/8				Rc1/4				Rc1/4			
	A, B port	M5 X 0.8 C4 (ø4 One-touch fitting) C6 (ø6 One-touch fitting)		Rc1/8 C4 (ø4 One-touch fitting) C6 (ø6 One-touch fitting)		Rc1/8 C6 (ø6 One-touch fitting) C8 (ø8 One-touch fitting)		Rc1/4 C6 (ø6 One-touch fitting) C8 (ø8 One-touch fitting)		Rc1/4 C10 (ø10 One-touch fitting)			
Manifold base weight W (g) n: Stations	W=39n+83		W=48n+99		W=67n+118		W=88n+151		W=109n+174				
Flat ribbon cable	Flat ribbon cable connector Socket: 26 pin MIL type with strain relief (MIL-C-83503 compliant)												
Internal wiring	Common to +COM and -COM (Z type is only compatible with +COM).												
Rated voltage	12, 24VDC 100, 110VAC												

- ⦿ Note1) In case of 10 or more stations (5 or more stations with 10-SS5Y7), supply pressure to P ports on both sides and exhaust from EA and EB ports on both sides.  
 Note2) The withstand voltage specification for the wiring unit is equivalent to class 1 in JIS C0704.

### Flow Characteristics

Model	Port size		Flow characteristics					
	1,5,3	4,2	1→4/2 (P→A/B)			4/2→5/3 (A/B→EA/EB)		
	(P,EA,EB)	(A,B)	C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv
SS5Y3-41P	Rc1/8	C6	0.75	0.19	0.18	0.81	0.23	0.20
SS5Y3-42P	Rc1/8	C6	0.75	0.20	0.18	0.82	0.20	0.20
SS5Y5-41P	Rc1/4	C8	1.8	0.23	0.44	1.9	0.16	0.45
SS5Y5-42P	Rc1/4	C8	1.9	0.20	0.46	1.9	0.12	0.43
SS5Y7-42P	Rc1/4	C10	3.0	0.25	0.75	3.0	0.12	0.66

Note) Value is for manifold with 5 stations and individually operated 2 position type.

### Manifold Internal Wiring (Non-polar type)

Note)

No terminal number is indicated on the connector. The terminal numbers in the connector wiring diagram show the correlation that assumes the terminals on the flat ribbon cable connector were numbered 1 to 26 starting from the side marked with a triangle, as shown in the figure to the right.

- ⦿
- In case of 10 or more stations, wire both COM pins.
  - For single solenoid, connect to the solenoid A side.
  - The maximum number of stations is 12. Contact SMC if more stations are required.

### ⚠ Caution

Non-polar type (U) valves with DC electrical connection can be used for both negative and positive COM. However, always use the positive COM with the Z type, since valves will not be actuated when the negative COM is used.



10-SY3000: 10-SS5Y3-41P- Stations -M5, C4, C6

Note) [ ] : For AC.

M5 X 0.8

Directional Control Valve

Stations n	4	5	6	7	8	9	10	11	12
<b>L1</b>	72.5	85	97.5	110	122.5	135	147.5	160	172.5
<b>L2</b>	64.5	77	89.5	102	114.5	127	139.5	152	164.5

**Solenoid Valve 10-SY3000/5000/7000**

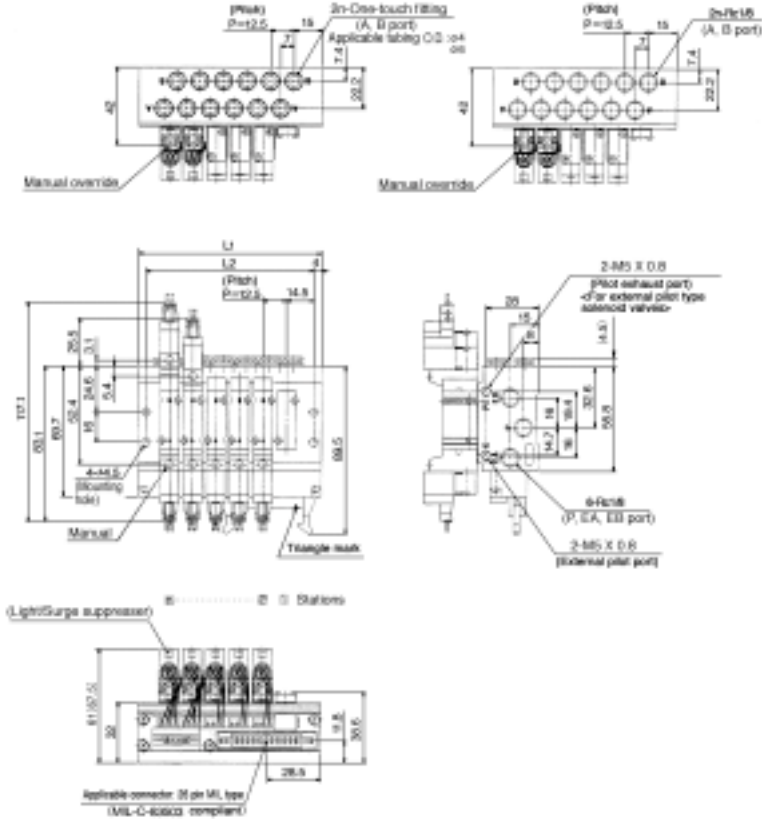
10-SY5000: 10-SS5Y5-41P- Stations -01, C6, C8

Note) [ ] : For AC.

Rc1/8

Stations n	3	4	5	6	7	8	9	10	11	12
<b>L1</b>	77	94.5	112	129.5	147	164.5	182	199.5	217	234.5
<b>L2</b>	67	84.5	102	119.5	137	154.5	172	189.5	207	224.5

Rc1/8



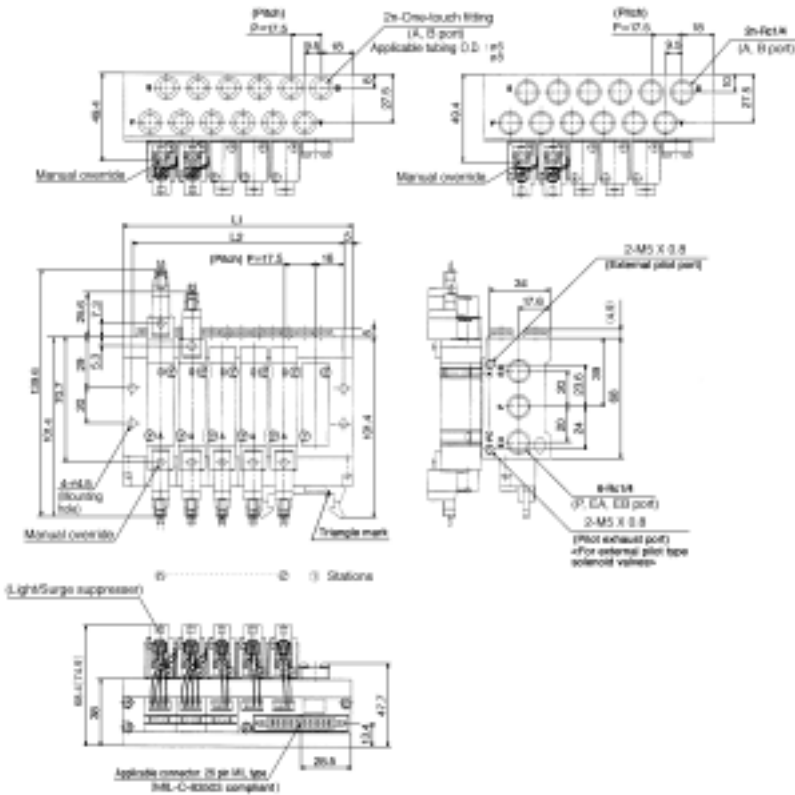
Stations n	4	5	6	7	8	9	10	11	12
L1	72.5	85	97.5	110	122.5	135	147.5	160	172.5
L2	64.5	77	89.5	102	114.5	127	139.5	152	164.5

Solenoid Valve **10-SY3000/5000/7000**

10-SY5000: 10-SS5Y5-42P- Stations -02, C6, C8

Note [ ] : For AC.

Rc1/4

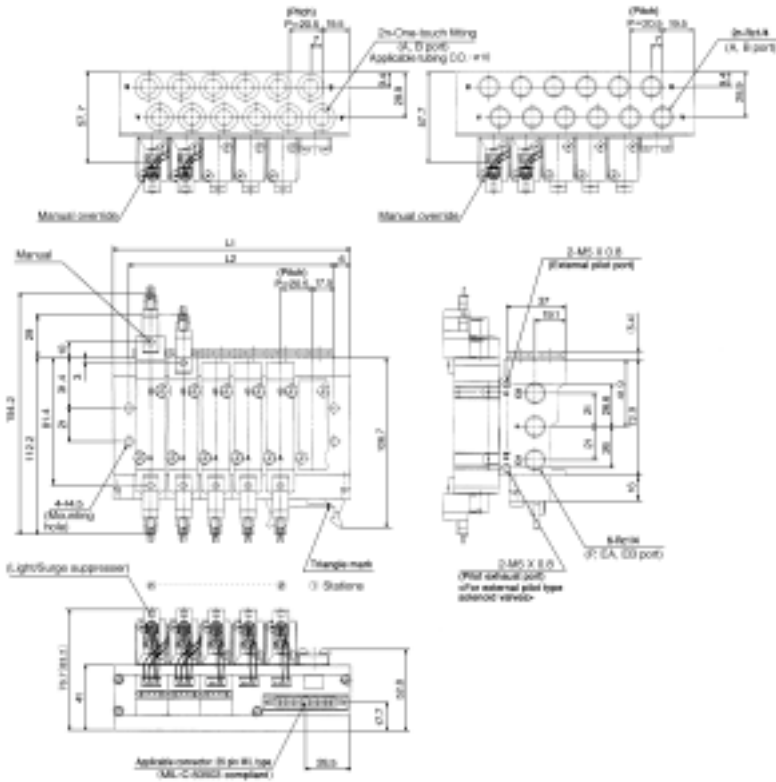


Stations n	3	4	5	6	7	8	9	10	11	12
L1	77	94.5	112	129.5	147	164.5	182	199.5	217	234.5
L2	67	84.5	102	119.5	137	154.5	172	189.5	207	224.5

10-SY7000: 10-SS5Y7-42P- Stations -02, C10

Note) [ ] : For AC.

Rc1/4



Directional Control Valve

Stations n	3	4	5	6	7	8	9	10	11	12
<b>L1</b>	88	108.5	129	149.5	170	190.5	211	231.5	252	272.5
<b>L2</b>	76	96.5	117	137.5	158	178.5	199	219.5	240	260.5

## Manifold Option

### ■ For types 41, 42 Blanking plate assembly



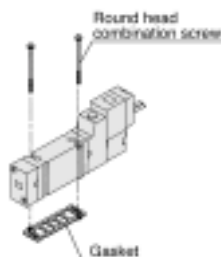
Series	Assembly part No.
<b>10-SY3000</b>	SY3000-26-9A
<b>10-SY5000</b>	SY5000-26-18A
<b>10-SY7000</b>	SY7000-26-20A

### ■ For types 41P, 42P Blanking plate assembly



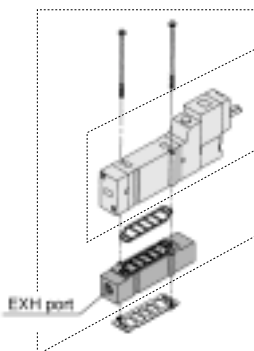
Series	Assembly part No.
<b>10-SY3000</b>	SY3000-26-10A
<b>10-SY5000</b>	SY5000-26-19A
<b>10-SY7000</b>	SY7000-26-21A

### ■ Bolt, Gasket part No.




Series	Round head combination screw	Gasket
<b>10-SY3000</b>	SY3000-23-4 (M2 X 21)	SY3000-11-25
<b>10-SY5000</b>	M3 X 26 (Flat nickel plated)	SY5000-11-13
<b>10-SY7000</b>	M4 X 31 (Flat nickel plated)	SY7000-11-7

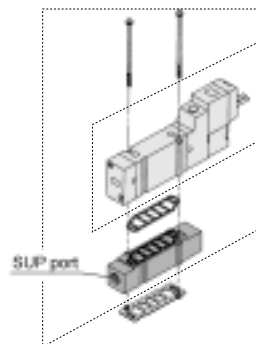
### ■ Individual EXH spacer assembly




Series	Assembly part No.	Port size
<b>10-SY3000</b>	SY3000-39-2A	M5 X 0.8
<b>10-SY5000</b>	SY5000-39-2A	Rc1/8
<b>10-SY7000</b>	SY7000-39-2A	Rc1/4

 Note) In case of types 41P, 42P and 43P, pipe the EA port (On the wiring unit) to prevent exhaust air from the valve from blowing directly against the wiring unit so that the wiring unit will be protected from the drain.

### ■ Individual SUP spacer assembly

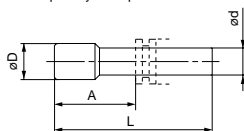


Series	Assembly part No.	Port size
<b>10-SY3000</b>	SY3000-38-2A	M5 X 0.8
<b>10-SY5000</b>	SY5000-38-2A	Rc1/8
<b>10-SY7000</b>	SY7000-38-2A	Rc1/4

 Note) The SUP port of SY3000, 5000 or 7000 can be directed either toward the lead wire or toward the end plate (It is set in the direction as in the figure at the time of shipment after assembly).

### ■ Plug (White)

To be inserted into unused cylinder ports and supply/exhaust ports.  
The minimum order quantity is 10 pieces. Order in multiples of 10.



### Dimensions

Applicable fitting size size ød	Model	A	L	D
4	<b>10-KQP-04</b>	16	32	6
6	<b>10-KQP-06</b>	18	35	8
8	<b>10-KQP-08</b>	20.5	39	10
10	<b>10-KQP-10</b>	22	43	12
12	<b>10-KQP-12</b>	24	45.5	14

### Caution

Mounting screw tightening torque

M2: 0.15 Nm  
M3: 0.6 Nm  
M4: 1.4 Nm



# Manifold Specifications

## Base Mounted Type Base Mounted Type Manifold/Stacking Type/DIN Rail Mount/Individual Wiring

### How to Order Manifolds

Type 45/Individual wiring



Series		Stations	
3	10-SY3000	02	2 stations
5	10-SY5000	⋮	⋮
		20	20 stations

Supply/Exhaust block ass'y mounting position

Symbol	Mounting position	Applicable stations
U	U side	2 to 10 stations
D	D side	
B	Double side	2 to 20 stations
*M	Special specifications	

\* In the case of special specifications, indicate separately on a manifold specification sheet.

A, B port size

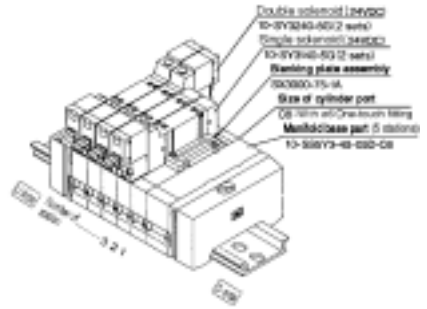
10-SY3000		10-SY5000	
Symbol	Port size	Symbol	Port size
C4	ø4 One-touch fitting	C4	ø4 One-touch fitting
C6	ø6 One-touch fitting	C6	ø6 One-touch fitting
*M	Mixed	C8	ø8 One-touch fitting
		*M	Mixed

\* For mixed specifications, order separately on a manifold specification sheet.

Option

When a DIN rail longer than the specified stations is necessary, indicate the number of required stations. (20 stations at the maximum)

### How to Order Manifold Assemblies (Example)



10-SS5Y3-45-05D-C6 ..... 1set (45P type 5 station manifold base part No.)  
 \* SY3000-75-1A ..... 1set (Blanking plate Ass'y part No.)  
 \* 10-SY3140-5G ..... 2set (Single solenoid part No.)  
 \* 10-SY3240-5G ..... 2set (Double solenoid part No.)  
 † \*To order valves and options mounted onto the manifold at the factory, list the valve/option with an asterisk(\*) in front of each part number.

Add the valve and option part numbers in order starting from the first station as shown above. When entry of part numbers becomes complicated, indicate on a manifold specification sheet.



## How to Order Valves

10-SY **5** **2** 40—**5** **L**

● **Series**

3	10-SY3000
5	10-SY5000

● **Actuation**

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

● **Rated voltage**

**DC specifications**

5	24VDC
6	12VDC
V	6VDC
S	5VDC
R	3VDC

**AC specifications (50/60Hz)**

1	100VAC
2	200VAC
3	110VAC [115VAC]
4	220VAC [230VAC]

⦿ Only 24 VDC and 12 VDC are available for D and DO types.

\* Types D and DO are not available with 10-SY5000.

● **Manual override**

Nil	Non-locking push type
D	Push-turn locking slotted type
E	Push-turn locking lever type

● **Light/surge voltage suppressor**

**If the electrical entry is G, H, L or M.**

Nil	Without light/surge suppressor
S	With light/surge suppressor
Z	With light/surge suppressor
R	With surge suppressor (Non-polar type)
U	With light/surge suppressor (Non-polar type)

⦿ \* Type "S" is not available with AC, which prevents surge voltage with a rectifier.  
\* Only DC is available with R and U.

**If the electrical entry is D.**

Nil	Without light/surge suppressor
S	With surge suppressor (Non-polar type)
Z	With light/surge suppressor (Non-polar type)

⦿ \* DOZ is not available.  
\* Type "S" is not available with AC, which prevents surge voltage with a rectifier.

● **Electrical entry**

24V, 12V, 6V, 5V, 3VDC/100V, 110V, 200V, 220VAC

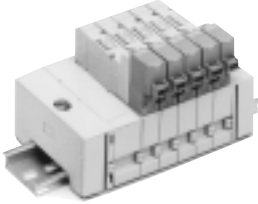
24V, 12VDC  
100V, 110VAC,  
200V, 220VAC

Grommet	L plug connector	M plug connector	DIN terminal
<b>G: Lead wire</b> Length 300mm	<b>L: With lead wire</b> (Length 300mm)	<b>M: With lead wire</b> (Length 300mm)	<b>For only 10-SY5000</b>
<b>H: Lead wire</b> Length 600mm	<b>LN: Without lead wire</b> <b>LO: Without connector</b>	<b>MN: Without lead wire</b> <b>MO: Without connector</b>	<b>D: With Connector</b> <b>DO: Without connector</b>

⦿ \*Types LN and MN include sockets.

\*Types D and DO are not available with 10-SY5000.

### Manifold Specifications



Model		<b>10-SS5Y3-45</b>	<b>10-SS5Y5-45</b>
Applicable valve		<b>10-SY3□40</b>	<b>10-SY5□40</b>
Manifold type		Stacking type/DIN rail	
P (SUP), R (EXH) system		Common SUP/EXH	
Stations		2 to 20 stations (Note1)	
A, B port piping specifications	Location	Base	
	Direction	Side	
Port size	P, R port	C8 (ø8 One-touch fitting)	C10 (ø10 One-touch fitting)
	A, B port	C4 (ø4 One-touch fitting) C6 (ø6 One-touch fitting)	C4 (ø4 One-touch fitting) C6 (ø6 One-touch fitting) C8 (ø8 One-touch fitting)
Manifold base weight W (g)		For 2 to 10 stations: W=22n+118	For 2 to 10 stations: W=47n+156
n: Stations		For 11 to 20 stations: W=22n+140	For 11 to 20 stations: W=47n+190



Note) In case of 11 or more stations, apply pressure to P ports on both sides and exhaust air from R ports on both sides.

### Flow Characteristics

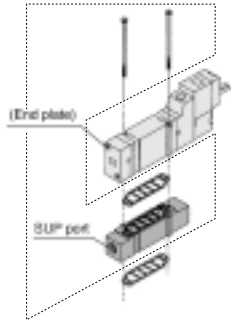
Model	Port size		Flow characteristics					
	1,5,3 (P,EA,EB)	4,2 (A,B)	1→4/2(P→A/B)			4/2→5/3(A/B→EA/EB)		
			C(dm <sup>3</sup> /s-bar)	b	Cv	C(dm <sup>3</sup> /s-bar)	b	Cv
<b>SS5Y3-45</b>	C8	C6	0.88	0.21	0.22	0.95	0.18	0.22
<b>SS5Y5-45</b>	C10	C8	2.2	0.24	0.53	2.5	0.18	0.58



Note) Value is for manifold base with 5 stations and individually operated 2 position type.

## Manifold Option

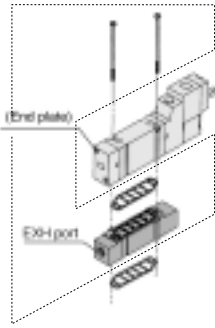
### Individual SUP spacer assembly



Series	Ass'y part No.	Port size
10-SY3000	SY3000-38-2A	M5 X 0.8
10-SY5000	SY5000-38-2A	Rc1/8

Note) Either in the lead wire direction or end plate direction. The SUP port can be used.

### Individual EXH spacer assembly



Series	Ass'y part No.	Port size
10-SY3000	SY3000-39-2A	M5 X 0.8
10-SY5000	SY5000-39-2A	Rc1/8

Note) EXH port can be directed either toward the lead wire or end plate.

### SUP block disc

By installing a supply block disc in the pressure supply passage of the manifold base, two or more different pressures, high or low, can be supplied to one manifold



Series	Part No.
10-SY3000	SX3000-77-1A
10-SY5000	SX5000-77-1A

### EXH block disc

By installing an exhaust block disc in the exhaust passage of the manifold bases, the passage can be divided so that the exhaust from one valve will not affect other valves. (Two block discs are required to block both exhaust ports.)



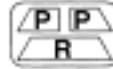
Series	Part No.
10-SY3000	SX3000-77-1A
10-SY5000	SX5000-77-1A

### Labels for block disc

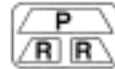
Labels are applied to blocks with SUP and EXH block discs for external confirmation of blocked passages. (3 labels per package)

#### VZ1000-123-1A

##### SUP gate label



##### EXH gate seal



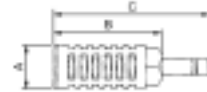
##### SUP, EXH gate label



Note) When the block discs are ordered with manifolds using a manifold specification sheet, block disc labels are already attached where block discs are installed at the time of shipment.

### Silencer with One-touch fitting

Can be attached in one-touch to the R (Exhaust) port of the manifold.



Series	Model	Effective area	A	B	C
For 10-SY3000 (ø8)	AN203-KM8	14mm <sup>2</sup>	ø16	26	51
	AN200-KM10	26mm <sup>2</sup>	ø22	53.8	80.8
For 10-SY5000 (ø10)	AN300-KM10	30mm <sup>2</sup>	ø25	70	97

### Plug (White)

To be inserted into unused cylinder ports and supply/exhaust ports. The minimum order quantity is 10 pieces. Order in multiples of 10.



### Dimensions

Applicable fitting size size ød	Model	A	L	D
4	10-KQP-04	16	32	6
6	10-KQP-06	18	35	8
8	10-KQP-08	20.5	39	10
10	10-KQP-10	22	43	12

### Blanking plate assembly



Series	Ass'y part No.
10-SY3000	SX3000-75-1A
10-SY5000	SX5000-76-1A

### Caution

Mounting screw tightening torque

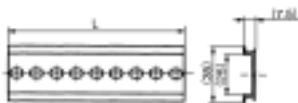
- M2: 0.15Nm
- M3: 0.6Nm
- M4: 1.4Nm

### DIN rail dimensions

#### VZ1000-11-1-□

##### L dimensions

\*For "□", enter the No. in the DIN rail dimension table below.



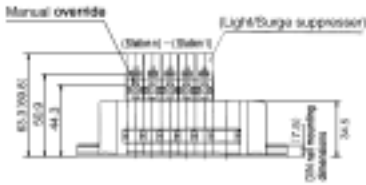
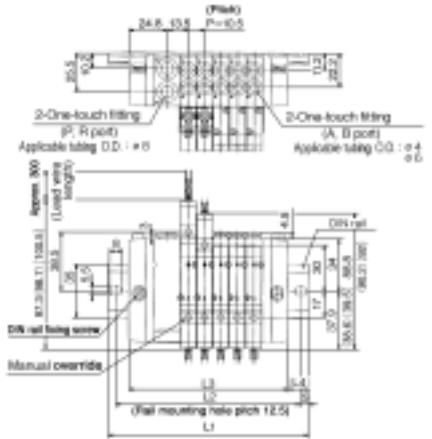
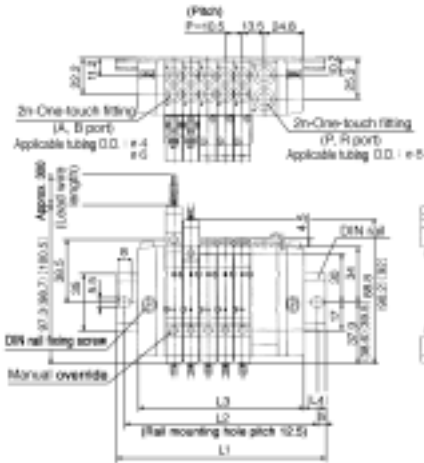
No.	0	1	2	3	4	5	6	7	8	9	10
L dimension	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223
No.	11	12	13	14	15	16	17	18	19	20	21
L dimension	235.5	248	260.5	273	285.5	298	310.5	323	335.5	348	360.5
No.	22	23	24	25	26	27	28	29	30	31	32
L dimension	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498
No.	33	34	35	36	37	38	39	40	41	42	43
L dimension	510.5	523	535.5	548	560.5	573	585.5	598	610.5	623	635.5
No.	44	45	46	47	48	49	50	51	52	53	54
L dimension	648	660.5	673	685.5	698	710.5	723	735.5	748	760.5	773
No.	55	56	57	58	59	60	61	62	63	64	65
L dimension	785.5	798	810.5	823	835.5	848	860.5	873	885.5	898	910.5
No.	66	67	68	69	70	71					
L dimension	923	935.5	948	960.5	973	985.5					

\*Refer to dimension L1 on pages starting from 101 for lengths that correspond to the number of manifold stations.

**Series 10-SY3000 Dimensions**

10-SS5Y3-45- [Stations] D<sup>C4</sup>  
C6

10-SS5Y3-45- [Stations] U-C<sup>4</sup>  
C6



Stations n	2	3	4	5	6	7	8	9	10
<b>L1</b>	98	110.5	123	135.5	148	148	160.5	173	185.5
<b>L2</b>	87.5	100	112.5	125	137.5	137.5	150	162.5	175
<b>L3</b>	70.5	81	91.5	102	112.5	123	133.5	144	154.5
<b>L4</b>	13.5	14.5	15.5	16.5	17.5	12.5	13.5	14.5	15.5

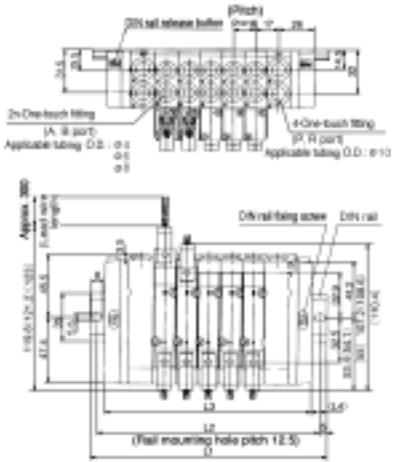




**Series 10-SY5000 Dimensions** Note) [ ]: For AC. < >: With surge voltage suppressor.

10-SS5Y5-45- Stations B-

C4  
C6  
C8



**L plug connector**



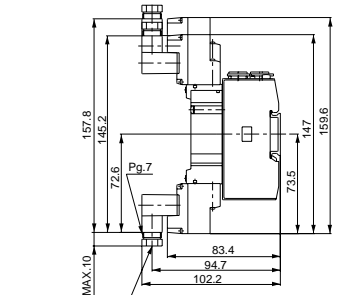
**M plug connector**



Stations n	2	3	4	5	6	7	8	9	10
<b>L1</b>	135.5	148	160.5	185.5	198	210.5	223	248	260.5
<b>L2</b>	125	137.5	150	175	187.5	200	212.5	237.5	250
<b>L3</b>	102	118	134	150	166	182	198	214	230
<b>L4</b>	16.5	15	13	17.5	16	14	12.5	17	15

Stations n	11	12	13	14	15	16	17	18	19	20
<b>L1</b>	273	285.5	310.5	323	335.5	360.5	373	385.5	398	423
<b>L2</b>	262.5	275	300	312.5	325	350	362.5	375	387.5	412.5
<b>L3</b>	246	262	278	294	310	326	342	358	374	390
<b>L4</b>	13.5	11.5	16	14.5	12.5	17	15.5	13.5	12	16.5

**DIN terminal**

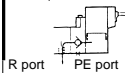



Applicable cable O.D.  
ø3.5 to ø7

Directional Control Valve

# Series 10-SYJ 4/5 Port Solenoid Valve Series SYJ3000

## How to Order

<p><b>5 port</b> (For type 20 manifold)</p>	<p><b>Clean series</b></p>	<p><b>Actuation</b>            1 — 2 position single solenoid            2 — 2 position double solenoid            3 — 3 position closed center            4 — 3 position exhaust center            5 — 3 position pressure center</p>	<p><b>Body option</b>            3 — Common exhaust (Pilot and main valves)</p> 	<p><b>Rated voltage</b>            1 — 100VAC (50/60Hz)            2 — 200VAC (50/60Hz)            3 — 110VAC [115VAC] (50/60Hz)            4 — 220VAC [230VAC] (50/60Hz)            5 — 24VDC            6 — 12VDC            V — 6VDC            S — 5VDC            R — 3VDC</p>	<p><b>Bracket</b>            Nil — Without bracket            F — With bracket            (Note) ● In case of a double solenoid valve, the bracket is supplied, but not assembled.            ● To order a double solenoid bracket for use with a single solenoid valve, order the single solenoid valve without a bracket and order the double solenoid bracket separately. Specify the part number of the bracket VJ3000-13-1 besides the part number of the solenoid valve.            [Example] 10-SYJ3123-5M-M3 VJ3000-13-1</p>
<p><b>Body Ported Type</b></p>	<p>10 - SYJ3</p>	<p>1 2 3 - 5</p>	<p>M</p>	<p>- M3 -</p>	
<p><b>Base Mounted Type (4 port)</b></p>	<p>10 - SYJ3</p>	<p>2 3 3 - 5</p>	<p>M</p>	<p>(For manifold use only)</p>	
<p><b>Base Mounted Type (5 port)</b></p>	<p>10 - SYJ3</p>	<p>2 4 3 - 5</p>	<p>M</p>		
<p><b>4 port</b> (31,S31,32,S32 manifold)</p> <p><b>5 port</b> (sub-plate,41,S41,46,S46 manifold)</p>		<p><b>Electrical entry</b>            Grommet            G — Lead wire (300mm)            H — Lead wire (600mm)            L plug connector            L — With lead wire (300mm)            LN — Without lead wire            LO — Without connector            M plug connector            M — With lead wire (300mm)            MN — Without lead wire            MO — Without connector            *Types LN and MN include 2 sockets.</p>			
		<p><b>Light/surge suppresser</b>            If the electrical entry is G, H, L or M.            Nil — Without light/surge suppresser            S — With surge suppresser            R — With surge suppresser (Non-polar type)            Z — With light/surge suppresser            U — With light/surge suppresser (Non-polar type)            * Type "S" is not available with AC since it is integrated with the rectifier.</p>			
		<p><b>Manual override</b>            Nil — Non-locking push type            D — Push-turn locking slotted type</p>			
		<p><b>Port size</b>            Nil — Without sub-plate (With gasket and screw)            M5 — M5 port with sub-plate</p>			

## ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.



## Model

Valve		Actuation		Port size	Effective area mm <sup>2</sup>	Weight g <sup>Note3, 4)</sup>		Flow characteristics <sup>Note2)</sup>						
						Grommet type	L/M plug connector	1→4/2 (P→A/B)			4/2→5/3 (A/B→EA/EB)			
								C <sub>d</sub> (dm <sup>3</sup> /s·bar)	b	C <sub>v</sub>	C <sub>d</sub> (dm <sup>3</sup> /s·bar)	b	C <sub>v</sub>	
5 port base mounted type (Mounted with sub-plate)	10-SYJ3143	2 position	Single	M5 X 0.8	—	59 (33)	61 (35)	0.46	0.36	0.12	0.46	0.35	0.12	
	10-SYJ3243		Double			73 (47)	77 (51)							
	10-SYJ3343	3 position	Closed center			76 (50)	80 (54)	0.47	0.33	0.12	0.47	0.31	0.12	
	10-SYJ3443		Exhaust center					0.36	0.39	0.10	0.59[0.40]	0.43[0.33]	0.16[0.11]	
	10-SYJ3543		Pressure center					0.58[0.32]	0.42[0.33]	0.16[0.080]	0.46	0.32	0.11	
5 port body ported type	10-SYJ3123	2 position	Single	M3 X 0.5	0.9	33	35							
	10-SYJ3223		Double			47	51							
	10-SYJ3323	3 position	Closed center			50	54							
	10-SYJ3423		Exhaust center											
	10-SYJ3523		Pressure center											
4 port base mounted type (For manifold use only)	10-SYJ3133	2 position	Single	—	—	33	35							
	10-SYJ3233		Double			47	51							
	10-SYJ3333	3 position	Closed center			50	54							
	10-SYJ3433		Exhaust center											
	10-SYJ3533		Pressure center											

Note1) In case of M5 and mounted on manifold base.

Note2) Values in "[ ]" are for normal position. Exhaust center: 4/2 → 5/3, pressure center: 1 → 4/2.

Note3) Values in "( )" are for types without sub-plate.

Note4) Values are for DC voltages. For AC voltages, add 1 g to the weight of the single solenoid and 2 g to the weight of the double solenoid and 3 position styles.

## Specifications

Fluid		Air	
Operating pressure range MPa	2 position single	0.15 to 0.7	
	2 position double	0.1 to 0.7	
	3 position	0.2 to 0.7	
Ambient and fluid temperature °C		Max. 50	
Note1) Response time ms (0.5MPa)	2 position single, Double	15 or less	
	3 position	30 or less	
Max. Operating frequency Hz	2 position Single, Double	10	
	3 position	3	
Manual override		Non-locking push type, Push-turn locking slotted type	
Pilot exhaust method		Common exhaust (Pilot and main valves)	
Lubrication		Not required	
Mounting position		Free	
Note2) Impact/Vibration resistance	m/s <sup>2</sup>	150/30	
Enclosure		Dust proof	

Note1) According to JISB8375-1981 dynamic performance test (With coil temperature of 20°C, at rated voltage and without surge voltage suppressor)

Note2) Impact resistance: No malfunction resulted in an impact test using a drop impact tester.

The test was performed each time in the axial and right angle directions of the main valve and armature, for both energized and deenergized states. Vibration resistance: No malfunction resulted from a one-sweep test between 8.3 and 2000Hz. The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage).

## Solenoid Specifications

Electrical entry		Grommet (G) / (H), L plug connector (L), M plug connector (M)	
Rated coil voltage V	DC	24, 12, 6, 5, 3	
	50/60HzAC	*100, 110, 200, 220	
Allowable voltage fluctuation		±10% of rated voltage	
Note) Power consumption W	DC	0.5 (With light: 0.55)	
Apparent power VA	AC	100V	0.9 (With light: 1.0)
		110V	1.0 (With light: 1.1)
		[115V]	[1.1 (With light: 1.2)]
		200V	1.8 (With light: 1.9)
		220V [230V]	1.9 (With light: 2.0) [2.2 (With light: 2.3)]
Surge voltage suppressor		Diode	
Indicator light		LED	

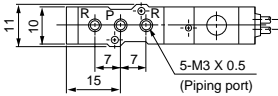
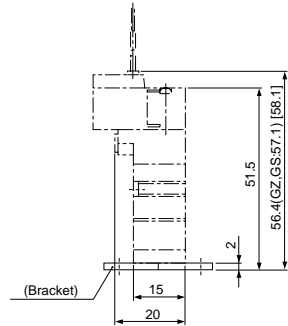
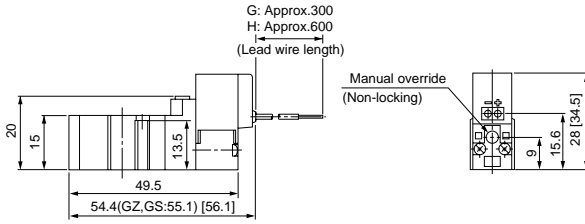
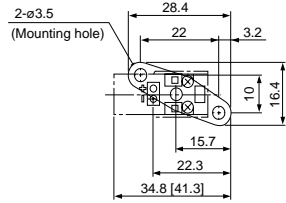
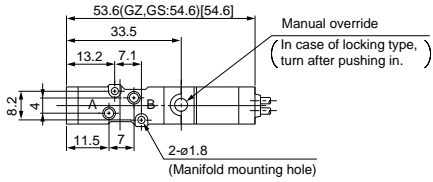
\*110VAC and 115VAC are common, as are 220VAC and 230VAC.

Note) At rated voltage

**Body Ported Type/2 Position Single**

Grommet (G), (H): 10-SYJ3123-□□□-M3

**With bracket**

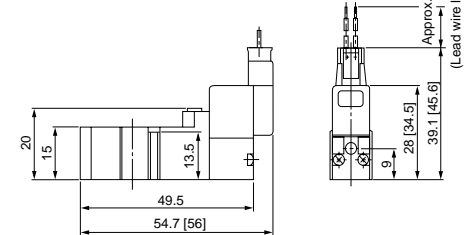
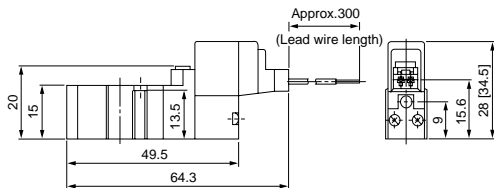
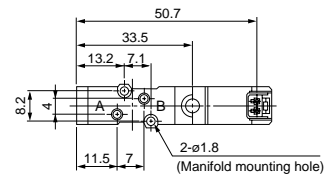
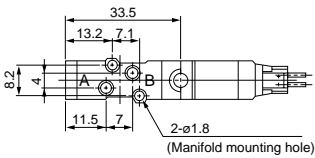


⦿ = Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

⦿ = Values in [ ] are for AC.

**L Plug Connector (L): 10-SYJ3123-□□□-M3**

**M Plug Connector (M): 10-SYJ3123-□□□-M3**

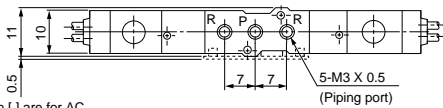
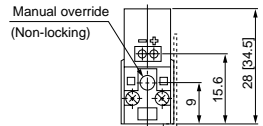
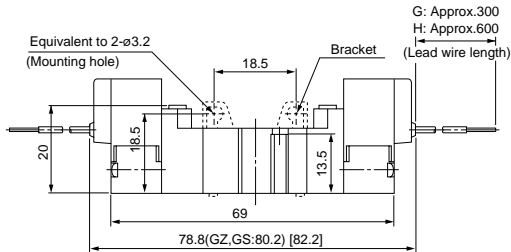
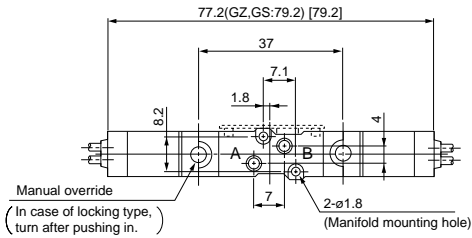


⦿ = Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

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 \* Other dimensions are identical with those of a grommet type.

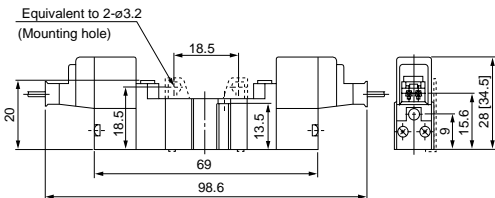
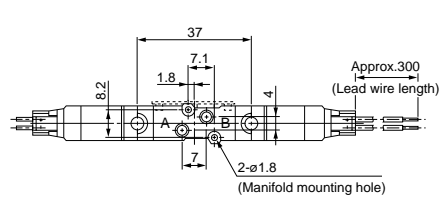
**Body Ported Type/2 Position Double**

Grommet (G), (H): 10-SYJ3223-□ $\frac{G}{H}$ □□-M3

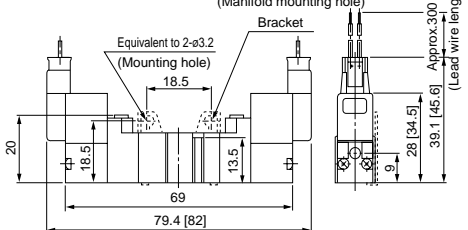
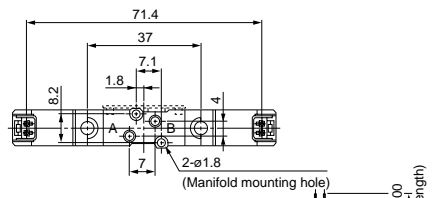


\* Values in [ ] are for AC.

**L Plug Connector (L): 10-SYJ3223-□L□□-M3**



**M Plug Connector (M): 10-SYJ3223-□M□□-M3**



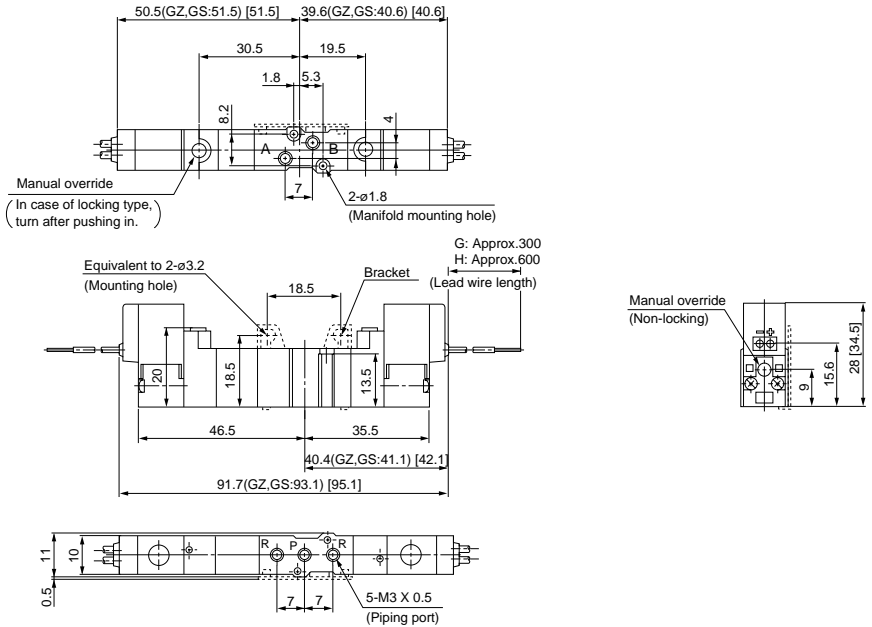
\* Values in [ ] are for AC.  
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\* Other dimensions are identical with those of a grommet type.

# Solenoid Valve 10-SYJ3000

## Body Ported Type/3 Position Closed Center/Exhaust Center/Pressure Center

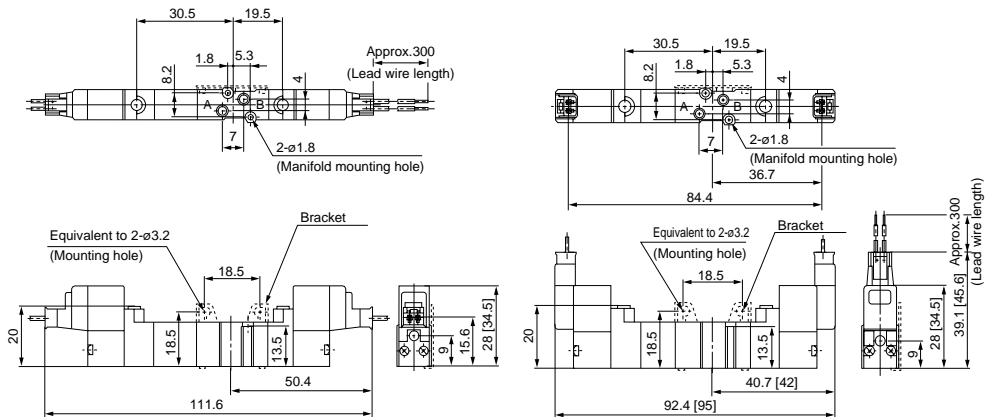
Grommet (G), (H): 10-SYJ3<sup>3</sup>/<sub>4</sub>23-□<sup>□</sup>□□-M3



\* Values in [ ] are for AC.

### L Plug Connector (L): 10-SYJ3<sup>3</sup>/<sub>4</sub>23-□<sup>□</sup>L□□-M3

### M Plug Connector (M): 10-SYJ3<sup>3</sup>/<sub>4</sub>23-□<sup>□</sup>M□□-M3

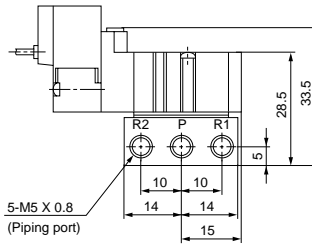
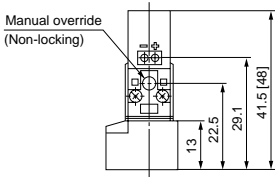
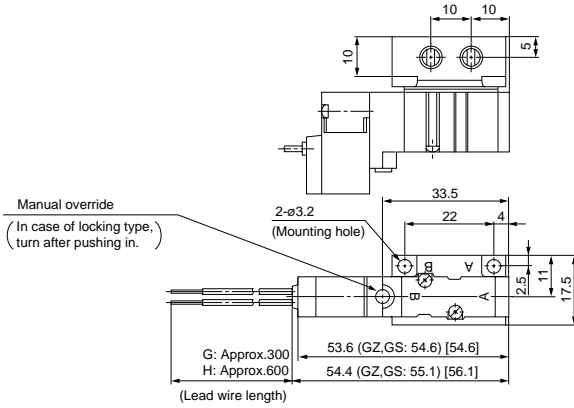


\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

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\* Other dimensions are identical with those of a grommet type.

**Base Mounted Type/2 Position Single**

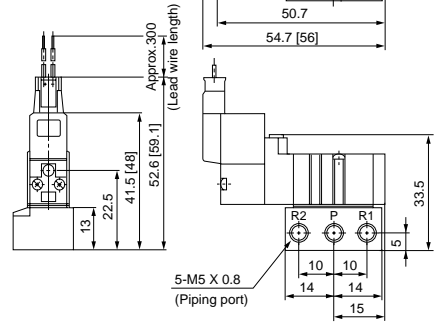
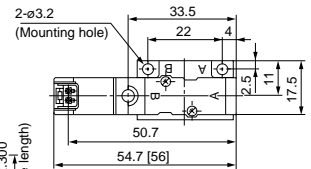
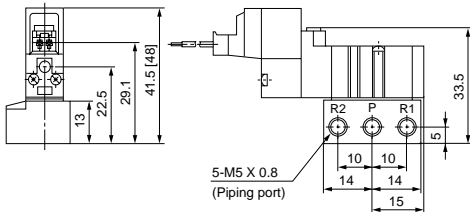
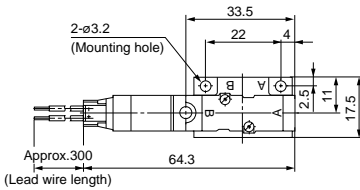
Grommet (G), (H): 10-SYJ3143-□□□□-M5



⦿ Values in [ ] are for AC.

**L Plug Connector (L): 10-SYJ3143-□□□□-M5**

**M Plug Connector (M): 10-SYJ3143-□□□□-M5**

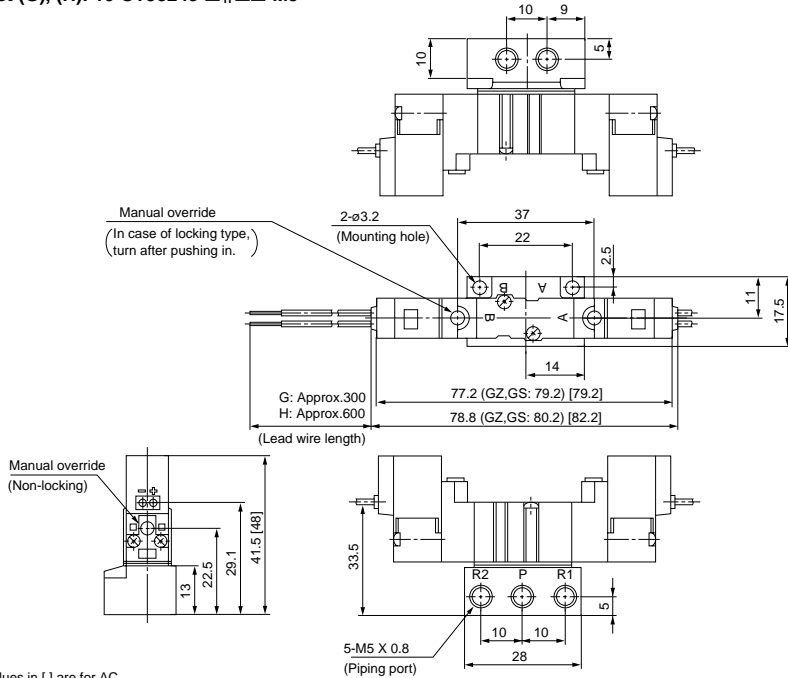


⦿ Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

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\* Other dimensions are identical with those of a grommet type.

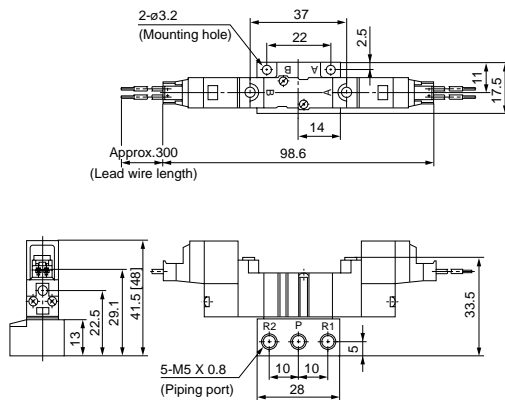
**Base Mounted Type/2 Position Double**

Grommet (G), (H): 10-SYJ3243-□□□□-M5

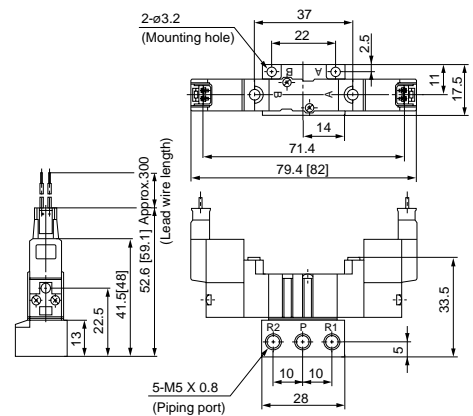


⦿ \* Values in [ ] are for AC.

**L Plug Connector (L): 10-SYJ3243-□L□□-M5**



**M Plug Connector (M): 10-SYJ3243-□M□□-M5**

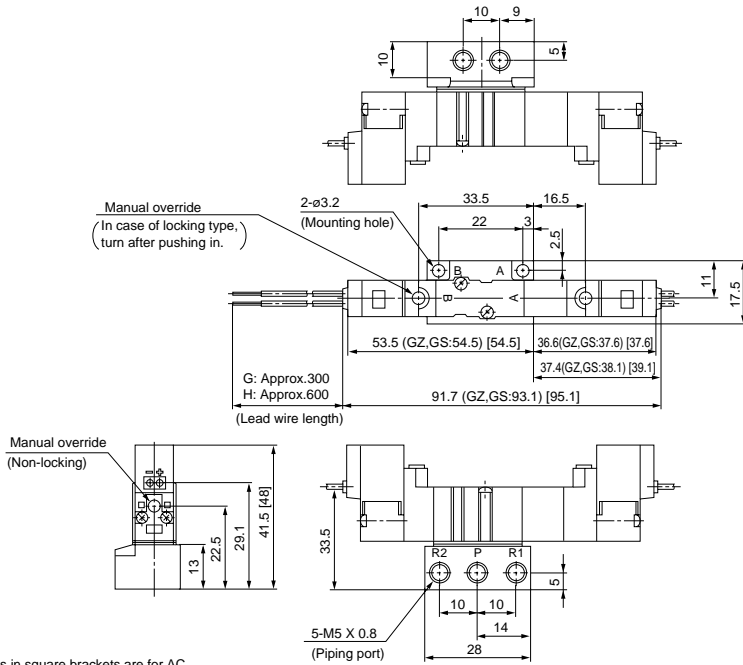


⦿ \* Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

⦿ \* Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

**Base Mounted Type/3 Position Closed Center/Exhaust Center/Pressure Center**

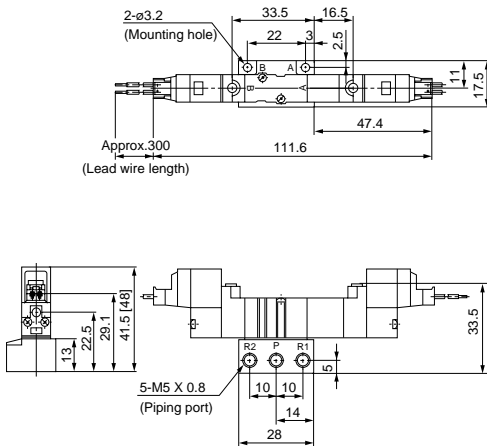
Grommet (G), (H): 10-SYJ3 $\frac{3}{8}$ 43-□□□-M5



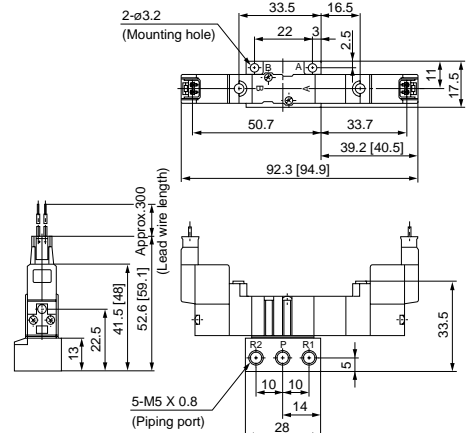
\* Values in square brackets are for AC.

**L Plug Connector (L): 10-SYJ3 $\frac{3}{8}$ 43-□□□-M5**

**M Plug Connector (M): 10-SYJ3 $\frac{3}{8}$ 43-□□□-M5**



\* Values in square brackets are for AC.  
\* Other dimensions are identical with those of a grommet type.



\* Values in square brackets are for AC.  
\* Other dimensions are identical with those of a grommet type.

Directional  
Control Valve

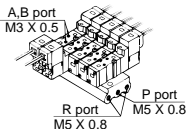
**Manifold**

**How to Order**

● **Common SUP/Common EXH system**

Note) In case of 10 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

**Type 20P (For 5 port body ported type)**



10 - SS5YJ3 - 20 - 05

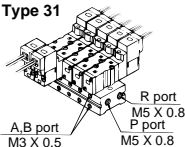
Applicable solenoid valve  
10-SYJ3□□3-□□□□-M3

Applicable blanking plate ass'y  
SYJ3000-21-1A

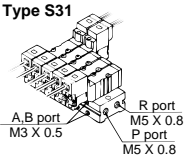
**Manifold stations**  
02 — 2 stations  
⋮  
20 — 20 stations

**Type 31 (For 4 port base mounted type)**

Type 31



Type S31



10 - SS5YJ3 - □ 31 - 05 - M3

Applicable solenoid valve  
10-SYJ3□□3-□□□□

Applicable blanking plate ass'y  
SYJ3000-21-2A

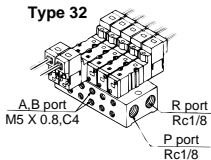
**Valve mounting direction**  
Nil — Single solenoid coil is located on the opposite side of A and B ports.

S — Single solenoid coil is located on the same side of A and B ports.

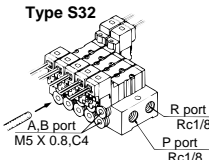
**Manifold stations**  
02 — 2 stations  
⋮  
20 — 20 stations

**Type 32 (For 4 port base mounted type)**

Type 32



Type S32



10 - SS5YJ3 - □ 32 - 05 - M5

Applicable solenoid valve  
10-SYJ3□□3-□□□□

Applicable blanking plate ass'y  
SYJ3000-21-2A

**Valve mounting direction**  
Nil — Single solenoid coil is located on the opposite side of A and B ports.

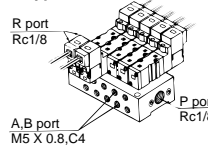
S — Single solenoid coil is located on the same side of A and B ports.

**Manifold stations**  
02 — 2 stations  
⋮  
20 — 20 stations

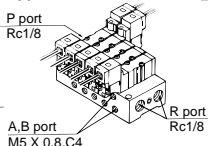
**A,B port size**  
M5 — M5 X 0.8  
C4 — ø4 One-touch fitting

**Type 41 (For 5 port base mounted type)**

Type 41



Type S41



10 - SS5YJ3 - □ 41 - 05 - C4

Applicable solenoid valve  
10-SYJ3□□43-□□□□

Applicable blanking plate ass'y  
SYJ3000-21-2A

**Valve mounting direction**  
Nil — Single solenoid coil is located on the opposite side of A and B ports.

S — Single solenoid coil is located on the same side of A and B ports.

**Manifold stations**  
02 — 2 stations  
⋮  
20 — 20 stations

**A,B port size**  
M5 — M5 X 0.8  
C4 — ø4 One-touch fitting



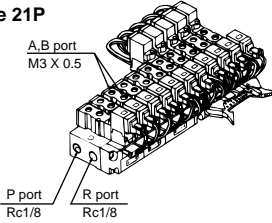
**Flat Ribbon Cable Type Manifold**

**How to Order**

● **Common SUP/Common EXH system**

Note) In case of 10 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

**Type 21P**



**10 - SS5YJ3 - 21P - 07**

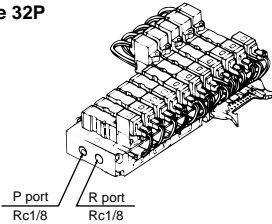
**Manifold stations**  
**04** — 4 stations  
 :  
 :  
**12** — 12 stations

**Applicable solenoid valve**  
 10-SYJ3□23-□LOU□-M3

**Applicable connector ass'y**  
 SY3000-37-28A (For 2 position single)  
 SY3000-37-29A (2 position double, for 3 position)

**Applicable blanking plate ass'y**  
 SYJ3000-21-3A (With dust cap)

**Type 32P**



**10 - SS5YJ3 - 32P - 07 - C4**

**Manifold stations**  
**04** — 4 stations  
 :  
 :  
**12** — 12 stations  
  
**A,B port size**  
**M5** — M5 X 0.8  
**C4** — ø4 One-touch fitting

**Applicable solenoid valve**  
 10-SYJ3□33-□LOU□

**Applicable connector ass'y**  
 SY3000-37-28A (For 2 position single)  
 SY3000-37-29A (2 position double, for 3 position)

**Applicable blanking plate ass'y**  
 SYJ3000-21-4A (With dust cap)

Directional Control Valve

# Solenoid Valve 10-SYJ3000

## Manifold Specifications

Model	Type 20	Type 31/Type S31	Type 32/Type S32	Type 41/Type S41	Type 21P	Type 32P
Manifold type	Single base type/B mount					
P (SUP)/R (EXH) system	Common SUP/Common EXH					
Stations	2 to 20 stations				4 to 12 stations	
A,B port piping specifications	Location	Valve		Base		Valve
	Direction	Top		Side		Top
Port size	P,R port	M5 X 0.8		Rc1/8		Rc1/8
	A,B port	M3 X 0.5		M5 X 0.8, C4 (ø4 One-touch fitting)		M3 X 0.5 M5 X 0.8, C4 (ø4 One-touch fitting)
Flat ribbon cable	—				Socket: 26 pin MIL type with strain relief (MIL-C-83503 compliant)	
Note 2) Internal wiring	—				Common to +COM and -COM	
Applicable solenoid valve	—				10-SYJ3□23- $\frac{5}{16}$ LOU□M3 10-SYJ3□33- $\frac{5}{16}$ LOU□	
Rated voltage	—				24VDC, 12VDC	

Note 1) The withstand voltage specification for the wiring unit is equivalent to class 1 in JIS C0704.

Note 2) The manifold can be wired for either positive or negative common because only non-polar valves are used.

Use of valves other than non polar types are not recommended. It may cause damage to the electrical circuit.

## Flow Characteristics

Manifold model			Port size		Flow characteristics						Effective area
					1→4/2 (P→A/B)			4/2→5/3 (A/B→R)			
					1(P), 5/3(R) port	2(B), 4(A) port	C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	
Body ported internal pilot	10-SS5YJ3-20	SYJ3□2□	M5 X 0.8	M3 X 0.5	—	—	—	—	—	—	0.9
	10-SS5YJ3- $\frac{31}{321}$	SYJ3□3□	M5 X 0.8	M3 X 0.5	—	—	—	—	—	—	0.9
Base mounted internal pilot	10-SS5YJ3-32-M5	SYJ3□3□	1/8	M5 X 0.8	0.25	0.19	0.060	0.32	0.25	0.077	—
	10-SS5YJ3-32-C4			C4	0.25	0.18	0.059	0.30	0.27	0.075	—
	10-SS5YJ3-S32-M5			M5 X 0.8	0.25	0.26	0.060	0.29	0.010	0.062	—
	10-SS5YJ3-S32-C4	C4	0.24	0.21	0.057	0.27	0.18	0.062	—		
	10-SS5YJ3-41-M5	SYJ3□4□	1/8	M5 X 0.8	0.32	0.25	0.081	0.33	0.19	0.079	—
	10-SS5YJ3-41-C4			C4	0.32	0.28	0.079	0.35	0.24	0.084	—
	10-SS5YJ3-S41-M5			M5 X 0.8	0.33	0.29	0.082	0.34	0.17	0.081	—
	10-SS5YJ3-S41-C4	C4	0.32	0.27	0.079	0.34	0.24	0.084	—		
	10-SS5YJ3-46-M5	SYJ3□4□	1/8	M5 X 0.8	0.20	0.25	0.048	0.10	0.12	0.024	—
	10-SS5YJ3-46-C4			C4	0.21	0.27	0.050	0.21	0.13	0.047	—
10-SS5YJ3-S46-M5	M5 X 0.8			0.20	0.25	0.048	0.19	0.16	0.024	—	
10-SS5YJ3-S46-C4	C4	0.22	0.34	0.057	0.10	0.090	0.024	—			
Body ported internal pilot	10-SS5YJ3-21P	SYJ3□23	1/8	M3 X 0.5	—	—	—	—	—	—	0.9
Base mounted internal pilot	10-SS5YJ3-32P-M5	SYJ3□33	1/8	M5 X 0.8	0.25	0.19	0.060	0.32	0.25	0.077	—
	10-SS5YJ3-32P-C4			C4	0.25	0.18	0.059	0.3	0.27	0.075	—

Note) Value for a 2 position single operation valve mounted on the manifold base.

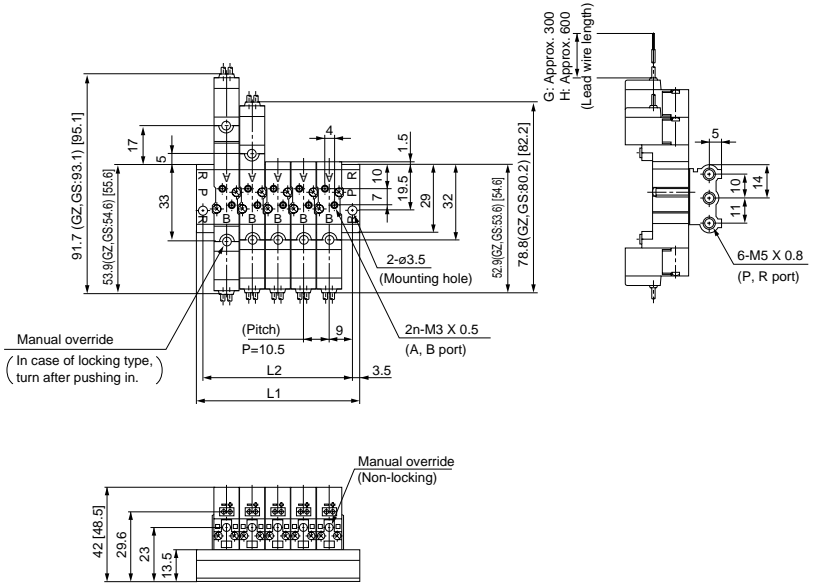
## How to Order Manifolds

10-SS5YJ3-32P-07-C4 ..... 1 (Manifold base)	*SYJ3000-21-4A ..... 1 (Blanking plate assembly)
*10-SYJ3133-5LOU ..... 3 (Valve)	*SY3000-37-28A ..... 3 (Connector assembly)
*10-SYJ3233-5LOU ..... 3 (Valve)	*SY3000-37-29A ..... 3 (Connector assembly)

⌞ \*To order valves and options mounted onto the manifold at the factory, list the valve/option with an asterisk(\*) in front of each part number.

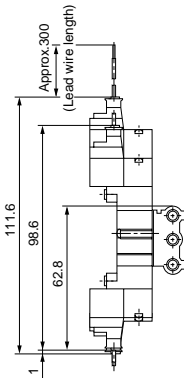
**Type 20 Manifold: Top Ported/10-SS5YJ3-20- Stations**

Grommet (G), (H)

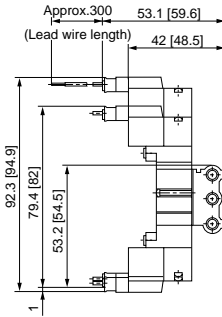


\* Values in [ ] are for AC.

**L Plug Connector (L)**



**M Plug Connector (M)**



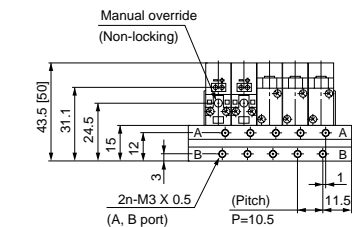
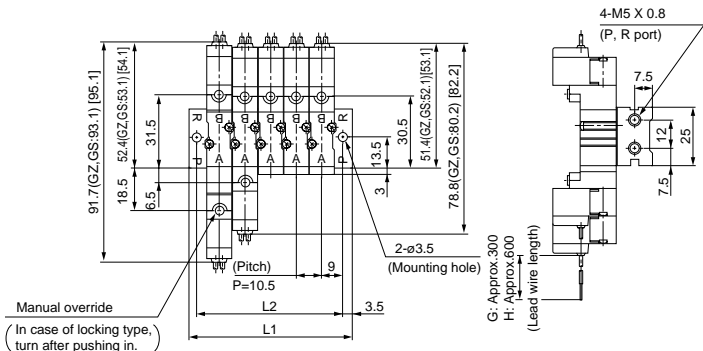
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	35.5	46	56.5	67	77.5	88	98.5	109	119.5	130	140.5	151	161.5	172	182.5	193	203.5	214	224.5
L <sub>2</sub>	28.5	39	49.5	60	70.5	81	91.5	102	112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5

**Type 31 Manifold: Side Ported/10-SS5YJ3-31- Stations -M3**

Grommet (G),(H)



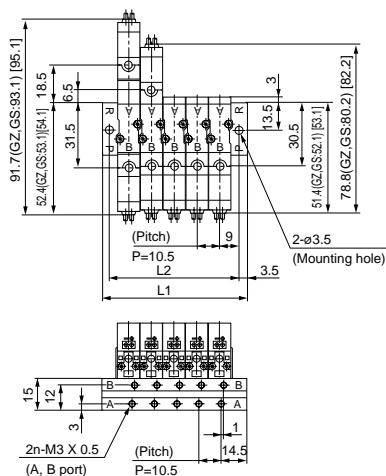
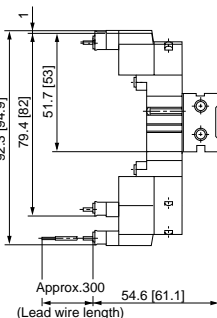
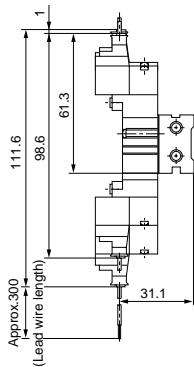
\*Values in [ ] are for AC.

**Type S31: Side Ported** (Single solenoid coil is located on the opposite side of A and B ports.)

**10-SS5YJ3-S31- Stations -M3**

**L Plug Connector (L)**

**M Plug Connector (M)**



\*Other dimensions are identical with those of a grommet type.

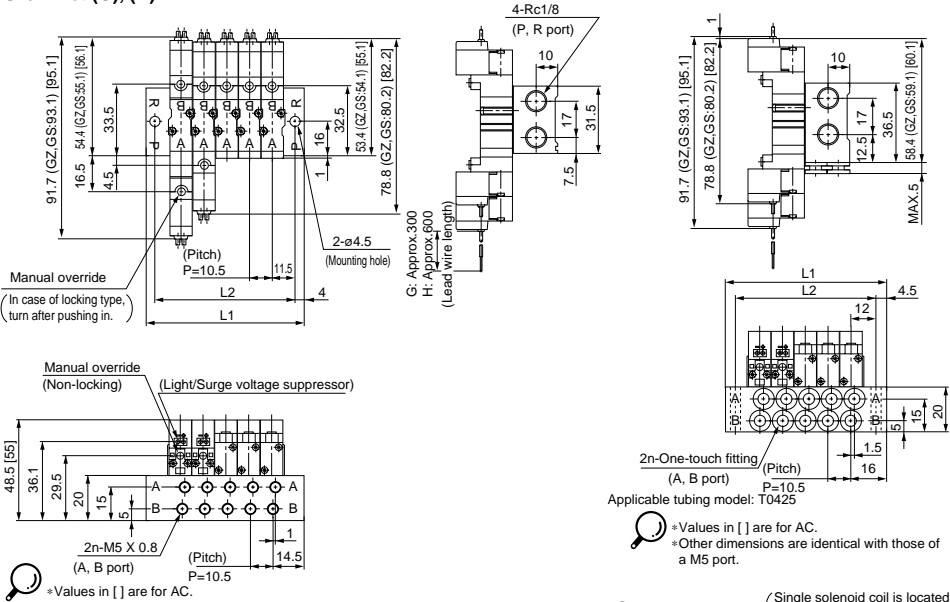
\*Values in [ ] are for AC.  
\*Other dimensions are identical with those of a grommet type.

\*Values in [ ] are for AC.  
\*Other dimensions are same as those of type 31.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	35.5	46	56.5	67	77.5	88	98.5	109	119.5	130	140.5	151	161.5	172	182.5	193	203.5	214	224.5
L2	28.5	39	49.5	60	70.5	81	91.5	102	112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5

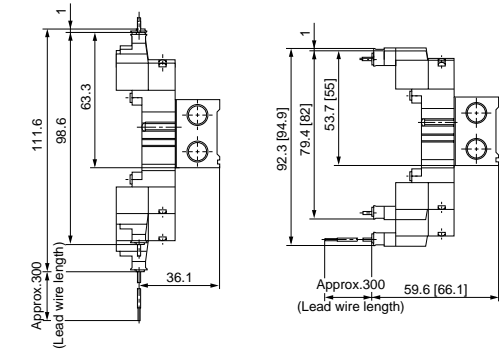
**Type 32 Manifold: Side Ported/10-SS5YJ3-32- Stations -M5, C4**

Grommet (G), (H)



**L Plug Connector (L)**

**M Plug Connector (M)**



\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

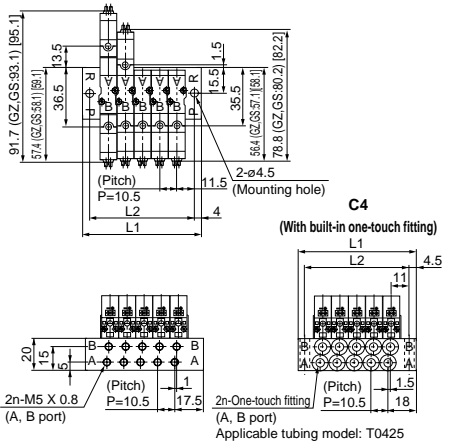
**SS5YJ3-32,S32- Stations -M5**

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	41.5	52	62.5	73	83.5	94	104.5	115	125.5	136	146.5	157	167.5	178	188.5	199	209.5	220	230.5
L2	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5

**SS5YJ3-32,S32- Stations -C4**

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	42.5	53	63.5	74	84.5	95	105.5	116	126.5	137	147.5	158	168.5	179	189.5	200	210.5	221	231.5
L2	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5

**Type S32: Side Ported** (Single solenoid coil is located on the opposite side of A and B ports.)  
**10-SS5YJ3-S32- Stations -M5, C4**



\* Values in [ ] are for AC.  
\* Other dimensions are same as those of type 32.

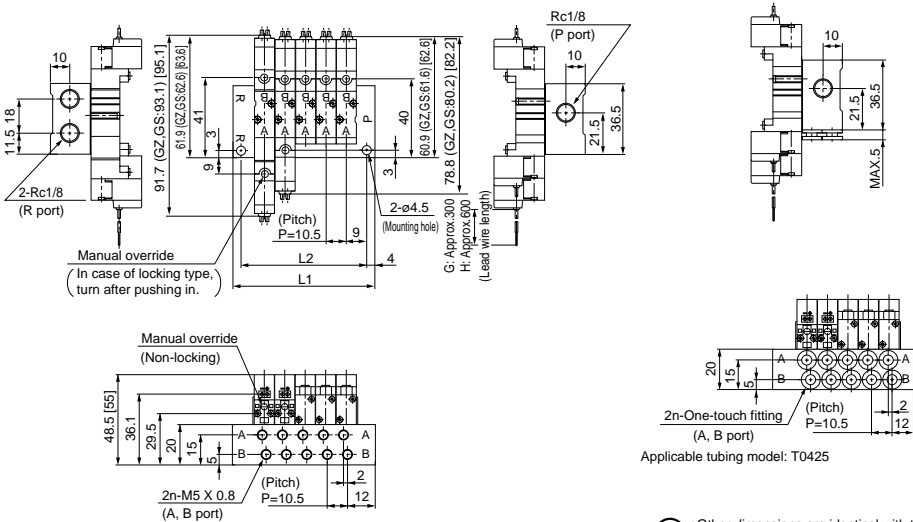
Directional Control Valve

# Solenoid Valve 10-SYJ3000

## Type 41 Manifold: Side Ported/10-SS5YJ3-41- Stations -M5, C4

Grommet (G), (H)

C4 (With built-in One-touch fitting)



Other dimensions are identical with those of a M5 port.

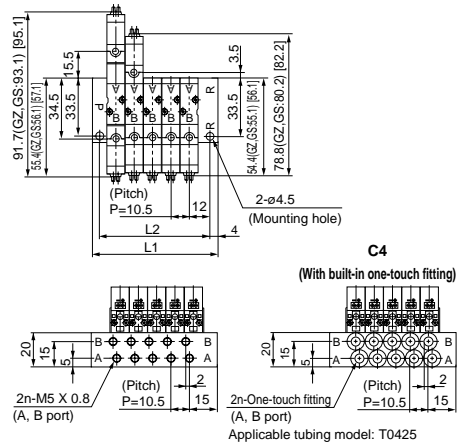
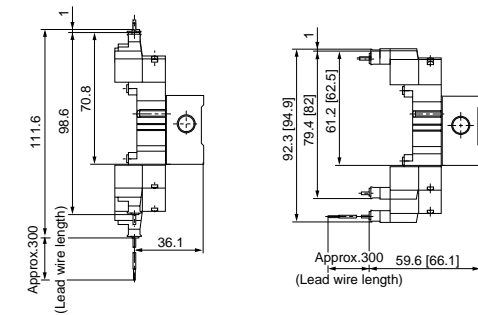
Values in [ ] are for AC.

## Type S41: Side Ported (Single solenoid coil is located on the opposite side of A and B ports.)

### 10-SS5YJ3-S41- Stations -M5, C4

L Plug Connector (L)

M Plug Connector (M)



Other dimensions are identical with those of a grommet type.

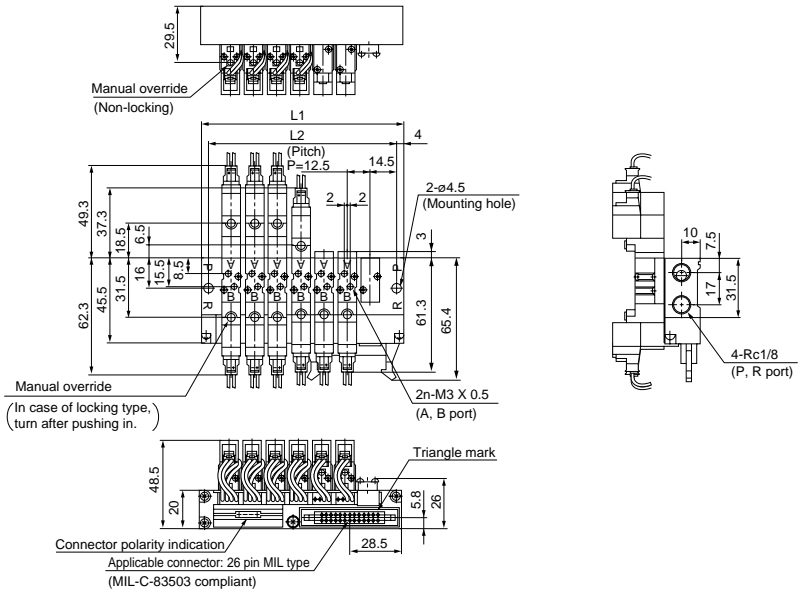
Values in [ ] are for AC.  
Other dimensions are identical with those of a grommet type.

Values in [ ] are for AC.  
Other dimensions are same as those of type 41.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	39.5	50	60.5	71	81.5	92	102.5	113	123.5	134	144.5	155	165.5	176	186.5	197	207.5	218	228.5
L2	31.5	42	52.5	63	73.5	84	94.5	105	115.5	126	136.5	147	157.5	168	178.5	189	199.5	210	220.5

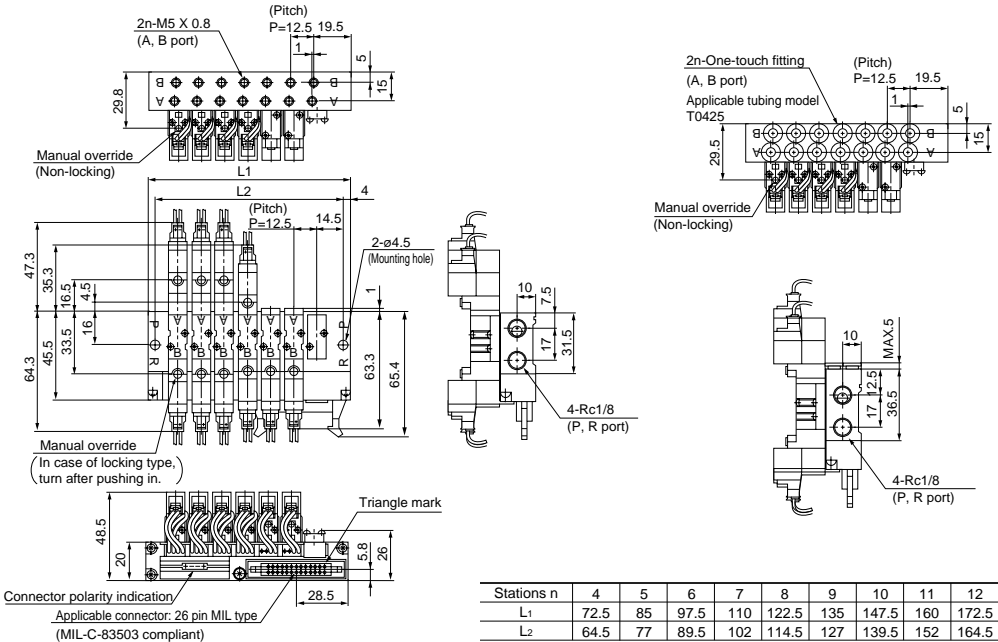
**Flat Ribbon Cable Manifold**

**10-SS5YJ3-21P-□ Stations**



**10-SS5YJ3-32P-□-M5, C4**

**C4 (With built-in One-touch fitting)**



Stations n	4	5	6	7	8	9	10	11	12
L1	72.5	85	97.5	110	122.5	135	147.5	160	172.5
L2	64.5	77	89.5	102	114.5	127	139.5	152	164.5

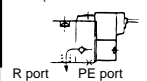
# Series 10-SYJ 4/5 Port Solenoid Valve Series SYJ5000

## How to Order

**Clean series**

**Actuation**  
 1 — 2 position single solenoid  
 2 — 2 position double solenoid  
 3 — 3 position closed center  
 4 — 3 position exhaust center  
 5 — 3 position pressure center

**Body option**  
 3 — Common exhaust (Pilot and main valves)



**Rated voltage**  
 1 — 100VAC (50/60Hz)  
 2 — 200VAC (50/60Hz)  
 3 — 110VAC [115VAC] (50/60Hz)  
 4 — 220VAC [230VAC] (50/60Hz)  
 5 — 24VDC  
 6 — 12VDC  
 V — 6VDC  
 S — 5VDC  
 R — 3VDC

**A, B port size**  
 M5 — M5 X 0.8  
 C4 — ø4 One-touch fitting  
 C6 — ø6 One-touch fitting

**Bracket**  
 Nil — Without bracket  
 F — With bracket  
 (Note) The bracket is supplied, but not assembled.

**Body Ported Type** 10 - SYJ5 1 2 3 - 5 L     - M5 -  

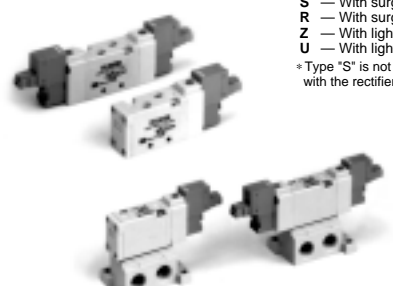
**Base Mounted Type** 10 - SYJ5 2 4 3 - 5 L     -  

**Electrical entry**  
 Grommet  
 G — Lead wire (300mm)  
 H — Lead wire (600mm)  
 L plug connector  
 L — With lead wire (300mm)  
 LN — Without lead wire  
 LO — Without connector  
 M plug connector  
 M — With lead wire (300mm)  
 MN — Without lead wire  
 MO — Without connector  
 \* Types LN and MN include 2 sockets.

**Light/surge suppresser**  
 If the electrical entry is G, H, L or M.  
 Nil — Without light/surge suppresser  
 S — With surge suppresser  
 R — With surge suppresser (Non-polar type)  
 Z — With light/surge suppresser  
 U — With light/surge suppresser (Non-polar type)  
 \* Type "S" is not available with AC since it is integrated with the rectifier.

**Manual override**  
 Nil — Non-locking push type  
 D — Push-turn locking slotted type

**Port size**  
 Nil — Without sub-plate  
 (With gasket and screw)  
 01 — Rc1/8 with sub-plate



## ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.



Model

	Valve	Actuation		Port size	Flow characteristics <sup>Note1)</sup>						Weight g <sup>Note2, 3)</sup>	
					1→4/2(P→A/B)			4/2→5/3(A/B→EA/EB)			Grommet type	L/M plug connector
					C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv		
Body ported type	10-SYJ5□23-□□-M5	2 position	Single	M5 X 0.8	0.47	0.41	0.13	0.47	0.41	0.13	58	45
			Double		0.49	0.44	0.13	0.44	0.40	0.12	65	69
		3 position	Closed center		0.46	0.37	0.12	0.47[0.39]	0.43[0.35]	0.13[0.10]	69	73
			Exhaust center		0.49[0.39]	0.51[0.38]	0.14[0.10]	0.45	0.42	0.12		
			Pressure center									
		Body ported type	10-SYJ5□23-□□-C4		2 position	Single	A/B port: C4 (ø4 One-touch fitting)	0.69	0.39	0.18	0.44	0.39
Double	0.69			0.40		0.19		0.43	0.40	0.12	65	69
3 position	Closed center			0.56	0.40	0.15		0.41[0.41]	0.37[0.37]	0.10[0.11]	76	80
	Exhaust center			0.57[0.41]	0.4[0.37]	0.15[0.10]		0.41	0.37	0.10		
	Pressure center											
Body ported type	10-SYJ5□23-□□-C6			2 position	Single	A/B port: C6 (ø6 One-touch fitting)		0.70	0.36	0.19	0.47	0.40
		Double	0.72		0.37		0.19	0.44	0.34	0.12	65	69
		3 position	Closed center	0.67	0.54		0.19	0.41[0.41]	0.38[0.38]	0.11[0.11]	76	80
			Exhaust center	0.82[0.44]	0.41[0.39]		0.23[0.12]	0.41	0.36	0.11		
			Pressure center									
		Base mounted type	10-SYJ5□43-□□-01	2 position	Single		Rc1/8	0.79	0.21	0.19	0.83	0.32
Double	0.80				0.28	0.18		0.86	0.34	0.20	92 (58)	96 (62)
3 position	Closed center			0.71	0.26	0.18		1.1[0.60]	0.24[0.44]	0.26[0.18]	103 (69)	107 (73)
	Exhaust center			0.99[0.47]	0.29[0.38]	0.24[0.12]		0.72	0.38	0.18		
	Pressure center											

Note 1) Values in [ ] are for the normal position. A, B→R1, R2 applies to the exhaust center while P→A, B applies to the pressure center.

Note 2) Values in ( ) are for types without sub-plate.

Note 3) Values are for DC voltages. For AC voltages, add 1 g to the weight of the single solenoid and 2 g to the weight of the double solenoid and 3 position styles.

Specifications

Fluid		Air	
Operating pressure range MPa	2 position single	0.15 to 0.7	
	2 position double	0.1 to 0.7	
	3 position	0.15 to 0.7	
Ambient and fluid temperature °C	Max. 50		
<sup>Note1)</sup> Response time ms (0.5MPa)	2 position single, Double	25 or less	
	3 position	40 or less	
Max. operating Frequency Hz	2 position single, Double	5	
	3 position	3	
Manual override	Non-locking push type, Push-turn-locking slotted type		
Pilot exhaust method	Common exhaust (Pilot and main valves)		
Lubrication	Not required		
Mounting orientation	free		
<sup>Note2)</sup> Impact/Vibration resistance m/s <sup>2</sup>	150/30		
Enclosure	Dust proof		

Note1) According to JIS B8375-1981 dynamic performance test (With coil temperature of 20°C, at rated voltage and without surge voltage suppressor)

Note2) Shock resistance: No malfunction resulted in an impact test using a drop impact tester.

The test was performed each time in the axial and right angle directions of the main valve and armature, for both energized and deenergized states. Impact resistance: No malfunction resulted from a one-sweep test between 8.3 and 2000Hz. The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage).

Solenoid Specifications

Electrical entry		Grommet(G)/(H) , L plug connector (L), M plug connector (M)		
Rated coil voltage V	DC	24, 12, 6, 5, 3		
	50/60Hz AC	*100, 110, 200, 220		
Allowable voltage fluctuation	±10% of rated voltage			
<sup>Note)</sup> Power consumption W	DC		0.5 (With light: 0.55)	
	Apparent power VA	AC	100V	0.9 (With light: 1.0)
			110V	1.0 (With light: 1.1)
			[115V]	[1.1 (With light: 1.2)]
			200V	1.8 (With light: 1.9)
			220V	1.9 (With light: 2.0)
			[230V]	[2.2 (With light: 2.3)]
Surge voltage suppressor	Diode			
Indicator light	LED			

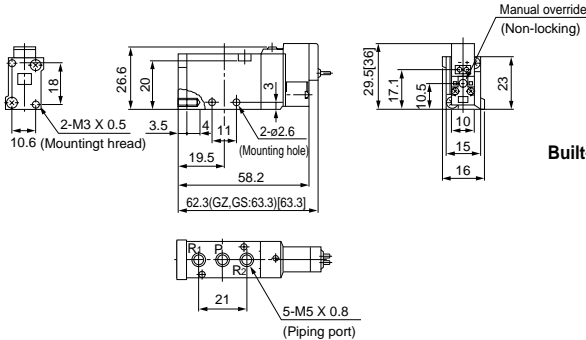
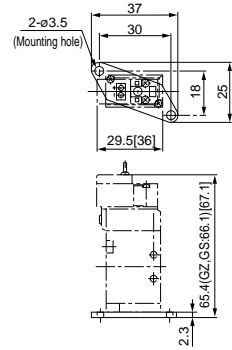
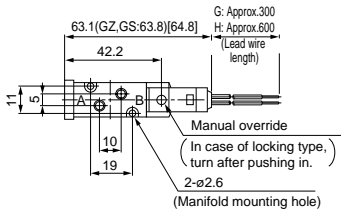
\* 110VAC and 115VAC are common, as are 220VAC and 230VAC.

Note) At rated voltage

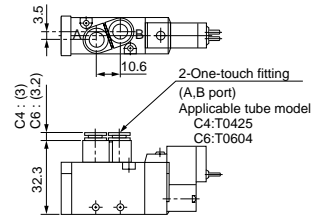
**Body Ported Type/2 Position Single**

Grommet (G),(H):10-SYJ5123-□□□□-M5

**With Bracket**



**Built-in One-touch Fitting: 10-SYJ5123-□□□□-C4 C6**

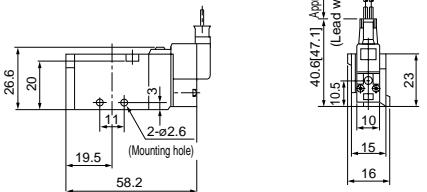
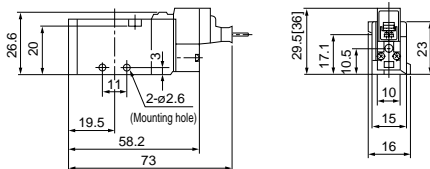
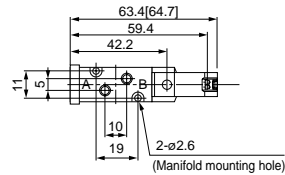
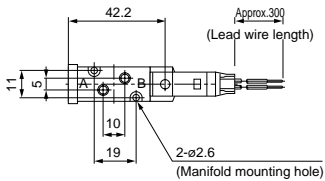


\* Values in [ ] are for AC.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**L Plug Connector (L): 10-SYJ5123-□□□□-M5**

**M Plug Connector (M): 10-SYJ5123-□□□□-M5**



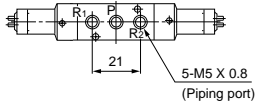
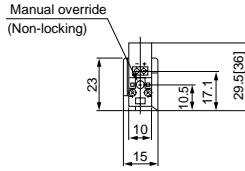
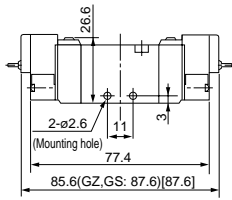
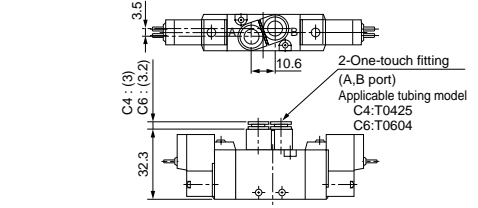
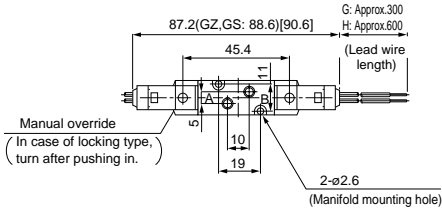
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**Body Ported Type/2 Position Double**

Grommet (G),(H):10-SYJ5223-□□□□-M5

Built-in One-touch Fitting: 10-SYJ5223-□□□□-C4

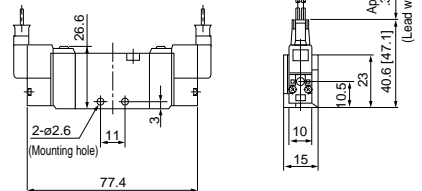
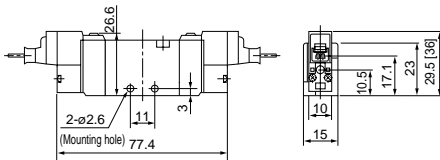
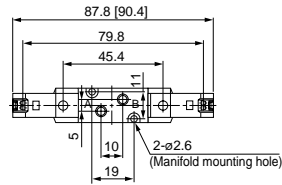
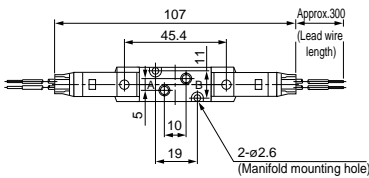


= Values in [ ] are for AC.

Directional Control Valve

**L Plug Connector (L): 10-SYJ5223-□□□□-M5**

**M Plug Connector (M): 10-SYJ5223-□□□□-M5**



= Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

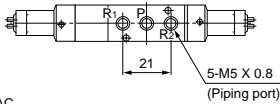
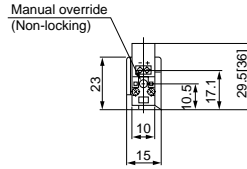
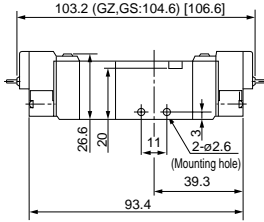
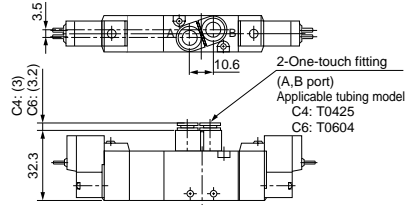
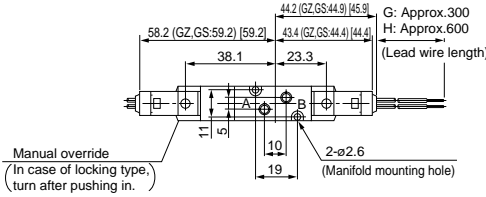
= Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

# Solenoid Valve 10-SYJ5000

## Body Ported Type/3 Position Closed Center/Exhaust Center/Pressure Center

Grommet (G), (H): 10-SYJ5 $\frac{3}{8}$ 23-□□□□-M5

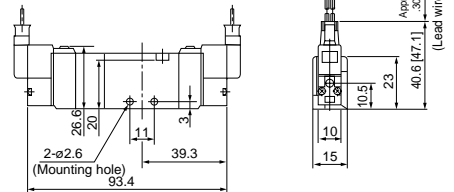
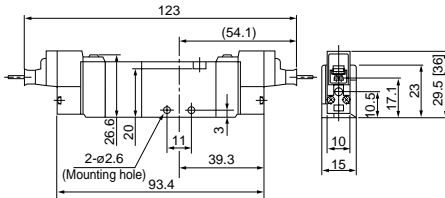
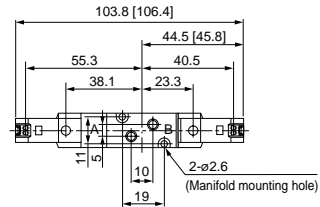
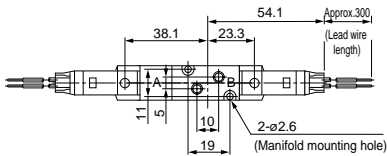
Built-in One-touch Fitting: 10-SYJ5 $\frac{3}{8}$ 23-□□□□-C4



\* Values in [ ] are for AC.

L Plug Connector (L): 10-SYJ5 $\frac{3}{8}$ 23-□□□□-M5

M Plug Connector (M): 10-SYJ5 $\frac{3}{8}$ 23-□□□□-M5



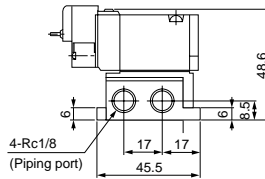
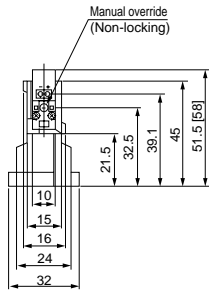
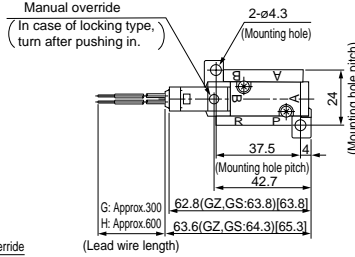
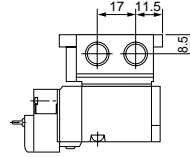
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**Base Mounted Type/2 Position Single**

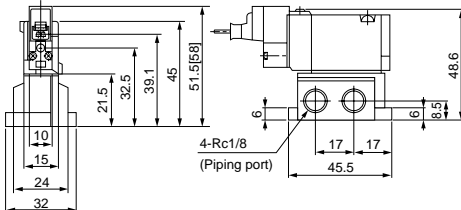
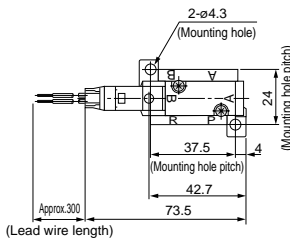
Grommet (G), (H): 10-SYJ5143-□□□□-01



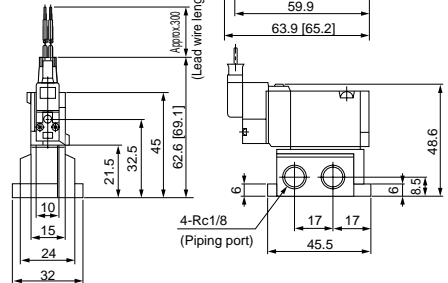
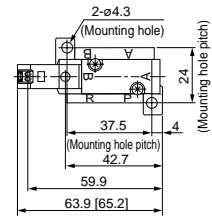
⊗ Values in [ ] are for AC.

**L Plug Connector (L): 10-SYJ5143-□□□□-01**

**M Plug Connector (M): 10-SYJ5143-□□M□□-01**



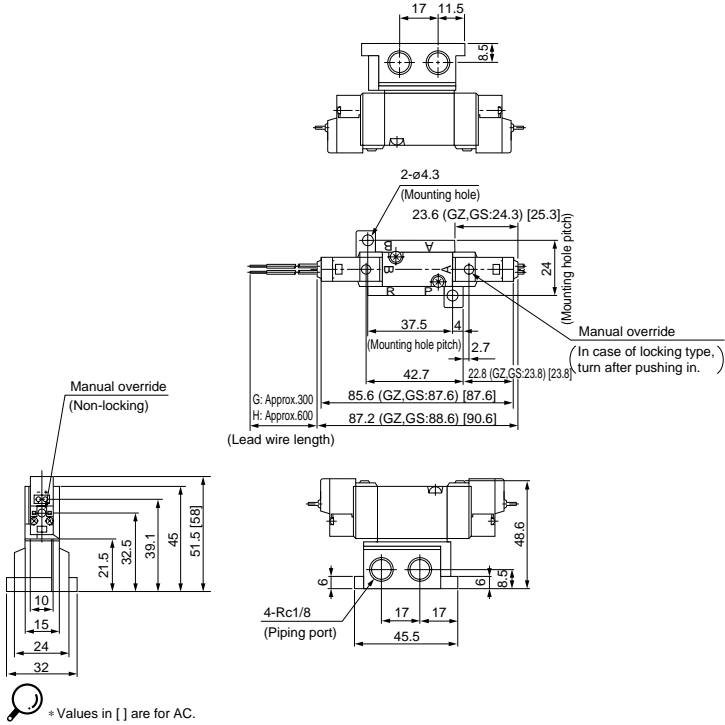
⊗ Values in [ ] are for AC.  
⊗ Other dimensions are identical with those of a grommet type.



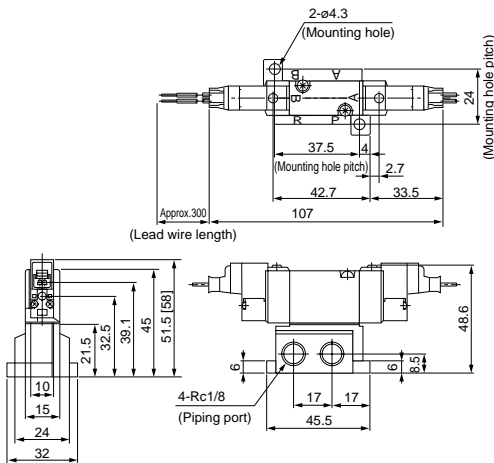
⊗ Values in [ ] are for AC.  
⊗ Other dimensions are identical with those of a grommet type.

**Base Mounted Type/2 Position Double**

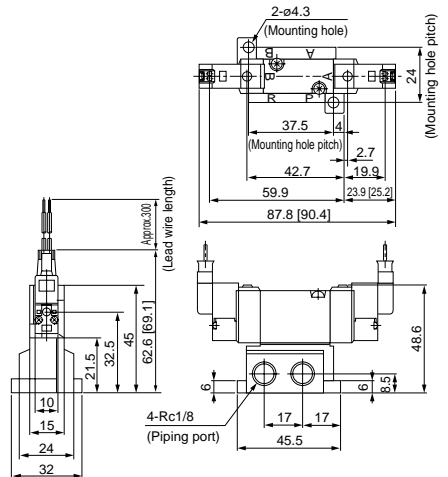
Grommet (G), (H): 10-SYJ5243-□□□□-01



**L Plug Connector (L): 10-SYJ5243-□□□□-01**



**M plug connector (M): 10-SYJ5243-□□M□□-01**

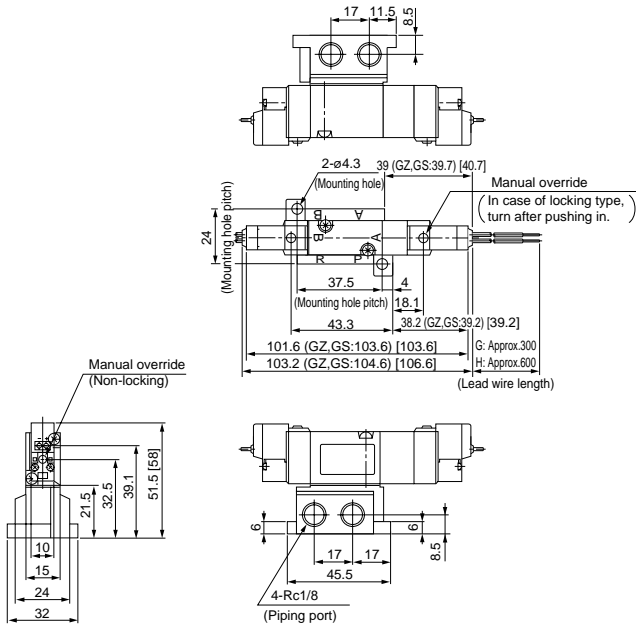


\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

Base Mounted Type/3 Position Closed Center/Exhaust Center/Pressure Center

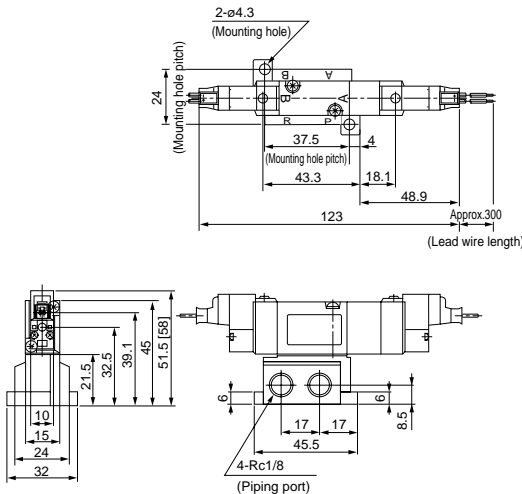
Grommet (G),(H):10-SYJ5<sup>3</sup>/<sub>4</sub>43-□□□-01



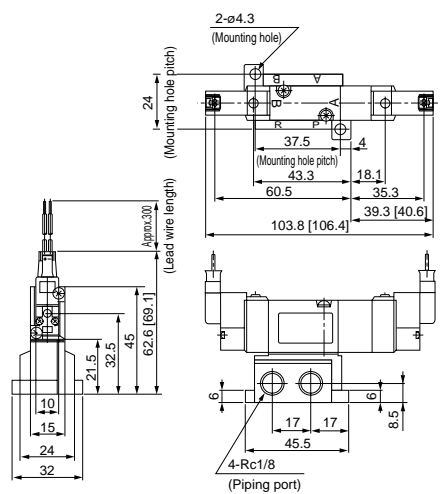
\* Values in [ ] are for AC.

L Plug Connector: 10-SYJ5<sup>3</sup>/<sub>4</sub>43-□□□-01

M Plug Connector: 10-SYJ5<sup>3</sup>/<sub>4</sub>43-□M□□-01



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.



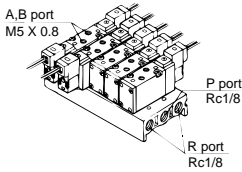
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**Manifold**

**How to Order Common SUP/Common EXH System**

Note) In case of 8 or more stations, apply pressure from both sides of P port and exhaust from R ports on both sides.

**Type 20 (For 5 port body ported type)**



10 - SS5YJ5 - 20 - 05

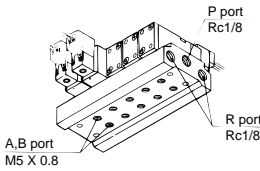
**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**Applicable solenoid valve**  
 10-SYJ5□23-□□□□-<sup>M5</sup><sub>C6</sub>

**Applicable blanking plate assembly**  
 SYJ5000-21-1A

**Applicable individual exhaust spacer assembly**  
 SYJ5000-17-1A

**Type 40 (For 5 port base mounted type)**



10 - SS5YJ5 - 40 - 05 - M5

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**A,B port size**  
 M5 — M5 X 0.8

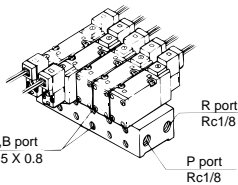
**Applicable solenoid valve**  
 10-SYJ5□43-□□□□  
 10-SYJ5□53-□□□□

**Applicable blanking plate assembly**  
 SYJ5000-21-1A

**Applicable individual exhaust spacer assembly**  
 SYJ5000-17-1A

**Applicable interface regulator assembly**  
 ARBYJ5000-00-P

**Type 41 (For 5 port base mounted type)**



10 - SS5YJ5 - 41 - 05 - M5

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**A,B port size**  
 M5 — M5 X 0.8

**Applicable solenoid valve**  
 10-SYJ5□43-□□□□  
 10-SYJ5□53-□□□□

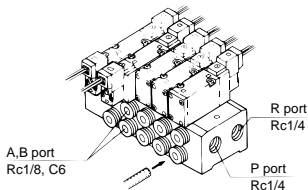
**Applicable blanking plate assembly**  
 SYJ5000-21-1A

**Applicable individual exhaust spacer assembly**  
 SYJ5000-17-1A

**Applicable individual supply spacer assembly**  
 SYJ5000-16-2A

**Applicable interface regulator assembly**  
 ARBYJ5000-00-P

**Type 42 (For 5 port base mounted type)**



10 - SS5YJ5 - 42 - 05 - C6

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**A,B port size**  
 01 — Rc1/8  
 C6 — ø6 One-touch fitting

**Applicable solenoid valve**  
 10-SYJ5□43-□□□□  
 10-SYJ5□53-□□□□

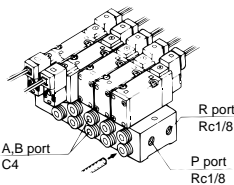
**Applicable blanking plate assembly**  
 SYJ5000-21-1A

**Applicable individual exhaust spacer assembly**  
 SYJ5000-17-1A

**Applicable individual supply spacer assembly**  
 SYJ5000-16-2A

**Applicable interface regulator assembly**  
 ARBYJ5000-00-P

**Type 43 (For 5 port base mounted type)**



10 - SS5Y5 - 43 - 05 - C4

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**A,B port size**  
 C4 — ø4 One-touch fitting

**Applicable solenoid valve**  
 10-SYJ5□43-□□□□  
 10-SYJ5□53-□□□□

**Applicable blanking plate assembly**  
 SYJ5000-21-1A

**Applicable individual exhaust spacer assembly**  
 SYJ5000-17-1A

**Applicable individual supply spacer assembly**  
 SYJ5000-16-2A

**Applicable interface regulator assembly**  
 ARBYJ5000-00-P

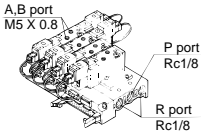


**Flat Ribbon Cable Type Manifold**

**How to Order Common SUP/Common EXH System**

Note) In case of 8 or more stations, apply pressure from both sides of P port and exhaust from R ports on both sides.

**Type 20P (For 5 port basic piping type)**



**10 - SS5YJ5 - 20P - 05**

**Manifold stations**

- 03 —3 stations
- ∴
- 12 —12 stations

**Applicable solenoid valve**

10-SYJ5□23- $\frac{5}{8}$ LOU□- $\frac{M5}{C6}$

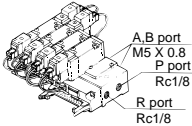
**Applicable blanking plate assembly**

SYJ5000-21-3A

**Applicable connector assembly**

SY3000-37-3A (For 2 position single)  
SY3000-37-4A (For 2 position double and 3 position)

**Type 41P (For 5 port base piping)**



**10 - SS5YJ5 - 41P - 05 - M5**

**Manifold stations**

- 03 —3 stations
- ∴
- 12 —12 stations

**Applicable solenoid valve**

10-SYJ5□43- $\frac{5}{8}$ LOU□  
10-SYJ5□53- $\frac{5}{8}$ LOU□□

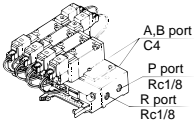
**Applicable blanking plate assembly**

SYJ5000-21-3A

**Applicable connector assembly**

SY3000-37-3A (For 2 position single)  
SY3000-37-4A (For 2 position double and 3 position)

**Type 43P (For 5 port base piping)**



**10 - SS5YJ5 - 43P - 05 - C4**

**Manifold stations**

- 03 —3 stations
- ∴
- 12 —12 stations

**Applicable solenoid valve**

10-SYJ5□43- $\frac{5}{8}$ LOU□  
10-SYJ5□53- $\frac{5}{8}$ LOU□□

**Applicable blanking plate assembly**

SYJ5000-21-3A

**Applicable connector assembly**

SY3000-37-3A (For 2 position single)  
SY3000-37-4A (For 2 position double and 3 position)

**Manifold Specifications**

Model	20 type	40 type	41 type	42 type	43 type	20P type	41P type	43P type
<b>Manifold type</b>	Single base type/B mount							
<b>P (SUP)/R (EXH) system</b>	Common SUP/Common EXH							
<b>Stations</b>	2 to 20 stations					3 to 12 stations		
<b>A,B port piping Specifications</b>	<b>Location</b>	Valve	Base	Base			Valve	Base
	<b>Direction</b>	Top	Bottom	Side			Top	Side
<b>Port size</b>	<b>P,R port</b>	Rc1/8			Rc1/4	Rc1/8	Rc1/8	Rc1/8
	<b>A,B port</b>	M5 X 0.8 C4, C6	M5 X 0.8		Rc1/8, C6 (ø6 One-touch fitting)	C4 (ø4 One-touch fitting)	M5 X 0.8, C4(ø4 One-touch fitting), C6(ø6 One-touch fitting)	M5 X 0.8 C4 (ø4 One-touch fitting)
<b>Flat ribbon cable</b>	—					Socket: 26 pin MIL type with strain relief (MIL-C-83503 compliant)		
<b>Internal wiring</b>	—					Common to +COM and -COM		
<b>Applicable solenoid valve</b>	—					10-SYJ5□23- $\frac{5}{8}$ LOU□- $\frac{M5}{C6}$ 10-SYJ5□43- $\frac{5}{8}$ LOU□ 10-SYJ5□53- $\frac{5}{8}$ LOU□		
<b>Rated voltage</b>	—					24VDC, 12VDC		

Note1) The withstand voltage specification for the unit with section conforms to JISC0704, Grade 1 or its equivalent.  
Note2) The manifold can be wired for either positive or negative common because only non-polar valves are used.  
Use of valves other than non polar types are not recommended. It may cause damage to the electrical circuit.

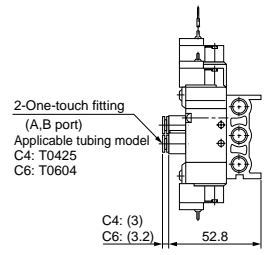
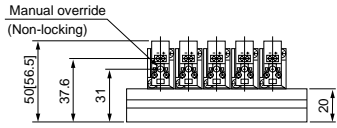
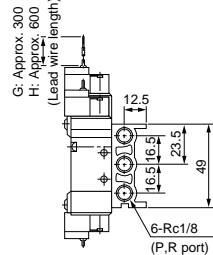
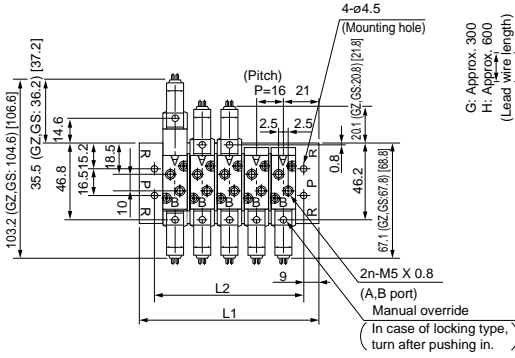
**Flow Characteristics**

Manifold model	Port size	Flow characteristics								
		1→4/2 (P→A/B)			4/2→5/3 (A/B→R)					
		1(P), 5/3(R) port	2(B), 4(A) port	C [dm <sup>3</sup> /(s-bar)]	b	Cv	C [dm <sup>3</sup> /(s-bar)]	b	Cv	
Body ported internal pilot	10-SS5YJ5-20	SYJ5□2□	1/8	M5 X 0.8	0.46	0.39	0.12	0.75	0.32	0.19
			1/8	C4	0.62	0.33	0.16	0.83	0.27	0.20
			1/8	C6	0.79	0.36	0.21	0.91	0.36	0.24
Base mounted internal pilot	10-SS5YJ5-40	SYJ5□4□	1/8	M5 X 0.8	0.55	0.35	0.15	0.64	0.26	0.16
	10-SS5YJ5-41		1/8	M5 X 0.8	0.59	0.35	0.16	0.68	0.23	0.17
	10-SS5YJ5-42-01		1/4	1/8	0.74	0.22	0.18	0.82	0.31	0.21
	10-SS5YJ5-42-01		1/4	C6	0.71	0.24	0.17	0.8	0.29	0.20
	10-SS5YJ5-43		1/8	C4	0.55	0.29	0.14	0.74	0.32	0.19
Body ported internal pilot	10-SS5YJ5-20P	SYJ5□23	1/8	M5 X 0.8	0.46	0.39	0.12	0.75	0.32	0.19
			1/8	C4	0.62	0.33	0.16	0.83	0.27	0.20
			1/8	C6	0.70	0.36	0.21	0.91	0.36	0.24
Base mounted internal pilot	10-SS5YJ5-41P	SYJ5□43□	1/8	M5 X 0.8	0.59	0.35	0.16	0.68	0.23	0.17
	10-SS5YJ5-43P		1/8	C4	0.55	0.29	0.14	0.74	0.32	0.19

Note) Value for a 2 position single operation mounted on the manifold base.

**Type 20 Manifold: Top Ported/10-SS5YJ5-20- Stations**

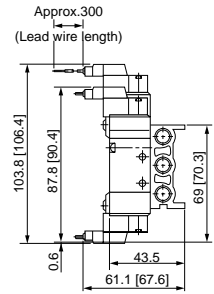
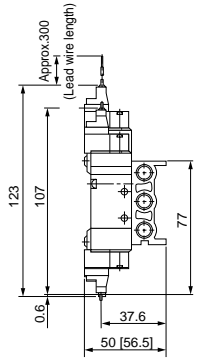
Grommet (G), (H)



\* Values in [ ] are for AC.

**L Plug Connector (L)**

**M Plug Connector (M)**



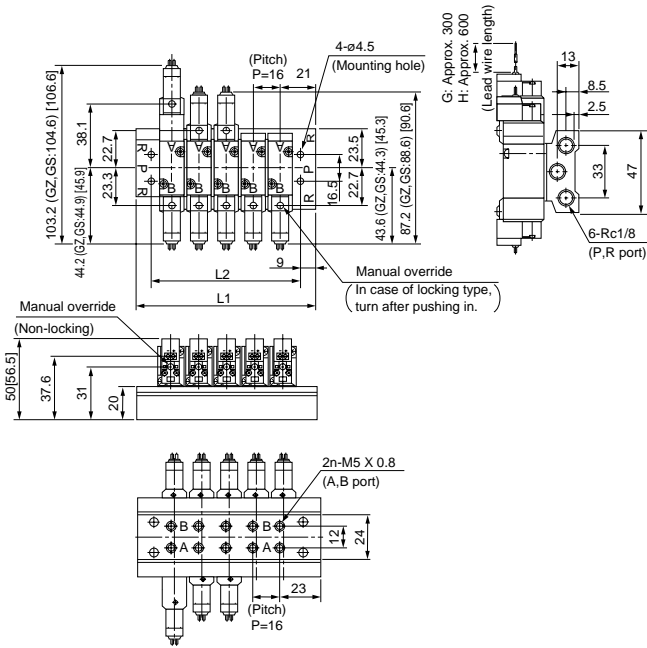
\* Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	58	74	90	106	122	138	154	170	186	202	218	234	250	266	282	298	314	330	346
L <sub>2</sub>	40	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296	312	328

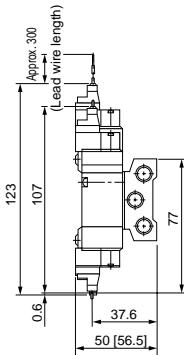
Type 40 Manifold: Bottom Ported/10-SS5YJ5-40- Stations -M5

Grommet (G),(H)

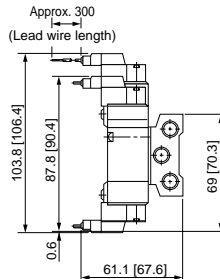


\* Values in [ ] are for AC.

L Plug Connector (L)



M Plug Connector (M)



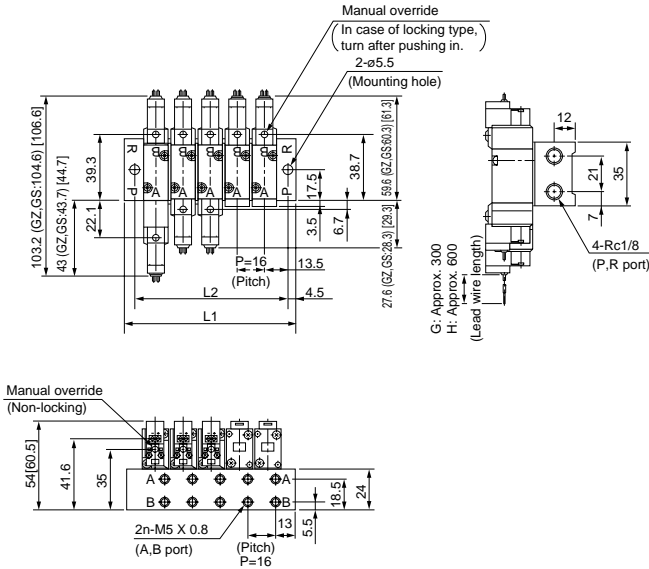
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	58	74	90	106	122	138	154	170	186	202	218	234	250	266	282	298	314	330	346
L2	40	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296	312	328

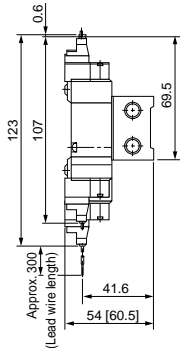
**Type 41 Manifold: Side Ported/10-SS5YJ5-41- Stations -M5**

Grommet (G), (H)

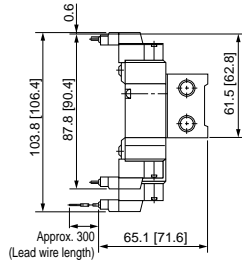


\* Values in [ ] are for AC.

**L Plug Connector (L)**



**M Plug Connector (M)**



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

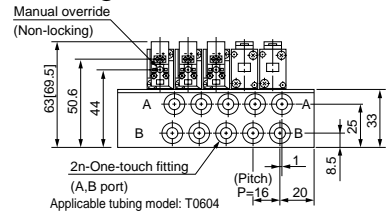
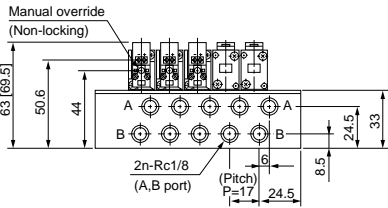
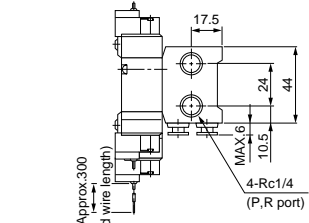
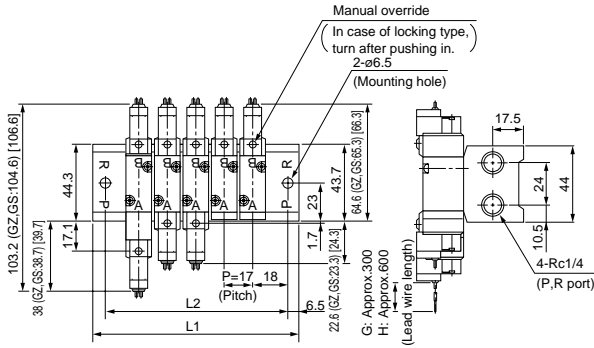
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276	292	308	324	340
L <sub>2</sub>	43	59	75	91	107	123	139	155	171	187	203	219	235	251	267	283	299	315	331

Type 42 Manifold: Side Ported/10-SS5YJ5-42- Stations -01, C6

Grommet (G), (H)

C6 (With built-in One-touch fitting)

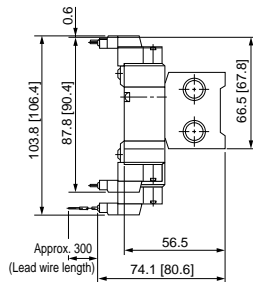
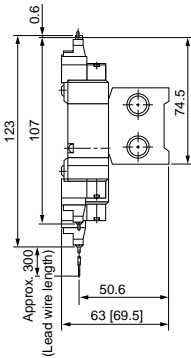


\* Values in [ ] are for AC.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

L plug connector (L)

M plug connector (M)



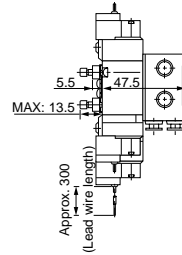
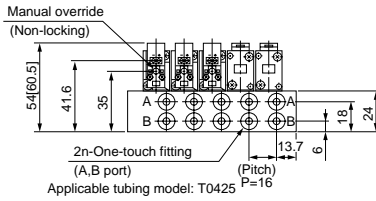
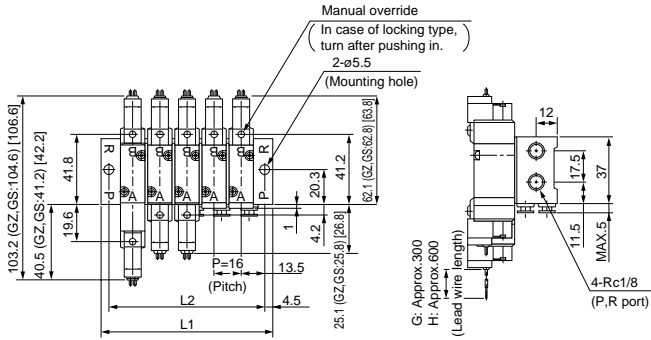
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

A,B port size	Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Rc1/8	L1	66	83	100	117	134	151	168	185	202	219	236	253	270	287	304	321	338	355	372
	L2	53	70	87	104	121	138	155	172	189	206	223	240	257	274	291	308	325	342	359
C6 (ø6 one-touch fittings)	L1	65	81	97	113	129	145	161	177	193	209	225	241	257	273	289	305	321	337	353
	L2	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276	292	308	324	340

Type 43 Manifold: Side Ported/10-SS5YJ5-43- **Stations** -C4

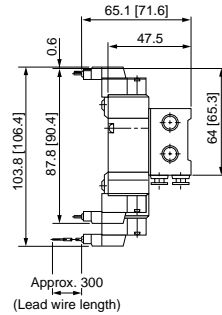
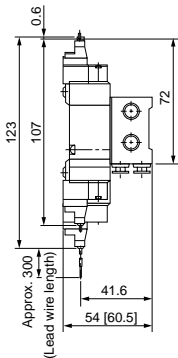
Grommet (G), (H)



\* Values in [ ] are for AC.

**L plug connector (L)**

**M plug connector (M)**



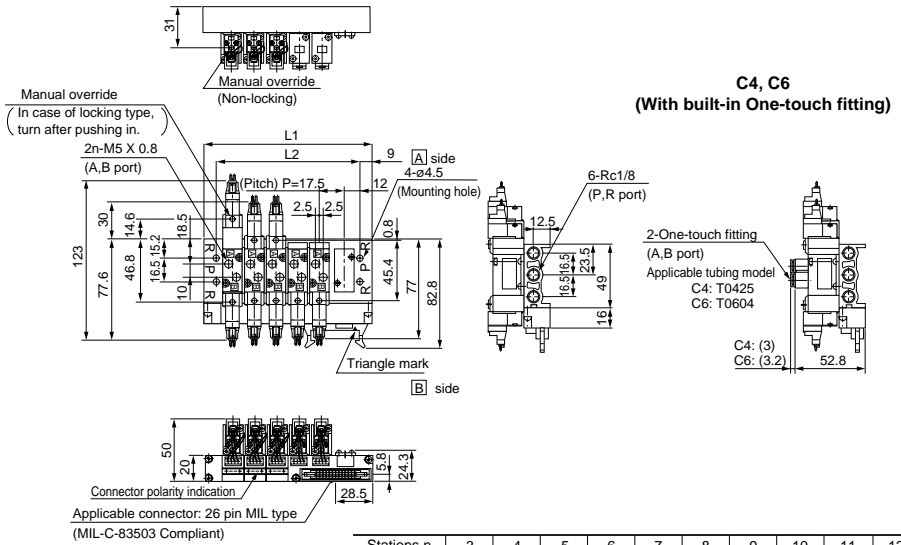
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276	292	308	324	340
L2	43	59	75	91	107	123	139	155	171	187	203	219	235	251	267	283	299	315	331

**Flat Ribbon Cable Manifold**

**10-SS5YJ5-20P- Stations**

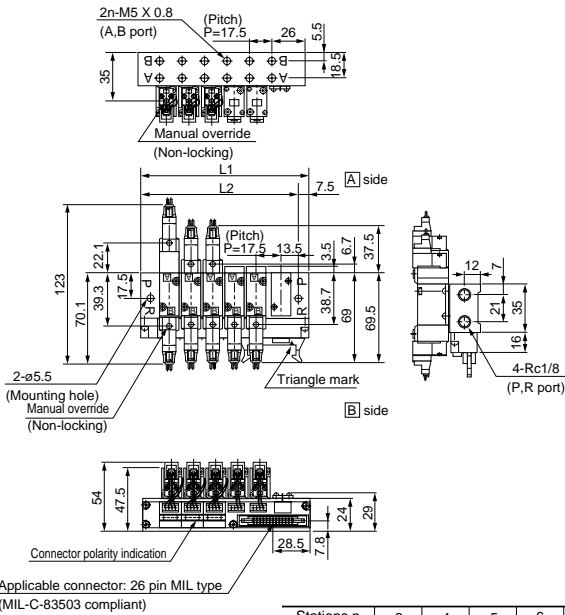


Stations n	3	4	5	6	7	8	9	10	11	12
L1	77	94.5	112	129.5	147	164.5	182	199.5	217	234.5
L2	59	76.5	94	111.5	129	146.5	164	181.5	199	216.5

Directional Control Valve

**Flat Ribbon Cable Manifold**

10-SS5YJ5-41P- **Stations** -M5

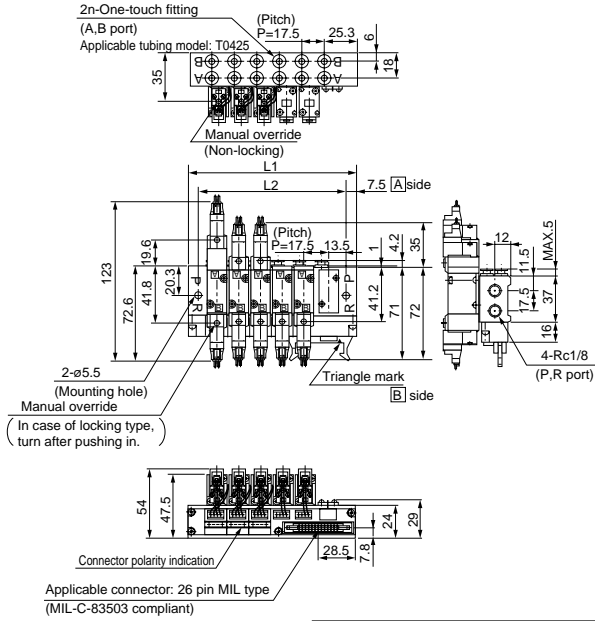


Stations n	3	4	5	6	7	8	9	10	11	12
L1	77	94.5	112	129.5	147	164.5	182	199.5	217	234.5
L2	62	79.5	97	114.5	132	149.5	167	184.5	202	219.5



**Flat Ribbon Cable Manifold**

10-SS5YJ5-43P- **Stations** -C4



Stations n	3	4	5	6	7	8	9	10	11	12
L1	77	94.5	112	129.5	147	164.5	182	199.5	217	234.5
L2	62	79.5	97	114.5	132	149.5	167	184.5	202	219.5

Directional  
Control Valve

# Series 10-SY100 3 Port Solenoid Valve Direct Operated Type

## How to Order

### Standard (Cv0.008)

<p><b>Clean series</b></p>	<p><b>Actuation</b>  <b>1</b> — Normally closed (N.C.)  <b>2</b> — Normally open (N.O.)</p>	<p><b>Light/surge suppressor</b>  <b>Nil</b> — Without light/surge suppressor  <b>S</b> — With surge suppressor  <b>R</b> — With surge suppressor (Non-polar type)  <b>Z</b> — With light/surge suppressor  <b>U</b> — With light/surge suppressor (Non-polar type)  <small>* For AC voltage valves, there is no "S" option.  It is already built into the rectifier.</small></p>	<p><b>Piping specifications</b>  <b>Nil</b> — For manifold  <b>P</b> — P,R,A port  For direct piping</p>	<p><b>Bracket</b>  <b>Nil</b> — Without bracket  <b>F</b> — With bracket  For only PM3</p>
<p><b>Body Ported Type</b></p>	<p>10 - SY1 <span style="border: 1px solid black; padding: 2px;">1</span> 3 - <span style="border: 1px solid black; padding: 2px;">5</span> <span style="border: 1px solid black; padding: 2px;">L</span> <span style="border: 1px solid black; padding: 2px;"> </span> <span style="border: 1px solid black; padding: 2px;"> </span> - <span style="border: 1px solid black; padding: 2px;"> </span> <span style="border: 1px solid black; padding: 2px;"> </span> M3 - <span style="border: 1px solid black; padding: 2px;"> </span></p>			
<p><b>Base Mounted Type</b></p>	<p>10 - SY1 <span style="border: 1px solid black; padding: 2px;">1</span> 4 - <span style="border: 1px solid black; padding: 2px;">5</span> <span style="border: 1px solid black; padding: 2px;">M</span> <span style="border: 1px solid black; padding: 2px;"> </span> <span style="border: 1px solid black; padding: 2px;"> </span> - <span style="border: 1px solid black; padding: 2px;"> </span></p>			
<p><b>Rated voltage</b>  DC specifications  <b>5</b> — 24VDC  <b>6</b> — 12VDC  <b>V</b> — 6VDC  <b>S</b> — 5VDC  <b>R</b> — 3VDC  AC specifications (50/60Hz)  <b>1</b> — 100VAC  <b>2</b> — 200VAC  <b>3</b> — 110VAC [115VAC]  <b>4</b> — 220VAC [230VAC]</p>	<p><b>Port size</b>  <b>Nil</b> — Without sub-plate  (With gasket and screw)  <b>M3</b> — With sub-plate</p>	<p><b>Manual override</b>  <b>Nil</b> — Non-locking push type  <b>B</b> — Slotted locking type  <b>D</b> — Push-turn locking slotted type  <b>E</b> — Push-turn locking lever type</p>		

**Electrical entry**  
24V, 12V, 6V, 5V, 3VDC  
100V, 110V, 200V, 220VAC  
Grommet  
**G** — Lead wire  
Length 300mm  
**H** — Lead wire  
Length 600mm  
L plug connector  
**L** — With lead wire  
Length 300mm  
**LN** — Without lead wire  
**LO** — Without connector  
M plug connector  
**M** — With lead wire  
Length 300mm  
**MN** — Without lead wire  
**MO** — Without connector  
\* Types LN and MN include  
2 sockets.

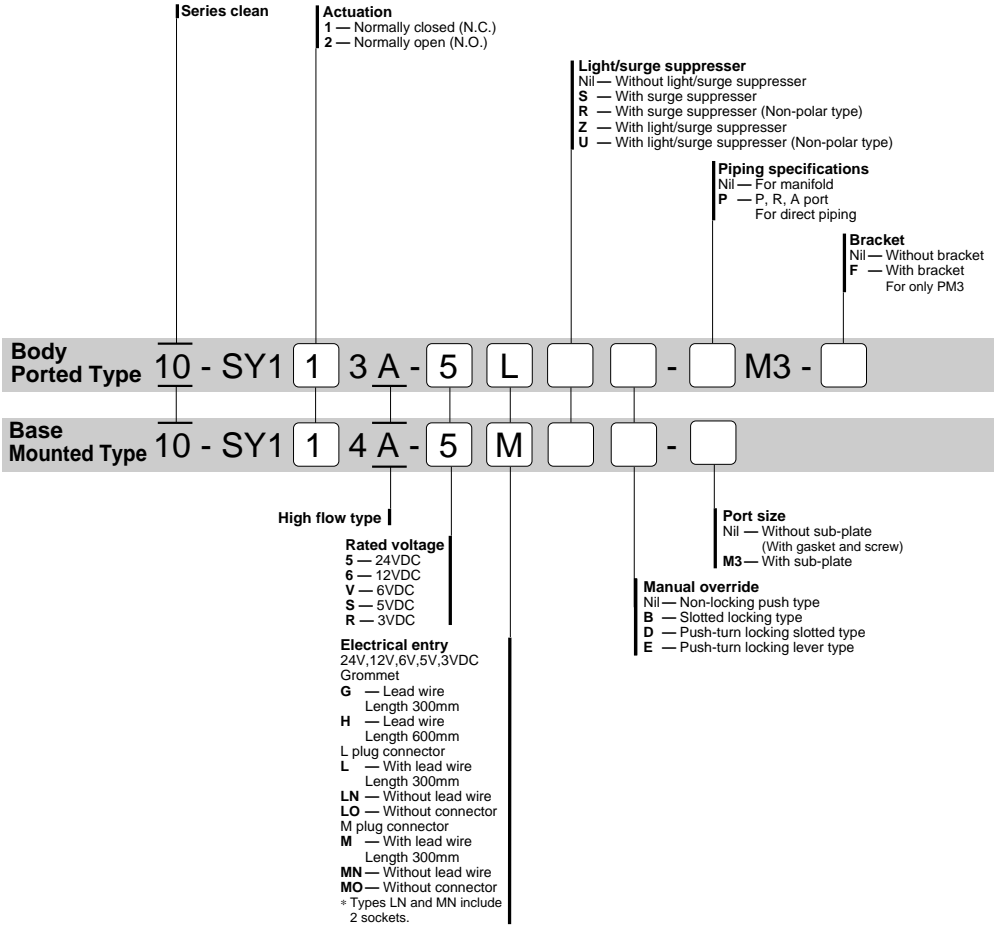


## ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

**How to Order**

**High Flow Type (Cv0.012)**





### Model

Actuation	Valve	Style	Operating pressure range MPa	Vacuum specifications MPa		Effective area mm <sup>2</sup>	Note 2) Weight g	
				P port	R port		Grommet type	LM plug connector
N.C.	10-SY11 <sup>3</sup> <sub>4</sub>	Standard	0 to 0.7	-100kPa to 0.6	-100kPa to 0	0.14	SY1□3(A): 13 SY1□4(A): 24	SY1□3(A): 15 SY1□4(A): 26
N.C.	10-SY11 <sup>3</sup> <sub>4</sub>	High flow	0 to 0.7	-100kPa to 0.6	-100kPa to 0	0.22		
N.O.	Note 1) 10-SY12 <sup>3</sup> <sub>4</sub>	Standard	0 to 0.7	-100kPa to 0	-100kPa to 0.6	0.14	(Without sub-plate12)	(Without sub-plate14)
N.O.	Note 1) 10-SY12 <sup>3</sup> <sub>4</sub> A	High flow	0 to 0.7	-100kPa to 0	-100kPa to 0.6	0.22		

Note 1) In case of 10-SY12<sup>3</sup><sub>4</sub> or 10-SY12<sup>3</sup><sub>4</sub>A, apply pressure from R port and exhaust air from P port.  
 Note 2) Values are for DC. Add 1 g in case of AC.

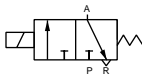
### Specifications

Fluid	Air
Ambient and fluid temperature °C	Max. 50
Note1) Response time ms	10 or less
Max. operating frequency Hz	20
Manual override	Non-locking push type, Slotted locking type Push-turn locking slotted type Push-turn locking lever type
Lubrication	Not required
Mounting orientation	Free
Note2) Impact/Vibration resistance m/s <sup>2</sup>	150/30
Enclosure	Dust proof

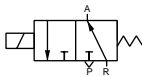
Note 1) According to JISB8374-1981 dynamic performance test (With coil temperature of 20°C, at rated voltage and without surge voltage suppressor)  
 Note 2) Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed each time in the axial and right angle directions of the main valve and armature, for both energized and deenergized states (value in the initial stage).  
 Vibration resistance: No malfunction resulted from a one-sweep test between 8.3 and 2000Hz.  
 The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states.  
 (Value in the initial stage).

JIS symbol

SY11<sup>3</sup><sub>4</sub>(A)



SY12<sup>3</sup><sub>4</sub>(A)



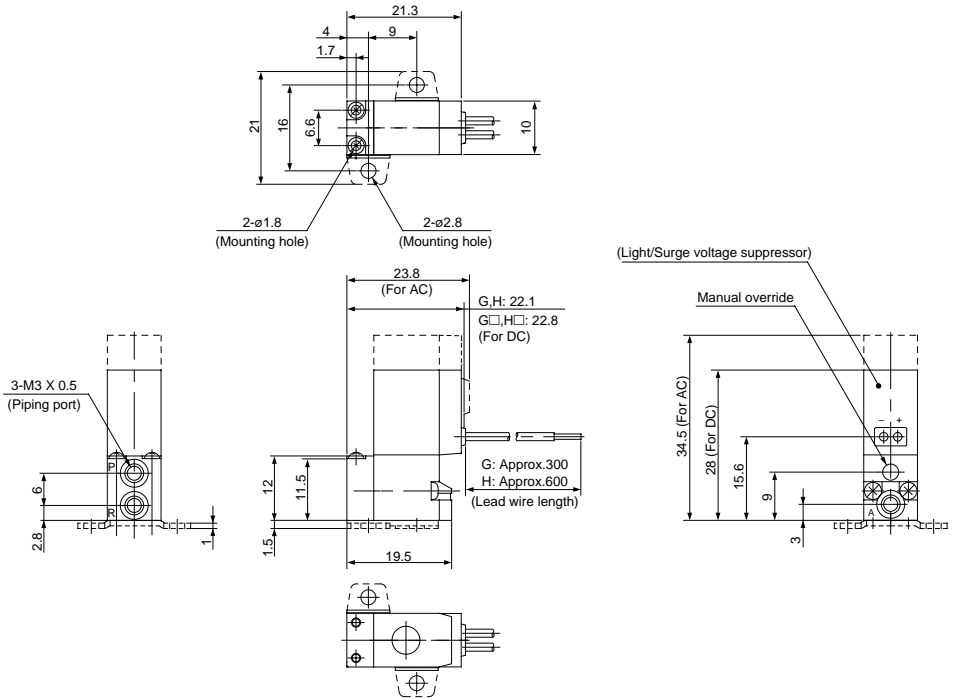
### Solenoid Specifications

Series		10-SY1 <sup>13</sup> <sub>24</sub>	10-SY1 <sup>13</sup> <sub>24</sub> A
Electrical entry		Grommet (G)/(H), L plug connector (L), M plug connector (M)	
Rated coil voltage V	DC	24, 12, 6, 5, 3	
	50/60Hz AC	100, 110, 200, 220	—
Allowable voltage fluctuation		-10 to +10%	
Note) Power consumption W	DC	0.5 (With light: 0.55)	0.75 (With light: 0.8)
Note) Apparent power VA	AC	100V	0.9 (With light: 1.0)
		110V	1.0 (With light: 1.1)
		[115V]	[1.1 (With light: 1.2)]
		200V	1.8 (With light: 1.9)
		220V	1.9 (With light: 2.0)
		[230V]	[2.2 (With light: 2.3)]
Surge voltage suppressor		Diode	
Indicator light		LED	

\*110VAC and 115VAC are common, as are 220VAC and 230VAC.  
 Note) At rated voltage

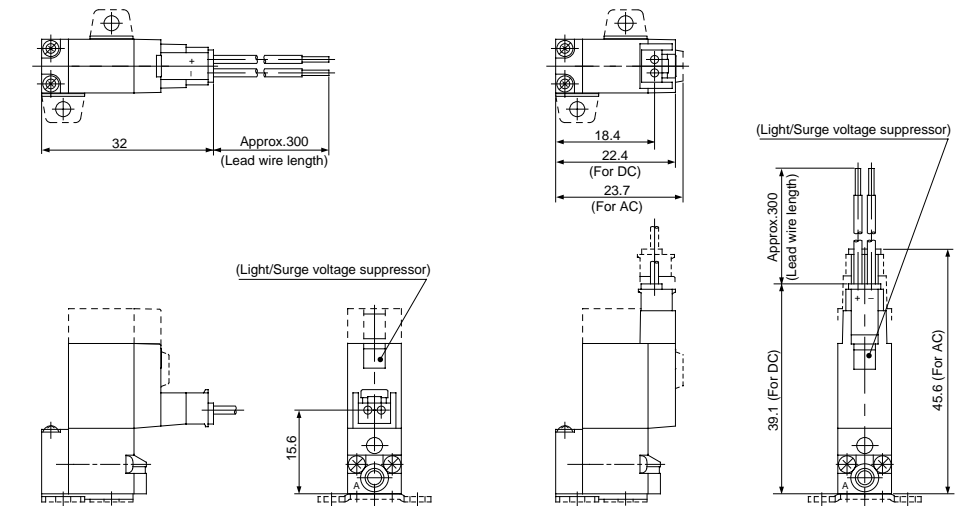
**Body Ported Type**

**Grommet (G), (H): 10-SY1 $\frac{1}{2}$ 3(A)-□ $\frac{G}{H}$ □□-M3**



**L Plug Connector (L): 10-SY1 $\frac{1}{2}$ 3(A)-□L□□-M3**

**M Plug Connector (M): 10-SY1 $\frac{1}{2}$ 3(A)-□M□□-M3**



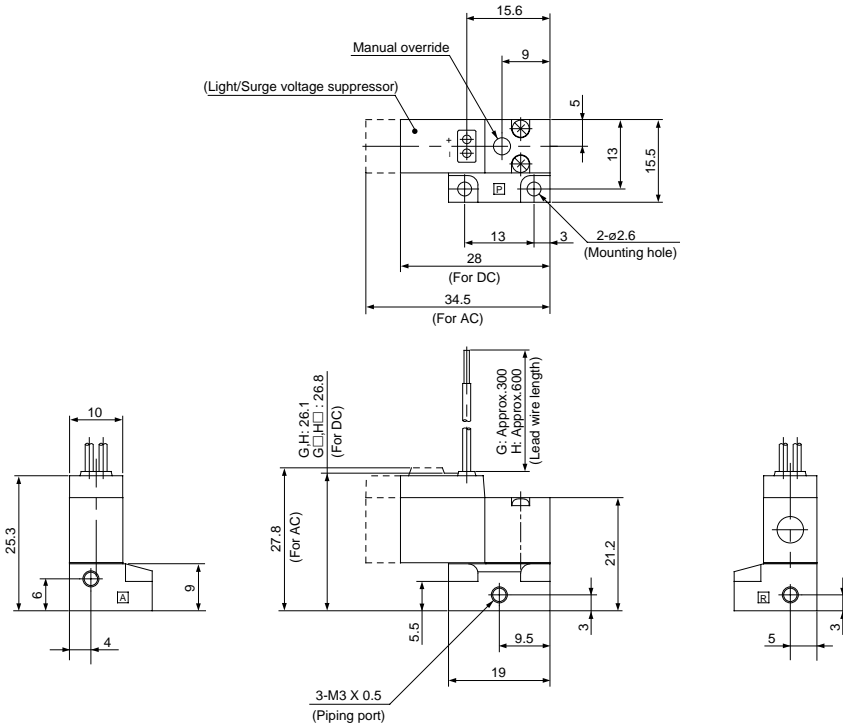
Ⓜ \* Other dimensions are identical with those of a grommet type.

Ⓜ \* Other dimensions are identical with those of a grommet type.

Directional Control Valve

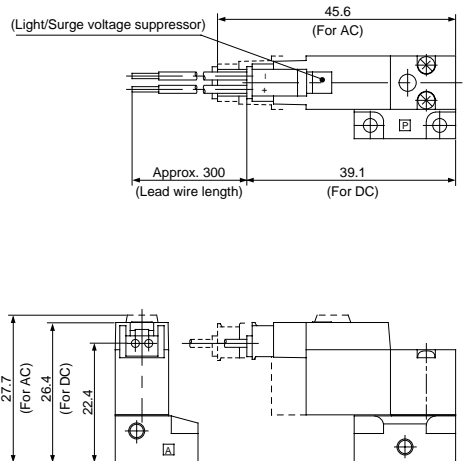
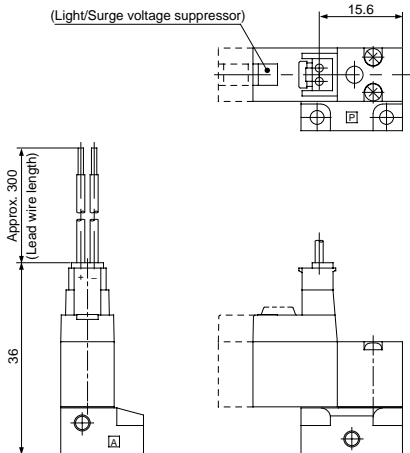
**Base Mounting (With Sub-plate)**

Grommet (G), (H):10-SY1<sub>2</sub>4(A)-□<sub>H</sub>□□-M3



**L Plug Connector (L): 10-SY1<sub>2</sub>4(A)-□L□□-M3**

**M Plug Connector (M):10-SY1<sub>2</sub>4(A)-□M□□-M3**



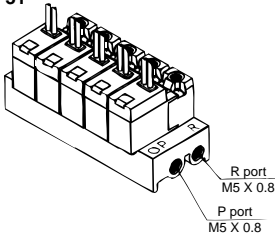
\* Other dimensions are identical with those of a grommet type.

\* Other dimensions are identical with those of a grommet type.

**Manifold**

**How to Order**

**Type 31**



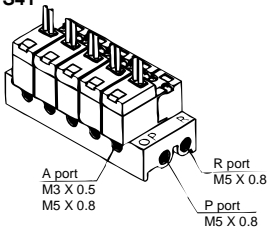
10 - SS3Y1 - 31 - 05

**Stations**  
02 — 2 stations  
⋮  
20 — 20 stations

**Applicable solenoid valve Note)**  
10-SY113-□□□□-M3  
10-SY113A-□□□□-M3  
10-SY123-□□□□-M3  
10-SY123A-□□□□-M3  
**Applicable blanking plate assembly**  
SY100-77-1A

Note) SY113(A) and SY123(A) cannot be mounted on the same manifold.

**Type S41**



10 - SS3Y1 - S41 - 05 - M3

**Stations**  
02 — 2 stations  
⋮  
20 — 20 stations

**A port size**  
M3 — M3 X 0.5  
M5 — M5 X 0.8

**Applicable solenoid valve Note)**  
10-SY114-□□□□  
10-SY114A-□□□□  
10-SY124-□□□□  
10-SY124A-□□□□  
**Applicable blanking plate assembly**  
SY100-77-1A

Note) SY113(A) and SY123(A) cannot be mounted on the same manifold.

**Manifold Specifications**

Model		Type 31	Type S41
Manifold model		Single base type/B mount	
P (SUP) /R (EXH) system		Common SUP/Common EXH	
Stations		2 to 20 stations	
A port piping specifications	Location	Valve	Base
	Direction	Top	Side
Port size	P,R port	M5 X 0.8	
	A port	M3 X 0.5	M3 X 0.5, M5 X 0.8
Note1) Effective area mm <sup>2</sup>	SY1□3	0.14 (0.008)	—
	SY1□3A	0.21 (0.012)	—
	SY1□4	—	0.14
	SY1□4A	—	0.21

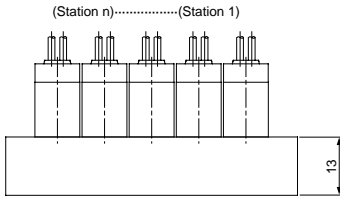
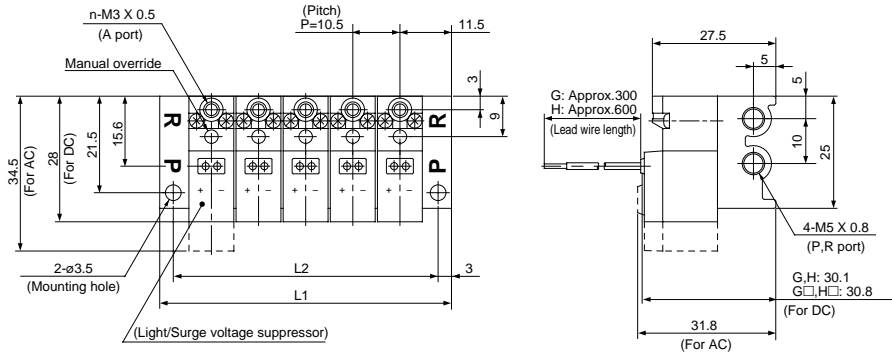
Note 1) When mounted on manifold base.  
 Note 2) 10-SY114(A) and 10-SY124(A) cannot be mounted on the same manifold.  
 Note 3) In case of 10-SY124(A), apply pressure from R port and exhaust air from P port.

Directional Control Valve

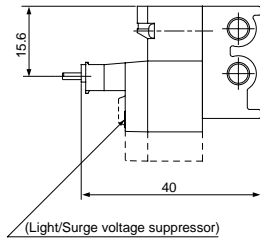
# Solenoid Valve 10-SY100

## Type 31 Manifold: Top Ported/10-SS3Y1-31- Stations

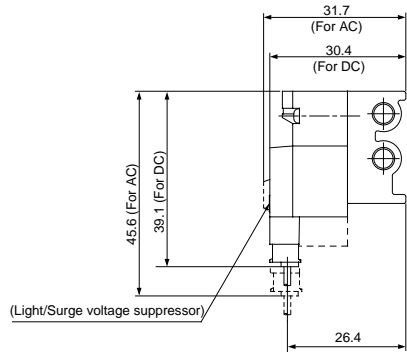
Grommet (G),(H)



### L Plug Connector (L)



### M Plug Connector (M)



\* Other dimensions are identical with those of a grommet type.

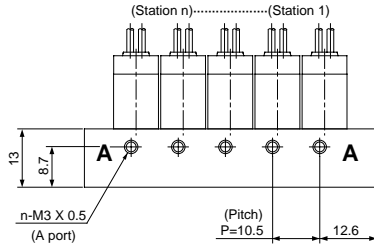
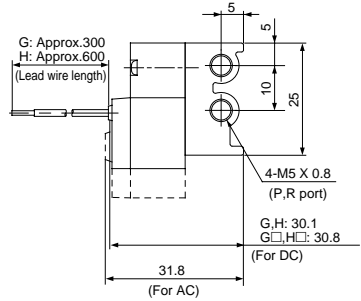
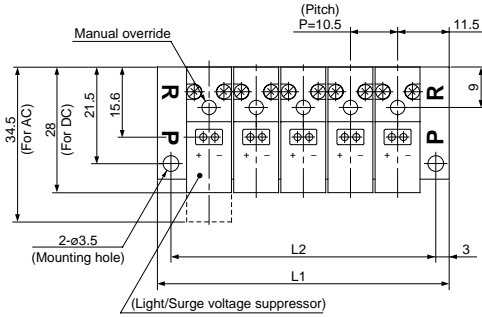
\* Other dimensions are identical with those of a grommet type.

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5
L <sub>2</sub>	27.5	38	48.5	59	69.5	80	90.5	101	111.5	122	132.5	143	153.5	164	174.5	185	195.5	206	216.5

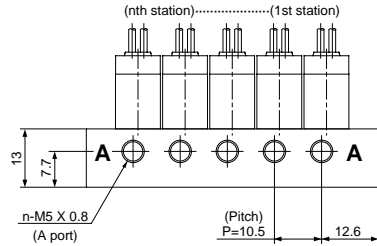


**Type S41 Manifold: Side Ported/10-SS3Y1-S41- Stations -M3,-M5**

Grommet (G),(H)

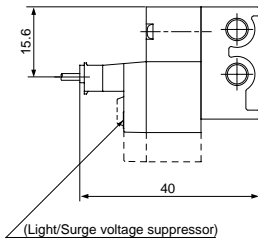


**M3**

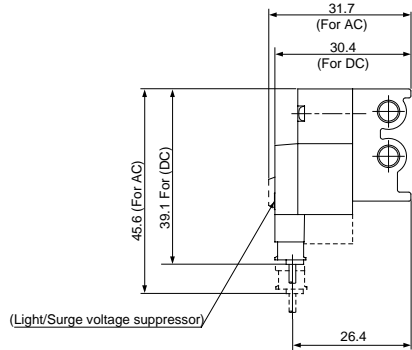


**M5**

**L Plug Connector (L)**



**M Plug Connector (M)**



\* Other dimensions are identical with those of a grommet type.

\* Other dimensions are identical with those of a grommet type.

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5
L <sub>2</sub>	27.5	38	48.5	59	69.5	80	90.5	101	111.5	122	132.5	143	153.5	164	174.5	185	195.5	206	216.5

# Series 10-SYJ 3 Port Solenoid Valve

## Series SYJ300

### How to Order

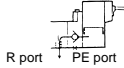
Clean series

**Actuation**

- 1 — Normally closed (N.C.)
- 2 — Normally open (N.O.)

**Body option**

- M — Common exhaust (pilot and main valves)



R port PE port  
(Pilot valve exhaust is integrated) with main valve exhaust



**Rated voltage**

DC specifications

- 5 — 24VDC
- 6 — 12VDC
- V — 6VDC
- S — 5VDC
- R — 3VDC

AC specifications (50/60Hz)

- 1 — 100VAC
- 2 — 200VAC
- 3 — 110VAC [115VAC]
- 4 — 220VAC [230VAC]

**Bracket**

- Nil — Without bracket
- F — With bracket
- \* Not including the external pilot type.

Body Ported Type 10 - SYJ3 1 2 M - 5 M [ ] [ ] - M3 - [ ]

Base Mounted Type 10 - SYJ3 1 4 M - 5 M [ ] [ ] - M5

**Electrical entry**

- Grommet
- G — Lead wire (300mm)
- H — Lead wire (600mm)
- L plug connector
- L — With lead wire (300mm)
- LN — Without lead wire
- LO — Without connector
- M plug connector
- M — With lead wire (300mm)
- MN — Without lead wire
- MO — Without connector
- \* Types LN and MN include 2 sockets.

**Light/surge suppresser**

- Nil — Without light/surge suppresser
- S — With light/surge suppresser
- R — With light/surge suppresser (Non-polar type)
- Z — With light/surge suppresser
- U — With light/surge suppresser (Non-polar type)

\* Type "S" is not available with AC since it is integrated with the rectifier.

**Manual override**

- Nil — Non-locking push type
- D — Push-turn locking slotted type

**Port size**

- Nil — Without sub-plate (With gasket and screw)
- M5 — M5 port with sub-plate

### ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

## Model

Valve		Actuation	Port size	Flow characteristics						Effective area mm <sup>2</sup>	Note) Weight g	
				1→2 (P→A)			2→3 (A→R)				Grommet type	L/M plug connector
				C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv			
Body ported type	10-SYJ312M	N.C.	M3 X 0.5	—	—	—	—	—	—	0.9	29	31
	10-SYJ322M	N.O.		—	—	—	—	—	—			
Base mounted type (Mounted with sub-plate)	10-SYJ314M	N.C.	M5 X 0.8	0.41	0.18	0.086	0.35	0.33	0.086	1.8	50 (Without sub-plate 29)	52 (Without sub-plate 31)
	10-SYJ324M	N.O.		0.36	0.31	0.089	0.36	0.31	0.089			

Note) Values are for DC. Add 1 g in case of AC.

## Specifications

Fluid	Air
Operating pressure range MPa	0.15 to 0.7
Ambient and fluid temperature °C	Max. 50
Note 1) Response time ms (0.5MPa)	15 or less
Max. operating frequency Hz	10
Manual override	Non-locking push type, Push-turn-locking slotted type
Pilot exhaust system	Common exhaust (Pilot and main valves)
Lubrication	Not required
Mounting orientation	Free
Note 2) Impact/Vibration resistance m/s <sup>2</sup>	150/30
Enclosure	Dust proof

Note 1) According to JIS B8374-1981 dynamic performance test (With coil temperature of 20°C, at rated voltage and without surge voltage suppressor)

Note 2) Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed each time in the axial and right angle directions of the main valve and armature, for both energized and deenergized states (Value in the initial stage).

Vibration resistance: No malfunction resulted from a one-sweep test between 3.8 and 2000Hz. The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage).

## Solenoid Specifications

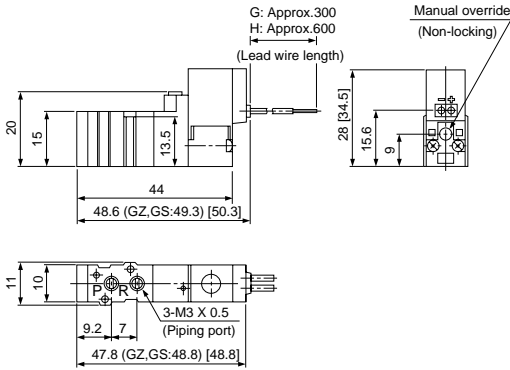
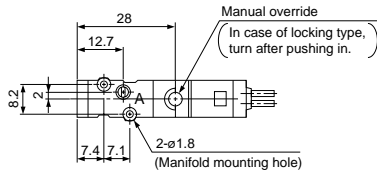
Electrical entry	Grommet (G)/(H), L plug connector (L), M plug connector (M)		
Rated coil voltage V	DC	24, 12, 6, 5, 3	
	50/60Hz AC	*100, 110, 200, 220	
Allowable voltage fluctuation	±10% of rated voltage		
Note) Power consumption W	DC	0.5 (With light: 0.55)	
Apparent power VA	AC	100V	0.9 (With light: 1.0)
		110V [115V]	1.0 (With light: 1.1) [1.1 (With light: 1.2)]
		200V	1.8 (With light: 1.9)
		220V [230V]	1.9 (With light: 2.0) [2.2 (With light: 2.3)]
		Surge voltage suppressor	Diode
Indicator light	LED		

\*110VAC and 115VAC are common, as are 220VAC and 230VAC.

Note) At rated voltage

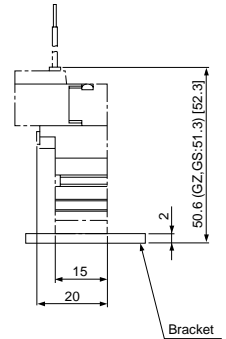
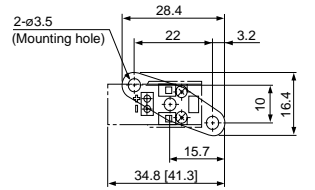
**Body Ported Type**

Grommet (G), (H): 10-SYJ3□2M-□□□□-M3



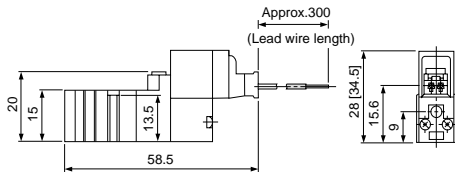
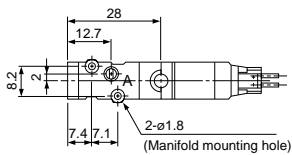
\* Values in [ ] are for AC.

**With Bracket**  
10-SYJ3□2-□□□□-M3-F



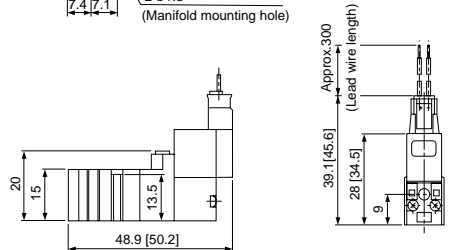
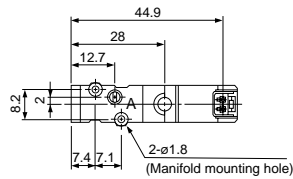
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**L Plug Connector (L): 10-SYJ3□2M-□□□□-M3**



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

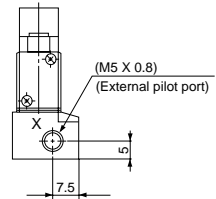
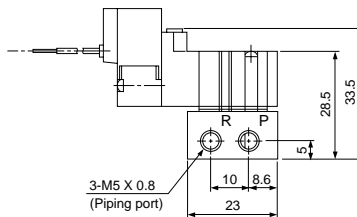
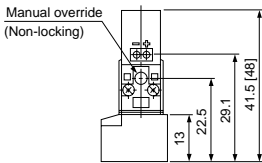
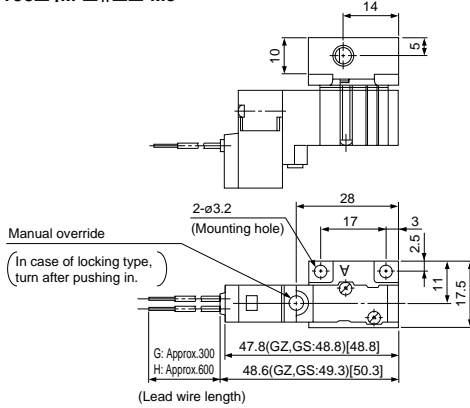
**M Plug Connector (M): 10-SYJ3□2M-□□□□-M3**



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**Base Mounted Type (With Sub-plate)**

Grommet (G), (H): 10-SYJ3□4M-□□□□-M5

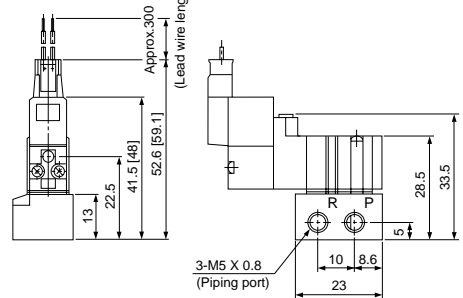
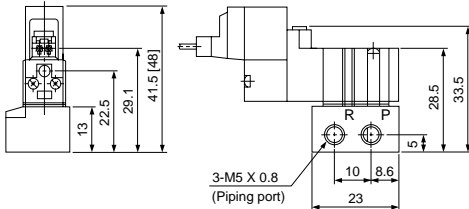
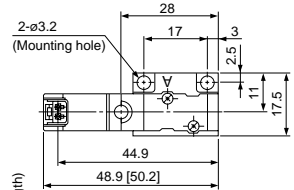
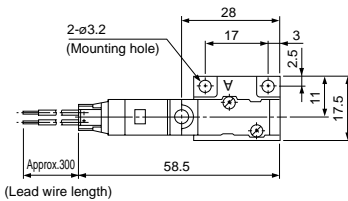


\* Values in [ ] are for AC.

Directional Control Valve

**L Plug Connector (L): 10-SYJ3□4M-□□□□-M5**

**M Plug Connector (M): 10-SYJ3□4M-□□□□-M5**



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

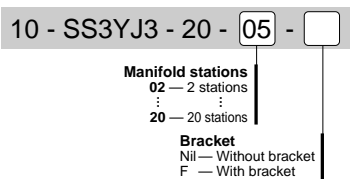
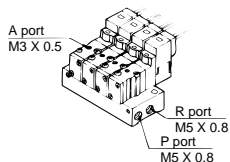


\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**Manifold**

**How to Order**

**Type 20**



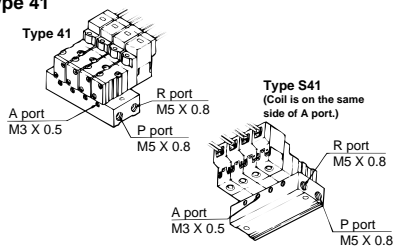
**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**Bracket**  
 Nil — Without bracket  
 F — With bracket

Applicable solenoid valve  
 10-SYJ312M-□□□□-M3  
 10-SYJ322M-□□□□-M3  
**Applicable blanking plate assembly**  
 SYJ300-10-1A

Note) In case of 10 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

**Type 41**



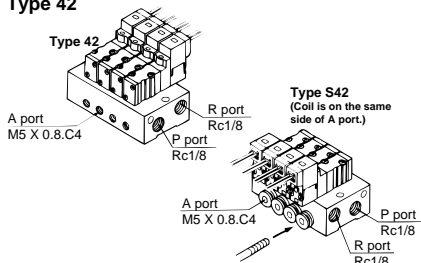
**Valve**  
 Nil — Coil is on the opposite side of A port.  
 S — Coil is on the same side of A port.

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

Applicable solenoid valve  
 10-SYJ314M-□□□□  
 10-SYJ324M-□□□□  
**Applicable blanking plate assembly**  
 SYJ300-10-2A

Note) In case of 10 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

**Type 42**



**Valve**  
 Nil — Coil is on the opposite side of A port.  
 S — Coil is on the same side of A port.

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**A port size**  
 M5 — M5 X 0.8  
 C4 — ø4 One-touch fitting

Applicable solenoid valve  
 10-SYJ314M-□□□□  
 10-SYJ324M-□□□□  
**Applicable blanking plate assembly**  
 SYJ300-10-2A

Note) In case of 8 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

**Manifold Specifications**

Model	Type 20		Type 41, Type S41		Type 42, Type S42	
Manifold type	Single base type/B mount					
P (SUP)/R (EXH) system	Common SUP/Common EXH					
Stations	2 to 20 stations					
A port piping specifications	Location	Valve			Base	
	Direction	Top			Side	
	P,R port	M5 X 0.8, Rc1/8		M5 X 0.8	Rc1/8	
Port size	A port	M3 X 0.5		M3 X 0.5	M5 X 0.8	
					C4 (ø4 One-touch fitting)	

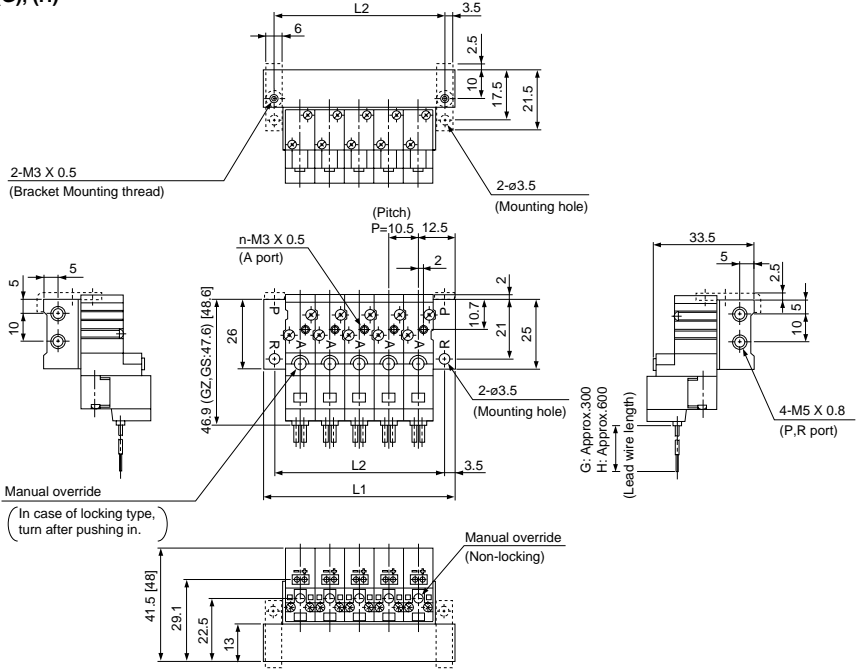
**Flow Characteristics**

Body ported internal pilot	Manifold model	Port size	Flow characteristics								Effective area
			1→2 (P→A)				2→3 (A→R)				
			1(P), 3(R) port	2A port	C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv	
Base mounted internal pilot	10-SS3YJ3-20	SYJ3□2	M5 X 0.8	M3 X 0.5	—	—	—	—	—	—	0.9
	10-SS3YJ3- <sup>41</sup> <sub>S41</sub>	SYJ3□4	M5 X 0.8	M3 X 0.5	—	—	—	—	—	—	1.5
	10-SS3YJ3-42-M5	SYJ3□4	1/8	M5 X 0.8	0.31	0.17	0.075	0.32	0.11	0.072	—
	10-SS3YJ3-42-C4			C4	0.33	0.36	0.086	0.33	0.2	0.082	—
Base mounted internal pilot	10-SS3YJ3-S42-M5	SYJ3□4	1/8	M5 X 0.8	0.32	0.3	0.079	0.33	0.35	0.086	—
	10-SS3YJ3-S42-C4			C4	0.35	0.17	0.082	0.35	0.26	0.086	—

Note) Value for a 2 position single operation mounted on the manifold base.

**Type 20 Manifold: Top Ported/10-SS3YJ3-20- Stations**

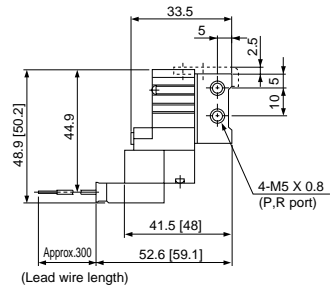
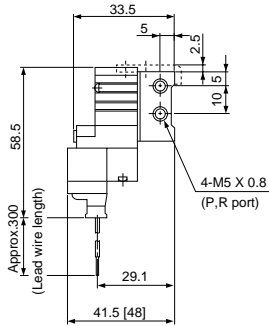
**Grommet (G), (H)**



\* Values in [ ] are for AC.

**L Plug Connector (L)**

**M Plug Connector (M)**



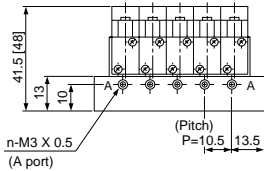
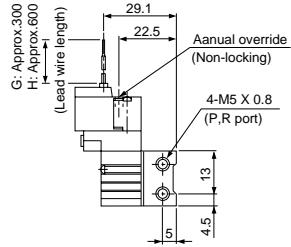
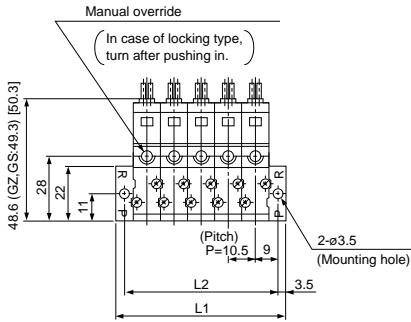
\* Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	35.5	46	56.5	67	77.5	88	98.5	109	119.5	130	140.5	151	161.5	172	182.5	193	203.5	214	224.5
L2	28.5	39	49.5	60	70.5	81	91.5	102	112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5

**Type 41 Manifold: Side Ported/10-SS3YJ3-41- Stations -M3**

Grommet (G), (H)

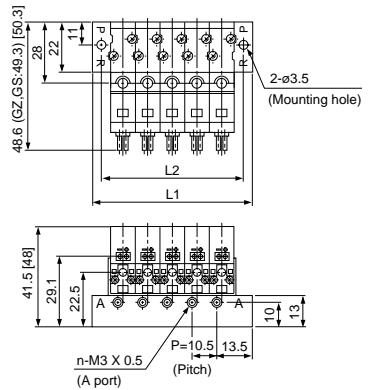
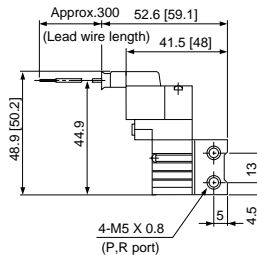
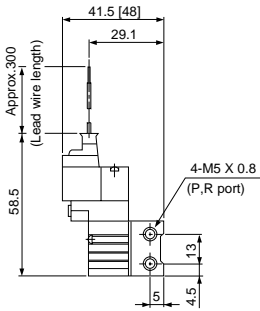


= Values in [ ] are for AC

**Type S41: Side Ported (Coil is on the same side of A port.)**

**L Plug Connector (L)**

**M Plug Connector (M)**



= Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

= Values in [ ] are for AC.  
 \* Other dimensions are identical with those of a grommet type.

= Values in [ ] are for AC.  
 \* Other dimensions are same as those of type 41.

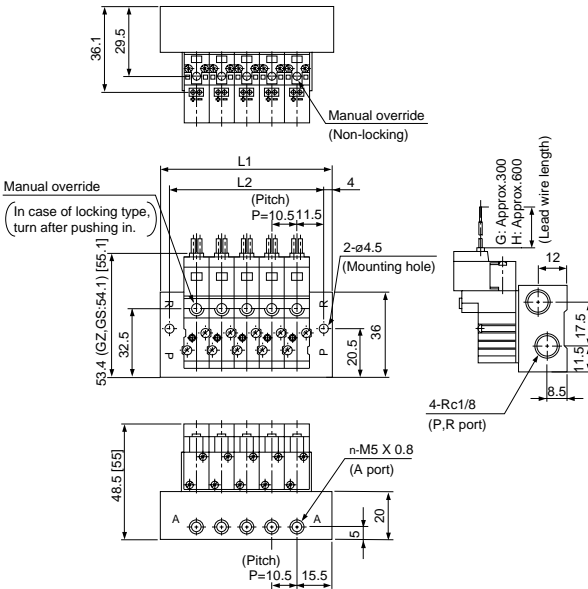
Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	35.5	46	56.5	67	77.5	88	98.5	109	119.5	130	140.5	151	161.5	172	182.5	193	203.5	214	224.5
L2	28.5	39	49.5	60	70.5	81	91.5	102	112.5	123	133.5	144	154.5	165	175.5	186	196.5	207	217.5



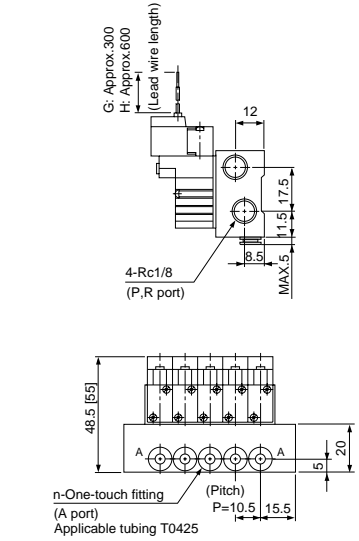
**Type 42 Manifold: Side Ported/10-SS3YJ3-42- Stations -M5, C4**

Grommet (G), (H)

C4 (With built-in One-touch fitting)



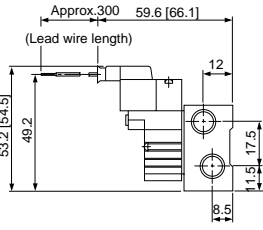
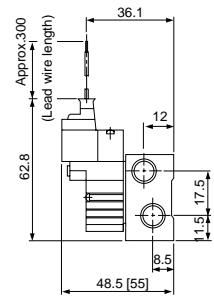
\* Values in [ ] are for AC.



\* Values in [ ] are for AC.  
\* Other dimensions are identical to those of a M5.

**L Plug Connector (L)**

**M Plug Connector (M)**

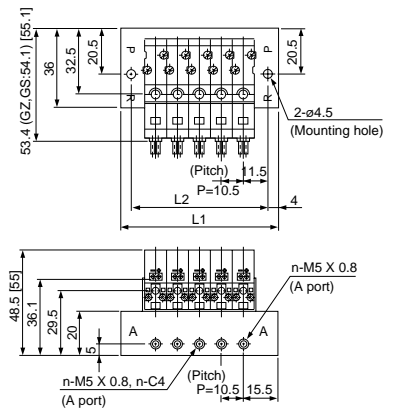


\* Values in [ ] are for AC.  
\* Other dimensions are identical to those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical to those of a grommet type.

**Type S42: Side Ported (Coil is on the same side of A port.)**

**10-SS3YJ3-S42- Stations -M5, C4**



\* Values in [ ] are for AC.  
\* Other dimensions are same as those of type 42.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	41.5	52	62.5	73	83.5	94	104.5	115	125.5	136	146.5	157	167.5	178	188.5	199	209.5	220	230.5
L2	33.5	44	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212	222.5

# Series 10-SYJ 3 Port Solenoid Valve


## Series SYJ500

### How to Order

**Clean series**


**Actuation**  
 1 — Normally closed (N.C.)  
 2 — Normally open (N.O.)

**Body option**  
 M — Common exhaust (pilot and main valves)



R port    PE port

**Rated voltage**  
**DC specifications**  
 5 — 24VDC  
 6 — 12VDC  
 V — 6VDC  
 S — 5VDC  
 R — 3VDC  
**AC specifications (50/60Hz)**  
 1 — 100VAC  
 2 — 200VAC  
 3 — 110VAC [115VAC]  
 4 — 220VAC [230VAC]



**Bracket**  
 Nil — Without bracket  
 F — With bracket  
 \* Brackets are not installed.

**Body Ported Type** 10 - SYJ5

**Base Mounted Type** 10 - SYJ5

1	2	M	-	5	M			-	M5	-	
---	---	---	---	---	---	--	--	---	----	---	--

1	4	M	-	5	M			-	01
---	---	---	---	---	---	--	--	---	----

**Electrical entry**  
 Grommet  
 G — Lead wire (300mm)  
 H — Lead wire (600mm)  
 L plug connector  
 L — With lead wire (300mm)  
 LN — Without lead wire  
 LO — Without connector  
 M plug connector  
 M — With lead wire (300mm)  
 MN — Without lead wire  
 MO — Without connector  
 \*Types LN and MN include 2 sockets.

**Light/surge suppresser**  
 Nil — Without light/surge suppresser  
 S — With surge suppresser  
 R — With surge suppresser (Non-polar type)  
 Z — Without light/surge suppresser  
 U — Without light/surge suppresser (Non-polar type)  
 \* Type "S" is not available with AC since it is integrated with the rectifier.

**Manual override**  
 Nil — Non-locking push type  
 D — Push-turn locking slotted type

**Port size**  
 Nil — Without sub-plate (With gasket and screw)  
 01 — Rc1/8 port With sub-plate

### ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Form matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

## Model

Valve		Actuation	Port size	Flow characteristics						Note) Weight g	
				1→2 (P→A)			2→3 (A→R)			Grommet type	L/M plug connector
				C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv		
Body ported type	10-SYJ512M	N.C.	M5 X 0.8	0.53	0.45	0.14	0.47	0.39	0.12	43	45
	10-SYJ522M	N.O.		0.66	0.45	0.18	0.66	0.45	0.18		
Base mounted type (Mounted with sub-plate)	10-SYJ514M	N.C.	Rc1/8	1.2	0.41	0.32	1.1	0.46	0.32	57	59
	10-SYJ524M	N.O.		1.3	0.37	0.33	1.2	0.48	0.34		

Note) Values are for DC. Add 1 g in case of AC.

## Specifications

Fluid	Air
Operating pressure range MPa	0.15 to 0.7
Ambient and fluid temperature °C	Max. 50
Note1) Response time ms (0.5MPa)	25 or less
Max. operating frequency Hz	5
Manual override	Non-locking push type, Push-turn-locking slotted style
Pilot exhaust system	Common exhaust (Pilot and main valve)
Lubrication	Not required
Mounting orientation	Free
Note2) Impact/Vibration resistance m/s <sup>2</sup>	150/30
Enclosure	Fust proof

Note 1) According to JIS B8374-1981 dynamic performance test (With coil temperature of 20°C, at rated voltage and without surge voltage suppressor)

Note 2) Impact resistance: Shock resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed each time in the axial and right angle directions of the main valve and armature, for both energized and deenergized states (Value in the initial stage).

Vibration resistance: No malfunction resulted from a one-sweep test between 8.3 and 2000Hz. The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage).

## Solenoid Specifications

Electrical entry	Grommet (G)/(H), L plug connector (L), M plug connector (M)		
Rated coil voltage V	DC	24, 12, 6, 5, 3	
	50/60Hz AC	*100, 110, 200, 220	
Allowable voltage fluctuation	±10% of rated voltage		
Note) Power consumption W	DC	0.5 (With light: 0.55)	
Apparent power VA	AC	100V	0.9 (With light: 1.0)
		110V	1.0 (With light: 1.1)
		[115V]	[1.1 (With light: 1.2)]
		200V	1.8 (With light: 1.9)
		220V [230V]	1.9 (With light: 2.0) [2.2 (With light: 2.3)]
Surge voltage suppressor	Diode		
Indicator light	LED		

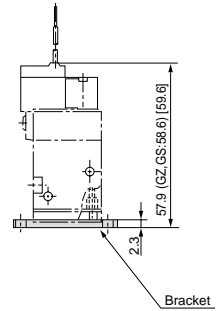
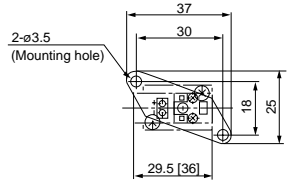
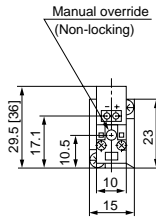
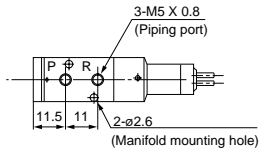
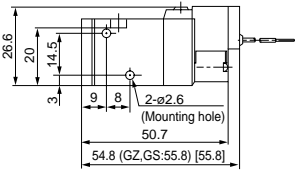
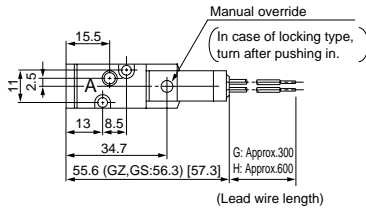
\*110VAC and 115VAC are common, as are 220VAC and 230VAC.

Note) At rated voltage

**Body Ported Type**

Grommet (G),(H):10-SYJ5□2M-□□□□-M5

With Bracket

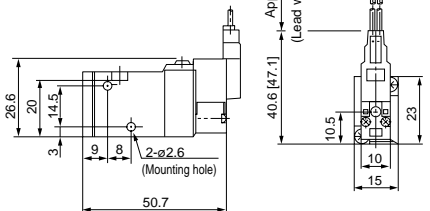
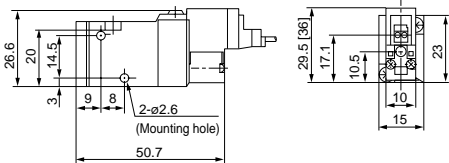
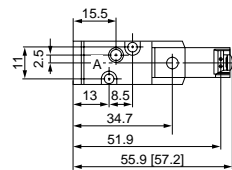
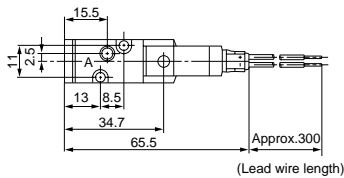


\* Values in [ ] are for AC.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**L Plug Connector (L): 10-SYJ5□2M-□□□□-M5**

**M Plug Connector (M): 10-SYJ5□2M-□□□□-M5**

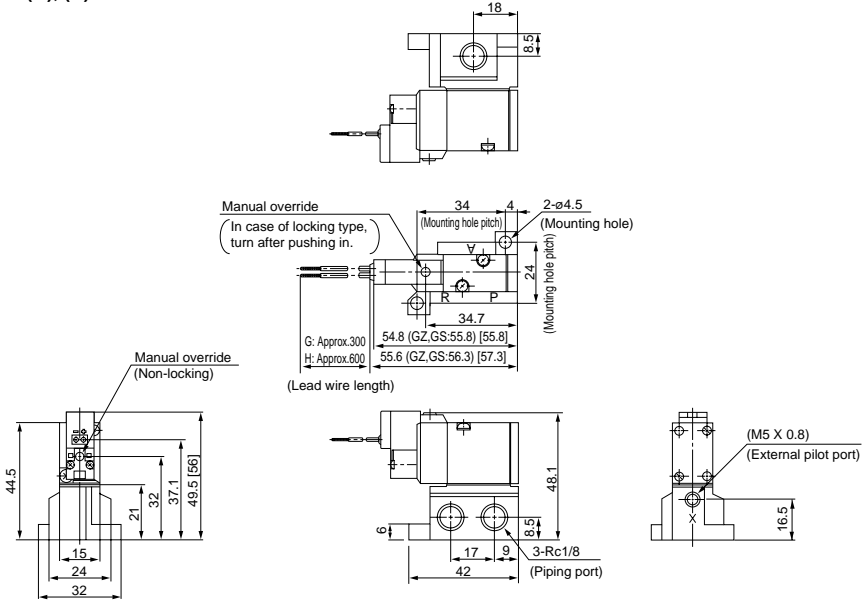


\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

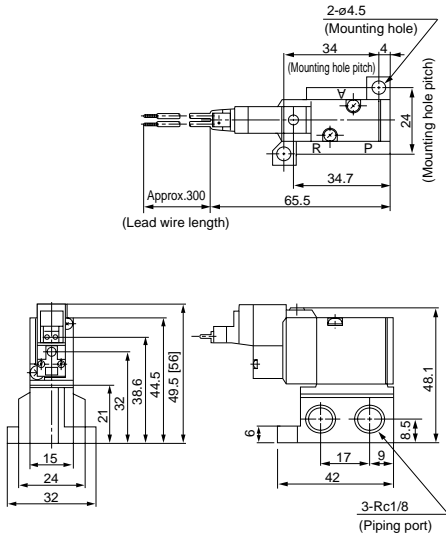
**Base Mounted Type (With Sub-plate)**

Grommet (G), (H): 10-SYJ5□4M-□□□□-01



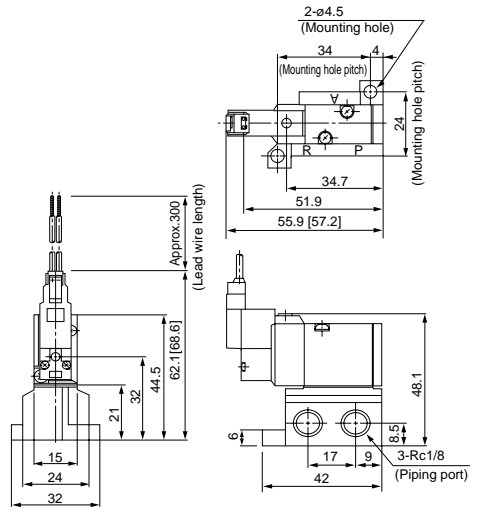
\* Values in [ ] are for AC.

**L Plug Connector (L) :10-SYJ5□4M-□□□□-01**



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

**M Plug Connector (M) :10-SYJ5□4M-□□□□-01**



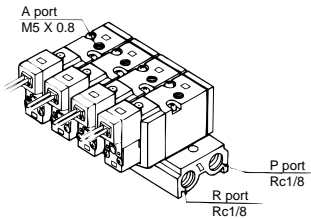
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

# Solenoid Valve 10-SYJ500

## Manifold

### How to Order

#### Type 20



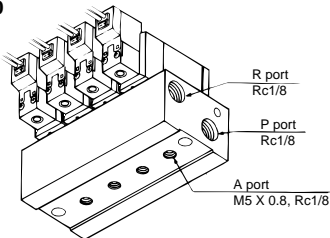
10 - SS3YJ5 - 20 - 05

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**Applicable solenoid valve**  
 10-SYJ512M-□□□□-M5  
 10-SYJ522M-□□□□-M5  
**Applicable blanking plate assembly**  
 SYJ500-10-1A

Note) In case of 6 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

#### Type 40



10 - SS3YJ5 - 40 - 05 - M5

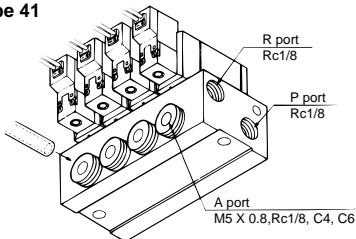
**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**A port size**  
 M5 — M5 X 0.8  
 01 — Rc1/8

**Applicable solenoid valve**  
 10-SYJ514M-□□□□  
 10-SYJ524M-□□□□  
**Applicable blanking plate assembly**  
 SYJ500-10-3A

Note) In case of 9 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

#### Type 41



10 - SS3YJ5 - 41 - 05 - C6

**Manifold stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations

**A port size**  
 M5 — M5 X 0.8  
 01 — Rc1/8  
 C4 — ø4 One-touch fitting  
 C6 — ø6 One-touch fitting

**Applicable solenoid valve**  
 10-SYJ514M-□□□□  
 10-SYJ524M-□□□□  
**Applicable blanking plate assembly**  
 SYJ500-10-3A

Note) In case of 9 or more stations, apply pressure from both sides of P port and exhaust air from R ports on both sides.

### Manifold Specifications

Model	Type 20	Type 40	Type 41	
<b>Manifold type</b>		Single base type/B mount		
<b>P (SUP) /R (EXH) system</b>		Common SUP/Common EXH		
<b>Stations</b>		2 to 20 stations		
<b>A port piping specifications</b>	<b>Location</b>	Valve	Base	
	<b>Direction</b>	Top	Bottom	Side
<b>Port size</b>	<b>P, R port</b>	Rc1/8	Rc1/8	Rc1/8
	<b>A port</b>	M5 X 0.8	M5 X 0.8 Rc1/8	M5 X 0.8, Rc1/8, C4 (ø4 One-touch fitting), C6 (ø6 One-touch fitting)

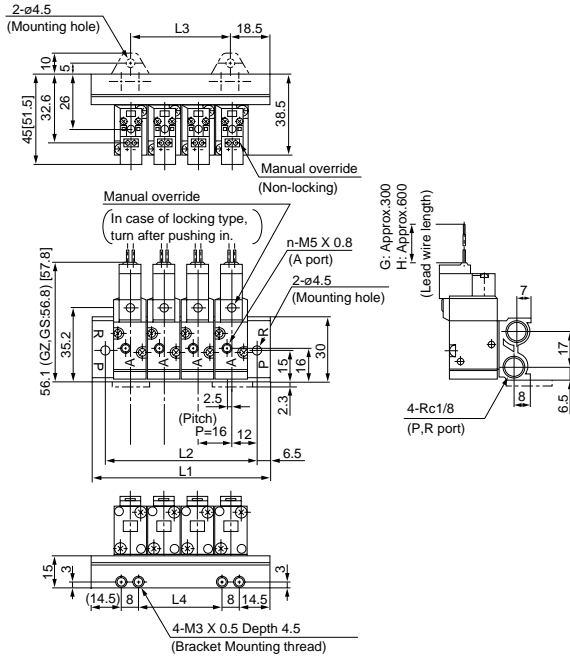
### Flow Characteristics

Manifold model	Port size		Flow characteristics							
			1→2 (P→A)			2→3 (A→R)				
			1(P), 3(R) port	2(A) port	C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv
Body ported internal pilot	10-SS3YJ5-20	SYJ5□2	1/8	M5 X 0.8	0.47	0.43	0.13	0.74	0.32	0.19
	10-SS3YJ5-40-M5		1/8	M5 X 0.8	0.71	0.52	0.21	0.81	0.28	0.20
	10-SS3YJ5-40-01		1/8	1/8	0.98	0.36	0.25	0.92	0.24	0.22
Base mounted internal pilot	10-SS3YJ5-41-M5	SYJ5□4	1/8	M5 X 0.8	0.71	0.49	0.20	0.80	0.23	0.19
	10-SS3YJ5-41-01		1/8	1/8	1.0	0.37	0.26	0.96	0.25	0.24
	10-SS3YJ5-41-C4		1/8	C4	0.68	0.35	0.17	1.0	0.25	0.24
	10-SS3YJ5-41-C6		1/8	C6	1.0	0.27	0.25	1.0	0.30	0.26

Note) Value for a 2 position single operation mounted on the manifold base.

**Type 20 Manifold: Top Ported/10-SS3YJ5-20- Stations**

**Grommet (G),(H)**

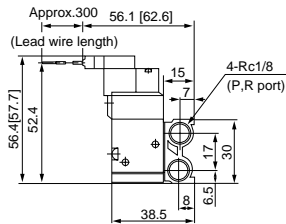
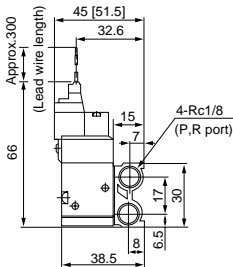


\* Values in [ ] are for AC.

Directional Control Valve

**L Plug Connector (L)**

**M Plug Connector (M)**



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

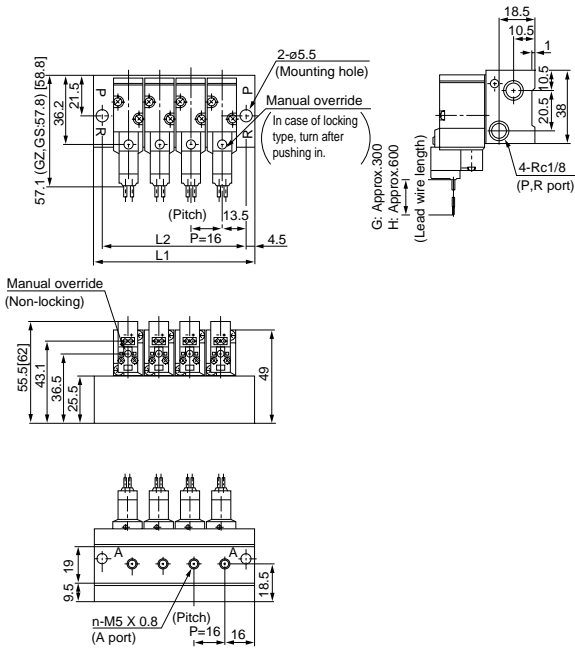
\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

Stations n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	53	69	85	101	117	133	149	165	181	197	213	229	245	261	277	293	309	325	341
L <sub>2</sub>	40	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296	312	328
L <sub>3</sub>	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304
L <sub>4</sub>	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296

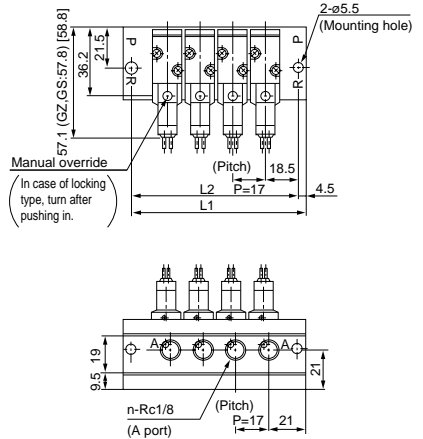
# Solenoid Valve 10-SYJ500

## Type 40 Manifold: Bottom Ported/10-SS3YJ5-40- Stations -M5, 01

### Grommet (G), (H)



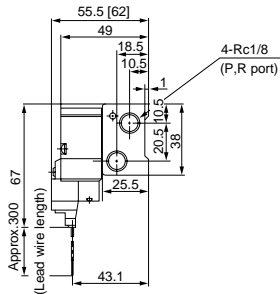
### Rc1/8



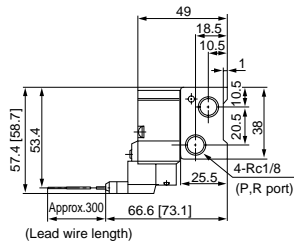
\* Values in [ ] are for AC.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of M5.

### L Plug Connector (L)



### M Plug Connector (M)



\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

\* Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

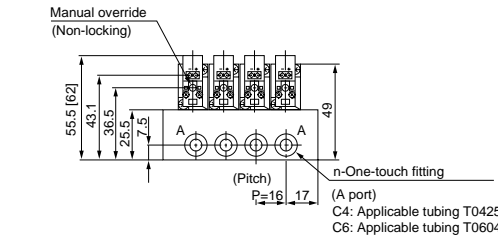
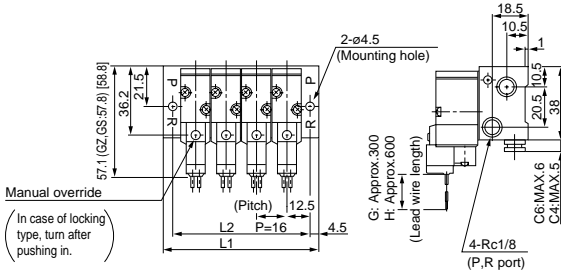
Port size	Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
M5	L1	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276	292	308	324	340
	L2	43	59	75	91	107	123	139	155	171	187	203	219	235	251	267	283	299	315	331
Rc1/8	L1	63	80	97	114	131	148	165	182	199	216	233	250	267	284	301	318	335	352	369
	L2	54	71	88	105	122	139	156	173	190	207	224	241	258	275	292	309	326	343	360



**Type 41 Manifold: Side Ported/10-SS3YJ5-41- Stations -M5, 01,C4,C6**

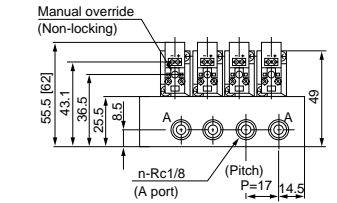
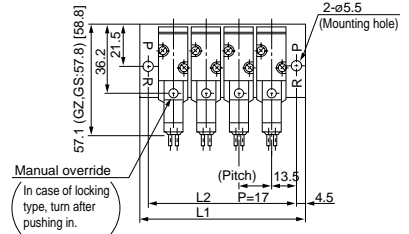
Grommet (G), (H)

Rc1/8



⦿ = Values in [ ] are for AC.

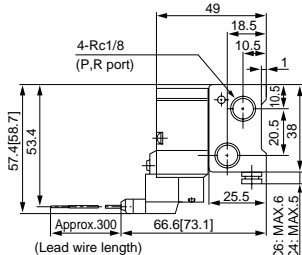
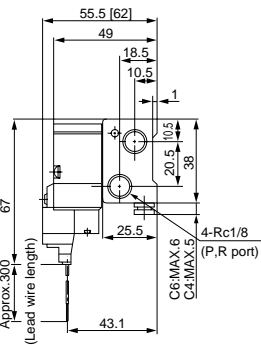
G: Approx.300  
H: Approx.600  
(Lead wire length)  
C6:MAX.6  
C4:MAX.5  
C4: Applicable tubing T0425  
C6: Applicable tubing T0604



⦿ = Values in [ ] are for AC.  
\* Other dimensions are same as those of C4 and C6.

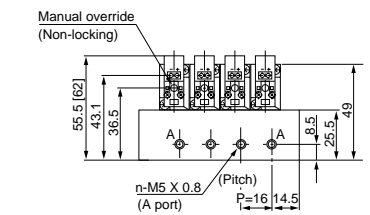
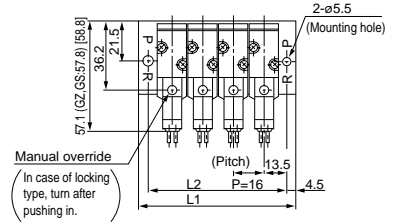
**L Plug Connector (L)**

**M Plug Connector (M)**



⦿ = Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.

⦿ = Values in [ ] are for AC.  
\* Other dimensions are identical with those of a grommet type.



⦿ = Values in [ ] are for AC.  
\* Other dimensions are same as those of C4 and C6.

Port size	Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
M5	L1	52	68	84	100	116	132	148	164	180	196	212	228	244	260	276	292	308	324	340
	L2	43	59	75	91	107	123	139	155	171	187	203	219	235	251	267	283	299	315	331
Rc1/8	L1	53	70	87	104	121	138	155	172	189	206	223	240	257	274	291	308	325	342	359
	L2	44	61	78	95	112	129	146	163	180	197	214	231	248	265	282	299	316	333	350
One-touch fitting	L1	50	66	82	98	114	130	146	162	178	194	210	226	242	258	274	290	306	322	338
	L2	41	57	73	89	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329

Directional Control Valve

# Series 10-VQ

5 Port Solenoid Valve  
Series VQ1000/2000

## VQ1000/Base Mounted Type Plug-in Unit

### How to Order Manifolds

Clean series | Series VQ1000 | Plug-in unit | Valve stations  
The number of maximum stations differs from kit to kit.  
(Refer to the table below.)

10 - V V 5 Q 1 1 - 06 C6 F U1 - N

**Cylinder port size**  
**C3** — For ø3.2 One-touch fitting  
**C4** — For ø4 One-touch fitting  
**C6** — For ø6 One-touch fitting  
**M5** — M5 thread Note 1)  
**CM** — Mixture or with port plug Note 2)  
 Note 1) In case of M5, P and R ports are Rc1/8.  
 Note 2) In case of mixture or a type with port plug, give descriptions on a manifold specification sheet.

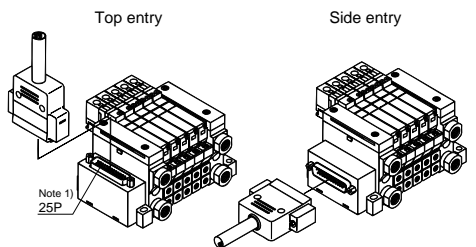
**Option**  
**Nil** — None  
**B** — Back pressure check valve Note 2)  
**D** — DIN rail mount type  
**K** — Special wiring specification (Except double wiring) Note 3)  
**N** — With name plate  
**R** — External pilot Note 4)

Note 1) When more than one option is specified, list them in alphabetical order (e.g. -BDN).  
 Note 2) In case of "B," indicating "with back pressure check valve," a back pressure check valve is installed on every manifold station.  
 Note 3) Indicate the wiring specification on a manifold specification sheet.  
 Note 4) Enter R for the external pilot specification.

**Kit designation/Electrical entry direction/Cable length**  
Refer to the figure below.

### Kit Designation/Electrical Entry Direction•Cable Length

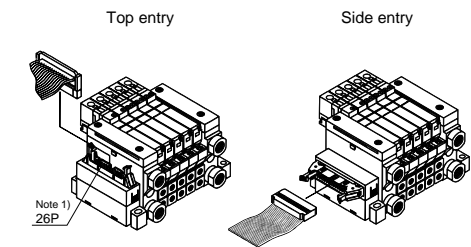
#### F Kit (D-sub Connector Kit)



Connector entry					
Top entry		Side entry			
<b>F</b> <b>Kit</b>	U0	<b>F</b> <b>Kit</b>	S0	Without cable	Note 2) 2 to 12 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, F kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

#### P Kit (Flat Ribbon Cable Kit)



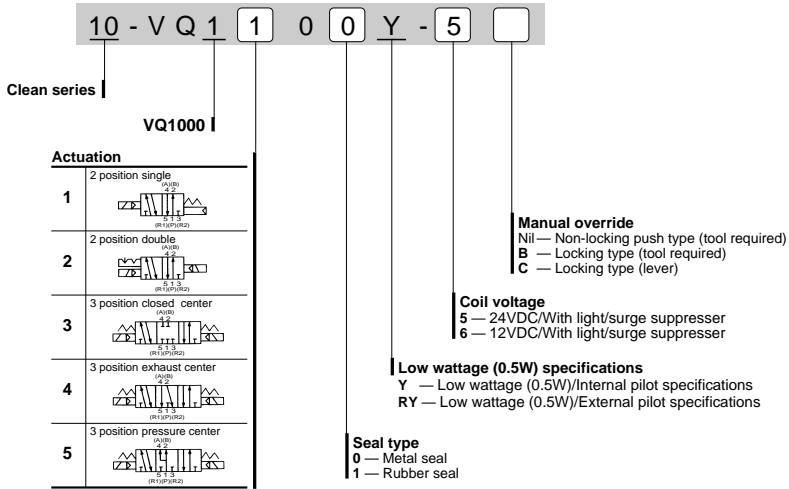
Connector entry					
Top entry		Side entry			
<b>P</b> <b>Kit</b>	U0	<b>P</b> <b>Kit</b>	S0	Without cable	Note 2) 2 to 12 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, P kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

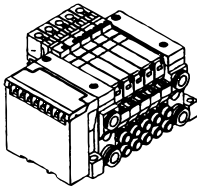
### ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

**How to Order Valves**



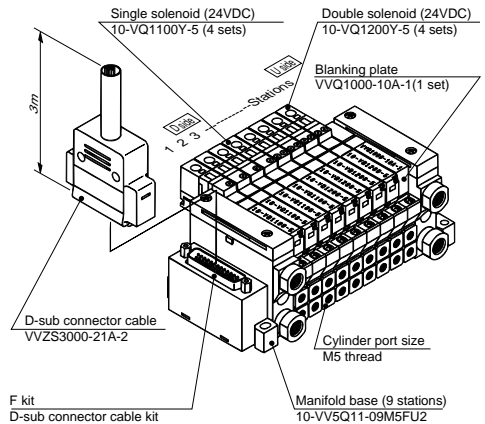
**S Kit (Serial Transmission Kit)**



<b>S</b> Kit	0	Without SI unit	Note)
	A	General purpose type: Series EX300	
	B	Mitsubishi Electric Corporation: MELSECNET/mini-S3 data link system	
	C	OMRON Corporation: SYSBUS Wire System	
	D	Sharp Corporation: Satellite I/O Link System	Maximum 16 stations
	E	Matsushita Electric Industrial Co., Ltd.: MEWNET-F System	
	F1	NKE Corporation: Uni wire system (16 outputs)	
	G	Remote I/O System (RIO) by Allen-Bradley Co.	
	H	NKE Corporation: Uni wire H system	
	J1	Corporation: S-LINK system (16 outputs)	
	J2	Corporation: S-LINK system (8 outputs)	Maximum 8 stations
	K	FUJII ELECTRIC CO.,LTD.: T Link Mini System	
	Q	Device Net and Omron CompoBus/D	Maximum 16 stations
	R1	CompoBus/S (16 points) by OMRON Co.	
R2	CompoBus/S (8 points) by OMRON Co.	Maximum 8 stations	
V	Mitsubishi Electric Corporation: CC -Link	Maximum 16 stations	

Note) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

**How to Order Manifold Assembly/Example**



- 10-VV5Q11-09M5FU2 ..... 1 sets (F kit 9 station manifold part No.)  
 \* 10-VQ1100Y-05 ..... 4 sets (Single solenoid part No.)  
 \* 10-VQ1200Y-05 ..... 4 sets (Double solenoid part No.)  
 \* VVQ1000-10A-1 ..... 1 set (Blanking plate part No.)

⊥ \* To order valves and options mounted onto the manifold at the factory, prefix the part number of the solenoid valve and other equipment with an asterisk (\*).

**VQ2000/Base Mounted Type Plug-in Unit**

**How to Order Manifolds**

Clean series

Series VQ2000

Plug-in unit

Valve stations  
The number of maximum stations differs from kit to kit.  
(Refer to the table below.)

**10 - V V 5 Q 2 1 - 08 C6 F U1 - N**

**Cylinder port size**  
**C4** — For ø4 One-touch fitting  
**C6** — For ø6 One-touch fitting  
**C8** — For ø8 One-touch fitting  
**Ø1** — Rc1/8 thread <sup>Note 1)</sup>  
**CM** — Mixture or with port plug <sup>Note 2)</sup>  
 Note 1) In case of Ø1, P and R ports are Rc1/4.  
 Note 2) In case of mixture or a type with port plug, give descriptions on a manifold specification sheet.

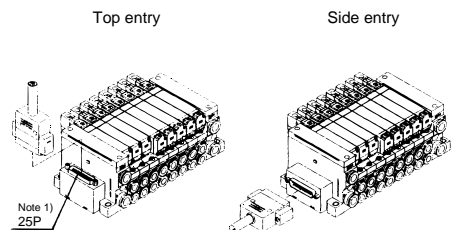
**Kit designation/Electrical entry direction/Cable length**  
Refer to the figure below.

**Option**  
**Nil** — None  
**B** — Back pressure check valve <sup>Note 2)</sup>  
**D** — DIN rail mount type  
**K** — Special wiring specification (Except double wiring) <sup>Note 3)</sup>  
**N** — With name plate  
**R** — External pilot <sup>Note 4)</sup>

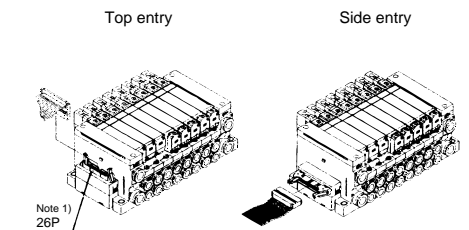
Note 1) When more than one option is specified, list them in alphabetical order (e.g. -BDN).  
 Note 2) In case of "B," indicating "with back pressure check valve," a back pressure check valve is installed on every manifold station.  
 Note 3) Indicate the wiring specification on a manifold specification sheet.  
 Note 4) Enter R for the external pilot specification.

**Kit Designation/Electrical Entry Direction/Cable Length**

**F Kit (D-sub Connector Kit)**



**P Kit (Flat Ribbon Cable Kit)**



Connector entry					
Top entry		In-line			
<b>F Kit</b>	U0	<b>F Kit</b>	S0	Without cable	<sup>Note 2)</sup> 2 to 12 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Connector entry					
Top entry		In-line			
<b>P Kit</b>	U0	<b>P Kit</b>	S0	Without cable	<sup>Note 2)</sup> 2 to 12 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, F kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

Note 1) Besides the above, P kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

How to Order Valves

**10 - V Q 2 | 1 0 0 Y - 5**

Clean series | **VQ2000**

Actuation	
1	2 position single 
2	2 position double 
3	3 position closed center 
4	3 position exhaust center 
5	3 position pressure center 

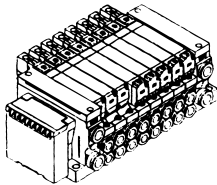
**Manual override**  
 Nil — Non-locking push type (tool required)  
 B — Locking type (tool required)  
 C — Locking type (lever)

**Coil voltage**  
 5 — 24VDC/With light/surge suppresser  
 6 — 12VDC/With light/surge suppresser

**Low wattage (0.5W) specifications**  
 Y — Low wattage(0.5W)/Internal pilot specifications  
 RY — Low wattage(0.5W)/External pilot specifications

**Seal type**  
 0 — Metal seal  
 1 — Rubber seal

**S Kit (Serial Transmission Kit)**



<b>S Kit</b>	<b>0</b>	Without SI unit	Note)
	<b>A</b>	General purpose type: Series EX300	
	<b>B</b>	Mitsubishi Electric Corporation: MELSECNET/mini-S3 data link system	
	<b>C</b>	OMRON Corporation: SYSBUS Wire System	
	<b>D</b>	Sharp Corporation: Satellite I/O Link System	
	<b>E</b>	Matsushita Electric Industrial Co., Ltd.: MEWNET-F System	Maximum 16 stations
	<b>F1</b>	NKE Corporation: Uni wire system (16 outputs)	
	<b>G</b>	Remote I/O System (RIO) by Allen-Bradley Co.	
	<b>H</b>	NKE Corporation: Uni wire H system	
	<b>J1</b>	Corporation: S-LINK system (16 outputs)	
	<b>J2</b>	Corporation: S-LINK system (8 outputs)	Maximum 8 stations
	<b>K</b>	FUJI ELECTRIC CO.,LTD.: T Link Mini System	
	<b>Q</b>	Device Net and Omron CompoBus/D	Maximum 16 stations
	<b>R1</b>	CompoBus/S (16 points) by OMRON Co.	
<b>R2</b>	CompoBus/S (8 points) by OMRON Co.	Maximum 8 stations	
<b>V</b>	Mitsubishi Electric Corporation: CC -Link	Maximum 16 stations	

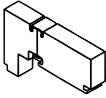
Note) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

Directional Control Valve

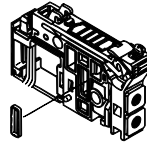
**Manifold Option**

**Upper row :** For 10-VQ1000  
**Lower row :** For 10-VQ2000

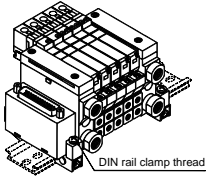
**Blanking Plate Assembly**  
 VVQ1000-10A-1  
 VVQ2000-10A-1



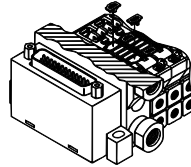
**SUP Blocking Plate**  
 VVQ1000-16A  
 VVQ2000-16A



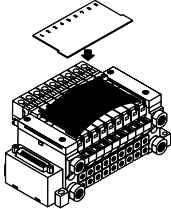
**DIN Rail Mounting Bracket [-D]**  
 VVQ1000-57A  
 VVQ2000-57A



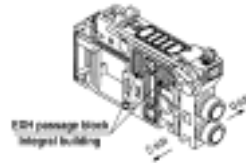
**Back Pressure Check Valve Assembly [-B]**  
 VVQ1000-18A  
 VVQ2000-18A



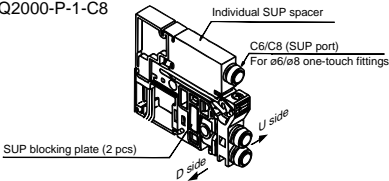
**Label [-N]**  
 VVQ1000-N-stations (1 to maximum stations)  
 VVQ2000-N-stations (1 to maximum stations)



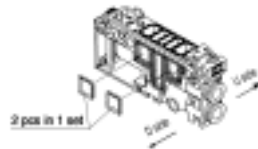
**EXH Blocking Base Assembly (For 10-VQ1000)**  
 10-VVQ1000-19A- $\square$  (C3, C4, C6, M5)



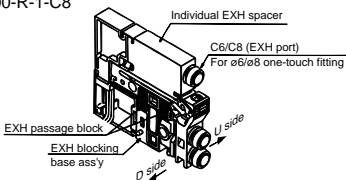
**Individual SUP Spacer**  
 10-VVQ1000-P-1-C6  
 10-VVQ2000-P-1-C8



**EXH Blocking Plate (For 10-VQ2000)**  
 VVQ2000-19A

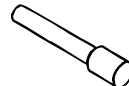


**Individual EXH Spacer**  
 10-VVQ1000-R-1-C6  
 10-VVQ2000-R-1-C8



**Blanking Plug (For One-touch Fitting)**

23  
 04  
 KQ2P06  
 08  
 10



**Model**

Series	Number of solenoids	Model	Flow characteristics <sup>Note 1)</sup>						Response time <sup>Note 2)</sup> ms	Weight g		
			1→2/4 (P → A/B)			2/4→3/5 (A/B→R1/R2)						
			C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv				
10-VQ1000	2 position	Single	Metal seal	10-VQ1100Y	0.70	0.15	0.16	0.72	0.25	0.18	15 or less	64
			Rubber seal	10-VQ1101Y	0.85	0.20	0.21	1.0	0.30	0.25	20 or less	
	Double	Metal seal	10-VQ1200Y	0.70	0.15	0.16	0.72	0.25	0.18	13 or less		
		Rubber seal	10-VQ1201Y	0.85	0.20	0.21	1.0	0.30	0.25	20 or less		
	3 position	Closed center	Metal seal	10-VQ1300Y	0.68	0.15	0.16	0.72	0.25	0.18	26 or less	78
			Rubber seal	10-VQ1301Y	0.70	0.20	0.16	0.65	0.42	0.18	33 or less	
		Exhaust center	Metal seal	10-VQ1400Y	0.68	0.15	0.16	0.72	0.25	0.18	26 or less	
			Rubber seal	10-VQ1401Y	0.70	0.20	0.16	1.0	0.30	0.25	33 or less	
		Pressure center	Metal seal	10-VQ1500Y	0.70	0.15	0.16	0.72	0.25	0.18	26 or less	
			Rubber seal	10-VQ1501Y	0.85	0.20	0.21	0.65	0.42	0.18	33 or less	
10-VQ2000	2 position	Single	Metal seal	10-VQ2100Y	2.0	0.15	0.46	2.6	0.15	0.60	29 or less	90
			Rubber seal	10-VQ2101Y	2.2	0.28	0.55	3.2	0.30	0.80	31 or less	
	Double	Metal seal	10-VQ2200Y	2.0	0.15	0.46	2.6	0.15	0.60	20 or less		
		Rubber seal	10-VQ2201Y	2.2	0.28	0.55	3.2	0.30	0.80	26 or less		
	3 position	Closed center	Metal seal	10-VQ2300Y	2.0	0.15	0.46	2.0	0.18	0.46	38 or less	110
			Rubber seal	10-VQ2301Y	2.0	0.28	0.49	2.2	0.31	0.60	44 or less	
		Exhaust center	Metal seal	10-VQ2400Y	2.0	0.15	0.46	2.6	0.15	0.60	38 or less	
			Rubber seal	10-VQ2401Y	2.0	0.28	0.49	3.2	0.30	0.80	44 or less	
		Pressure center	Metal seal	10-VQ2500Y	2.4	0.17	0.57	2.0	0.18	0.46	38 or less	
			Rubber seal	10-VQ2501Y	3.2	0.28	0.80	2.2	0.31	0.60	44 or less	

Note 1) Cylinder port size: C6 (10-VQ1000), C8 (10-VQ2000), without back pressure check valve.

Note 2) According to JIS B8375-1981. (A value at supply pressure of 0.5MPa with light/surge voltage suppressor when clean air is used. The value differs with the pressure and the quality of air.) Values for double types are when the switch is ON.

**Specifications**

Valve specifications	Valve type	Metal seal	Rubber seal	
	Fluid	Air, Inert gas		
	Max. operating pressure	0.7MPa	0.7MPa	
	Min. operating pressure	Single	0.1MPa	0.15MPa
		Double	0.1MPa	0.1MPa
		3 position	0.1MPa	0.2MPa
	Ambient and fluid temperature	-10 to 50 °C <sup>Note 1)</sup>	-10 to 50 °C <sup>Note 1)</sup>	
Lubrication	Not required			
Pilot valve manual override	Push type/Option: Locking type (tool required, lever), Option			
Electrical specification	Enclosure	Dust proof		
	Rated coil voltage	12V, 24VDC		
	Allowable voltage fluctuation	±10% of rated voltage		
	Type of coil insulation	Equivalent to class B		
	Power consumption	0.5W DC (21mA)		
	DC (current)	12VDC 0.5W DC (42mA)		

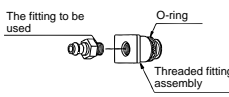
Note 1) Use dry air to prevent condensation when operating at a low temperature.

**Precautions to Install Threaded Fitting Assembly**

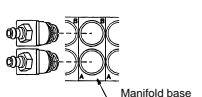
Threaded fitting ass'ys used for this manifold are not mounted on the manifold base or valve in order to improve installation efficiency of connecting the fittings to the port.

Install the threaded fitting following the steps below.

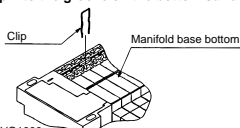
**1. Screw in the fitting to the ancillary threaded fitting assembly.**



**2. Insert the threaded fitting assembly into the manifold port.**



**3. Insert the ancillary clip into the groove on the bottom surface of valve.**



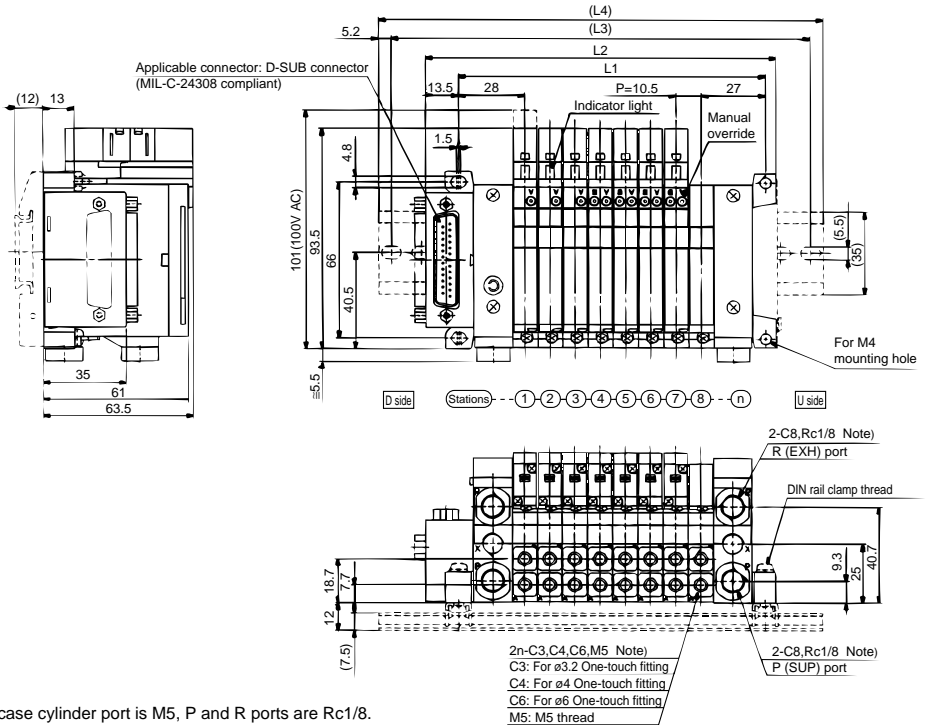
**■Precautions**

- Be careful not to scratch or stain the O-ring of the fitting assembly. It may cause air leakage.
  - Do not screw in the fitting to the ancillary threaded fitting assembly already installed on the manifold base. If the screwing torque is large, the manifold base may be damaged.
- To prevent exhaust air at EXH from pressurization (0.3 MPa or more) by throttling, double side piping is recommended for EXH port. (Otherwise delay in response or air leakage may result.)

Directional Control Valve

**Kit (D-sub Connector Kit)/10-VQ1000**

The broken lines indicate DIN rail mounted type [D] and side entry connector [FS].



Note) In case cylinder port is M5, P and R ports are Rc1/8.

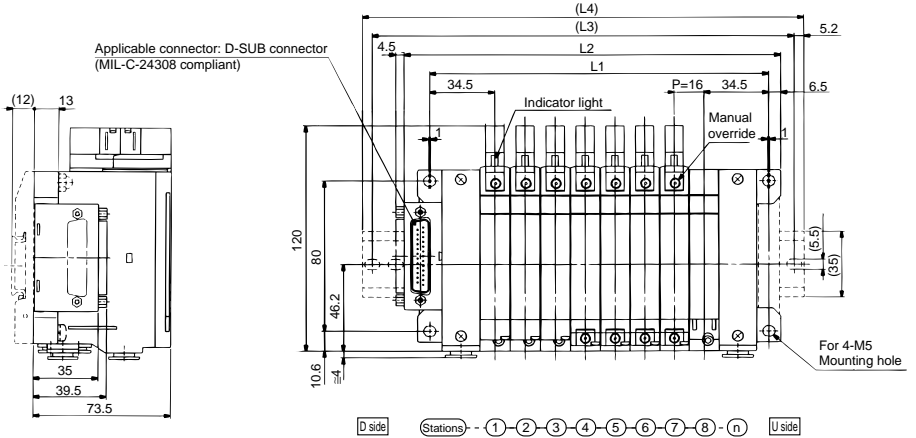
**Formula**  $L1=10.5n+44.5$  /  $L2=10.5n+62.5$  / n: stations (Max. 12 stations: standard)

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<b>L1</b>	65.5	76	86.5	97	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286	296.5
<b>L2</b>	83.5	94	104.5	115	125.5	136	146.5	157	167.5	178	188.5	199	209.5	220	230.5	241	251.5	262	272.5	283	293.5	304	314.5
<b>(L3)</b>	112.5	125	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5	275	287.5	300	312.5	325	325	337.5
<b>(L4)</b>	123	135.5	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298	310.5	323	335.5	335.5	348



**Kit (D-sub Connector Kit)/10-VQ2000**

The broken lines indicate DIN rail mounted type [-D] and side entry connector [-FS].



Directional Control Valve

Note) In case cylinder 01, P and R ports are Rc1/4.

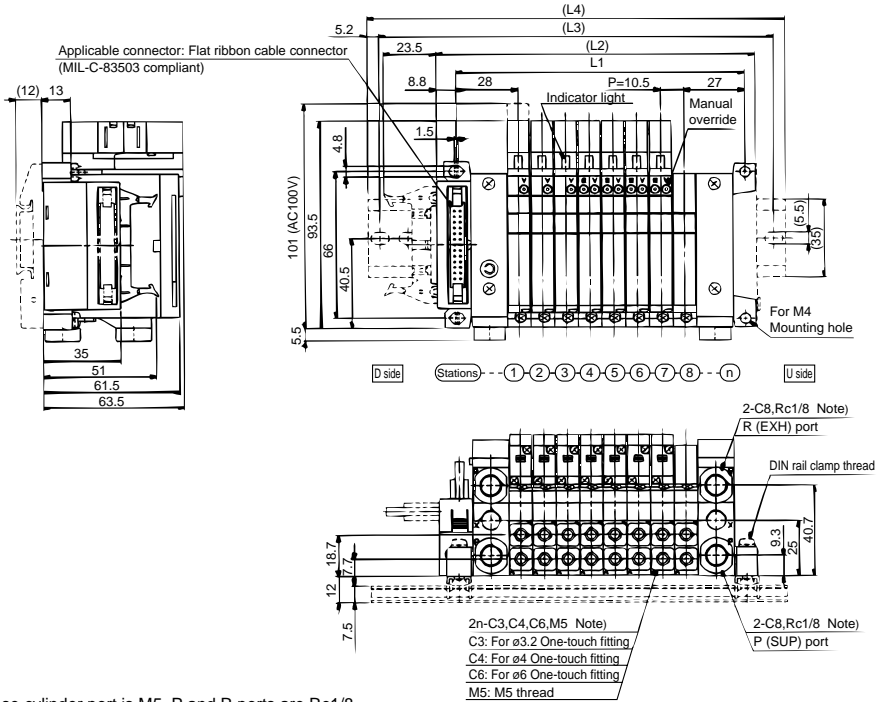
**Formula**  $L1=16n+53$  /  $L2=16n+73$  / n: stations (Max. 12 stations: standard)

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<b>L1</b>	85	101	117	133	149	165	181	197	213	229	245	261	277	293	309	325	341	357	373	389	405	421	437
<b>L2</b>	105	121	137	153	169	185	201	217	233	249	265	281	297	313	329	345	361	377	393	409	425	441	457
<b>(L3)</b>	137.5	150	162.5	187.5	200	212.5	225	250	262.5	275	300	312.5	325	337.5	350	375	387.5	400	412.5	437.5	450	462.5	487.5
<b>(L4)</b>	148	160.5	173	198	210.5	223	235.5	260.5	273	285.5	310.5	323	335.5	348	360.5	385.5	398	410.5	423	448	460.5	473	498

Solenoid Valve **10-VQ1000/2000**

**Kit (Flat Ribbon Cable Kit)/10-VQ1000**

The broken lines indicate DIN rail mounted type [-D] and side entry connector [-FS].

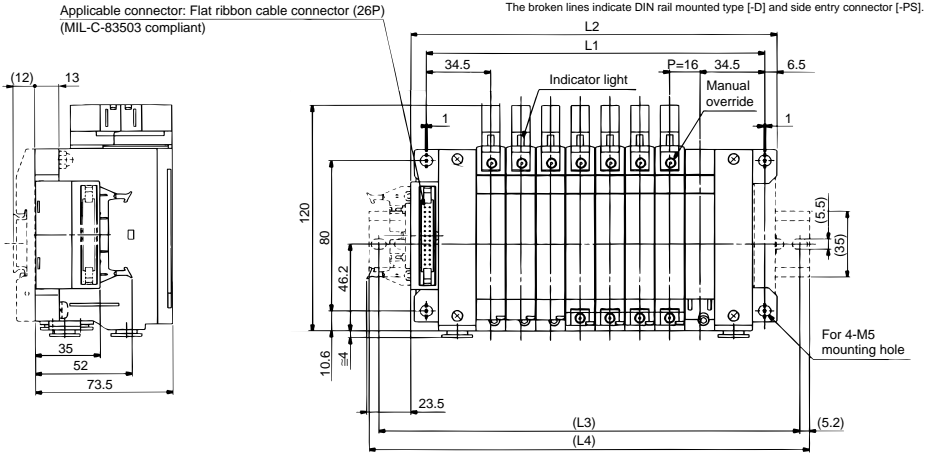


Note) In case cylinder port is M5, P and R ports are Rc1/8.

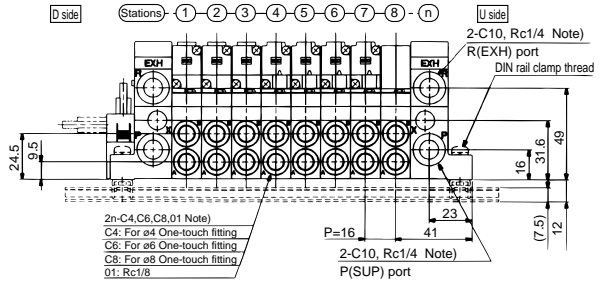
**Formula**  $L1=10.5n+44.5 / L2=10.5n+57.5 / n$ : stations (Max. 12 stations: standard)

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<b>L1</b>	65.5	76	86.5	97	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5	223	233.5	244	254.5	265	275.5	286	296.5
<b>L2</b>	78.5	89	99.5	110	120.5	131	141.5	152	162.5	173	183.5	194	204.5	215	225.5	236	246.5	257	267.5	278	288.5	299	309.5
<b>(L3)</b>	112.5	125	137.5	150	162.5	175	187.5	198.5	210.5	222.5	234.5	246.5	258.5	270.5	282.5	294.5	306.5	318.5	330.5	342.5	354.5	366.5	378.5
<b>(L4)</b>	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398

**Kit (Flat Ribbon Cable Kit)/10-VQ2000**



Note) In case cylinder 01,  
P and R parts are Rc1/4.



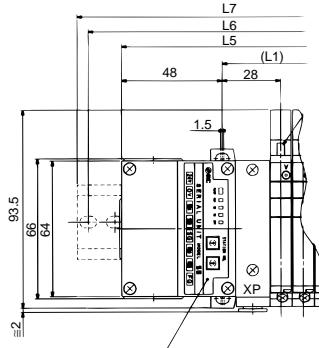
Directional Control Valve

**Formula**  $L1=16n+53$  /  $L2=16n+68$  / n: stations (Max. 12 stations: standard)

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
<b>L1</b>	85	101	117	133	149	165	181	197	213	229	245	261	277	293	309	325	341	357	373	389	405	421	437
<b>L2</b>	100	116	132	148	164	180	196	212	228	244	260	276	292	308	324	340	356	372	388	404	420	436	452
<b>(L3)</b>	125	150	162.5	175	187.5	212.5	225	237.5	262.5	275	287.5	300	312.5	337.5	350	362.5	387.5	400	412.5	425	450	462.5	475
<b>(L4)</b>	135.5	160.5	173	185.5	198	223	235.5	248	273	285.5	298	310.5	323	348	360.5	373	398	410.5	423	435.5	460.5	473	485.5

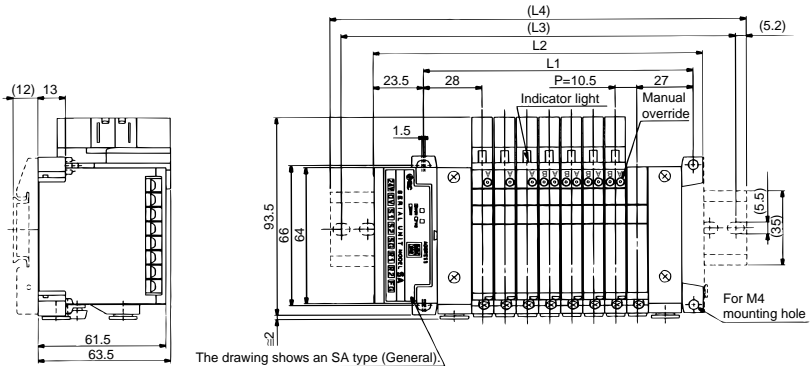
**S** Kit (Serial Transmission Kit)/10-VQ1000

The broken lines indicate DIN rail mounted type [-D].

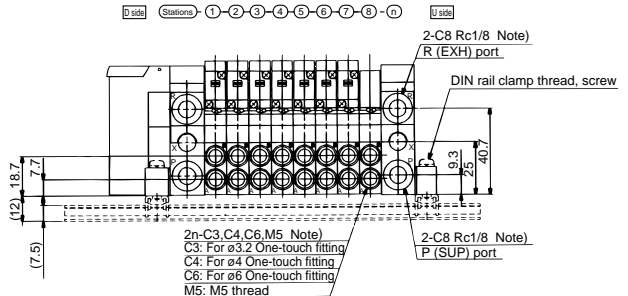


The figure shows SB type (for Mitsubishi Electric Corporation)

Dustproof SI unit



The drawing shows an SA type (General)



Note) In case cylinder port is M5,  
P and R ports are Rc1/8.

**Formula**  $L1=10.5n+44.5 / L2=10.5n+72.5 / n$ ; Stations (Max. 8 stations: standard)

In case of dustproof SI unit  $L5=10.5n+97 / L6=L3+25 / L7=L4+25$

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L1</b>	65.5	76	86.5	97	107.5	118	128.5	139	149.5	160	170.5	181	191.5	202	212.5
<b>L2</b>	93.5	104	114.5	125	135.5	146	156.5	167	177.5	188	198.5	209	219.5	230	240.5
<b>(L3)</b>	125	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5
<b>(L4)</b>	135.5	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273

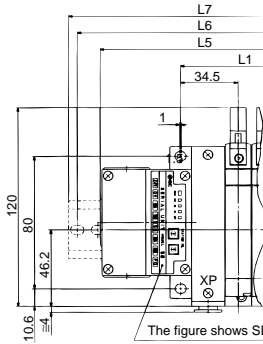
In case of ejector mounting: Formula  $L1=10.5n+28.7+(\text{Number of ejector units} \times 26.7)$

$L2=10.5n+56.3+(\text{Number of ejector units} \times 26.7)$

$L4$  is obtained by adding approx. 30 to  $L2$ .

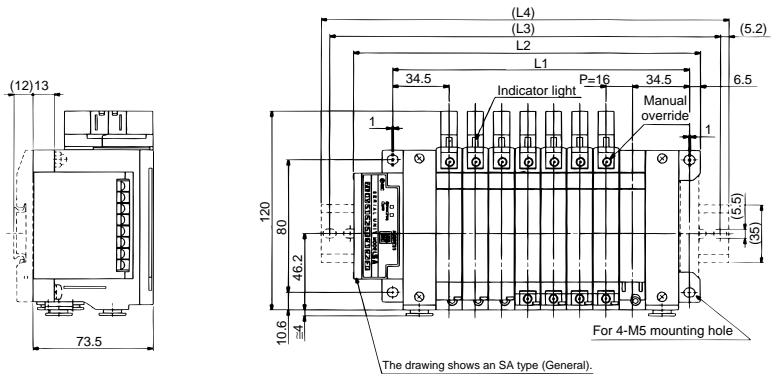
Note) Manifolds with SI unit for Matsushita Electric Industrial (MEVNET FP) or Allen Bradley Co. have the same  $L5$ ,  $L6$  and  $L7$  dimensions as manifolds with dustproof SI unit.

**S** Kit (Serial Transmission Kit)/10-VQ2000

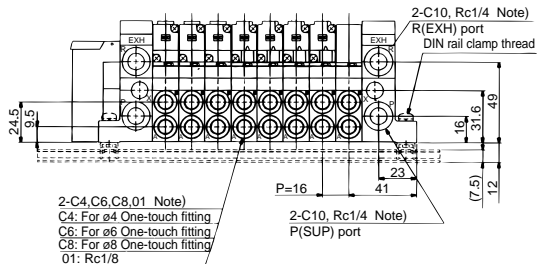
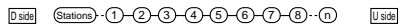


The broken lines indicate DIN rail mounted type [-D].

Dustproof SI unit



Directional Control Valve



Note) In case cylinder 01, P and R parts are Rc1/4.

**Formula** L1=16n+53 / L2=16n+83 / n: Stations (Max. 8 stations: standard)

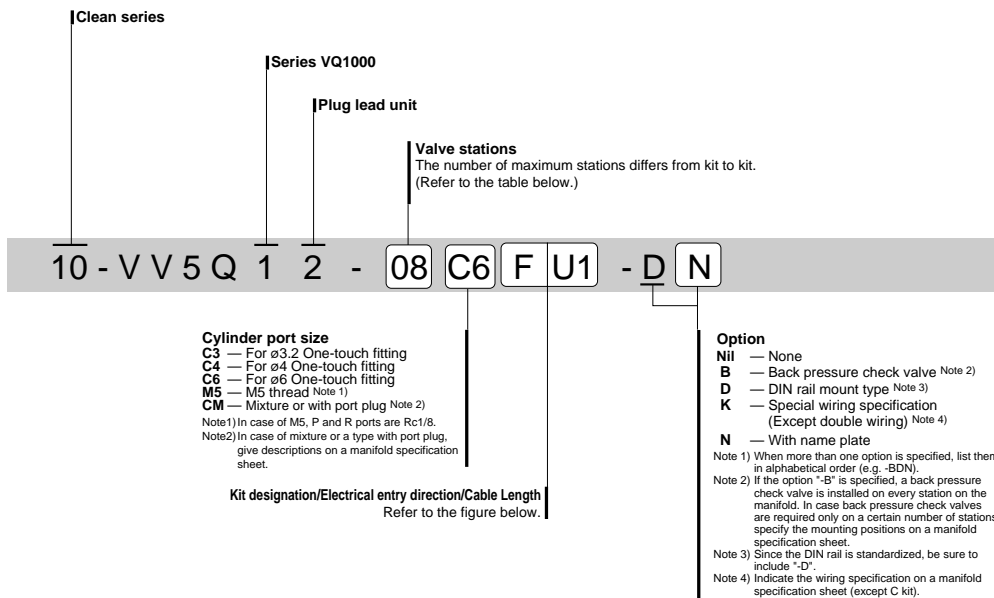
In case of dustproof SI unit L5=16n+108 / L6=L3+25 / L7=L4+25

Stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L1</b>	85	101	117	133	149	165	181	197	213	229	245	261	277	293	309
<b>L2</b>	115	131	147	163	179	195	211	227	243	259	275	291	307	323	339
<b>(L3)</b>	137.5	162.5	175	187.5	200	225	237.5	250	262.5	287.5	300	312.5	337.5	350	362.5
<b>(L4)</b>	148	173	185.5	198	210.5	235.5	248	260.5	273	298	310.5	323	348	360.5	373

Note) Manifolds with SI unit for Matsushita Electric Industrial (MEWNET FP) or Allen Bradley Co. have the same L5, L6 and L7 dimensions as manifolds with dustproof SI unit.

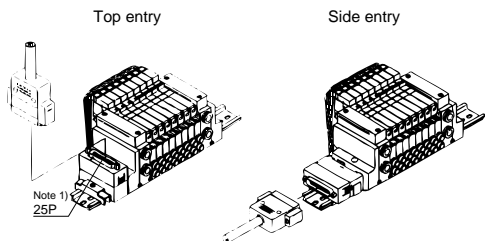
**VQ1000/Base Mounted Type Plug Lead Unit**

**How to Order Manifolds**



**Kit Designation/Electrical Entry Direction/Cable Length**

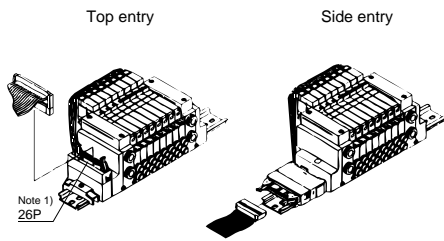
**F Kit (D-sub Connector Kit)**



Connector entry					
Top entry		Side entry			
<b>F Kit</b>	U0	<b>F Kit</b>	S0	Without cable	Note 2) Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, F kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

**P Kit (Flat Ribbon Cable Kit)**



Connector entry					
Top entry		Side entry			
<b>P Kit</b>	U0	<b>P Kit</b>	S0	Without cable	Note 2) Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, P kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

## How to Order Valves

**Clean series** | **VQ1000**

**Seal type**  
 0 — Metal seal  
 1 — Rubber seal

**10 - V Q 1 1 1 0 Y - 5 LO**

**Actuation**

- 1 2 position single
- 2 2 position double
- 3 3 position closed center
- 4 3 position exhaust center
- 5 3 position pressure center

**Low wattage (0.5W) specifications**

**Coil voltage**  
 5 — 24VDC/with indicator light/surge suppressor  
 6 — 12VDC/with indicator light/surge suppressor

**Electrical entry**  
 L — L plug connector with lead wire  
 LO — L plug connector without lead wire

Note) LO valve are used for F, P and S kits plug connector and lead wire layers are attached to the manifold.

**Manual override**  
 Nil — Non-locking push type (tool required)  
 B — Lock type (tool required)  
 C — Locking type (lever)

## How to Order Manifold Assembly/Example

Specify the part numbers of valves and options below the manifold base part numbers.

Single solenoid (24VDC)  
10-VQ1110Y-5L

Double solenoid (24VDC)  
10-VQ1210Y-5L

Stations

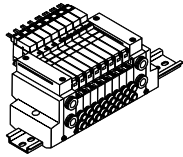
1/2"  
1/4"  
1/8"

Cylinder port size  
C6: For ø6 One-touch fittings

Manifold base (8 stations)  
10-VV5Q12-08C6C-BD

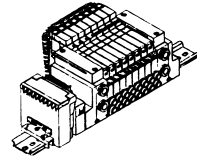
10-VV5Q12-08C6C-BD ...1 set (C kit, 8 station manifold part No.)  
 \* 10-VQ1110Y-5L ...4 sets (Single solenoid part No.)  
 \* 10-VQ1210Y-5L ...4 sets (Double solenoid part No.)  
 † \* To order valves and options mounted onto the manifold at the factory, prefix the part number of the solenoid valve and other equipment with an asterisk (\*).

## C Kit (Connector)



<b>C</b>	Connector kit	Maximum 16 stations
----------	---------------	---------------------

## S Kit (Serial Transmission Kit)



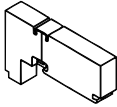
<b>O</b>	Without SI unit	
<b>A</b>	General purpose type: Series EX300	
<b>B</b>	Mitsubishi Electric Corporation: MELSECNET/MINI-S3 data link system	
<b>C</b>	OMRON Corporation: SYSBUS Wire system	Maximum 16 stations
<b>D</b>	Sharp Corporation: Satellite I/O Link System	
<b>E</b>	Matsushita Electric Industrial Co., Ltd.: MEWNET-F System	
<b>F1</b>	NKE Corporation: Uni wire system (16 outputs)	
<b>G</b>	Remote I/O System (RIO) by Allen-Bradley Co.	
<b>H</b>	NKE Corporation: Uni wire H system compatible	
<b>J1</b>	Corporation: S-LINK system (16 outputs)	Maximum 8 stations
<b>J2</b>	Corporation: S-LINK system (8 outputs)	
<b>K</b>	FUJI ELECTRIC CO.,LTD.: T Link Mini System	Maximum 16 stations
<b>Q</b>	Device Net and Omron CompoBus/D	
<b>R1</b>	CompoBus/S (16 points) by OMRON Co.	Maximum 8 stations
<b>R2</b>	CompoBus/S (8 points) by OMRON Co.	
<b>V</b>	Mitsubishi Electric Corporation: CC-Link	Maximum 16 stations



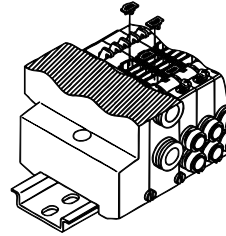
Note1) The general type requires a transmission unit on the CPU side.

**Manifold Option**

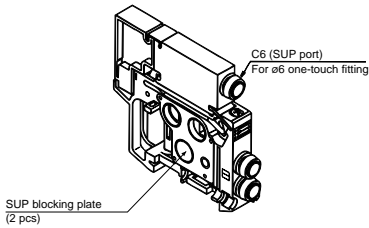
**Blanking Plate Assembly**  
VVQ1000-10A-1



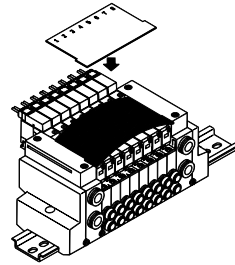
**Back Pressure Check Valve Assembly [-B]**  
VVQ1000-18A



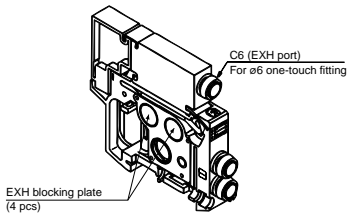
**Individual SUP Spacer**  
10-VVQ1000-P-2-C6



**Name Plate [-N]**  
VVQ1000-N2-stations (1 to maximum stations)

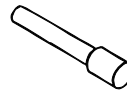


**Individual EXH Spacer**  
10-VVQ1000-R-2-C6

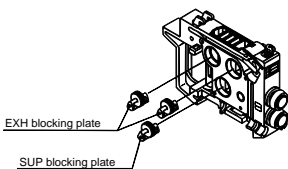


**Blanking Plug (For One-touch Fitting)**

23  
04  
KQ2P-06  
08



**SUP/EXH Blocking Plate**  
10-VVQ1000-16A-2





Model

Series	Number of solenoids	Model	Flow characteristics Note 1)						Response time Note 2)	Weight <sup>g</sup>			
			1→4/2 (P→A/B)			4/2→5/3 (A/B→R1/R2)							
			C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv					
10-VQ1000	2 position	Single	Metal seal	10-VQ1110Y	0.70	0.15	0.16	0.72	0.25	0.18	15 or less	64	
			Rubber seal	10-VQ1111Y	0.85	0.20	0.21	1.0	0.30	0.25	20 or less		
	Double		Metal seal	10-VQ1210Y	0.70	0.15	0.16	0.72	0.25	0.18	13 or less		
			Rubber seal	10-VQ1211Y	0.85	0.20	0.21	1.0	0.30	0.25	20 or less		
	3 position	Closed center		Metal seal	10-VQ1310Y	0.68	0.15	0.16	0.72	0.25	0.18		26 or less
				Rubber seal	10-VQ1311Y	0.70	0.20	0.16	0.65	0.42	0.18		33 or less
		Exhaust center		Metal seal	10-VQ1410Y	0.68	0.15	0.16	0.72	0.25	0.18		26 or less
				Rubber seal	10-VQ1411Y	0.70	0.20	0.16	1.0	0.30	0.25		33 or less
		Pressure center		Metal seal	10-VQ1510Y	0.70	0.15	0.16	0.72	0.25	0.18		26 or less
				Rubber seal	10-VQ1511Y	0.85	0.20	0.21	0.65	0.42	0.18		33 or less

Note 1) Cylinder port size: C6 (without back pressure check valve).

Note 2) According to JIS B8375-1981. (A value at supply pressure of 0.5MPa with light/surge voltage suppressor when clean air is used. The value differs with the pressure and the quality of air.) Values for double types are when the switch is ON.

Specifications

Valve specifications	Valve type	Metal seal	Rubber seal	
	Fluid	Air, Inert gas		
	Max. operating pressure	0.7MPa	0.7MPa	
	Min. operating pressure	Single	0.1MPa	0.15MPa
		Double	0.1MPa	0.1MPa
		3 position	0.1MPa	0.2MPa
	Ambient and fluid temperature	-10 to 50°C Note 1)	-10 to 50°C Note 1)	
	Lubrication	Not required		
	Manual override	Push type/Option: Locking type (tool required, lever)		
	Enclosure	Dust proof		
Electrical specifications	Rated coil voltage	12V, 24VDC		
	Allowable voltage fluctuation	±10% of rated voltage		
	Type of coil insulation	Equivalent to class B		
	Power consumption DC (Current)	24VDC	0.5W DC (21mA)	
		12VDC	0.5W DC (42mA)	

Note 1) Use dry air to prevent condensation when operating at a low temperature.

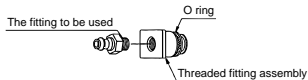
Directional Control Valve

Precautions to Install Threaded Fitting Assembly

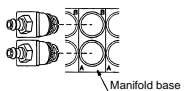
Threaded fitting assemblies used for this manifold are not mounted on the manifold base or valve in order to improve installation efficiency of connecting the fittings to the port.

Install the threaded fitting following the steps below.

1. Screw in the fitting to the ancillary threaded fitting assembly.



2. Insert the threaded fitting assembly into the manifold port.

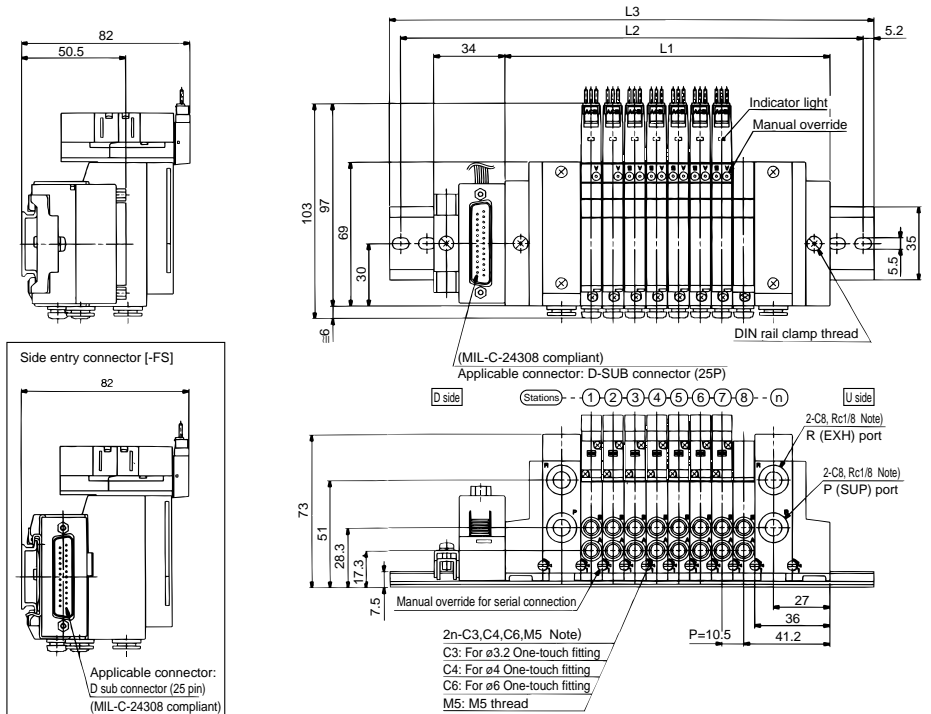


3. Insert the ancillary clip into the groove on the bottom surface of valve.

■Precautions

- Be careful not to scratch or stain the O-ring of the fitting assembly. It may cause air leakage.
  - Do not screw in the fitting to the ancillary threaded fitting assembly already installed on the manifold base. If the screwing torque is large, the manifold base may be damaged.
- To prevent exhaust air at EXH from pressurization (0.3 MPa or more) by throttling, double side piping is recommended for EXH port. (Otherwise delay in response or air leakage may result.)

**F Kit (D-sub Connector Kit)/10-VQ1000**



**Top entry connector (-FU)**

**Formula**  $L1=10.5n+72$  / n: Stations (Max. 8 stations: standard)

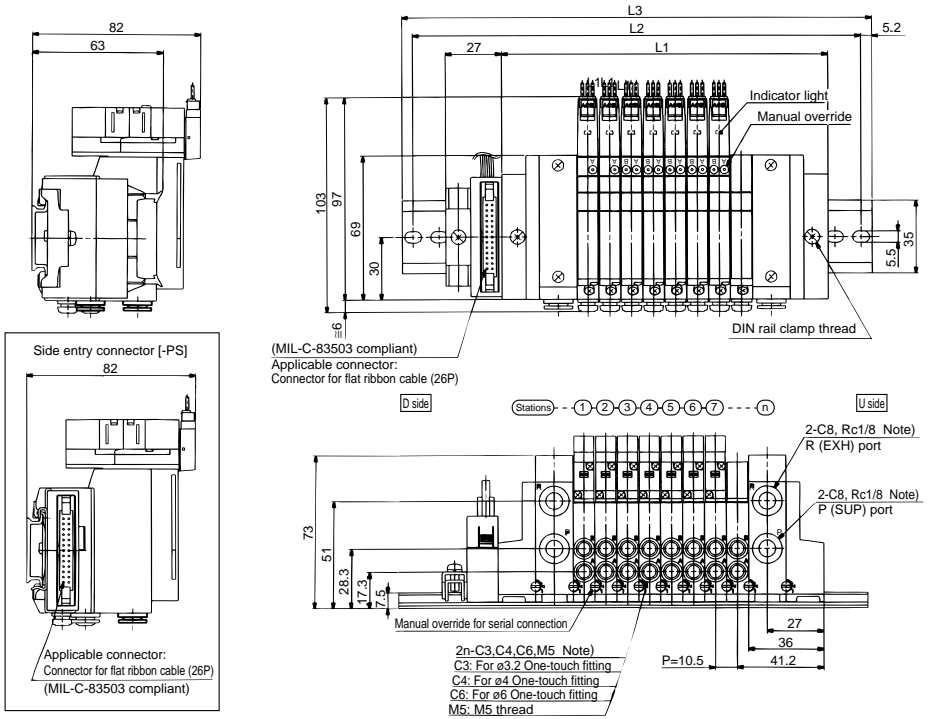
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	82.5	93	103.5	114	124.5	135	145.5	156	166.5	177	187.5	198	208.5	219	229.5	240
L2	137.5	150	162.5	175	187.5	200	200	212.5	225	237.5	250	262.5	262.5	275	287.5	300
L3	148	160.5	173	185.5	198	210.5	210.5	223	235.5	248	260.5	273	273	285.5	298	310.5

**Dimensions/Side entry connector [-FS]**

**Formula**  $L1=10.5n+72$  / n: Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L2	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5	275	287.5	300	312.5	312.5
L3	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298	310.5	323	323

**P Kit (Flat Ribbon Cable Kit)/10-VQ1000**



Directional Control Valve

**Top entry connector [-PU]**

**Formula**  $L1=10.5n+72$  / n: Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	82.5	93	103.5	114	124.5	135	145.5	156	166.5	177	187.5	198	208.5	219	229.5	240
L2	137.5	150	150	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5	275	287.5	287.5
L3	148	160.5	160.5	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273	285.5	298	298

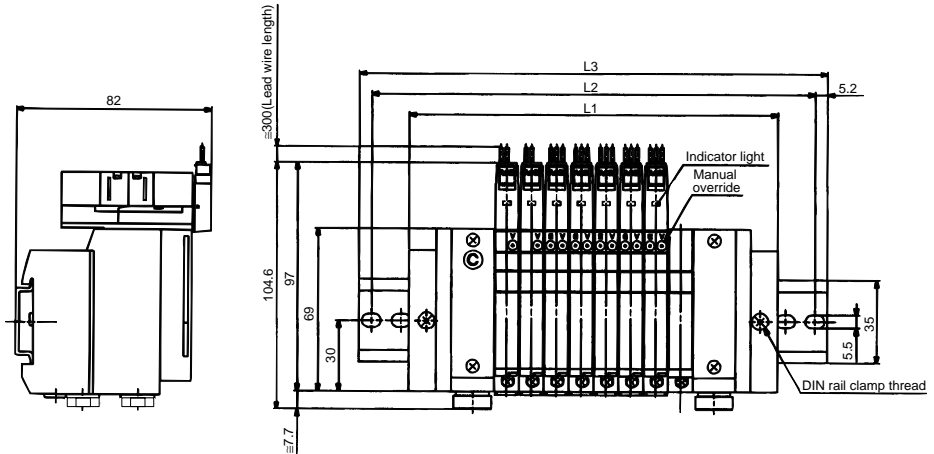
**Dimensions/Side entry connector [-PU]**

**Formula**  $L1=10.5n+72$  / n: Stations (Max. 8 stations: standard)

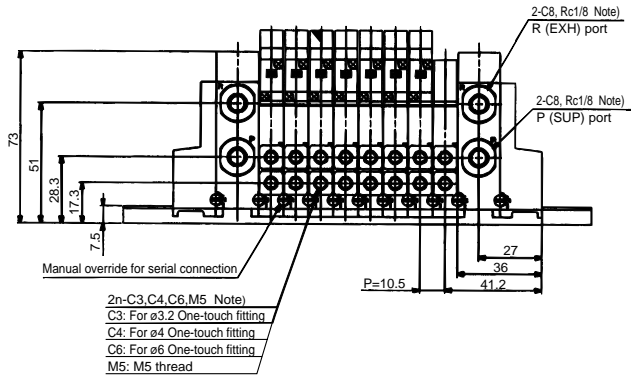
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L2	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5	275	287.5	300	312.5	312.5
L3	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273	285.5	298	310.5	323	323

Solenoid Valve **10-VQ1000/2000**

**C Kit (Connector Kit)10-VQ1000**



D side (Stations) -- ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ -- n U side

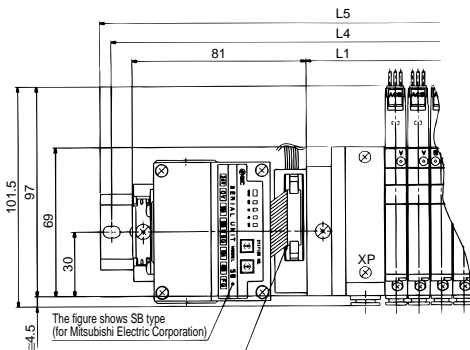


Note) In case cylinder port is M5, P and R ports are Rc1/8.

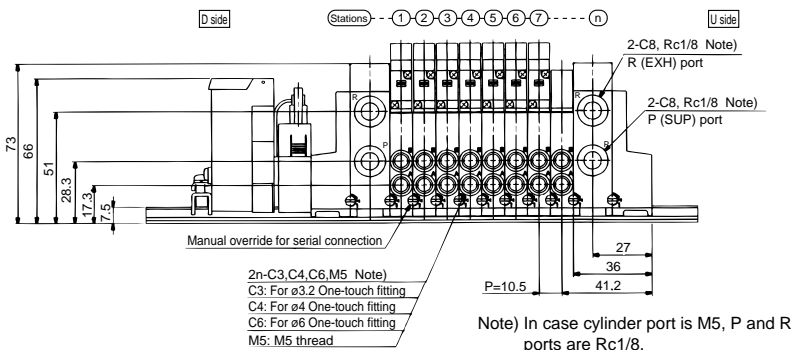
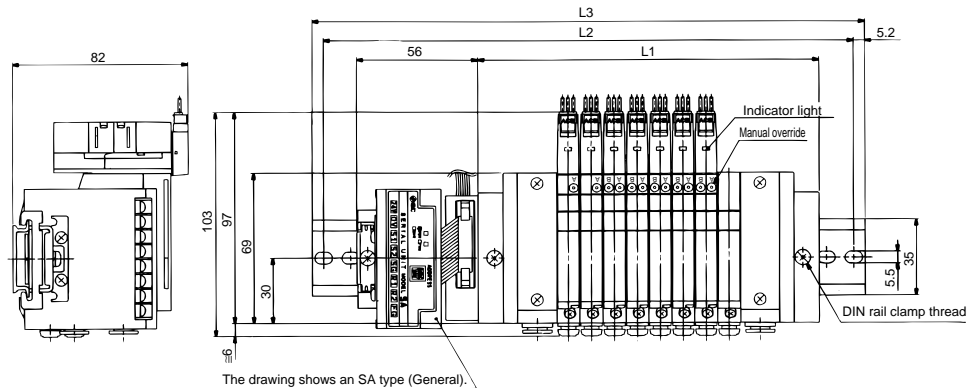
**Formula**  $L1=10.5n+72 / n$ ; Stations (Max. 16 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	82.5	93	103.5	114	124.5	135	145.5	156	166.5	177	187.5	198	208.5	219	229.5	240
L2	112.5	112.5	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	250	262.5
L3	123	123	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	260.5	273

**S** Kit (Serial Transmission Kit)/10-VQ1000



Applicable connector: Connector for flat ribbon cable(20P) (MIL-C-83503 compliant) Dustproof SI unit



**Formula**  $L1=10.5n+72 / n$ : Stations (Max. 16 stations: standard)

In case of dustproof SI unit  $L4=L3+25 / L5=L4+25$

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L1</b>	82.5	93	103.5	114	124.5	135	145.5	156	166.5	177	187.5	198	208.5	219	229.5	240
<b>L2</b>	162.5	175	187.5	200	212.5	225	237.5	250	262.5	275	287.5	298	310.5	323	335.5	
<b>L3</b>	173	185.5	198	210.5	210.5	223	235.5	248	260.5	273	285.5	285.5	298	310.5	323	335.5

Note) Manifolds with SI unit for Matsushita Electric Industrial (MEWNET FP) or Allen Bradley Co. have the same L4, L5 dimensions as manifolds with dustproof SI unit.

**VQ1000/Body Ported Type** Flip Plug-in Unit

**How to Order Manifolds**

Clean series | Series VQ1000 | Flip plug-in unit | Valve stations  
The number of maximum stations differs from kit to kit. (Refer to the table below.) | A,B port size  
A: For ø6 One-touch fitting  
B: Rc(PT)1/8 thread

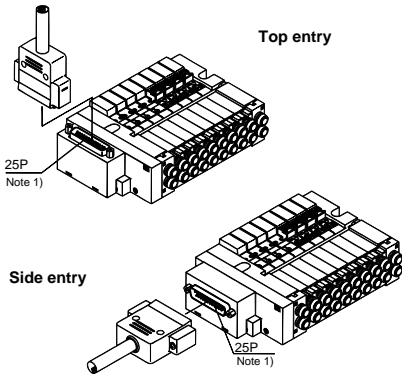
10 - V V 5 Q 1 3 - 08 A F S1 - N

Kit designation/Electrical entry direction/Cable Length  
Refer to the figure below.

**Option**  
 Nil — None  
 D — DIN rail mount type Note 2)  
 K — Special wiring specification (Except double wiring)Note 3)  
 N — Name plate  
 Note 1) When more than one option is specified, list them in alphabetical order (e.g. -DKN).  
 Note 2) S kit is only available for DIN rail mounting so include an option symbol "D".  
 Note 3) Indicate the wiring specification on a manifold specification sheet.

**Kit Designation/Electrical Entry Direction/Cable Length**

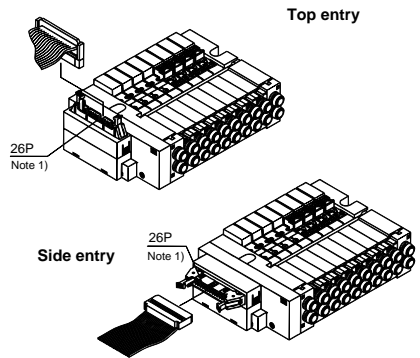
**F Kit (D-sub Connector Kit)**



Connector entry					
Top entry		Side entry			
F Kit	U0	F Kit	S0	Without cable	Note) Maximum 12 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, F kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

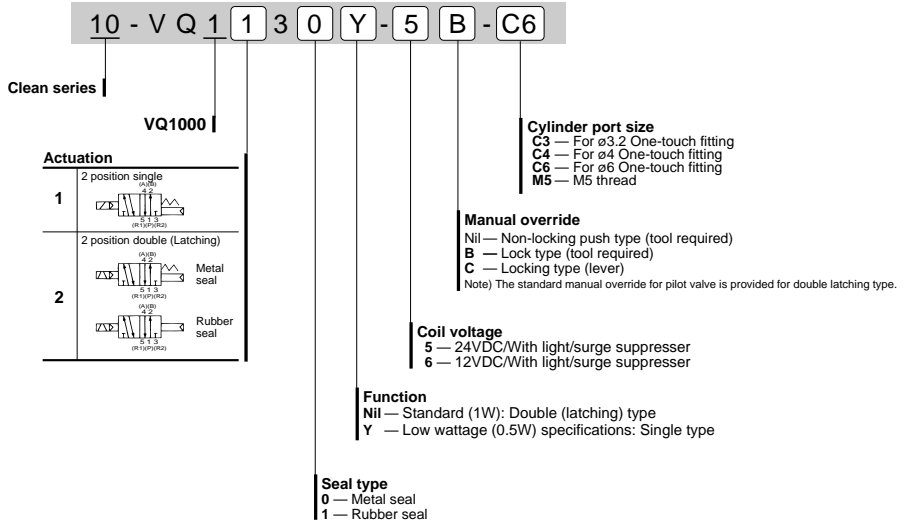
**P Kit (Flat Ribbon Cable Kit)**



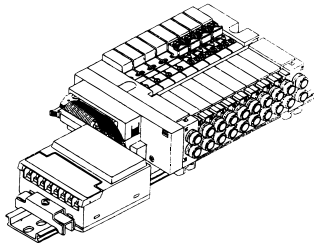
Connector entry					
Top entry		Side entry			
P Kit	U0	P Kit	S0	Without cable	Note) Maximum 12 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, P kits with different number of pins are available.  
 Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

How to Order Valves



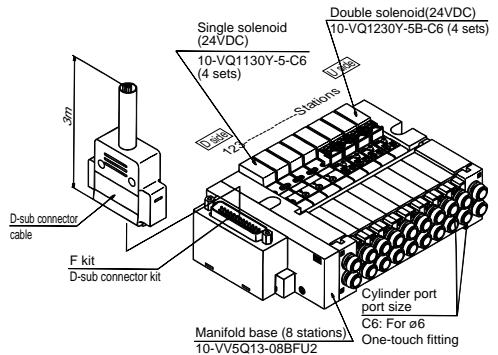
**S Kit (Serial Transmission Kit)**



Note 2) <b>S Kit</b>	<b>O</b>	Without SI unit	Note 1) Maximum 8 stations
	<b>A</b>	General purpose type SI unit	
	<b>B</b>	SI unit for Mitsubishi (MELSEC-A)	
	<b>C</b>	SI unit for OMRON (SYSMAC)	
	<b>D</b>	SI unit for Sharp (New Satellite)	
	<b>F1</b>	SI unit for NKE Corporation UNI-WIRE System (16 points)	
	<b>H</b>	SI unit for NKE Corporation UNI-WIRE H System (16 points)	

Note 1) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.  
 Note 2) Consult SMC regarding serial transmission kits by Matsushita Electric Industrial Co., Ltd., Allen Bradley Co., SUNX Limited, FUJI ELECTRIC CO.,LTD. and OMRON Corporation.

How to Order Manifold Assembly/Example



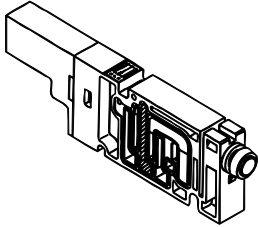
10-VV5Q13-08BFU2 .....1 set (F kit 8 station manifold base part No.)  
 \* 10-VQ1130Y-5-C6 .....4 sets (Single solenoid part No.)  
 \* 10-VQ1230-5B-C6 .....4 sets (Double latching solenoid part No.)  
 \* To order valves and options mounted onto the manifold at the factory, prefix the part number of the solenoid valve and other equipment with an asterisk (\*).

Specify the valves to be installed below the manifold part number. If the layout is complicated, give descriptions on a manifold specification sheet.

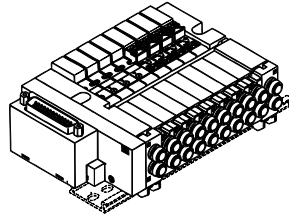
Directional Control Valve

**Manifold Option**

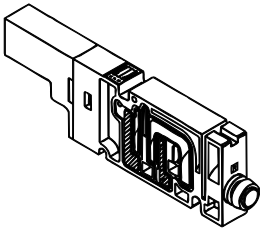
**Individual SUP Spacer**  
10-VVQ1000-P-3-C6



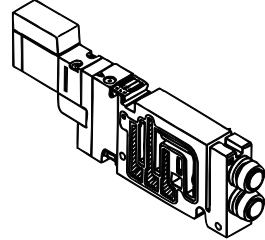
**DIN Rail Mounting Bracket [-D]**  
VVQ1000-57A-3



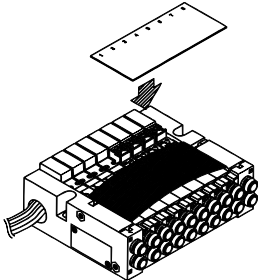
**Individual EXH Spacer**  
10-VVQ1000-R-3-C6



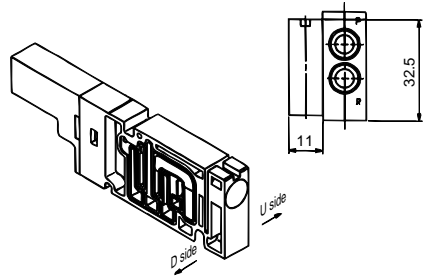
**P  
R Blocking Valve**  
PR  
10-VQ1  $\frac{1}{2}$   $\frac{0}{3}$  1 - □ - □ - □  
P (SUP passage block)  
R (EXH passage block)  
PR (SUP/EXH passage block)



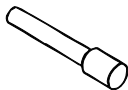
**Name Plate [-N3]**  
VVQ1000-N3-stations (1 to maximum stations)



**Blanking Plate Assembly**  
10-VVQ1000-10A-3



**Blanking Plug (For One-touch Fitting)**  
KQ2P-<sup>23</sup>04  
06





## Model

Series	Number of solenoids	Model	Flow characteristics <sup>Note 1)</sup>						Response time <sup>Note 2)</sup> ms	Weight g	
			1→4/2 (P→A/B)			4/2→5/3 (A/B→R1/R2)					
			C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv			
10-VQ1000	2 position Single	Metal seal	10-VQ1130Y	0.77	0.14	0.18	0.84	0.14	0.19	15 or less	57
		Rubber seal	10-VQ1131Y	0.91	0.19	0.21	1.0	0.21	0.25	20 or less	
	Double(Latching)	Metal seal	10-VQ1230	0.77	0.14	0.18	0.84	0.14	0.19	15 or less	
		Rubber seal	10-VQ1231	0.91	0.19	0.21	1.0	0.21	0.25	20 or less	

Note 1) Cylinder port size C6.

Note 2) According to JIS B8375-1981 (At supply pressure of 0.5MPa with light/surge voltage suppressor. The value differs with the pressure and the quality of air.)

## Specifications

Valve specifications	Valve type	Metal seal	Rubber seal	
	Fluid	Air, Inert gas		
<sup>Note 3)</sup> Max. operating pressure	0.7MPa		0.7MPa	
Min. operating pressure	Single	0.1MPa	0.15MPa	
	Double (Latching)	0.18MPa	0.18MPa	
	3 position	0.1MPa	0.2MPa	
Ambient and fluid temperature	-10 to 50°C <sup>Note 1)</sup>	-10 to 50°C <sup>Note 1)</sup>		
Lubrication	Not required			
Manual override	Push type/Option: Locking type (tool required, lever)			
Enclosure	Dust proof			
Electrical specifications	Rated coil voltage	12V, 24VDC		
	Allowable voltage fluctuation	±10% of rated voltage		
	Type of coil insulation	Equivalent to class B		
	Power consumption DC (Current)	24VDC	0.5W DC (21mA)	
		12VDC	0.5W DC (42mA)	

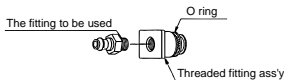
Note 1) Use dry air to prevent condensation when operating at a low temperature.

## Precautions to Install Threaded Fitting Assembly

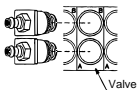
Threaded fitting assemblies used for this manifold are not mounted on the manifold base or valve in order to improve installation efficiency of connecting the fittings to the port.

Install the threaded fitting following the steps below.

### 1. Screw in the fitting to the ancillary threaded fitting assembly.



### 2. Insert the threaded fitting assembly into the manifold port.



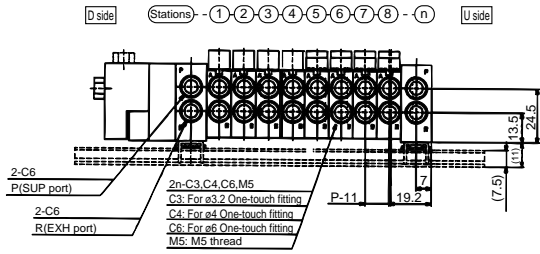
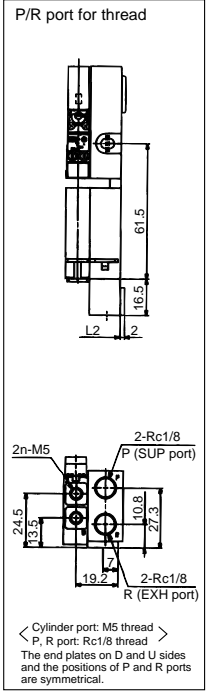
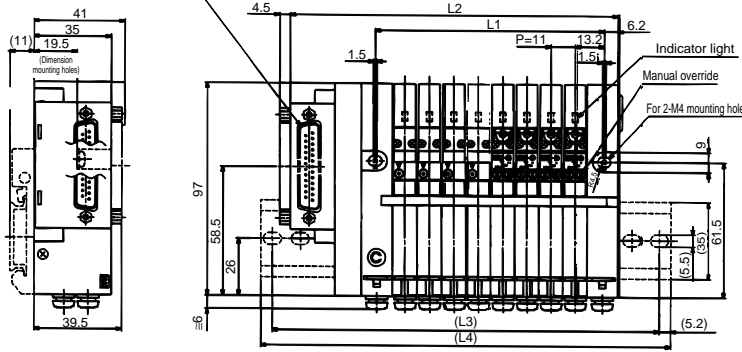
### 3. Insert the ancillary clip into the groove on the bottom surface of the valve.

### ■Precautions

- Be careful not to scratch or stain the O-ring of the fitting assembly. It may cause air leakage.
- To prevent exhaust air at EXH from pressurization (0.3 MPa or more) by throttling, double side piping is recommended for EXH port. (Otherwise delay in response or air leakage may result.)

**Kit (D-sub Connector Kit)/10-VQ1000**

Applicable connector: D-SUB connector (25P)  
(MIL-C-24308 compliant)

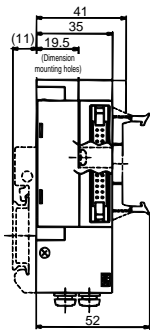


The broken lines indicate DIN rail mounted type [-D] and side entry connector [-FU].  
Note) The 3 position type occupies space for 2 stations.  
The cylinder port is positioned on the U side body of the two.

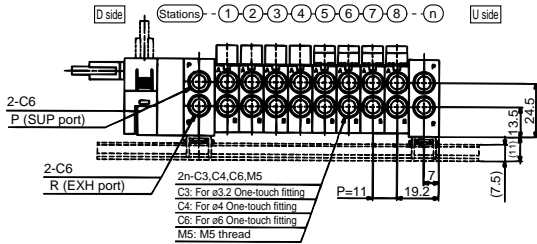
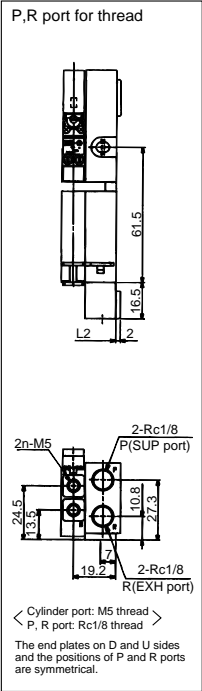
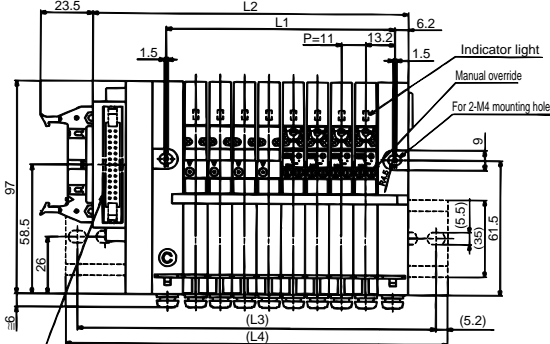
**Formula**  $L1=11n+15.5 / L2=11n+60 / n$ : Stations (Max. 12 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12
<b>L1</b>	26.5	37.5	48.5	59.5	70.5	81.5	92.5	103.5	114.5	125.5	136.5	147.5
<b>L2</b>	71	82	93	104	115	126	137	148	159	170	181	192
<b>(L3)</b>	100	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	212.5
<b>(L4)</b>	110.5	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	223

**P Kit (Flat Ribbon Cable Kit)/10-VQ1000**



Applicable connector: Flat ribbon cable connector (26P)  
(MIL-C-83503 compliant)



The broken lines indicate DIN rail mounted type [-D] and side entry connector [-PU].

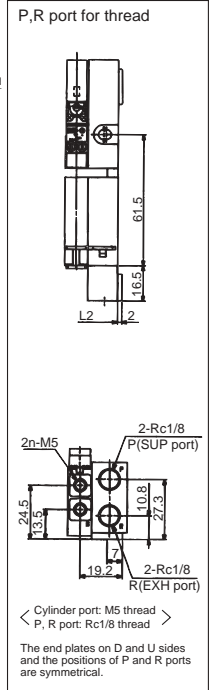
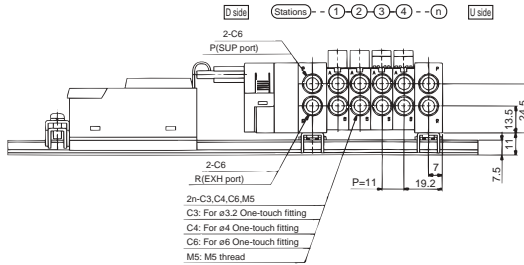
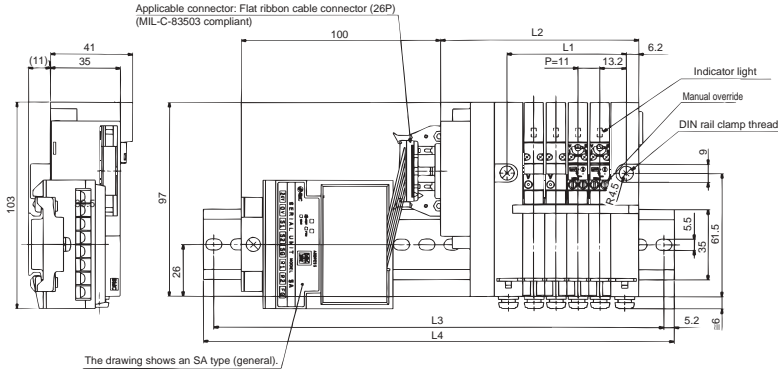
Note) The 3 position type occupies space for 2 stations.  
The cylinder port is positioned on the U side body of the two.

Formula  $L1=11n+15.5$  /  $L2=11n+55$  / n: Stations (Max. 12 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12
L1	26.5	37.5	48.5	59.5	70.5	81.5	92.5	103.5	114.5	125.5	136.5	147.5
L2	66	77	88	99	110	121	132	143	154	165	176	187
(L3)	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	212.5	225
(L4)	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235

Directional Control Valve

**S** Kit (Serial Transmission Kit)/10-VQ1000



Note) The 3 position type occupies space for 2 stations.  
The cylinder port is positioned on the U side body of the two.

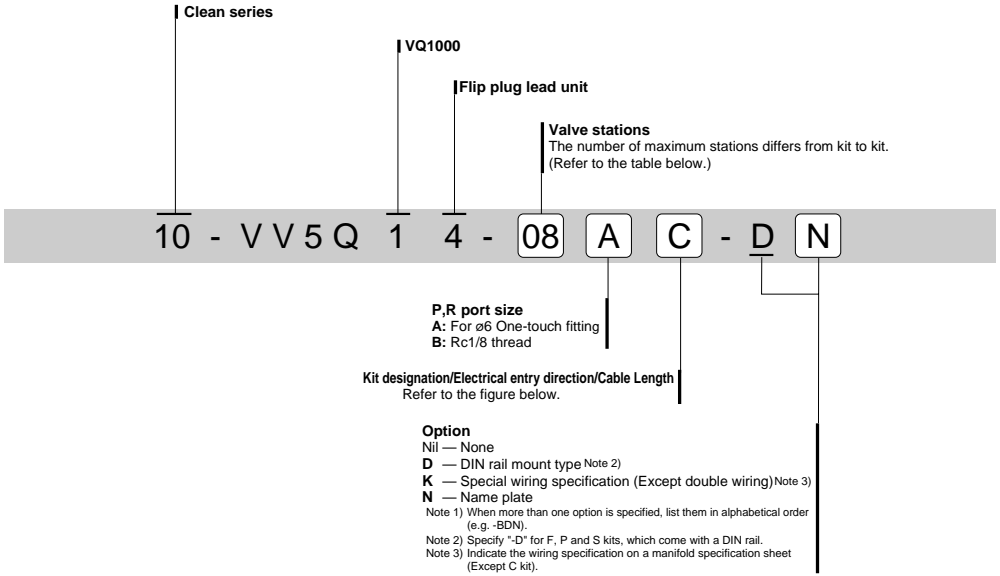
**Formula**  $L1=11n+15.5$  /  $L2=11n+55$  / n: Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	26.5	37.5	48.5	59.5	70.5	81.5	92.5	103.5	114.5	125.5	136.5	147.5	158.5	169.5	180.5	191.5
L2	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220	231
L3	187.5	200	212.5	225	237.5	250	262.5	275	275	287.5	300	312.5	325	337.5	350	362.5
L4	198	210.5	223	235	248	260.5	273	285.5	285.5	298	310.5	323	335.5	348	360.5	373



**VQ1000/Body Ported Type Flip Plug Lead Unit**

**How to Order Manifolds**



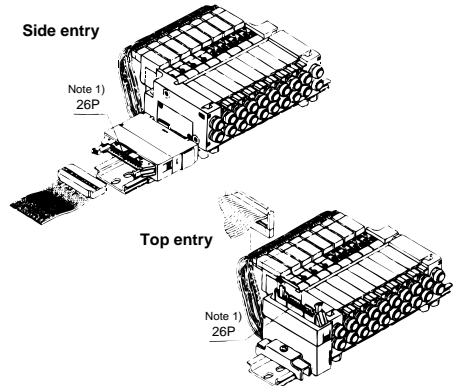
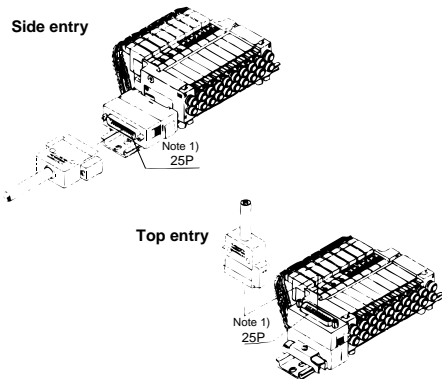
**Kit Designation/Electrical Entry Direction/Cable Length**

**F Kit (D-sub Connector Kit)**

**P Kit (Flat Ribbon Cable Kit)**

Side entry

Side entry



Connector entry					
Top entry		Side entry			
<b>F Kit</b>	U0	<b>F Kit</b>	S0	Without cable	Note 2) Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Connector entry					
Top entry		Side entry			
<b>P Kit</b>	U0	<b>P Kit</b>	S0	Without cable	Note 2) Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1) Besides the above, F kits with different number of pins are available.  
Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

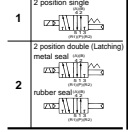
Note 1) Besides the above, P kits with different number of pins are available.  
Note 2) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

## How to Order Valves

10-VQ 1 1 4 0 Y-5 L - C6

Clean series  
VQ1000

### Actuation



**Cylinder port size**  
C3 — For ø3.2 One-touch fittings  
C4 — For ø4 One-touch fittings  
C6 — For ø6 One-touch fittings  
M5 — M5 thread

**Manual override**  
Nil — Non-latching push type (tool required)  
Note) B — Lock type (tool required)  
C — Locking type (lever)  
Note) The standard double (latching) type is B, locking type (tool required). Specify the symbol B or C.

**Electrical entry**  
L plug connector M plug connector  
L — With lead wire M — With lead wire  
LO — Without connector MO — Without connector  
Note) LO and MO valves are used for F, P and S kits. Plug connector and lead wire layers are attached to the manifold.

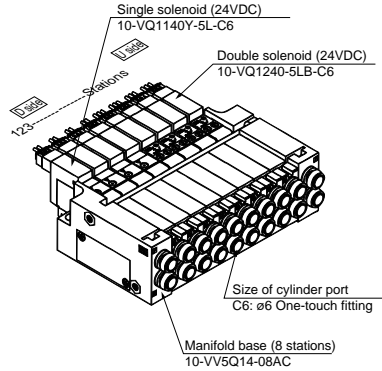
**Coil voltage**  
5 — 24VDC/With light/surge suppresser  
6 — 12VDC/With light/surge suppresser

**Function**  
Y — Low wattage (0.5W) specifications: Single type  
Nil — Standard (1W): Double (latching) type

**Seal type**  
0 — Metal seal  
1 — Rubber seal

## How to Order Manifold Assembly/Example

Specify the valves to be installed below the manifold part number.

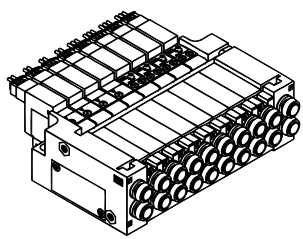


10-VV5Q14-08AC .....1 set (C kit, 8 station manifold part No.)  
\* 10-VQ1140Y-5L-C6.....4 sets (Single solenoid part No.)  
\* 10-VQ1240-5LB-C6.....4 sets (Double solenoid part No.)  
↳ To order valves and options onto the manifold at the factory, prefix the part number of the solenoid valve and other equipment with an asterisk (\*).

Directional Control Valve

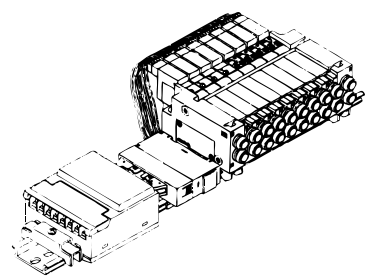
## Kit Designation/Electrical Entry Direction/Cable Length

### C Kit (Connector Kit)



C	Connector kit	Maximum 16 stations
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### S Kit (Serial Transmission Kit)

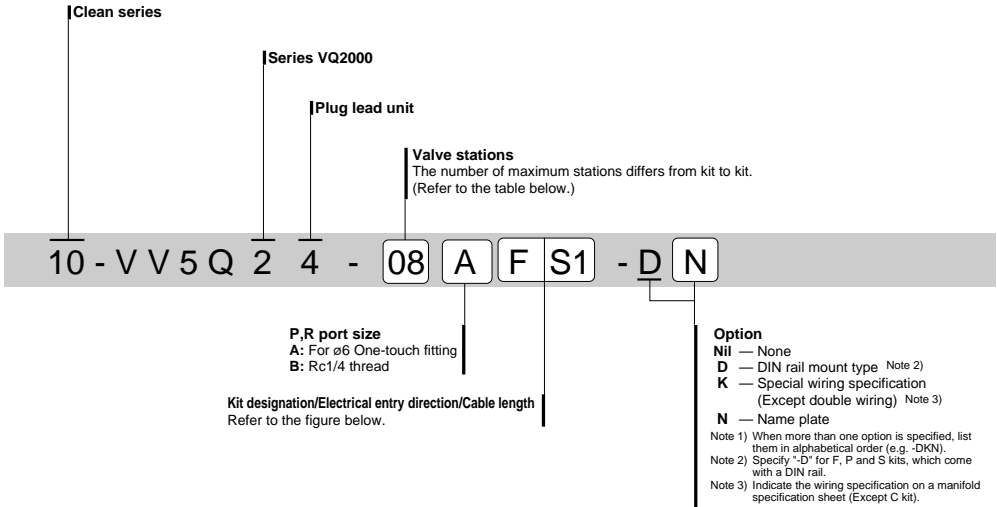


Kit S (Note 2)	O	Without SI unit	Note1) Maximum 16 stations
	A	General purpose type SI unit	
	B	SI unit for Mitsubishi (MELSEC-A)	
	C	SI unit for OMRON (SYSMAC)	
	D	SI unit for Sharp (New Satellite)	
	F1	SI unit for NKE Corporation UNI-WIRE System (16 points)	
	H	SI unit for NKE Corporation UNI-WIRE H System (16 points)	

Note 1) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.  
Note 2) Consult SMC regarding serial transmission kits by Matsushita Electric Industrial Co., Ltd., Allen Bradley Co., SUNX Limited, FUJI ELECTRIC CO., LTD. and OMRON Corporation.

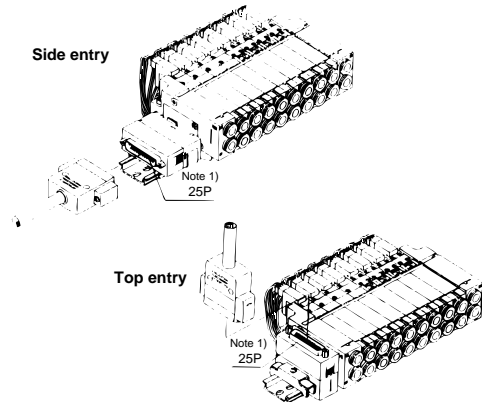
**VQ2000/Body Ported Type** Flip Plug Lead Unit

**How to Order Manifolds**



**Kit Designation/Electrical Entry Direction/Cable Length**

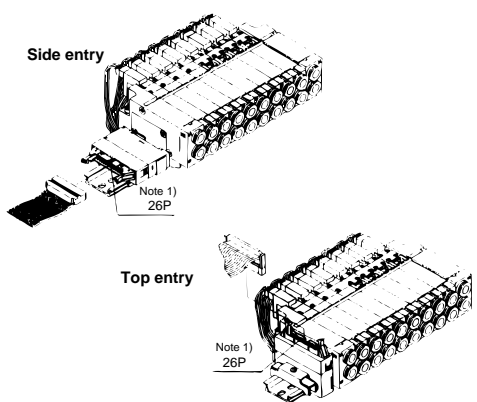
**F Kit (D-sub Connector Kit)**



Connector entry					
Top entry		Side entry			
<b>F Kit</b>	U0	<b>F Kit</b>	S0	Without cable	<small>Note 2</small> Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1 Besides the above, F kits with different number of pins are available.  
Note 2 Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

**P Kit (Flat Ribbon Cable Kit)**



Connector entry					
Top entry		Side entry			
<b>P Kit</b>	U0	<b>P Kit</b>	S0	Without cable	<small>Note 2</small> Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

Note 1 Besides the above, P kits with different number of pins are available.  
Note 2 Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

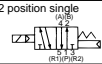


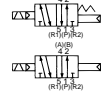
How to Order Valves

**10-VQ 2 1 4 0 Y - 5 L - C6**

Clean series | **VQ2000**

**Actuation**

**1** 2 position single  


**2** 2 position double (Latching)  
  
 Metal seal  
 Rubber seal

**Seal type**  
 0 — Metal seal  
 1 — Rubber seal

**Cylinder port size**  
**C4** —For ø4 One-touch fitting  
**C6** —For ø6 One-touch fitting  
**C8** —For ø8 One-touch fitting

**Manual override**  
**Nil** — Non-locking push type (tool required)  
**B** (Note) — Lock type (tool required)  
**C** — Locking type (lever)  
 (Note) The standard manual override for pilot valve is provided for double (latching) type.

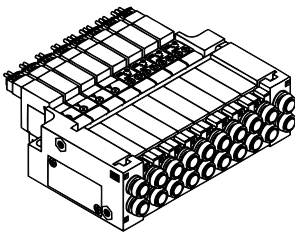
**Electrical entry**  
**L** plug connector **M** plug connector  
**L** — With lead wire **M** — With lead wire  
**LO** — Without connector **MO** — Without connector  
 (Note) LO and MO valves are used for F, P and S kits. Plug connector and lead wire layers are attached to the manifold.

**Coil voltage**  
**5** — 24VDC/With light/surge suppresser  
**6** — 12VDC/With light/surge suppresser

**Function**  
**Y** — Low wattage (0.5W) specifications: Single type  
**Nil** — Standard (1W): Double (latching) type

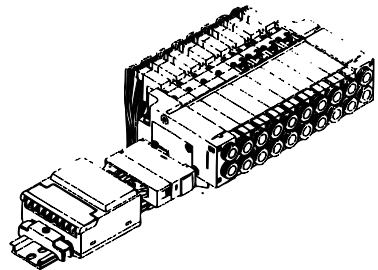
Directional Control Valve

**C** Kit (Connector Kit)



<b>C</b>	Connector kit	Maximum 16 stations
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**S** Kit (Serial Transmission Kit)



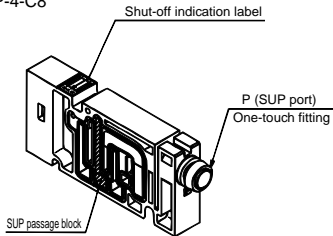
	<b>O</b>	Without SI unit	
	<b>A</b>	General purpose type SI unit	
Note 2)	<b>B</b>	SI unit for Mitsubishi (MELSEC-A)	Note1)
S Kit	<b>C</b>	SI unit for Sharp (New Satellite)	Maximum 16 stations
	<b>D</b>	SI unit for Sharp (New Satellite)	
	<b>F1</b>	SI unit for NKE Corporation UNI-WIRE System (16 points)	
	<b>H</b>	SI unit for NKE Corporation UNI-WIRE H System (16 points)	

Note 1) Using special wiring, semi-standard specifications with a larger maximum number of stations are available.  
 Note 2) Consult SMC regarding serial transmission kits by Matsushita Electric Industrial Co., Ltd., Allen Bradley Co., SUNX Limited, FUJI ELECTRIC CO., LTD. and OMRON Corporation.

**Manifold Option**

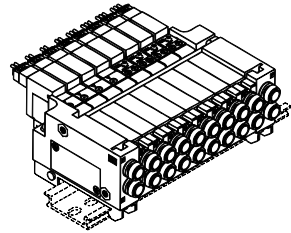
**Individual SUP Spacer**

10-VVQ1000-P-4-C6  
10-VVQ2000-P-4-C8



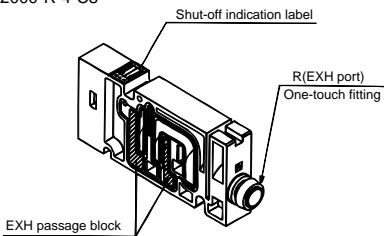
**DIN Rail Mounting Bracket [-D]**

VVQ1000-57A-4  
VVQ2000-57A-4



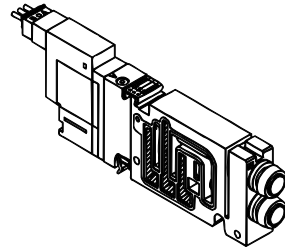
**Individual EXH Spacer**

10-VVQ1000-R-4-C6  
10-VVQ2000-R-4-C8



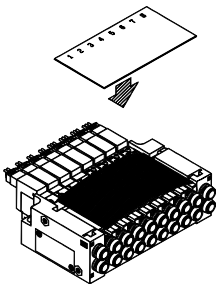
**P  
R Blocking Valve**

10-VQ□<sub>1</sub>□<sub>2</sub>□<sub>4</sub>□<sub>0</sub> - □ - □ - □ - □  
P (SUP. passage block)  
R (EXH. passage block)  
PR (SUP., EXH. passage block)



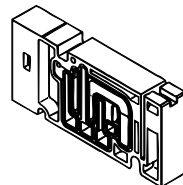
**Name Plate [-N4]**

VVQ1000-N4-stations(1 to maximum stations)  
VVQ2000-N4-stations(1 to maximum stations)



**Blanking Plate**

10-VVQ1000-10A-4  
10-VVQ2000-10A-4



**Blanking Plug (For One-touch Fitting)**

23  
KQ2P<sub>04</sub>  
<sub>06</sub>  
<sub>08</sub>



Model

Series	Number of solenoids	Model		Flow characteristics <small>Note 1)</small>						<small>Note 2)</small> Response time		Weight g
				1→4/2 (P→A/B)			4/2→5/3 (A/B→R1/R2)			ms		
				C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv			
10-VQ1000	Single	Metal seal	10-VQ1140Y	0.77	0.14	0.18	0.84	0.14	0.19	15 or less	57	
		Rubber seal	10-VQ1141Y	0.91	0.19	0.21	1.0	0.21	0.25	20 or less		
	Double(Latching)	Metal seal	10-VQ1240	0.77	0.14	0.18	0.84	0.14	0.19	15 or less		
		Rubber seal	10-VQ1241	0.91	0.19	0.21	1.0	0.21	0.25	20 or less		
10-VQ2000	Single	Metal seal	10-VQ2140Y	2.0	0.13	0.43	2.3	0.15	0.58	29 or less	103	
		Rubber seal	10-VQ2141Y	2.3	0.21	0.54	2.7	0.25	0.62	31 or less		
	Double(Latching)	Metal seal	10-VQ2240	2.0	0.13	0.43	2.3	0.15	0.58	29 or less		
		Rubber seal	10-VQ2241	2.3	0.21	0.54	2.7	0.25	0.62	31 or less		

Note 1) Cylinder ports: C6 (10-VQ1000) and C8 (10-VQ2000)

Note 2) According to JIS B8375-1981. (A value at supply pressure of 0.5MPa(5.1kgf/cm<sup>2</sup>) with light/surge voltage suppressor when clean air is used. The value differs with the pressure and the quality of air.)

Specifications

Valve specifications	Valve type	Metal seal	Rubber seal	
	Fluid	Air, Inert gas		
	Max. operating pressure	0.7MPa	0.7MPa	
	Min. operating pressure	Single	0.1MPa	0.15MPa
		Double (Latching)	0.18MPa	0.18MPa
		3 positions	0.15MPa	0.2MPa
	Ambient and fluid temperature	-10 to 50°C <small>Note 1)</small>	-10 to 50°C <small>Note 1)</small>	
	Lubrication	Not required		
Manual override	Push type/Option: Locking type (tool required, lever)			
Enclosure	Dust proof			
Electric specifications	Rated coil voltage	12V, 24VDC		
	Allowable voltage fluctuation	±10% of rated voltage		
	Type of coil insulation	Equivalent to class B		
	Power consumption DC (Current)	24VDC	0.5W DC (21mA)	
		12VDC	0.5W DC (42mA)	

Note 1) Use dry air to prevent condensation when operating at a low temperature.

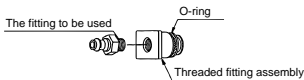
Directional Control Valve

Precautions to Install Threaded Fitting Assembly

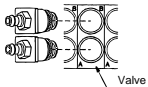
Threaded fitting assemblies used for this manifold are not mounted on the manifold base or valve in order to improve installation efficiency of connecting the fittings to the port.

Precautions to install threaded fitting assembly.

1. Screw in the fitting to the ancillary threaded fitting assembly.



2. Insert the threaded fitting assembly into the manifold port.



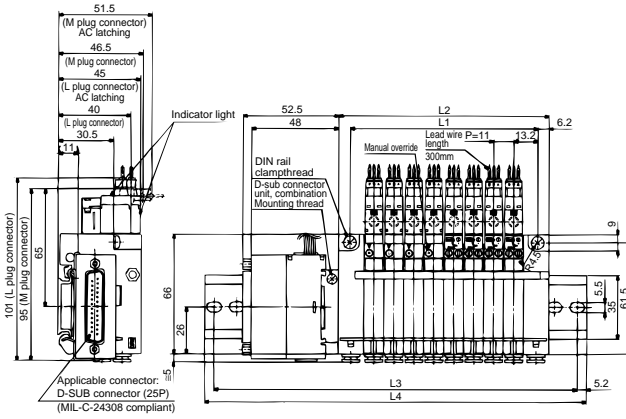
3. Insert the ancillary clip into the groove on the bottom surface of the valve.

■Precautions

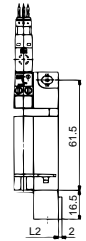
- Be careful not to scratch or stain the O-ring of the fitting assembly. It may cause air leakage.
- To prevent exhaust air at EXH from pressurization (0.3 MPa or more) by throttling, double side piping is recommended for EXH port. (Otherwise delay in response or air leakage may result.)

Solenoid Valve **10-VQ1000/2000**

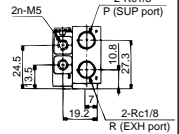
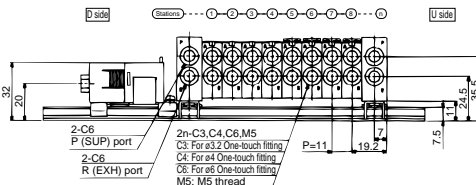
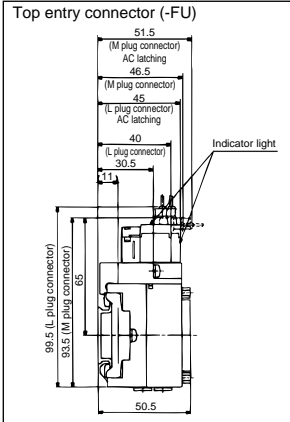
**Kit (D-sub Connector Kit)/10-VQ1000**



P,R port for thread



**Top entry connector (-FU)**



◁ Cylinder port: M5 thread ▷  
P,R port: Rc1/8 thread  
The end plates on D and U sides and the positions of P and R ports are symmetrical.

**Dimensions/Side entry connector [-FS]**

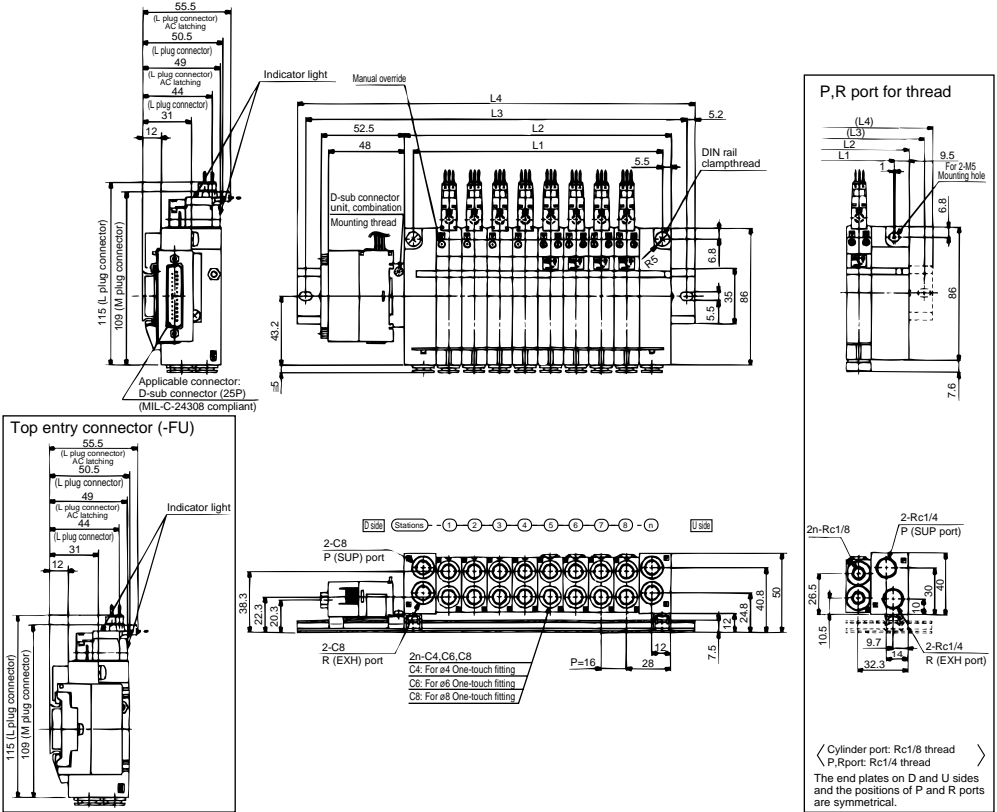
**Formula**  $L1=11n+15.5 / L2=11n+28 / n$ : Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L1</b>	26.5	37.5	48.5	59.5	70.5	81.5	92.5	103.5	114.5	125.5	136.5	147.5	158.5	169.5	180.5	191.5
<b>L2</b>	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204
<b>L3</b>	112.5	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	262.5	275	287.5
<b>L4</b>	123	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	273	285.5	298

**Dimensions/Top entry connector [-FU]**

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L3</b>	100	112.5	125	137.5	137.5	150	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5
<b>L4</b>	110.5	123	135.5	148	148	160.5	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273

**Kit (D-sub Connector Kit)/10-VQ2000**



Directional Control Valve

**P, R port: In case of One-touch fittings**

**Dimensions/Side entry connector [-FS]** Formula  $L1=16n+29 / L2=16n+40 / n$ : Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296
L3	137.5	150	162.5	187.5	200	212.5	225	250	262.5	275	300	312.5	325	337.5	362.5	375
L4	148	160.5	173	198	210.5	223	235.5	260.5	273	285.5	310.5	323	335.5	348	373	385.5

**Dimensions/Top entry connector [-FU]**

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	112.5	137.5	150	162.5	175	200	212.5	225	237.5	262.5	275	287.5	312.5	325	337.5	350
L4	123	148	160.5	173	185.5	210.5	223	235.5	248	273	285.5	298	323	335.5	348	360.5

**P, R port: In case of thread**

**Dimensions/Side entry connector [-FS]** Formula  $L1=16n+29 / L2=16n+48 / n$ : Stations (Max. 8 stations: standard)

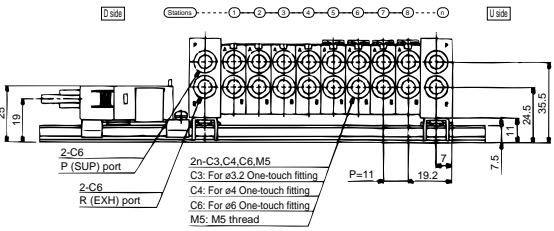
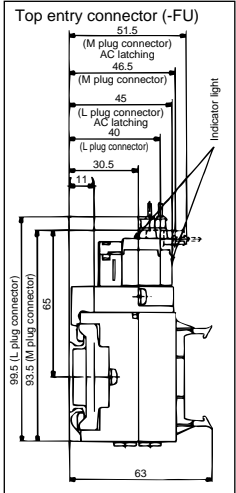
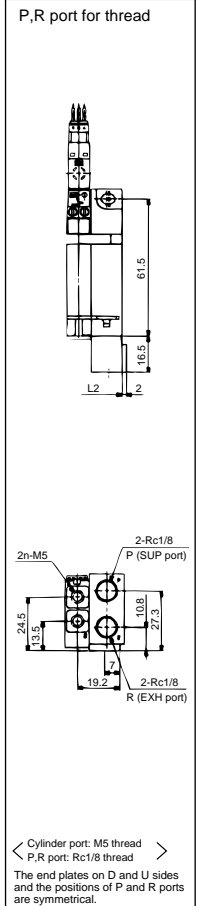
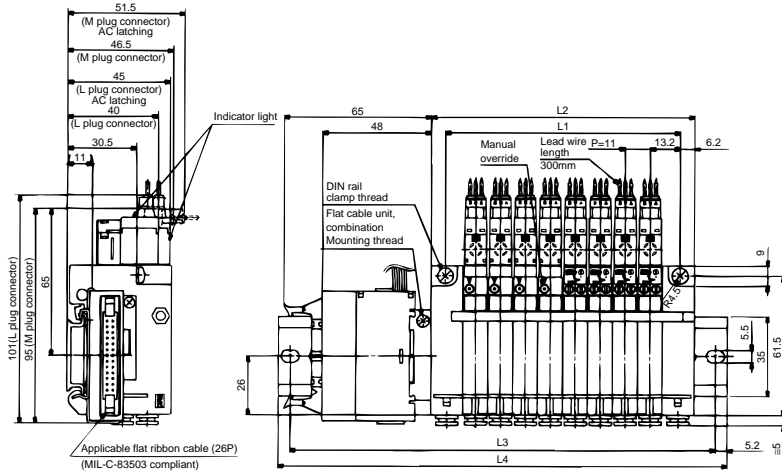
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304
L3	137.5	162.5	175	187.5	200	225	237.5	250	275	287.5	300	312.5	337.5	350	362.5	387.5
L4	148	173	185.5	198	210.5	235.5	248	260.5	285.5	298	310.5	323	348	360.5	373	398

**Dimensions/Top entry connector [-FU]**

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	125	137.5	150	175	187.5	200	225	237.5	250	262.5	287.5	300	312.5	337.5	350	362.5
L4	135.5	148	160.5	185.5	198	210.5	235.5	248	260.5	273	298	310.5	323	348	360.5	373

# Solenoid Valve 10-VQ1000/2000

## Kit (Flat Ribbon Cable Kit)/10-VQ1000



### Dimensions/Side entry connector [-PS]

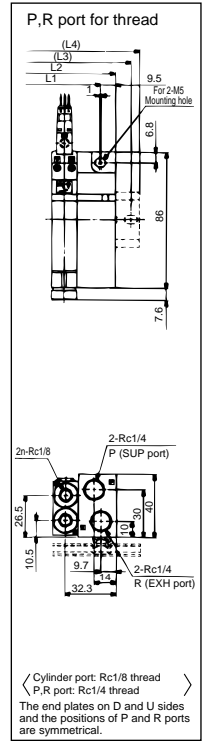
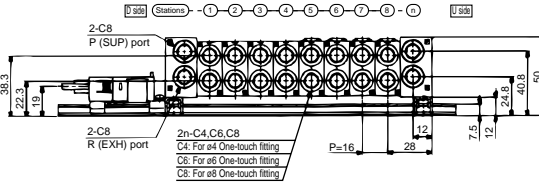
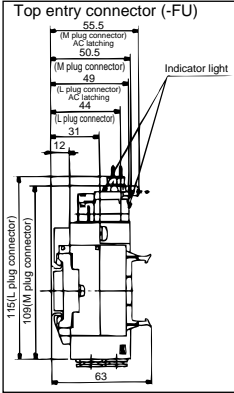
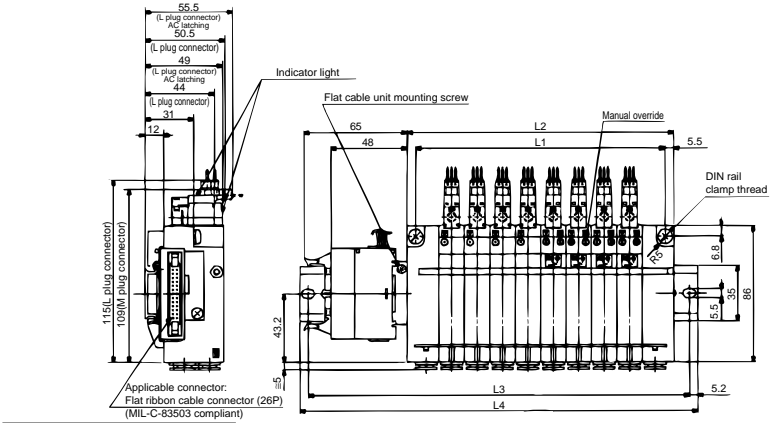
Formula  $L1=11n+15.5$  /  $L2=11n+28$  / n: Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	26.5	37.5	48.5	59.5	70.5	81.5	92.5	103.5	114.5	125.5	136.5	147.5	158.5	169.5	180.5	191.5
L2	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204
L3	112.5	125	137.5	150	162.5	175	187.5	187.5	200	212.5	225	237.5	250	262.5	275	287.5
L4	123	135.5	148	160.5	173	185.5	198	198	210.5	223	235.5	248	260.5	273	285.5	298

### Dimensions/Top entry connector [-PU]

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	87.5	100	112.5	125	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	250	262.5
L4	98	110.5	123	135.5	148	160.5	173	173	185.5	198	210.5	223	235.5	248	260.5	273

**Kit (Flat Ribbon Cable Kit)/10-VQ2000**



**P, R port: In case of One-touch fittings**

**Dimensions/Side entry connector [-PS]** Formula  $L1=16n+29 / L2=16n+40 / n$ : Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296
L3	137.5	150	162.5	187.5	200	212.5	225	250	262.5	275	287.5	312.5	325	337.5	362.5	375
L4	148	160.5	173	198	210.5	223	235.5	260.5	273	285.5	298	323	335.5	348	373	385.5

**Dimensions/Top entry connector [-PU]**

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	112.5	125	137.5	162.5	175	187.5	200	225	237.5	250	262.5	287.5	300	312.5	337.5	350
L4	123	135.5	148	173	185.5	198	210.5	235.5	248	260.5	273	298	310.5	323	348	360.5

**P, R port: In case of thread**

**Dimensions/Side entry connector [-PS]** Formula  $L1=16n+29 / L2=16n+48 / n$ : Stations (Max. 8 stations: standard)

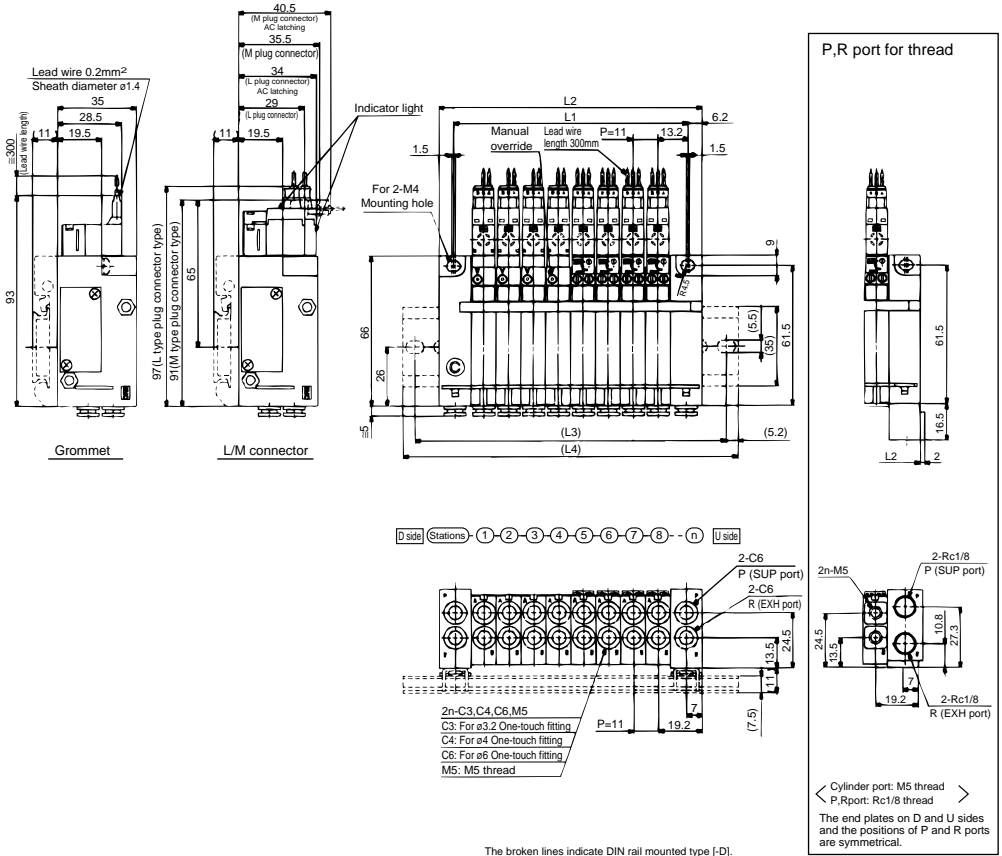
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304
L3	137.5	162.5	175	187.5	200	225	237.5	250	275	287.5	300	312.5	337.5	350	362.5	387.5
L4	148	173	185.5	198	210.5	235.5	248	260.5	28.5	298	310.5	323	348	360.5	373	398

**Top entry connector [-PU]**

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	112.5	137.5	150	162.5	175	200	206.5	225	250	262.5	275	287.5	312.5	325	337.5	362.5
L4	123	148	160.5	173	185.5	210.5	217	235.5	260.5	273	285.5	298	323	335.5	348	373

# Solenoid Valve 10-VQ1000/2000

## Kit (Connector Kit)/10-VQ1000



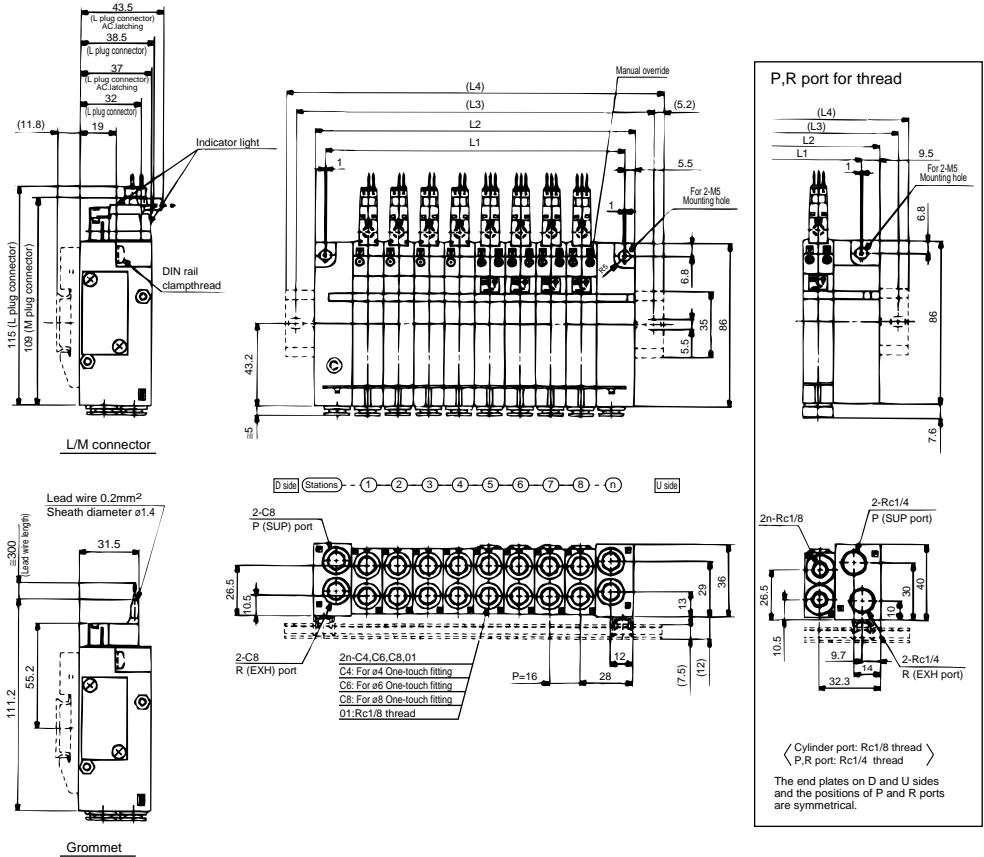
### Dimensions

**Formula**  $L1=11n+15.5/L2=11n+28 / n$ : Stations (Max. 16 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L1</b>	26.5	37.5	48.5	59.5	70.5	81.5	92.5	103.5	114.5	125.5	136.5	147.5	158.5	169.5	180.5	191.5
<b>L2</b>	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204
<b>(L3)</b>	62.5	75	87.5	100	112.5	125	125	137.5	150	162.5	175	187.5	200	212.5	212.5	225
<b>(L4)</b>	73	85.5	98	110.5	123	135.5	135.5	148	160.5	173	185.5	198	210.5	223	223	235.5



**Kit (Connector Kit)/10-VQ2000**



Directional Control Valve

**Dimensions/P, R port: In case of One-touch fittings** **Formula** L1=16n+29/L2=16n+40/n: Stations (Max. 16 stations: standard)

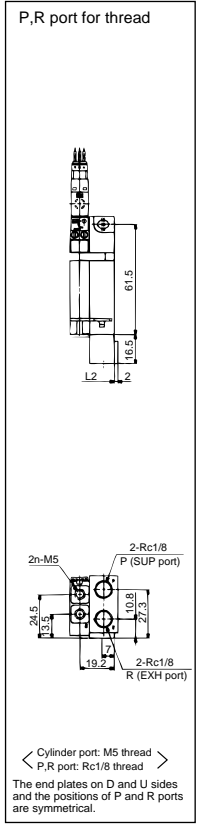
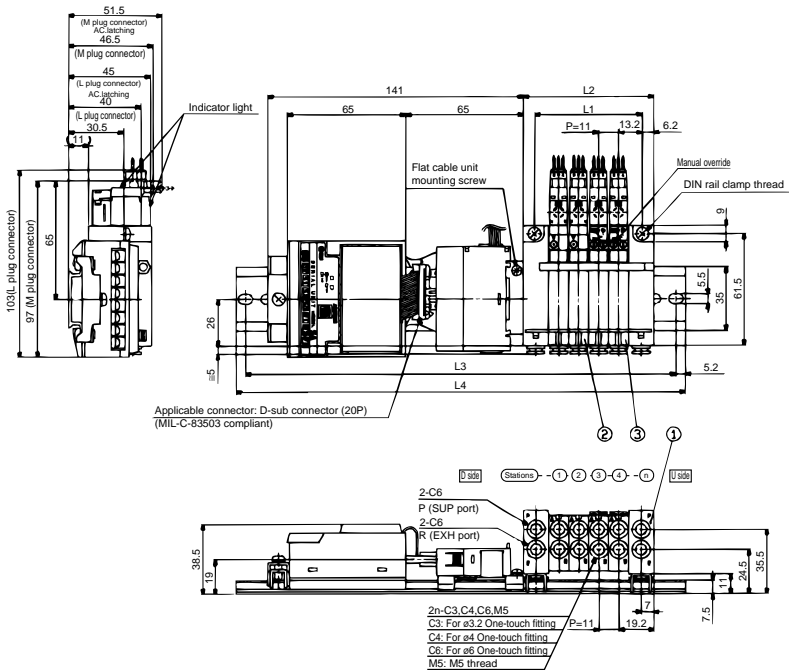
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296
(L3)	87.5	100	112.5	125	150	162.5	175	187.5	212.5	225	237.5	262.5	275	287.5	300	325
(L4)	98	110.5	123	135.5	160.5	173	185.5	198	223	235.5	248	273	285.5	298	310.5	335.5

**Dimensions/P, R port: In case of thread** **Formula** L1=16n+29/L2=16n+48/n: Stations (Max. 16 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304
(L3)	87.5	100	125	137.5	150	175	187.5	200	212.5	237.5	250	262.5	287.5	300	312.5	325
(L4)	98	110.5	135.5	148	160.5	185.5	198	210.5	223	248	260.5	273	298	310.5	323	335.5

# Solenoid Valve 10-VQ1000/2000

## Kit (Serial Transmission Kit)/10-VQ1000

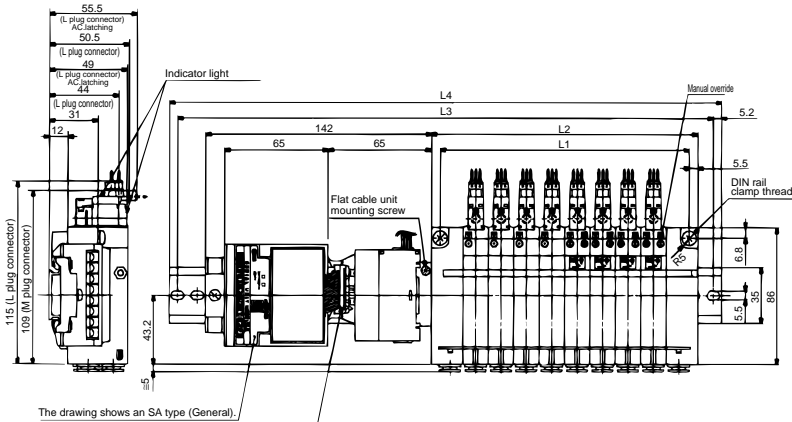


### Dimensions

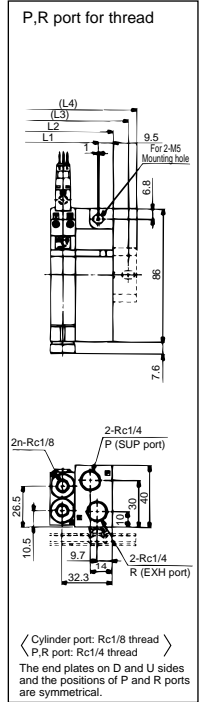
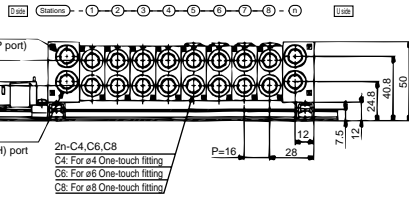
### Formula $L1=11n+15.5/L2=11n+28 / n$ : Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	26.5	37.5	48.5	59.5	70.5	81.5	92.5	103.5	114.5	125.5	136.5	147.5	158.5	169.5	180.5	191.5
L2	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204
L3	212.5	212.5	225	237.5	250	262.5	275	287.5	300	300	312.5	325	337.5	350	362.5	375
L4	223	223	235.5	248	260.5	273	285.5	298	310.5	310.5	323	335.5	348	360.5	373	385.5

**S** Kit (Serial Transmission Kit)/10-VQ2000



Applicable connector: Flat ribbon cable connector (20P)  
(MIL-C-83503 compliant)



Directional Control Valve

**Dimensions/P, R port: In case of One-touch fittings** Formula  $L1=16n+29/L2=16n+40$  / n: Stations (Max. 8 stations: standard)

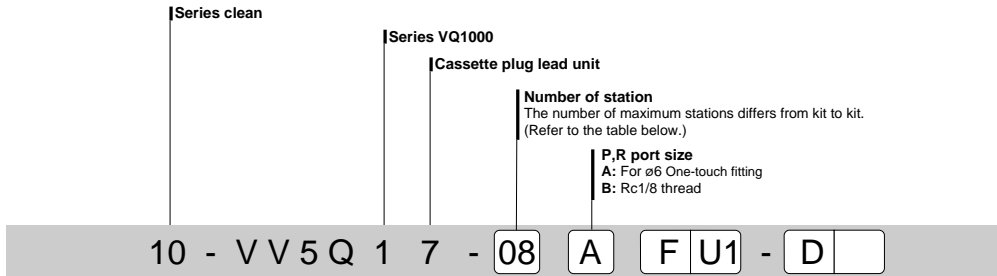
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296
L3	225	237.5	250	275	287.5	300	325	337.5	350	375	387.5	400	412.5	437.5	450	462.5
L4	235.5	248	260.5	285.5	298	310.5	335.5	348	360.5	373	398	410.5	423	448	460.5	473

**Dimensions/P, R port: In case of thread** Formula  $L1=16n+29/L2=16n+48$  / n: Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	45	61	77	93	109	125	141	157	173	189	205	221	237	253	269	285
L2	64	80	96	112	128	144	160	176	192	208	224	240	256	272	288	304
L3	237.5	250	262.5	275	300	312.5	325	337.5	362.5	375	387.5	412.5	425	437.5	450	475
L4	248	260.5	273	285.5	310.5	323	335.5	348	373	385.5	398	423	435.5	448	460.5	485.5

**VQ1000/Body Ported Type** Cassette Plug Lead Unit

**How to Order Manifolds**



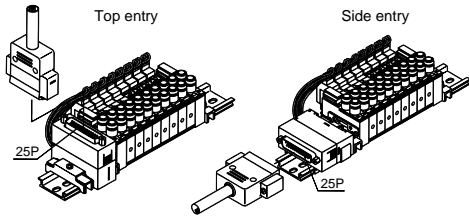
**Kit designation/Electrical entry direction/Cable length**  
Refer to the figure below.

**Option**

- D** — DIN rail mount type *Note 1)*
  - K** — Special wiring specification (Except double wiring) *Note 2)*
  - N** — Name plate *Note 3)*
- Note 1)* All options are for DIN rail mounting so the symbol “-D” should be specified.  
*Note 2)* Indicate the wiring specification on a manifold specification sheet (Except C kit).  
*Note 3)* Unmountable with a locking lever type manual of the valve.  
*Note 4)* More than one option is specified, list them in alphabetical order.

**Kit Designation/Electrical Entry Direction/Cable Length**

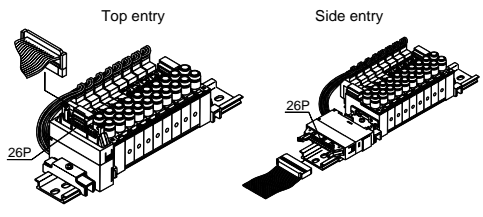
**F Kit (D-sub Connector Kit)**



Connector entry					
Top entry		Side entry			
<b>F Kit</b>	U0	<b>F Kit</b>	S0	Without cable	<i>Note)</i> Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

*Note 1)* Besides the above, F kits with different number of pins are available.  
*Note 2)* Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

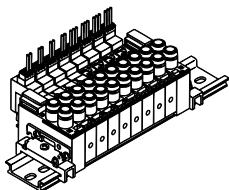
**P Kit (Flat Ribbon Cable Kit)**



Connector entry					
Top entry		Side entry			
<b>P Kit</b>	U0	<b>P Kit</b>	S0	Without cable	<i>Note)</i> Maximum 8 stations
	U1		S1	With 1.5 m cable	
	U2		S2	With 3 m cable	
	U3		S3	With 5 m cable	

*Note 1)* Besides the above, P kits with different number of pins are available.  
*Note 2)* Using special wiring, semi-standard specifications with a larger maximum number of stations are available.

**C Kit (Connector)**




<b>C</b>	Connector kit	Maximum 16 stations
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

**How to Order Valves**

**10 - VQ1 1 7 0 Y - 5 M - C6**

Clean series | **VQ1000**

**Actuation**

**1** 2 position single  


**2** 2 position double (Latching)  
  


**Cylinder port size**  
**C3** — For ø3.2 One-touch fitting  
**C4** — For ø4 One-touch fitting  
**C6** — For ø6 One-touch fitting  
**M5** — M5 thread

**Manual override**  
**Nil** — Non-locking push type (tool required)  
**B** — Lock type (tool required)  
**C** — Locking type (lever)  
 (Note) The standard manual override for pilot valve is provided for double (latching) type.

**Electrical entry**  
**L** plug connector      **M** plug connector  
**L** —With lead wire      **M** —With lead wire  
**LO** —Without connector      **MO** —Without connector  
 (Note 1) LO and MO valves are used for F and P kits. Plug connector and lead wire layers are attached to the manifold.

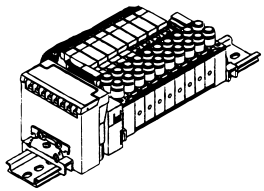
**Coil voltage**  
**5** — 24VDC/With light/surge suppresser  
**6** — 12VDC/With light/surge suppresser

**Function**  
**Nil** — Standard (1W)      : Double (Latching) type  
 (Note) **Y** — Low wattage (0.5W) specifications: Single type

**Seal type**  
**0** — Metal seal  
**1** — Rubber seal

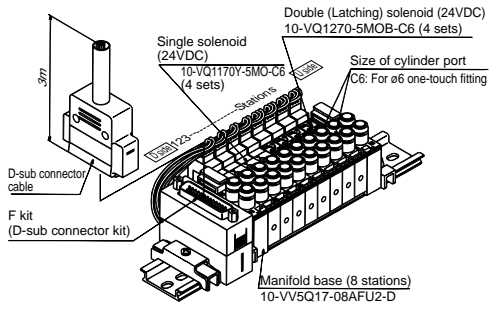
Directional Control Valve

**S Kit (Serial Transmission Kit)**



<b>Kit S</b>	<b>O</b>	Without SI unit	
	<b>A</b>	General purpose type: Series EX300	
	<b>B</b>	Mitsubishi Electric Corporation: MELSECNET/mini-S3 data link system	
	<b>C</b>	OMRON Corporation: SYSBUS Wire System	
	<b>D</b>	Sharp Corporation: Satellite I/O Link System	
	<b>E</b>	Matsushita Electric Industrial Co., Ltd.: MEWNET-F System	Maximum 16 stations
	<b>F1</b>	NKE Corporation: Uni wire system (16 outputs)	
	<b>G</b>	Remote I/O System (RIO) by Allen-Bradley Co.	
	<b>H</b>	NKE Corporation: Uni wire H system	
	<b>J1</b>	Corporation: S-LINK system (16 outputs)	
	<b>J2</b>	Corporation: S-LINK system (8 outputs)	Maximum 8 stations
	<b>K</b>	FUJI ELECTRIC CO.,LTD.: T Link Mini System	
	<b>Q</b>	Device Net and Omron CompoBus/D	Maximum 16 stations
	<b>R1</b>	CompoBus/S (16 points) by OMRON Co.	
<b>R2</b>	CompoBus/S (8 points) by OMRON Co.	Maximum 8 stations	
<b>V</b>	Mitsubishi Electric Corporation: CC -Link	Maximum 16 stations	

**How to Order Manifold Assembly/Example**



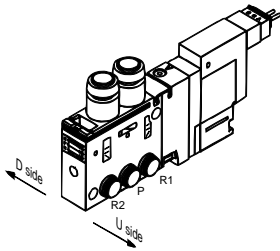
10-VV5Q17-08AFU2-D .....1 set (F kit 8 station manifold base part No.)  
 \*10-VQ1170Y-5MO-C6 ...4 sets (Single solenoid part No.)  
 \*10-VQ1270-5MOB-C6 ...4 sets (Double latching solenoid part No.)  
 \* To order valves and options mounted onto the manifold at the factory, prefix the part number of the solenoid valve and other equipment with an asterisk (\*).

Specify the valves to be installed below the manifold part number. If the layout is complicated, give descriptions on a manifold specification sheet.

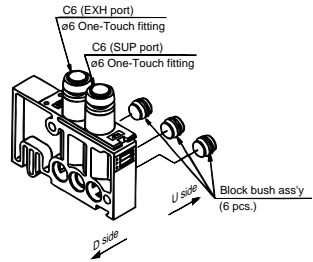
(Note) The general type requires a transmission unit with the CPU.

**Manifold Option**

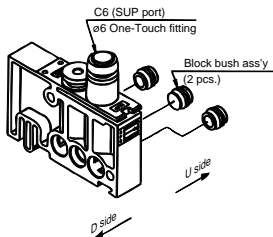
**SUP/EXH Block Bush Assembly**  
10-VVQ1000-87A-B-50



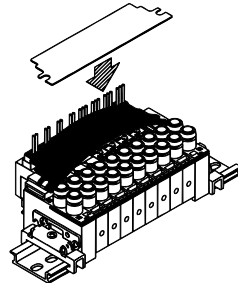
**Individual SUP/EXH Spacer**  
10-VVQ1000-PR-7-C6



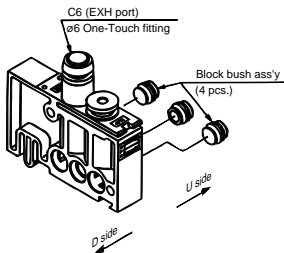
**Individual SUP Spacer**  
10-VVQ1000-P-7-C6



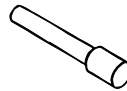
**Name Plate [-N7]**  
VVQ1000-N7-Stations (1 to Maximum stations)



**Individual EXH Spacer**  
10-VVQ1000-R-7-C6



**Blanking Plug (With One-touch Fitting)**  
23  
KQ2P-04  
06



**Model**

Series	Number of solenoids	Model		Flow characteristics <small>Note 1)</small>						Response time <small>Note 2)</small> ms	Weight g
				1→4/2 (P→A/B)			4/2→5/3 (A/B→R1/R2)				
				C[dm <sup>3</sup> /(s·bar)]	b	Cv	C[dm <sup>3</sup> /(s·bar)]	b	Cv		
10-VQ1000	2 position Single	Metal seal	10-VQ1170Y	0.56	0.15	0.13	0.60	0.12	0.14	15 or less	67
		Rubber seal	10-VQ1171Y	0.71	0.20	0.17	0.80	0.16	0.19	20 or less	
	Double (Latching)	Metal seal	10-VQ1270	0.56	0.15	0.13	0.60	0.12	0.14	15 or less	
		Rubber seal	10-VQ1271	0.71	0.20	0.17	0.80	0.16	0.19	20 or less	

Note 1) Cylinder port size C6

Note 1) According to JIS B8375-1981 (At supply pressure of 0.5MPa with light/surge voltage suppressor. The value differs with the pressure and the quality of air.)

**Specifications**

Valve specifications	Valve type		Metal seal	Rubber seal
	Fluid		Air, Inert gas	
	Max. operating pressure		0.7MPa	0.7MPa
	Min. operating pressure	Single	0.1MPa	0.15MPa
		Double (Latching)	0.18MPa	0.18MPa
		3 positions	0.15MPa	0.2MPa
	Ambient and fluid temperature		-10 to 50°C <small>Note 1)</small>	-10 to 50°C <small>Note 1)</small>
	Lubrication		Not required	
Manual override		Push type/Option: Locking type (tool required, lever)		
Enclosure		Dust proof		
Electrical specifications	Rated coil voltage		12V, 24VDC	
	Allowable voltage fluctuation		±10% of rated voltage	
	Type of coil insulation		Equivalent to class B	
	Power consumption DC (Current)	24VDC	0.5W DC (21mA)	
		12VDC	0.5W DC (42mA)	

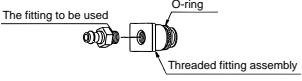
Note 1) Use dry air to prevent condensation when operating at a low temperature.

**Precautions to Install Threaded Fitting Assembly**

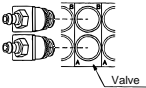
Threaded fitting assemblies used for this manifold are not mounted on the manifold base or valve in order to improve installation efficiency of connecting the fittings to the port.

Install the threaded fitting following the steps below.

**1. Screw in the fitting to the ancillary threaded fitting assembly.**



**2. Insert the threaded fitting assembly into the manifold port.**



**3. Insert the ancillary clip into the groove on the bottom surface of the valve.**

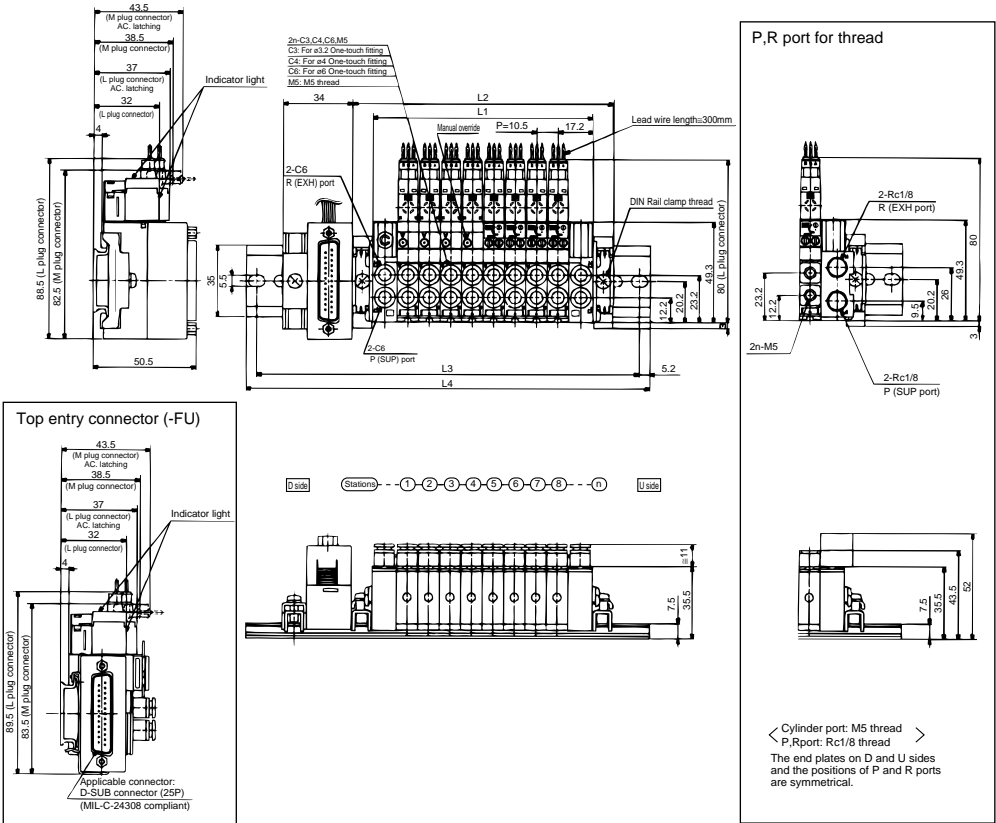
**■Precautions**

- Be careful not to scratch or stain the O-ring of the fitting assembly. It may cause air leakage.
- To prevent exhaust air at EXH from pressurization (0.3 MPa or more) by throttling, double side piping is recommended for EXH port. (Otherwise delay in response or air leakage may result.)

**Solenoid Valve 10-VQ1000/2000**

**Kit (D-sub Connector Kit)/10-VQ1000**

**Top Entry Connector [-FU]**



**Dimensions/Top entry connector [-FU]**

Formula  $L1=10.5n+24$  /  $L2=10.5n+44$  / n:Stations (Max. 8 stations: standard)

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	34.5	45	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192
L2	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212
L3	112.5	125	137.5	150	150	162.5	175	187.5	200	212.5	225	225	237.5	250	262.5	275
L4	123	135.5	148	160.5	160.5	173	185.5	198	210.5	223	235.5	235.5	248	260.5	273	285.5

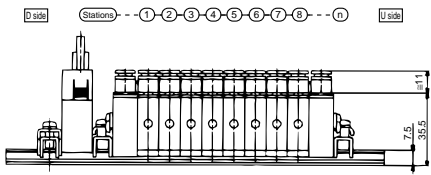
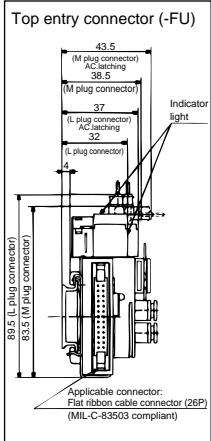
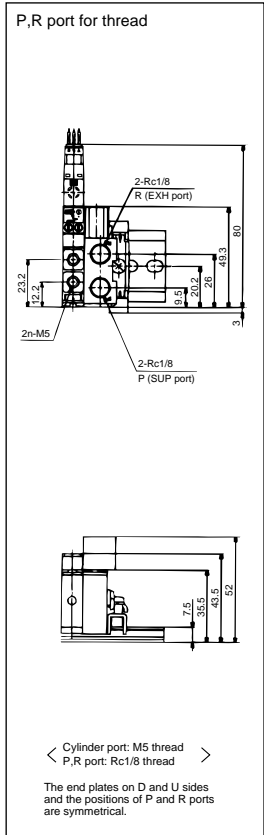
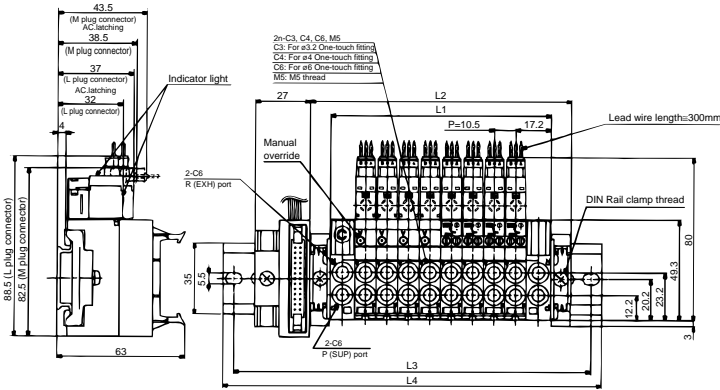
**Dimensions/Side entry connector [-FS]**

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	137.5	137.5	150	162.5	175	187.5	200	200	212.5	225	237.5	250	262.5	262.5	275	287.5
L4	148	148	160.5	173	186.5	198	210.5	210.5	223	235.5	248	260.5	273	273	285.5	298



**Kit (Flat Ribbon Cable Kit)/10-VQ1000**

**Top entry connector [-PU]**



**Dimensions/Top entry connector [-PU]**

Formula  $L1=10.5n+24$  /  $L2=10.5n+44$  / n:Stations (Max. 8 stations: standard)

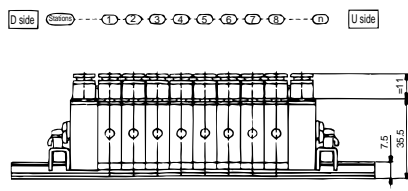
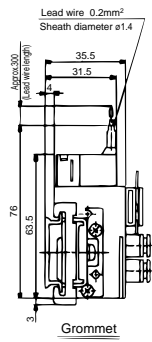
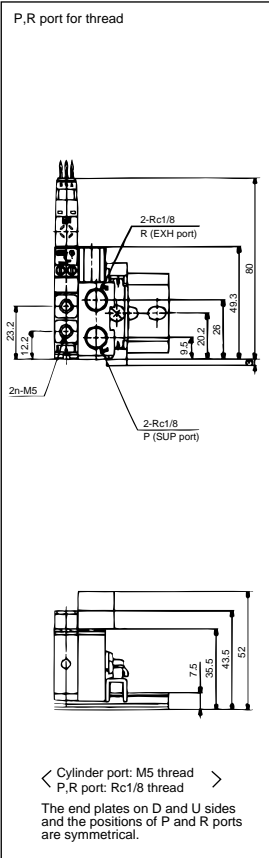
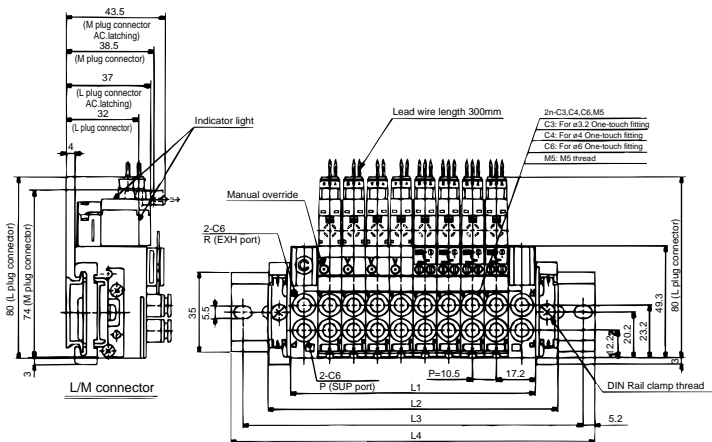
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	34.5	45	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192
L2	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212
L3	112.5	112.5	125	137.5	150	162.5	175	175	187.5	200	212.5	225	237.5	237.5	250	262.5
L4	123	123	135.5	148	160.5	173	185.5	185.5	198	210.5	223	235.5	248	248	260.5	273

**Dimensions/Side entry connector [-PS]**

Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L3	137.5	137.5	150	162.5	175	187.5	200	200	212.5	225	237.5	250	262.5	262.5	275	287.5
L4	148	148	160.5	173	185.5	198	210.5	210.5	223	235.5	248	260.5	273	273	285.5	298

# Solenoid Valve 10-VQ1000/2000

## Kit (Connector Kit)/10-VQ1000



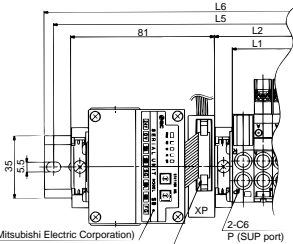
### Dimensions

Formula  $L1=10.5n+24$  /  $L2=10.5n+44$  / n:stations (Max. 16 stations: standard)

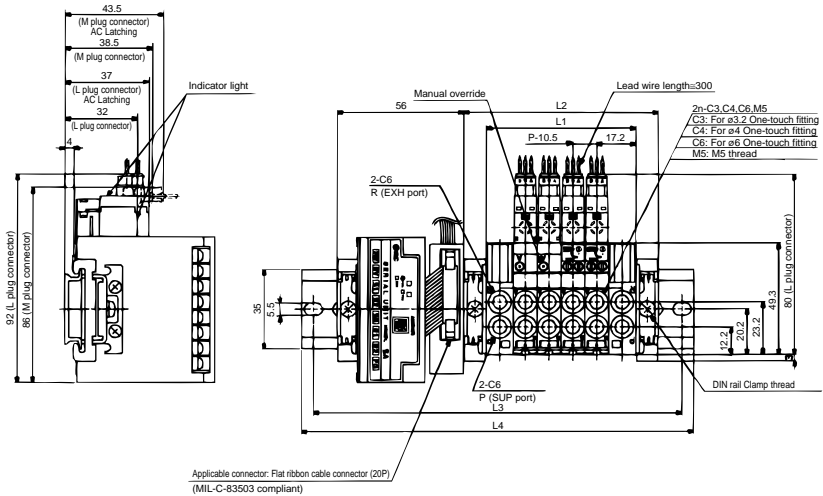
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	34.5	45	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192
L2	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212
L3	75	87.5	100	112.5	125	137.5	150	162.5	175	187.5	200	200	212.5	225	237.5	
L4	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	210.5	223	235.5	248	

**S** Kit (Serial Transmission Kit)/10-VQ1000

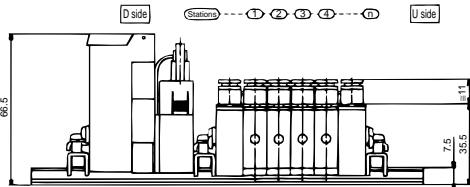
In case of dustproof SI unit



The figure shows SB type (for Mitsubishi Electric Corporation)  
Applicable connector: Flat ribbon cable connector (20P)  
(MIL-C-83503 compliant)



Applicable connector: Flat ribbon cable connector (20P)  
(MIL-C-83503 compliant)



Directional Control Valve

**Dimensions**

**Formula** L1=10.5n+24 / L2=10.5n+44 / n: Stations (Max. 16 stations: standard)

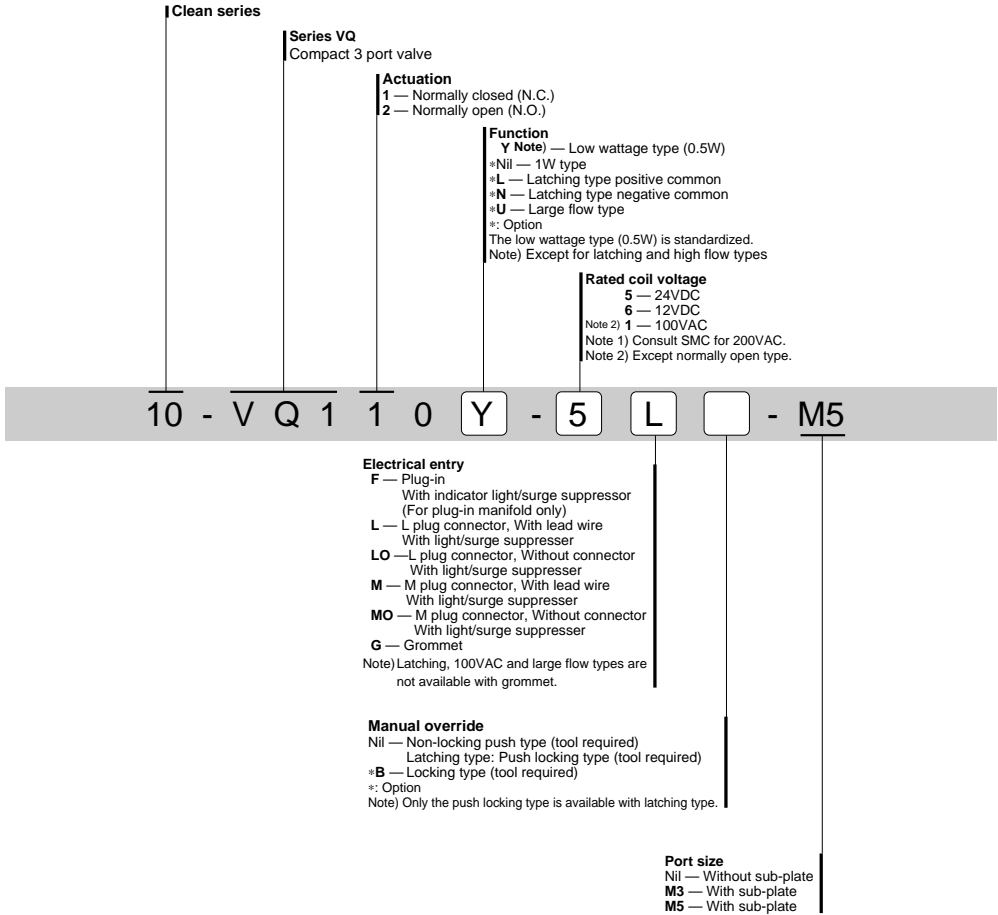
Stations	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<b>L1</b>	34.5	45	55.5	66	76.5	87	97.5	108	118.5	129	139.5	150	160.5	171	181.5	192
<b>L2</b>	54.5	65	75.5	86	96.5	107	117.5	128	138.5	149	159.5	170	180.5	191	201.5	212
<b>L3</b>	137.5	150	162.5	162.5	175	187.5	200	212.5	225	237.5	237.5	250	262.5	275	287.5	300
<b>L4</b>	148	160.5	173	173	185.5	198	210.5	223	235.5	248	248	260.5	273	285.5	298	310.5

In case of dustproof SI unit L5=L3+25 L6=L4+25

Manifolds with SI unit for Matsushita Electric Industrial (MEWNET FP) or Allen Bradley Co. have the same L5, L6 dimensions as manifolds with dustproof SI unit.

# Series 10-VQ100 3 Port Solenoid Valve

## How to Order



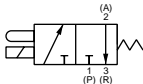
## ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

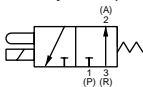
## Specifications



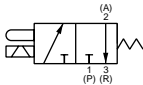
JIS symbol



Normally closed (N.C.)



Normally open (N.O.)



Latching type

Type		Low wattage type (0.5W)	1W type	
Valve specifications	Valve type	Direct acting 3 port poppet type (N.C.)		
	Fluid	Air, Inert gas		
	Max. operating pressure	0.7MPa		
	Min. operating pressure	0MPa		
	Flow characteristics	1→2	C[dm <sup>3</sup> /(s·bar)]	0.055
			b	0.22
		2→3	Cv	0.014
			C[dm <sup>3</sup> /(s·bar)]	0.083
			b	0.28
	Cv	0.021		
Response time <sup>Note 1)</sup>	ON: 3.5ms, OFF: 2.5ms	ON: 3.5ms, OFF: 2ms		
Ambient and fluid temperature	-10 to 50°C <sup>Note 2)</sup>			
Lubrication	Not required			
Manual override	Non-locking push type/Locking type (tool required) <sup>Note 3)</sup>			
Mouting orientation	Free			
Impact/ Vibration resistance <sup>Note 4)</sup>	150/30m/s <sup>2</sup>			
Enclosure	Dust proof			
Weight	12.6g (L, M plug connector, Without sub-plate)			
Electrical specifications	Rated coil voltage	DC	24V, 12V	
	Allowable voltage fluctuation	±10% of rated voltage		
	Type of coil insulation	Equivalent to class B		
	Power consumption	DC	0.5W (21mA)	1W (42mA)
	Electrical entry	Grommet		
		Plug-in, L plug connector, M plug connector (With light/surge suppressor)		

Note 1) According to JIS B8374-1993. A value with light/surge voltage suppressor (clean air). Dispersion accuracy of ±1ms.

Note 2) Use dry air to prevent condensation when operating at a low temperature.

Note 3) Locking type is option.

Note 4) Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed each time in the axial and right angle directions of the main valve and armature, for both energized and deenergized states.

Vibration resistance: No malfunction resulted in a one-sweep test in a 8.3 to 2000Hz range in the axial and right angle directions of the main valve and armature, for both energized and de-energized states (value in the initial stage).

## Specifications for Options

Items	Types				
	Latching type	AC type	Large flow type		
Valve specifications	Model	10-VQ110L-□	10-VQ110-□	10-VQ110U-□	
	Max. operating pressure	0.7MPa		0.6MPa	
	Flow characteristics	1→2	C[dm <sup>3</sup> /(s·bar)]	0.042	0.14
			b	0.27	0.26
		2→3	Cv	0.011	0.036
			C[dm <sup>3</sup> /(s·bar)]	0.045	0.14
			b	0.28	0.25
Cv	0.012	0.036			
Response time <sup>Note 2)</sup>	5ms or less	6.5ms or less	5ms or less		
Electrical specifications	Power consumption	24VDC	1W (42mA)	0.7W (29mA) <sup>Note 2)</sup>	
		12VDC	1W (83mA)	0.7W (29mA) <sup>Note 2)</sup>	
		100VAC	0.6VA (6mA)	0.5VA (5mA)	
	Electrical entry <sup>Note 3)</sup>	Plug-in, L plug connector, M plug connector (With light/surge suppressor)			

Note 1) According to JIS B8374-1993. A value with light/surge voltage suppressor (clean air).

Note 2) Inrush 3.1 W (10ms after energization), Holding 0.7W

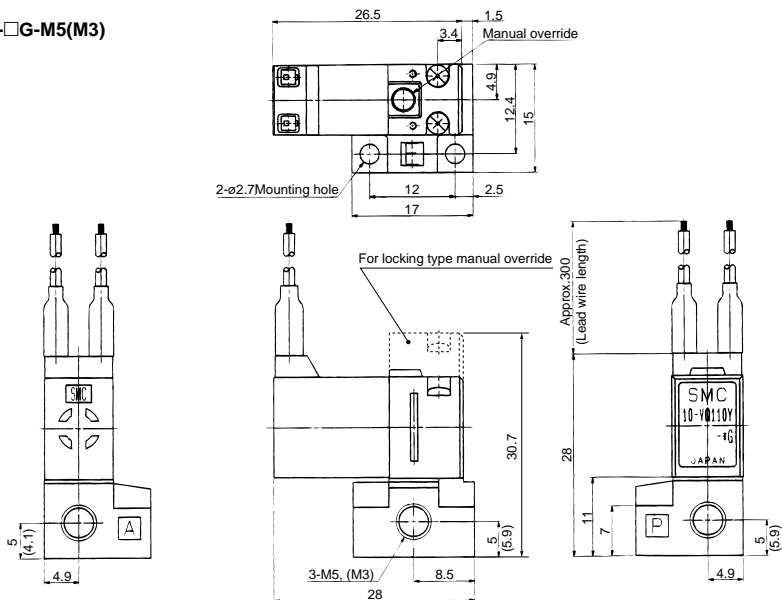
Note 3) The grommet is available only for normally open type (without light/surge voltage suppressor).

Only 1W DC specification is available with the normally open type.

## Dimensions

### Grommet

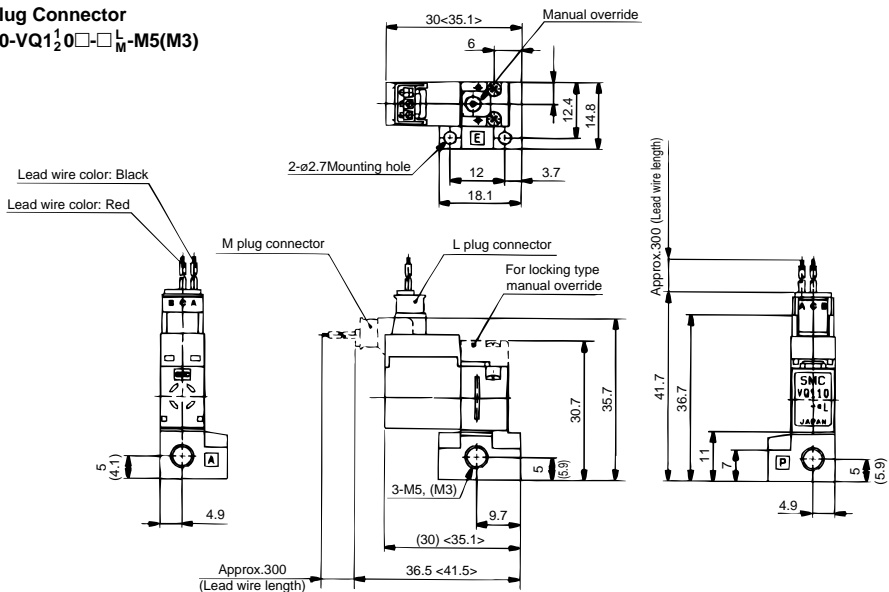
10-VQ1 $\frac{1}{2}$ 0□-□G-M5(M3)



Note) •Dimensions in "( )" are those for M3.  
•The broken lines indicate the locking type manual override.

### Plug Connector

10-VQ1 $\frac{1}{2}$ 0□-□<sub>M</sub>L-M5(M3)

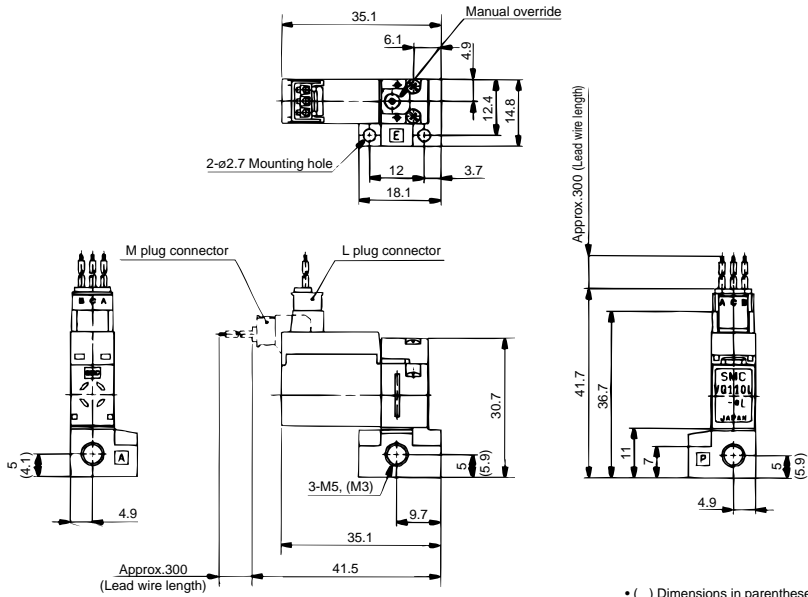


• ( ) Dimensions in parentheses are those for M3.  
• The broken lines indicate the locking type manual override and push locking type manual override (latching).  
• < > is for AC.

## Dimensions

### Latching Type

10-VQ110□<sub>N</sub>-□<sub>M</sub>-M5(M3)




• ( ) Dimensions in parentheses are those for M3.

**Manifold Specifications/Plug-in Unit Manifold with Multi-connector**

**How to Order Manifolds**

**10 - VV3Q 1 1 - 08 C U 1 - D**

**Clean series**



Applicable solenoid valve (Plug-in type)  
10-VQ110□□□□

- Consult SMC when the latching type is to be mounted.
- U type (Large flow) can be mounted.

**Series VQ100**

**Manifold base model**  
Plug-in unit

**Stations**  
02 — 2 stations  
⋮  
18 — 18 stations

**Electrical entry**  
Multi-connector type

**Electrical entry direction**  
U — Top entry  
S — Side entry

**Cable length**  
0 — Without cable  
1 — With 1.5 m cable  
2 — With 3 m cable  
3 — With 5 m cable

**Option**  
Nil — None  
D — DIN rail mounted (With DIN rail)  
Note) DO — DIN rail mounted (Without DIN rail)  
Note) The DIN rail should be ordered separately.

**How to Order Valves**

**10 - VQ1 1 0 Y - 5 F □**

**Clean series**

**Series VQ**  
Compact 3 port valve

**Actuation**  
1 — Normally closed (N.C.)  
2 — Normally open (N.O.)

**Function**  
Y Note) — Low wattage type (0.5W)  
\*Nil — 1 Watt type  
\*U — Large flow type  
\*Option  
The low wattage type (0.5 W) is standardized.  
Note) Except large flow capacity specification.

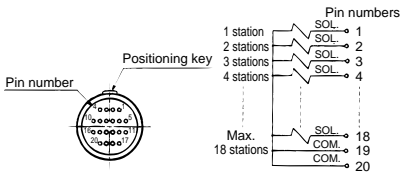
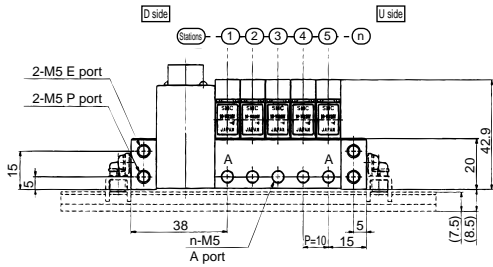
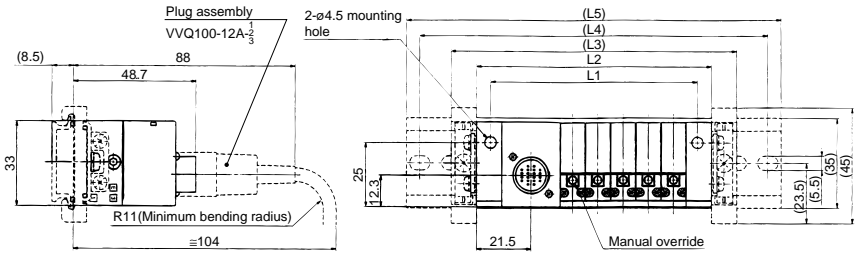
**Rated coil voltage**  
5 — 24VDC  
6 — 12VDC  
1 — 100VAC

**Electrical entry**  
F — Plug-in  
With light/surge suppresser  
(For plug-in manifold only)

**Manual override**  
Nil — Non-locking push type (tool required)  
\*B — Locking type (tool required)  
\*Option



**Plug-in Unit Manifold with Multi-connector**



Multi-connector pin layout

Electrical wiring specifications


**Dimensions Formula**  $L_1=10n+32$   $L_2=10n+43$

n:Stations (Max. 18 stations)

L \ n	2	3	4	5	6	7	8	9	10
<b>L1</b>	52	62	72	82	92	102	112	122	132
<b>L2</b>	63	73	83	93	103	113	123	133	143
<b>(L3)</b>	83	93	103	113	123	133	143	153	163
<b>(L4)</b>	112.5	112.5	125	137.5	150	162.5	162.5	175	187.5
<b>(L5)</b>	123	123	135.5	148	160.5	173	173	185.5	198

## Manifold Specifications/Plug Lead Unit Manifold

### How to Order Manifolds



**10 - VV3Q 1 2 - 08**

**Clean series**

**Series VQ100**

**Manifold base model**  
**2** — Plug lead unit  
**2U** — Plug lead unit  
     U type (large flow) base

**Stations**  
**02** — 2 stations  
 ⋮  
**20** — 20 stations

**Port size and thread**  
 Nil — M5, Rc1/8  
**01N** — NPT 1/8  
**01T** — NPTF 1/8  
**01F** — PF 1/8  
 (Note) Choice of port size is possible only for 1/8 port size.

### How to Order Valves

**10 - VQ1 1 0 Y - 5 L**

**Clean series**

**Series VQ**  
Compact 3 port valve

**Actuation**  
**1** — Normally closed  
**2** — Normally open

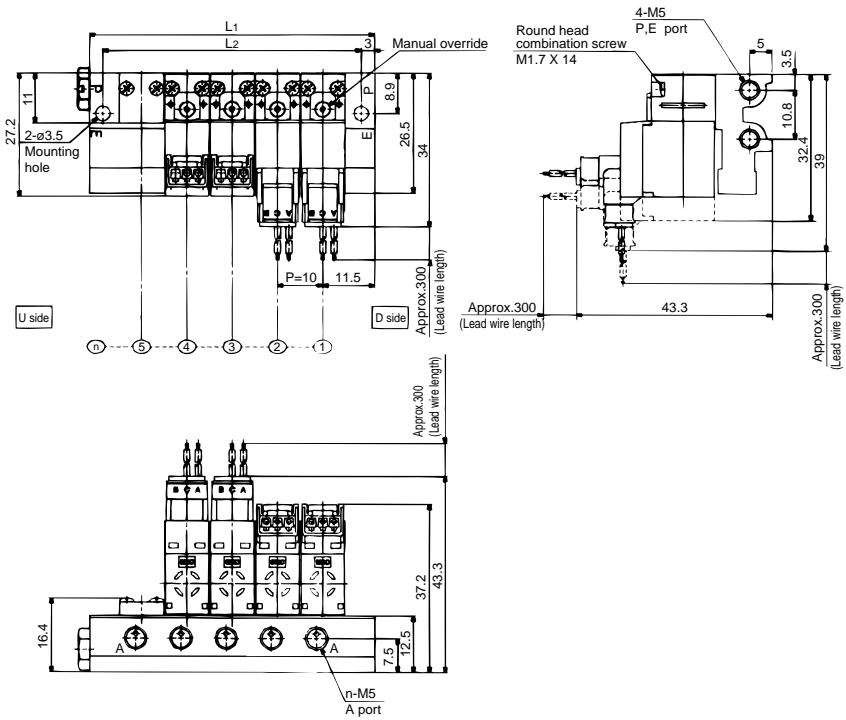
**Function**  
**Y** <sup>Note</sup> — Low wattage type (0.5W)  
 \***L** — Latching type positive common  
 \***N** — Latching type negative common  
 \***U** — Large flow type  
 \* Option  
 The low wattage type (0.5 W) is standardized.  
 (Note) Except for latching and high flow types.

**Rated coil voltage**  
**5** — 24VDC  
**6** — 12VDC  
**1** — 100VAC  
 Consult SMC for 200VAC.

**Electrical entry**  
**L** — L plug connector, With lead wire  
     With light/surge voltage suppressor  
**LO** — L plug connector, Without connector  
     With light/surge voltage suppressor  
**M** — M plug connector, With lead wire  
     With light/surge voltage suppressor  
**MO** — M plug connector, Without connector  
     With light/surge voltage suppressor  
**G** — Grommet  
 (Note) Latching, 100VAC and large flow types are not available with grommet.

**Manual override**  
 Nil — Non-locking push type (tool required)  
     Latching type: Push locking type (tool required)  
 \***B** — Lock type (Tool type)  
 \* Option  
 (Note) Only the push locking type is available with latching type.

**Plug Lead Unit Manifold (10-VV3Q12)**

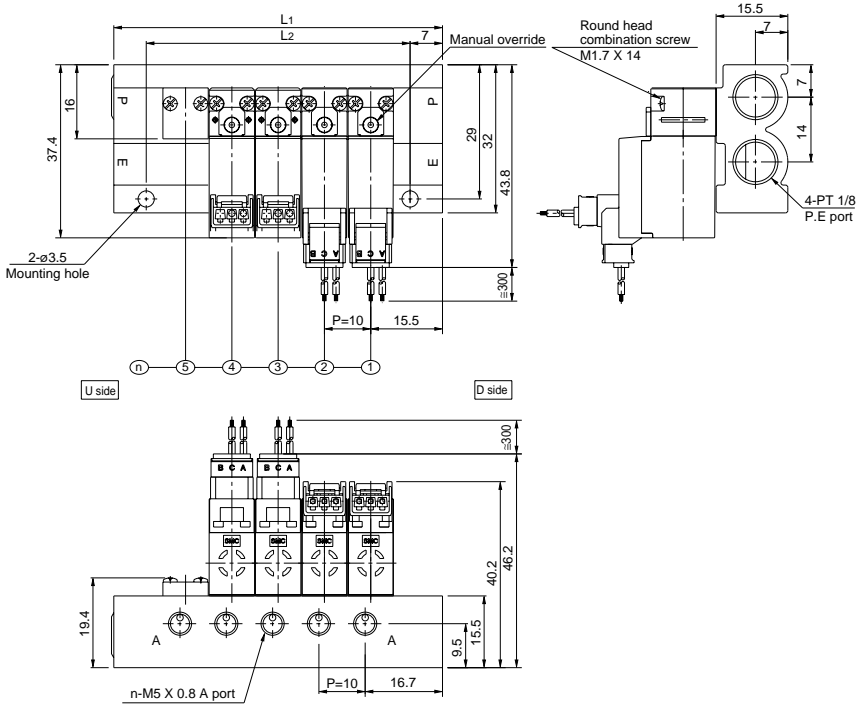


**Dimensions**

**Formula**  $L_1=10n+13$   $L_2=10n+7$  n: Stations (Max. 20 stations)

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	23	33	43	53	63	73	83	93	103	113	123	133	143	153	163	173	183	193	203	213
L <sub>2</sub>	17	27	37	47	57	67	77	87	97	107	117	127	137	147	157	167	177	187	197	207

**Plug Lead Unit Manifold U Type (Large Flow) Base (10-VV3Q12U)**



**Dimensions**

**Formula**  $L_1=10n+21$   $L_2=10n+7$  n: Stations (Max. 20 stations)

L \ n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L <sub>1</sub>	31	41	51	61	71	81	91	101	111	121	131	141	151	161	171	181	191	201	211	221
L <sub>2</sub>	17	27	37	47	57	67	77	87	97	107	117	127	137	147	157	167	177	187	197	207



# Series 10-VQD1000 4 Port Direct Operated Poppet Solenoid Valve

## How to Order

**Clean series**

**Valve option**  
 Nil — Standard (2W)  
 V — For vacuum (2W)  
 \*U — Large flow (3.2W)  
 \*W — Large flow, Vacuum (3.2W)  
 \*Power saving type

**Rated voltage**  
 5 — 24VDC  
 6 — 12VDC  
 \*Consult SMC for other voltages.

**Electrical entry**  
 L — L plug connector  
 M — M plug connector

**Port size**  
 Nil — Without sub-plate (for manifold)  
 M5 — M5 X 0.8

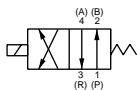
**10 - VQD1151 U - 5 L - M5**

M plug connector



L plug connector

Symbol



## Standard Specifications

Item	Style	Standard (2W)	High flow type (3.2W/Energy saving type)
	Valve type		4 port direct acting poppet valve
Fluid		Air, Inert gas	
Max. operating pressure		0.7MPa	
Min. operating pressure/ Vacuum		0MPa/10Torr	
Response time <small>Note 1)</small>		ON: 4ms, OFF: 2ms	
Ambient and fluid temperature		<small>Note 2)</small> -10 to 50°C	
Lubrication		Not required	
Manual override		Non-locking push type	
Impact/Vibration resistance <small>Note 3)</small>		150/30m/s <sup>2</sup>	
Mounting orientation		Free	
Enclosure		Dust proof	
Weight		34g (Without sub-plate)	
Electrical specifications	Rated coil voltage	DC	24V, 12V
	Allowable voltage fluctuation	±10% rated voltage	
	Type of coil insulation	Equivalent to B class	
	Power consumption	DC	2W <small>3.2W (Energy saving type) (Inrush 4W, Holding 2W)</small>
Electrical entry		L plug connector, M plug connector (Without light/surge suppressor)	

Note 1) According to JISB8375-1981. A valve with light/surge voltage suppressor (clean air). Dispersion accuracy of ±1ms.

Note 2) Use dry air to prevent condensation when operating at a low temperature.

Note 3) Impact resistance: No malfunction resulted in an impact test using a drop impact tester. The test was performed each time in the axial and right angle directions of the main valve and armature, for both energized and deenergized states (Value in the initial stage).

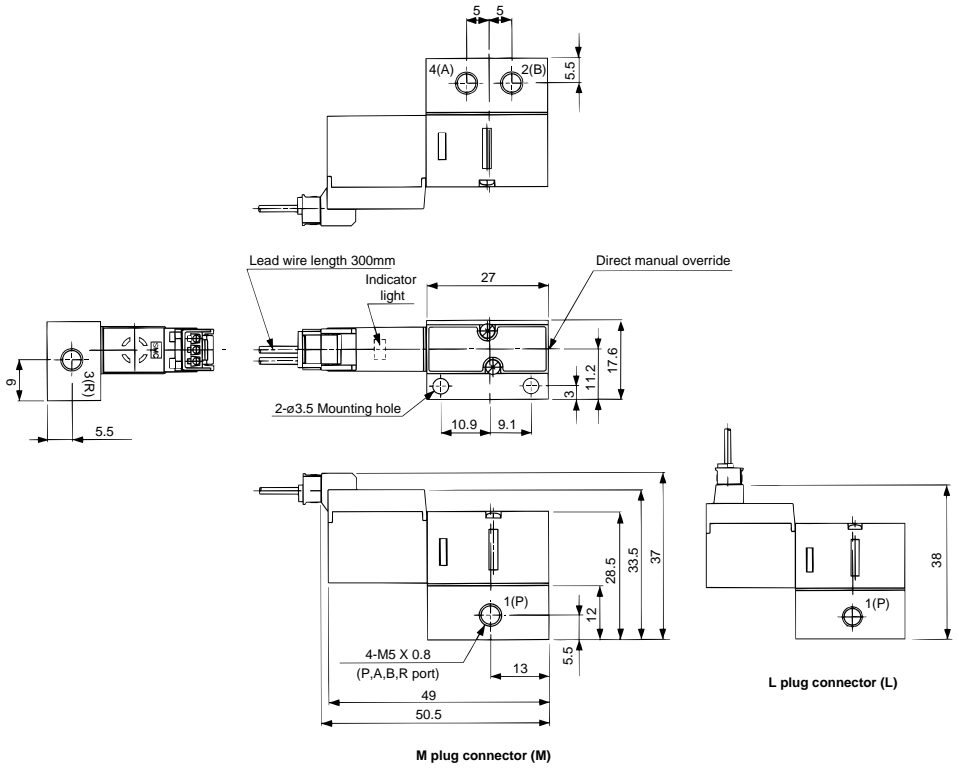
Vibration resistance: No malfunction resulted from a one-sweep test between 8.3 and 2000Hz. The test was performed on the axis and right angle directions of the main valve and armature, for both energized and de-energized states. (Value in the initial stage).

## Flow Characteristics

Valve model		Port size	Flow characteristics					
			1→4/2 (P→A/B)			4/2→5/3 (A/B→EA/EB)		
			C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv
Body ported	10-VQD1121□□□□□M5	M5 X 0.8	0.22	0.16	0.05	0.19	0.31	0.05
	10-VQD1121□□□□□M5		0.27	0.24	0.07	0.28	0.28	0.07
Base mounted (with sub-plate)	10-VQD1151□□□□□M5		0.22	0.10	0.05	0.22	0.31	0.06
	10-VQD1151□□□□□M5		0.27	0.25	0.07	0.27	0.28	0.07

## ⚠ Caution

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 236 to 238 for common precautions for directional control valve.

**Dimensions****L Plug Connector: 10-VQD1151□-□L-M5****M Plug Connector: 10-VQD1151□-□M-M5**

# Manifold Specifications

## How to Order

10 - V V 4 Q D 15 -

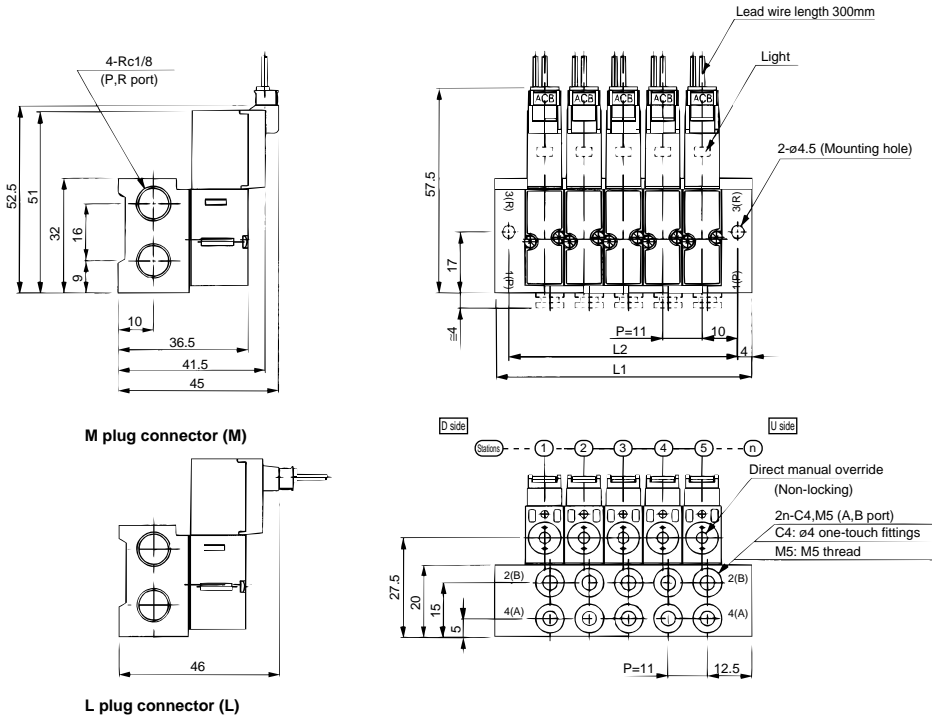
**Clean series** |

**Stations**  
 02 — 2 stations  
 ⋮  
 20 — 20 stations (Maximum)

**Port size**  
 M5— M5 X 0.8  
 C4—  $\phi 4$  cassette  
 Note) 1(P) and 3(R) ports are Rc1/8.

## Dimensions

Plug lead unit manifold: 10-VV4QD15-□□



**Dimensions**

n: Stations

L/n	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	39	50	61	72	83	94	105	116	127	138	149	160	171	182	193	204	215	226	237
L2	31	42	53	64	75	86	97	108	119	130	141	152	163	174	185	196	207	218	229



# Clean Series Air Line Equipment

### Flow Control Equipment

<b>AS</b>	Clean Speed Controller Series AS P.434
<b>10-AS</b>	Speed Controller Series AS P.438

### Air Filter/Regulator

<b>10-AF</b>	Air Filter Series AF P.474
<b>10-AR</b>	Regulator Series AR P.482

<b>10-AW</b>	Filter Regulator Series AW P.494
<b>10-IR</b>	Precision Regulator Series IR P.506

### Fittings & Tubing

<b>10-K□</b>	Fittings & Tubing Series K□ P.514
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# Flow Control Equipment/Common Precautions

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series.

## Selection

### Warning

- ① **Products mentioned in this catalog are not designed for the use as stop valve with zero air leakage.**

Products specification allows for a small amount of air leakage.

## Mounting

### Warning

- ① **Check that the lock nut is tightened.**

A loose lock nut may cause actuator speed changes.

- ② **Confirm the degree of rotation of the needle valve.**

Products mentioned in this catalog are retainer type so that the needle is not removed completely. Over rotation will cause damage.

- ③ **Confirm air flow direction.**

If mounted in the wrong direction, the speed adjustment needle may not function and may cause uncontrolled extension of the piston rod.

- ④ **Adjust needle by opening the needle slowly after having closed it completely.**

Loose needle valves may cause unexpected sudden actuator extension. When needle valve is turned clockwise, it is closed and cylinder speed decreases. When needle valve is turned counter clockwise, it is open and cylinder speed increases.



# Flow Control Equipment/Specific Product Precautions

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Handing on One-touch Fittings

### ⚠ Caution

- ① Refer to page 2.0-7 and 2.0-8 in Best Pneumatics ④ for One-touch Fittings.

## Series 10-ASD

### Operation

### ⚠ Caution

- ① Single acting cylinder

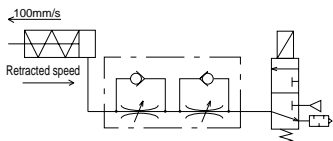
When single acting cylinder is controlled, cylinder retracted speed depends on operating condition. Confirm the maximum retracted speed mentioned in the table below.

Speed controller	Cylinder	Solenoid valve	Tubing	Silencer	Max. retracted speed mm/s		
					100	200	300
ASD230F	CJ2	VJ500	TU0604 1m	AN110-01	ø6		
					ø10		
					ø16		
ASD330F	CM2	VZ500	TU0604 1m	AN110-01	ø20		
					ø25		
					ø32		

<Specification condition>

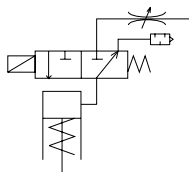
- Cylinder extending speed: 100mm/s
- Needle fully open at meter-out side

\*At pressure 0.5Mpa, temperature 20°C



(Reference) Recommended circuit to accelerate the return speed.

When extended speed is low speed and retracted speed is required high speed, below circuit with 3 port is recommended.



Note) Use AS-F series as speed controller.

## Selection

### ⚠ Warning

- ① Please confirm if it is compatible with PTFE.

PTFE powder (polytetrafluoroethylene resin) is included in sealant. Confirm if the use of it may cause any adverse effect in the system.

## Mounting

### ⚠ Warning

- ① To install/remove the Flow Control Equipment, tighten/loosen at wrench flat B as close to the thread as possible using the appropriate wrench.

Do not apply torque at other points as the product may be damaged. Rotate Body A manually for positioning after installation.

- ② Do not use universal type fittings for applications involving continuous rotation.

It may cause failure of the fittings.

## Tightening Torque

### ⚠ Caution

- ① Suitable torque for tightening fittings is shown in the table below. For standard installation, turn 2 to 3 turns using tool after fastening by hand. Take care not to damage the product by over torque.

Male thread	Appropriate tightening torque Nm	Hexagonal width mm	Adjustable spanner nominal mm
M3	1/4 turn after manual tightening	4.5	—
M5	1/6 turn after manual tightening	8	100
1/8	7 to 9	12	150
1/4	12 to 14	17	200
3/8	22 to 24	19	200
1/2	28 to 30	24	200

## Tightening Torque for Lock Nuts

### ⚠ Caution

- ① Suitable tightening torque for a hexagon lock nut is shown in the table below. For standard installation, turn 15 to 30° using tool, after fastening by hand. Pay attention not to over torque the product.

Body size	Appropriate tightening torque Nm
M3	0.07
M5	0.3
1/8	1
1/4	1.5
3/8	4
1/2	10

# Series AS-FPQ/FPG

Clean Speed Controller with One-touch Fittings  
Elbow Type

## How to Order

AS 2 2 1 1 F P Q 01 06

**Body size**

1	M5 standard
2	1/8, 1/4 standard
3	3/8 standard
4	1/2 standard

**Type**

2	Elbow
---	-------

**Controlled method**

0	Meter-out
1	Meter-in

**With One-touch fittings**

**Clean specification**

**Metal part material**

Q	Brass (Electroless nickel plated)
G	Stainless steel (SUS304)


**Applicable tubing O.D. Metric size**

04	ø4
06	ø6
08	ø8
10	ø10
12	ø12


**Port size**

M5	M5 X 0.8
01	1/8
02	1/4
03	3/8
04	1/2

**AS-FPQ/Brass (Electroless nickel plated)**  
Release button color: Light gray



**AS-FPG/Stainless Steel (SUS304)**  
Release button color: Light blue



## Model

Elbow type	Port size	Applicable tubing O.D. (mm)					Applicable cylinder bore size (mm)
		4	6	8	10	12	
AS12□1FP□-M5	M5 X 0.8	●	●				6, 10, 16, 20
AS22□1FP□-01	R1/8	●	●	●			20, 25, 32
AS22□1FP□-02	R1/4	●	●	●	●		20, 25, 32, 40
AS32□1FP□-03	R3/8		●	●	●	●	40, 50, 63
AS42□1FP□-04	R1/2				●	●	63, 80, 100

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.

### Specifications

<b>Particle generation grade</b>	Grade 1 <small>Note 1)</small>
<b>Proof pressure (20°C)</b>	1.5MPa
<b>Max. operating pressure (20°C)</b>	1MPa <small>Note 3)</small>
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (Note2) 8 rotations)

Note 1) Refer to the particle generation grade classifications.

Note 2) In case of AS12□1FP□

Note 3) The maximum operating pressure is the value at 20°C.

Refer to operating pressure curve for values at other temperatures.

### Air Flow/Effective Area

Model		AS12□1FP□-M5			AS22□1FP□-01			AS22□1FP□-02			AS32□1FP□-03			AS42□1FP□-04	
<b>Tubing O.D.</b>	Metric size	ø4	ø4	ø6	ø4	ø6	ø8	ø6	ø8	ø10	ø10	ø12	ø10	ø12	
	Flow rate /min (ANR)	100	180	230	260	390	460	660	790	920	1580	1710			
<b>Controlled (Free) flow</b>	Effective area mm <sup>2</sup>	1.5	2.7	3.5	4	6	7	10	12	14	24	26			

Note) Supply pressure: 0.5Mpa,  
Temperature: 20°C

### Recommended Applicable Tubing

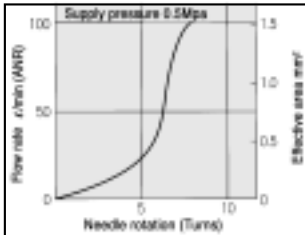
<b>Tubing material</b>	Clean series polyurethane tubing: Series 10-
<b>Tubing O.D.</b>	ø4, ø6, ø8, ø10, ø12

Polyurethane tubing: Series TU, Nylon tubing: Series T

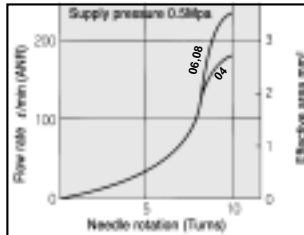
Soft polyurethane tubing: Series TS is also applicable. However, the cleanliness performance will decline.

### Needle Valve/Flow Characteristics

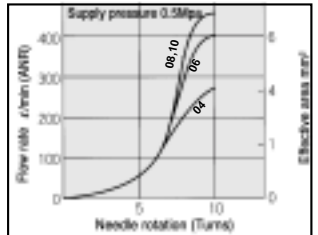
AS12□1FP□-M5



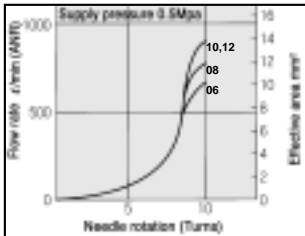
AS22□1FP□-01



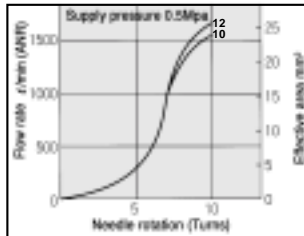
AS22□1FP□-02



AS32□1FP□-03



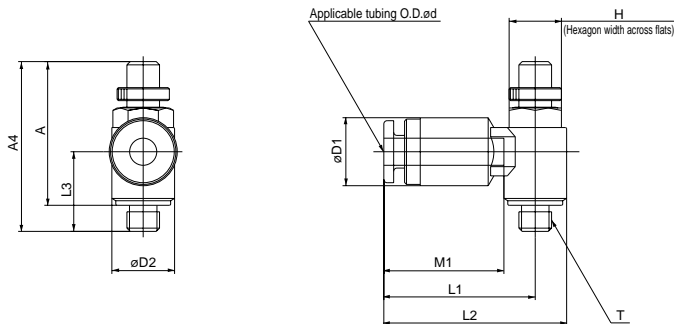
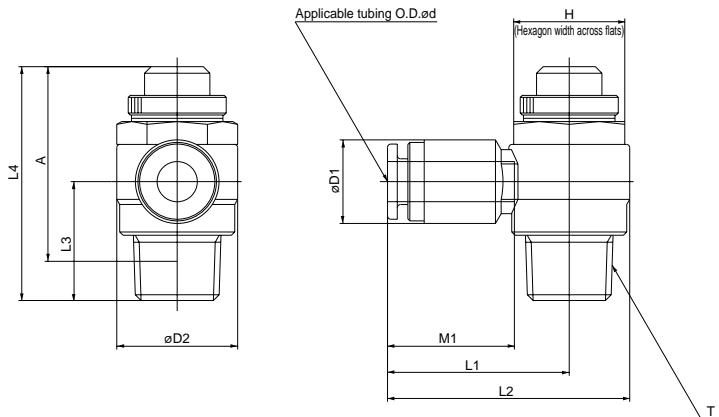
AS42□1FP□-04



Air Line Equipment

**Dimensions**

**M5**



Model	Tubing O.D. d	T	H	D1	D2	L1	L2	L3	L4		A <sup>Note1)</sup>		M1	Weight (g) <sup>Note 2)</sup>	
									MAX.	MIN.	MAX.	MIN.		*1	*2
AS12□1FP□-M5-04	4	M5 X 0.8	8	10.4	9.6	23.2	28	12.2	28.3	25.5	25	22.2	18.4	7	7
AS12□1FP□-M5-06	6			12.8		24.2	29						19.4	8	8
AS22□1FP□-01-04	4	R1/8	12	10.4	14.2	25.3	32.4	14.3	36.4	31.4	32.4	27.4	18.4	17	17
AS22□1FP□-01-06	6			12.8		26.3	33.4						19.4	18	18
AS22□1FP□-01-08	8	R1/4	17	15.2	18.5	28.5	35.6	18.2	40.8	35.8	34.8	29.8	21.9	20	20
AS22□1FP□-02-04	4			10.4		27.8	37						18.4	33	33
AS22□1FP□-02-06	6	R3/8	19	12.8	23	27.8	37	20.9	46.9	41.9	40.6	35.6	19.4	33	33
AS22□1FP□-02-08	8			15.2		30.4	39.6						21.9	35	35
AS22□1FP□-02-10	10	R1/2	24	18.5	28.6	38.3	47.5	25.4	55.6	50.6	47.4	42.4	23.8	38	38
AS32□1FP□-03-06	6			12.8		30.4	41.9						19.4	59	55
AS32□1FP□-03-08	8	R3/8	19	15.2	23	32.9	44.4	20.9	46.9	41.9	40.6	35.6	21.9	61	57
AS32□1FP□-03-10	10			18.5		34.6	46.1						23.8	63	59
AS32□1FP□-03-12	12	R1/2	24	20.9	28.6	35.8	47.3	25.4	55.6	50.6	47.4	42.4	25	65	61
AS42□1FP□-04-10	10			18.5		36.6	50.9						23.8	107	100
AS42□1FP□-04-12	12	R1/2	24	20.9	28.6	38.2	52.5	25.4	55.6	50.6	47.4	42.4	25	109	102

Note 1) Reference thread dimensions after being screwed in.

Note 2) \*1 is the weight of type AS□2□1FPQ (Brass + electroless nickel plating). \*2 is the weight of type AS□2□1FPG (SUS304).



# 10-AS-Fseries

Speed Controller with One-touch Fittings  
Elbow Type/Universal Type

## How to Order

**Clean series**

**Body size**  
 1 — M3, M5 standard  
 2 — 1/8, 1/4 standard  
 3 — 3/8 standard  
 4 — 1/2 standard

**Type**  
 2 — Elbow  
 3 — Universal

**Controlled method**  
 0 — Meter-out  
 1 — Meter-in

**With One-touch fittings**


**Port size**  
 M3 — M3 X 0.5  
 M5 — M5 X 0.8  
 01 — R1/8  
 02 — R1/4  
 03 — R3/8  
 04 — R1/2

**Applicable tubing O.D.**  
**Metric size**  
 23 — ø3.2\*  
 04 — ø4  
 06 — ø6  
 08 — ø8  
 10 — ø10  
 12 — ø12  
 \*ø1/8 tube should be used.

**Option\***  
 Nil — No  
 S — With sealant  
 K — Hexagon lock nut  
 \*Please give the order SK to the option.

**Nickel plated specification**  
 (Not required by types indicated with ● in the table of models below.)

10 - AS 2 2 1 1 F - 01 - 06 [ ] N



## Model

Elbow type	Universal type	Port size	Applicable tubing O.D.					Applicable cylinder bore size (mm)	
			Metric size						
			3.2	4	6	8	10	12	
10-AS12□1F-M3	10-AS13□1F-M3	M3 X 0.5	●	●					2.5, 4, 6
10-AS12□1F-M5	10-AS13□1F-M5	M5 X 0.8	●	●	●				6, 10, 16, 20
10-AS22□1F-01	10-AS23□1F-01	R1/8	●	●		●	●		20, 25, 32
10-AS22□1F-02	10-AS23□1F-02	R1/4		●	●	●	●		20, 25, 32, 40
10-AS32□1F-02	10-AS33□1F-02	R1/4			●	●	●	●	40, 50, 63
10-AS32□1F-03	10-AS33□1F-03	R3/8			●	●	●	●	40, 50, 63
10-AS42□1F-04	10-AS42□1F-04	R1/2				●	●	●	63, 80, 100

Note 1) \*Elbow type only.

Note 2) Distinction between meter-out/meter-in types by appearance.

They are distinguished by the lock nut. The lock nut on the meter-out type is electroless nickel plated, while the meter-in type is black zinc chromate plated.



## Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (8 rotations (Note 1))
<b>Applicable tubing material</b>	Polyurethane (Note 2)
<b>Option (Note 3)</b>	With seal, Hexagon lock nut

Note 1) In case of AS12□1F and AS13□1F-M5 types

Note 2) The maximum operating pressure for polyurethane is 0.8 MPa.

Note 3) M3 and M5 type ports are not available with sealant.

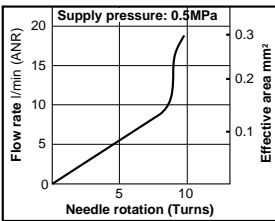
## Air Flow/Effective Area

Model		10-AS12□1F-M3 10-AS13□1F-M3	10-AS12□1F-M5 10-AS13□1F-M5	10-AS22□1F-01 10-AS23□1F-01	10-AS22□1F-02 10-AS23□1F-02	10-AS32□1F 10-AS33□1F	10-AS42□1F 10-AS43□1F
<b>Tubing O.D. (mm)</b>		3.2, 4	3.2, 4, 6	3.2, 4, 6, 8, 10	4, 6, 8, 10	6, 8, 10, 12	10, 12
<b>Controlled (Free) flow</b>	<b>Flow rate /min (ANR)</b>	20	100	180, 230	260, 390	460, 660, 790	920, 1580, 1710
	<b>Effective area mm<sup>2</sup></b>	0.3	1.5	2.7, 3.5	4, 6, 7	10, 12, 14	24, 26

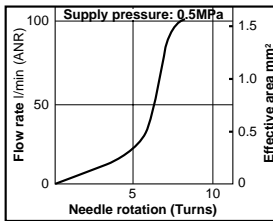
(Note) Supply pressure: 0.5MPa, Temperature: 20°C.

## Needle Valve/Flow Characteristics

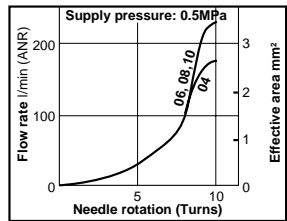
10-AS1201F-M3, 10-AS1211F-M3  
10-AS1301F-M3, 10-AS1311F-M3



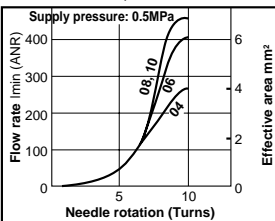
10-AS1201F-M5, 10-AS1211F-M5  
10-AS1301F-M5, 10-AS1311F-M5



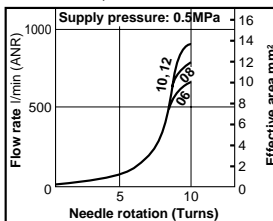
10-AS2201F-01, 10-AS2211F-01  
10-AS2301F-01, 10-AS2311F-01



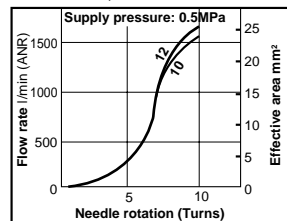
10-AS2201F-02, 10-AS2211F-02  
10-AS2301F-02, 10-AS2311F-02



10-AS3201F, 10-AS3211F  
10-AS3301F, 10-AS3311F



10-AS4201F, 10-AS4211F  
10-AS4301F, 10-AS4311F

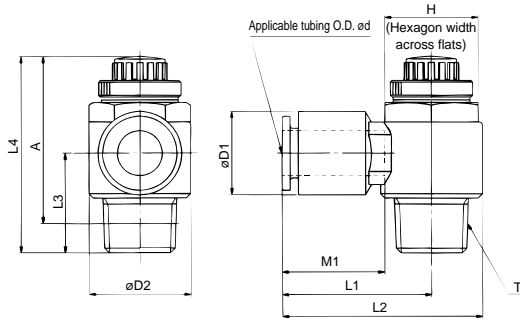


## ⚠ Caution

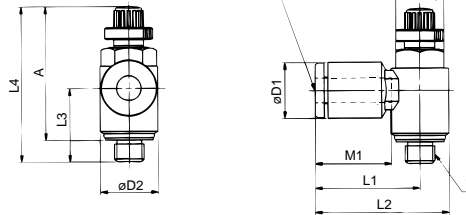
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.

# Speed Controller with One-touch Fittings 10-AS

## Elbow Type



With M3 and M5 types

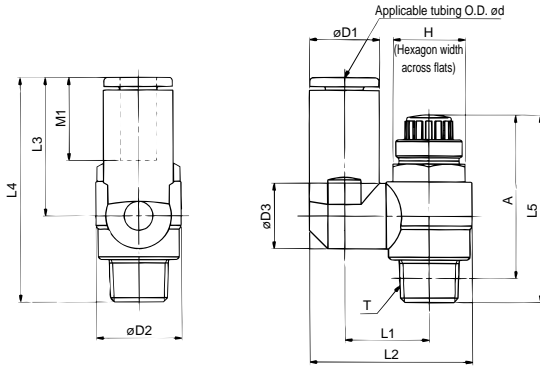


## Metric Size

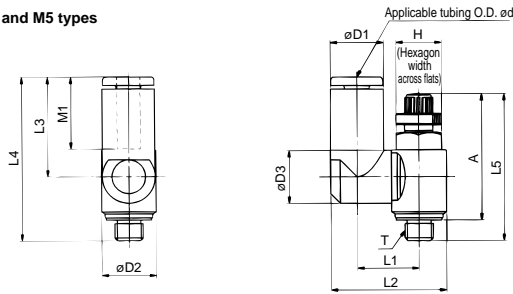
Model	Applicable tubing O.D. d	T	H	D1	D2	L1	L2	L3	L4		A*		M1	Weight g
									MAX.	MIN.	MAX.	MIN.		
10-AS12□1F-M3-23	3.2	M3 X 0.5	5.5	8.4	7.2	16.1	19.7	10.5	26.6	24.1	24	21.5	12.6	4
10-AS12□1F-M3-04	4			9.3									12.7	
10-AS12□1F-M5-23	3.2	M5 X 0.8	8	8.4	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
10-AS12□1F-M5-04	4			9.3									13.5	
10-AS12□1F-M5-06	6	R1/8	12	11.6	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	13.5	16
10-AS22□1F-01-23	3.2			9.3									12.7	
10-AS22□1F-01-04	4	R1/8	12	9.3	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	12.7	17
10-AS22□1F-01-06	6			9.3									13.5	
10-AS22□1F-01-08	8	R1/8	12	11.6	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	13.5	19
10-AS22□1F-01-10	10			15.2									18.5	
10-AS22□1F-02-04	4	R1/8	12	15.2	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	18.5	21
10-AS22□1F-02-06	6			18.5									21	
10-AS22□1F-02-08	8	R1/8	12	18.5	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	21	21
10-AS22□1F-02-10	10			33.1									40.2	
10-AS22□1F-02-04	4	R1/4	17	15.2	18.5	25.2	34.4	18.2	40.4	35.4	34.4	29.4	15.8	32
10-AS22□1F-02-06	6			18.5									21	
10-AS22□1F-02-08	8	R1/4	17	15.2	18.5	25.2	34.4	18.2	40.4	35.4	34.4	29.4	16.8	34
10-AS22□1F-02-10	10			18.5									21	
10-AS22□1F-02-10	10	R1/4	17	18.5	18.5	33.1	40.2	15	40.4	35.4	34.4	29.4	21	36
10-AS32□1F-02-06	6			33.1									40.2	
10-AS32□1F-02-06	6	R1/4	17	10.4	18.5	25.2	34.4	18.2	40.4	35.4	34.4	29.4	15.8	32
10-AS32□1F-02-08	8			12.8									16.8	
10-AS32□1F-02-08	8	R1/4	17	15.2	18.5	27.2	36.4	18.8	40.4	35.4	34.4	29.4	18.5	34
10-AS32□1F-02-10	10			18.5									21	
10-AS32□1F-02-10	10	R1/4	17	18.5	18.5	35.3	44.5	18.8	40.4	35.4	34.4	29.4	21	36
10-AS32□1F-02-12	12			35.3									44.5	
10-AS32□1F-02-06	6	R1/4	19	12.8	23	27.8	39.3	21.8	48.8	43.8	42.8	37.8	16.8	60
10-AS32□1F-02-08	8			15.2									20.9	
10-AS32□1F-02-08	8	R1/4	19	15.2	23	27.8	39.3	21.8	48.8	43.8	42.8	37.8	18.5	63
10-AS32□1F-02-10	10			18.5									21	
10-AS32□1F-02-10	10	R1/4	19	18.5	23	31.8	43.3	20.9	48.8	43.8	42.8	37.8	21	67
10-AS32□1F-02-12	12			20.9									22	
10-AS32□1F-03-06	6	R3/8	19	12.8	23	27.8	39.3	20.9	46.5	41.5	40.2	35.2	16.8	55
10-AS32□1F-03-08	8			15.2									18.5	
10-AS32□1F-03-08	8	R3/8	19	15.2	23	29.5	41	20.9	46.5	41.5	40.2	35.2	18.5	57
10-AS32□1F-03-10	10			18.5									21	
10-AS32□1F-03-10	10	R3/8	19	18.5	23	31.8	43.3	20.9	46.5	41.5	40.2	35.2	21	59
10-AS32□1F-03-12	12			20.9									22	
10-AS32□1F-03-12	12	R3/8	19	20.9	23	32.8	44.3	25.4	57.6	50.1	49.4	41.9	22	61
10-AS42□1F-04-10	10			32.8									44.3	
10-AS42□1F-04-10	10	R1/2	24	18.5	28.6	33.6	47.9	25.4	57.6	50.1	49.4	41.9	21	100
10-AS42□1F-04-12	12			20.9									22	

\*Reference thread dimensions after being screwed in.

**Universal Type**



With M3 and M5 types



**Metric Size**

Model	Applicable tubing O.D. d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		A*		M1	Weight g
											MAX.	MIN.	MAX.	MIN.		
10-AS13□1F-M3-23	3.2	M3 X 0.5	5.5	8.4	7.2	7.2	10.1	17.9	17.6	28.3	26.6	24.1	24	21.5	12.9	4
10-AS13□1F-M3-04	4			9.3				18.3	17.9	28.6						5
10-AS13□1F-M5-23	3.2	M5 X 0.8	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	28.6	25.8	25	22.2	12.9	7
10-AS13□1F-M5-04	4			9.3				20.3	20.6	31.8						13.7
10-AS13□1F-M5-06	6	R1/8	12	11.6	14.2	9.3	13.1	21.4	17.5	31.8	36.1	31.1	32.1	27.1	12.9	17
10-AS23□1F-01-23	3.2			8.4				24.4	24.9	31.8						18.7
10-AS23□1F-01-04	4	R1/8	12	9.3	14.2	10.9	14	26.9	22.9	37.2	36.1	31.1	32.1	27.1	13.7	18
10-AS23□1F-01-06	6			11.6				10.9	14	26.9						22.9
10-AS23□1F-01-08	8	R1/8	12	15.2	14.2	12.9	16.2	30.9	28.2	41.7	36.1	31.1	32.1	27.1	18.7	21
10-AS23□1F-02-04	4			10.4				10.9	16.2	30.6						21.9
10-AS23□1F-02-06	6	R1/4	17	12.8	18.5	12.9	18.4	34	25.2	42.6	40.4	35.4	34.4	29.4	16.8	32
10-AS23□1F-02-08	8			15.2				12.9	18.3	35.2						28.2
10-AS23□1F-02-10	10	R1/4	17	18.5	18.5	12.9	20.2	38.7	31	48.4	40.4	35.4	34.4	29.4	20.8	40
10-AS23□1F-02-06	6			12.8				12.9	20.6	38.5						25.2
10-AS33□1F-02-08	8	R1/4	19	15.2	23	12.9	20.6	39.7	28.2	50	48.8	43.8	42.8	37.8	18.7	63
10-AS33□1F-02-10	10			18.5				23	43.7	32.6						54.4
10-AS33□1F-02-12	12	R1/4	19	20.9	23	16.2	23	44.9	34.4	56.2	48.8	43.8	42.8	37.8	21.8	69
10-AS33□1F-03-06	6			12.8				12.9	20.6	38.5						25.2
10-AS33□1F-03-08	8	R3/8	23	15.2	23	12.9	20.6	39.7	28.2	49.1	46.5	41.5	40.2	35.2	18.7	59
10-AS33□1F-03-10	10			18.5				23	43.7	32.6						53.5
10-AS33□1F-03-12	12	R3/8	23	20.9	23	16.2	23	44.9	34.4	55.3	46.5	41.5	40.2	35.2	21.8	65
10-AS43□1F-04-10	10			18.5				16.2	23	44.9						34.4
10-AS43□1F-04-12	12	R1/2	24	21.7	28.6	16.2	19.4	26.8	52	61.7	57.6	50.1	49.4	41.9	21.8	104
10-AS43□1F-04-12	12			19.4				26.8	52	61.7						21.8

\*Reference thread dimensions after being screwed in.

# Series 10-AS-FG

Speed Controller with One-touch Fittings  
Stainless Steel Specifications (Elbow/Universal)

## How to Order

10 - AS 2 3 1 1 F G - 01 06

Series clean

**Body size**

1	M5 standard
2	1/8, 1/4 standard
3	3/8 standard
4	1/2 standard

**Type**

2	Elbow
3	Universal

**Controlled method**

0	Meter-out
1	Meter-in

With One-touch fittings

Stainless steel specifications (SUS303)

**Thread type**

Nil	Metric thread (M5)
	R

**Option**

Nil	—
S	With sealant*

\*Sealant is not available with the M5 type.

**Applicable tubing O.D. Metric size**

23	ø3.2 *
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

\*ø1/8 tubing should be used.

**Port size**

M5	M5 X 0.8
01	1/8
02	1/4
03	3/8
04	1/2

Elbow type                      Universal type

## Model

Elbow type	Universal type	Port size	Applicable tubing O.D.					Applicable cylinder bore size (mm)	
			Metric size						
			3.2	4	6	8	10	12	
10-AS12□1FG-M5	10-AS13□1FG-M5	M5 X 0.8	●	●	●				6, 10, 16, 20
10-AS22□1FG-01	10-AS23□1FG-01	R1/8	●	●	●	●	●*		20, 25, 32
10-AS22□1FG-02	10-AS23□1FG-02	R1/4		●	●	●	●		20, 25, 32, 40
10-AS32□1FG-02	10-AS33□1FG-02	R1/4			●	●	●	●	40, 50, 63
10-AS32□1FG-03	10-AS33□1FG-03	R3/8			●	●	●	●	40, 50, 63
10-AS42□1FG-04	10-AS43□1FG-04	R1/2					●	●	63, 80, 100

Note 1) The meter-out and meter-in types can be visually determined by the flow direction symbol on the resin body.

Note 2) \*Elbow type only.

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.

**Specifications**

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (8 rotations <sup>Note 1)</sup> )
<b>Applicable tubing material</b> <sup>Note 2)</sup>	Nylon, Soft nylon, Polyurethane, Soft polyurethane

Note 1) In case of 10-AS12□1FG and 10-AS13□1FG

Note 2) Pay attention to the maximum operating pressure when soft nylon or Polyurethane is used.  
(For details, refer to pages 2.4-1 to 2.4-3 of Best Pneumatics ④.)

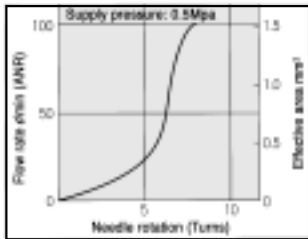
**Air Flow/Effective Area**

Model		10-AS12□1FG 10-AS13□1FG	10-AS22□1FG-□01 10-AS23□1FG-□01	10-AS22□1FG-□02 10-AS23□1FG-□02			10-AS32□1FG 10-AS33□1FG			10-AS42□1FG 10-AS43□1FG		
Tubing O.D.	Metric size	ø3.2 ø4 ø6	ø3.2 ø4 ø8 ø10	ø6	ø4	ø6 ø8 ø10	ø6	ø8 ø10	ø10 ø12	ø10	ø12	
	Flow rate /min (ANR)	100	180	230	260	390	460	660	790	920	1580	1710
Controlled (Free) flow	Effective area mm <sup>2</sup>	1.5	2.7	3.5	4	6	7	10	12	14	12	26

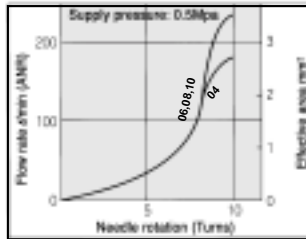
Note) Supply pressure: 0.5MPa, Temperature: 20°C.

**Needle Valve/Flow Characteristics**

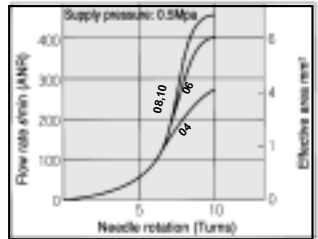
**10-AS12□1FG  
10-AS13□1FG**



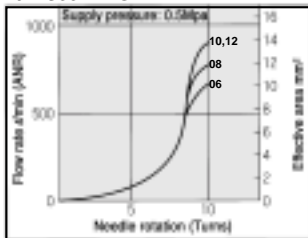
**10-AS22□1FG-□01  
10-AS23□1FG-□01**



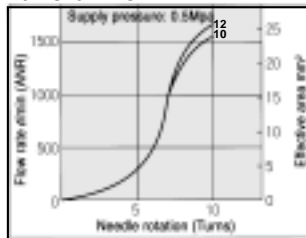
**10-AS22□1FG-□02  
10-AS23□1FG-□02**



**10-AS32□1FG  
10-AS33□1FG**



**10-AS42□1FG  
10-AS43□1FG**



Air Line Equipment

**Dimensions/Elbow Type**

**M5 type**

**Metric Size**

Model	d	T	H	D1	D2	L1	L2	L3	L4		A*		M1	Weight g
									MAX.	MIN.	MAX.	MIN.		
10-AS12□1FG-M5-23	3.2	M5 X 0.8	8	8.4	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
10-AS12□1FG-M5-04	4	M5 X 0.8	8	9.3	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
10-AS12□1FG-M5-06	6			11.6		18.1	22.9	11.7					13.5	
10-AS22□1FG-01-23	3.2	R1½8	12	9.3	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	12.7	16
10-AS22□1FG-01-04	4	R1½8	12	9.3	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	12.7	17
10-AS22□1FG-01-06	6			11.6		20.4	27.5						13.5	
10-AS22□1FG-01-08	8			15.2		25.3	32.4						18.5	
10-AS22□1FG-01-10	10			18.5		33.1	40.2						21	
10-AS22□1FG-02-04	4	R1½4	17	10.4	18.5	25.2	34.4	18.2	40.4	35.4	34.4	29.4	16	32
10-AS22□1FG-02-06	6			12.8		25.2	34.4						17	
10-AS22□1FG-02-08	8			15.2		27.2	36.4						18.5	
10-AS22□1FG-02-10	10			18.5		33.9	43.2						21	
10-AS32□1FG-02-06	6	R1½4	19	12.8	23	27.8	39.3	21.8	48.8	43.8	42.8	37.8	17	60
10-AS32□1FG-02-08	8			15.2		29.5	41						18.5	
10-AS32□1FG-02-10	10			18.5		31.8	43.3						21	
10-AS32□1FG-02-12	12			20.9		32.8	44.3						22	
10-AS32□1FG-03-06	6	R3½8	19	12.8	23	27.8	39.3	20.9	46.5	41.5	40.2	35.2	17	55
10-AS32□1FG-03-08	8			15.2		29.5	41						18.5	
10-AS32□1FG-03-10	10			18.5		31.8	43.3						21	
10-AS32□1FG-03-12	12			20.9		32.8	44.3						22	
10-AS42□1FG-04-10	10	R1½2	24	18.5	28.6	33.6	47.9	25.4	57.6	50.1	49.6	42.1	21	100
10-AS42□1FG-04-12	12			20.9		34.6	48.9						22	

\*Reference thread dimensions after being screwed in.

**Dimensions/Universal Type**

In case of M5 type

**Metric Size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		A*		M1	Weight g
											MAX.	MIN.	MAX.	MIN.		
10-AS13□1FG-M5-23	3.2	M5 X 0.8	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	28.6	25.8	25	22.2	12.7	7
10-AS13□1FG-M5-04	4			9.3				20.3								
10-AS13□1FG-M5-06	6			11.6				21.4								
10-AS23□1FG-01-23	3.2	R1/8	12	8.4	14.2	9.3	13.1	24.4	17.5	31.8	36.1	31.1	32.1	27.1	12.7	17
10-AS23□1FG-01-04	4			9.3				24.9								
10-AS23□1FG-01-06	6			11.6				26.9								
10-AS23□1FG-01-08	8	R1/4	17	15.2	18.5	12.9	16.2	30.9	28.2	41.7	40.4	35.4	34.4	29.4	18.5	21
10-AS23□1FG-02-04	4			10.4				30.6								
10-AS23□1FG-02-06	6			12.8				34								
10-AS23□1FG-02-08	8	R1/4	19	15.2	23	12.9	20.6	35.2	28.2	45.6	48.8	43.8	42.8	37.8	18.5	21
10-AS23□1FG-02-10	10			18.5				38.7								
10-AS33□1FG-02-06	6			12.8				38.5								
10-AS33□1FG-02-08	8	R1/4	19	15.2	23	12.9	20.6	39.7	28.2	50	46.5	43.8	42.8	37.8	18.5	21
10-AS33□1FG-02-10	10			18.5				43.7								
10-AS33□1FG-02-12	12			20.9				44.9								
10-AS33□1FG-03-06	6	R3/8	19	12.8	23	12.9	20.6	38.5	25.2	46.1	46.5	41.5	40	35	17	56
10-AS33□1FG-03-08	8			15.2				39.7								
10-AS33□1FG-03-10	10			18.5				43.7								
10-AS33□1FG-03-12	12	R1/2	24	20.9	28.6	16.2	25.8	44.9	34.4	55.3	57.6	50.1	49.6	42.1	21	104
10-AS43□1FG-04-10	10			18.5				49.4								
10-AS43□1FG-04-12	12			20.9				52								

\*Reference dimensions of M5 X 0.8, R thread after being screwed in.

# Series 10-AS-FG

Speed Controller with One-touch Fittings  
Stainless Steel Specifications (Inline Type)

## How to Order

**10** – AS **200** 1 F G – **06**

Clean series •

Body size •

100	M5 standard
200	1/8 standard
205	1/4 standard
300	3/8 standard
400	1/2 standard

With One-touch fittings •

Stainless steel specifications (SUS303) •

Applicable tubing O.D. Metric size •

23	ø3.2*
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

\*ø1/8 tubing should be used.



## Model

Model	Applicable tubing O.D.						Applicable cylinder bore size (mm)
	Metric size						
	3.2	4	6	8	10	12	
10-AS1001FG	●	●	●				6, 10, 16, 20
10-AS2001FG		●	●				20, 25, 32
10-AS2051FG			●	●			20, 25, 32, 40
10-AS3001FG			●	●	●	●	40, 50, 63
10-AS4001FG					●	●	63, 80, 100

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.



### Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (8 rotations <sup>Note 1)</sup> )
<b>Applicable tubing material</b> <sup>Note 2)</sup>	Nylon, Soft nylon, Polyurethane, Soft polyurethane

Note 1) In case of 10-AS1001FG type.

Note 2) Take precautions regarding the maximum operating pressure with soft nylon, polyurethane and soft polyurethane. (For details, refer to pages 2.4-1 to 2.4-3 of Best Pneumatics ④.)

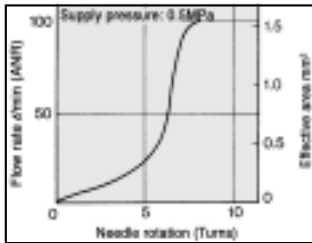
### Air Flow/Effective Area

Model		10-AS1001FG	10-AS2001FG		10-AS2051FG		10-AS3001FG			10-AS4001FG		
<b>Tubing O.D.</b>	Metric size	ø3.2 ø4 ø6	ø4	ø6	ø6	ø8	ø6	ø8	ø10 ø12	ø10	ø12	
	<b>Controlled (Free) flow</b>	Flow rate /min (ANR)	100	130	230	290	460	420	660	920	1050	1390
		Effective area mm <sup>2</sup>	1.5	2	3.5	4.5	7	6.5	10	14	16	21

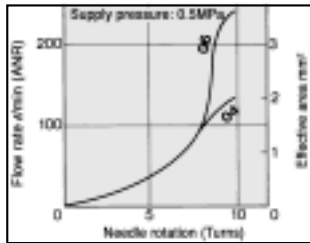
(Note) Supply pressure: 0.5MPa, Temperature: 20°C.

### Needle Valve/Flow Characteristics

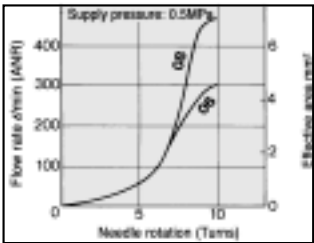
10-AS1001FG



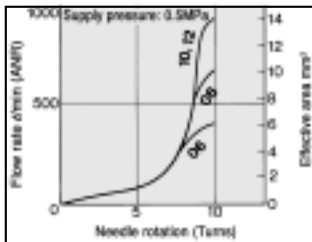
10-AS2001FG



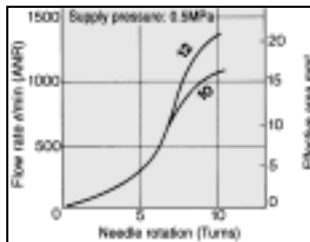
10-AS2051FG



10-AS3001FG



10-AS4001FG



**Dimensions**

---

**Metric Size**

Model	d	D1	D2	L1	L2	L3		M1	Weight g
						MAX.	MIN.		
10-AS1001FG-23	3.2	8.4	10	38	4.5	23.5	20.7	12.7	6
10-AS1001FG-04	4	9.3		39.2	5.2	24.2	21.4		7
10-AS1001FG-06	6	11.6		40.7	6.2	25.2	22.4	13.5	8
10-AS2001FG-04	4	9.3	11.8	40.7	5.2	32.6	27.6	12.7	12
10-AS2001FG-06	6	11.6	14.8	44.8	6.3	33.7	28.7	13.5	13
10-AS2051FG-06	6	12.8		53.2	6.7	35.2	30.2	17	26
10-AS2051FG-08	8	15.2	19.8	59.8	8.1	32.6	27.6	18	31
10-AS3001FG-06	6	12.8		59	7.4	38.3	33.3	17	18
10-AS3001FG-08	8	15.2		64.4	8.2	39.1	34.1	18	21
10-AS3001FG-10	10	18.5	26.5	71.6	9.8	40.6	35.6	21	32
10-AS3001FG-12	12	20.9		76	11	41.8	36.8	22	33
10-AS4001FG-10	10	18.5	26.5	82	11.3	51.1	43.6	21	36
10-AS4001FG-12	12	20.9				52.1	44.6	22	40



# Series 10-ASD Dual Speed Controller with One-touch Fittings

## How to Order

10 - ASD 3 30 F - 01 - 06 S K

Clean series

Body size

2	M5 standard
3	1/8 standard
4	1/4 standard
5	3/8 standard
6	1/2 standard

Type

3	Universal
---	-----------

With One-touch fittings

Thread type

Nil	R
-----	---

Option

Nil	None
K	Hexagon lock nut


With seal

Applicable tubing O.D. Metric size

04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

Port size

M5	M5 X 0.8
01	R1/8
02	R1/4
03	R3/8
04	R1/2



## Model

Part no.	Port size	Applicable tubing O.D.				
		Metric size				
		ø4	ø6	ø8	ø10	ø12
10-ASD230F-M5	M5 X 0.8	●	●			
10-ASD330F-01	R1/8		●	●		
10-ASD430F-02	R1/4		●	●	●	
10-ASD530F-02	R1/4		●	●	●	●
10-ASD530F-03	R3/8		●	●	●	●
10-ASD630F-04	R1/2				●	●

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.

### Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (8 rotations (Note1))
<b>Applicable tubing material (Note2)</b>	Nylon, Soft nylon, Polyurethane
<b>Option</b>	Hexagon lock nut

Note 1) In case of type 10-ASD230F.

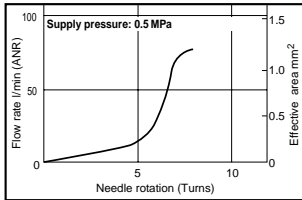
Note 2) Take precautions regarding the maximum operating pressure with soft nylon and polyurethane.

### Air Flow/Effective Area

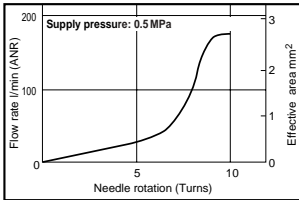
Model		10-ASD230F	10-ASD330F	10-ASD430F		10-ASD530F			10-ASD630F	
Tubing O.D.	Metric size	ø4,ø6	ø6,ø8	ø6	ø8,ø10	ø6	ø8	ø10,ø12	ø10	ø12
Controlled flow (Free)	Flow rate /min (ANR)	75	175	295	350	500	600	700	1200	1300
	Effective area mm <sup>2</sup>	1.1	2.7	4.5	5.3	7.6	9.1	10.7	18.3	19.8

### Needle Valve/Flow Characteristics

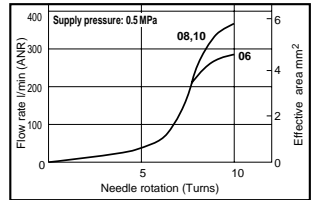
**10-ASD230F**



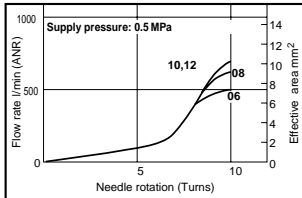
**10-ASD330F**



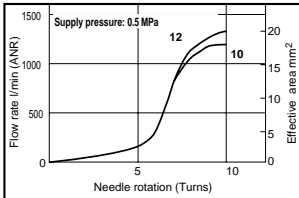
**10-ASD430F**



**10-ASD530F**



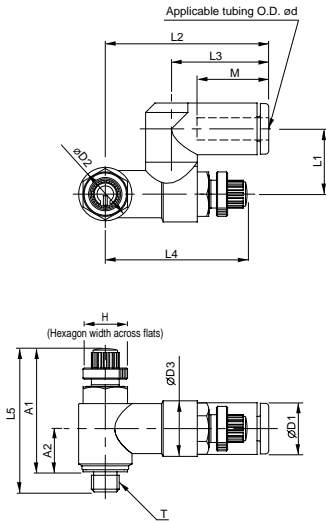
**10-ASD630F**



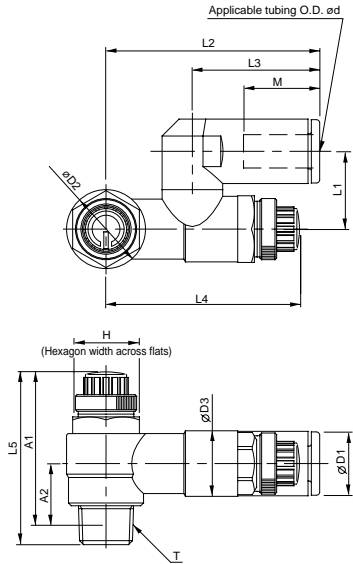
Air Line Equipment

**Dimensions**

**10-ASD230F**



**10-ASD330F-430F**  
**10-ASD530F-630F**



**Metric size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4		L5		*A1		*A2	M	Weight g
										MAX.	MIN.	MAX.	MIN.	MAX.	MIN.			
10-ASD230F-M5-04	4	M5 X 0.8	8	9.3	9.6	10	11.7	29.4	17.5	28.3	25.5	28.6	25.8	25	22.2	7.8	12.9	12
10-ASD230F-M5-06	6			11.6				32.5	20.6								13.7	13
10-ASD330F-01-06S	6	R1/8	12	11.6	14.2	11.8	14	38.5	22.9	39.6	34.6	36.1	31.1	32.1	27.1	10.6	13.7	29
10-ASD330F-01-08S	8			15.2			44.8	28.2	38.9								33.9	18.5
10-ASD430F-02-06S	6	R1/4	17	12.8	18.5	15	18	43.5	25.2	41.7	36.7	40.4	35.4	34.4	29.4	11	17	53
10-ASD430F-02-08S	8			15.2			46.5	28.2	18.5								55	58
10-ASD430F-02-10S	10			18.5			19.7	49.3	31								21	58
10-ASD530F-02-06S	6	R1/4	19	12.8	23	19.8	20.3	48.3	25.2	46.9	41.9	48.8	43.8	42.8	37.8	15.4	17	74
10-ASD530F-02-08S	8			15.2			51.3	28.2	18.5								76	
10-ASD530F-02-10S	10			18.5			23.1	54.1	32.6								21	80
10-ASD530F-02-12S	12			20.9				55.9	34.4								22	83
10-ASD530F-03-06S	6	R3/8	19	12.8	23	19.8	20.3	48.3	25.2	46.9	41.9	46.5	41.5	40	35	14	17	74
10-ASD530F-03-08S	8			15.2			51.3	28.2	18.5								93	
10-ASD530F-03-10S	10			18.5			23.1	54.1	32.6								21	98
10-ASD530F-03-12S	12			20.9				55.9	34.4								22	101
10-ASD630F-04-10S	10	R1/2	24	18.5	28.6	26.5	25.9	64.3	32.6	64.8	57.3	57.6	50.1	49.6	42.1	18.6	21	177
10-ASD630F-04-12S	12			20.9			66.1	34.4	22								179	

\*Reference dimensions of M5 X 0.8, R thread after being screwed in.



# Series 10-AS-FM

Speed Controller for Low Speed Operation  
with One-touch Fittings (Resin Body)

## How to Order

10 - AS 2 2 1 1 F M - 01 - 06

Clean series

**Body size**

1	M5 standard
2	1/8, 1/4 standard

**Type**

2	Elbow
3	Universal

**Controlled method**

0	Meter-out
1	Meter-in

With One-touch fittings

For low speed operation

**Thread type**

Nil	Metric thread (M5)
	R

**Option**

Nil	—
S	With seal

\* Sealant is not available with the M5 type.


**Applicable tubing O.D. Metric size**

23	ø3.2*
04	ø4
06	ø6
08	ø8
10	ø10

\*ø1/8 tube should be used.

**Port size**

M5	M5 X 0.8
01	1/8
02	1/4



## Model

Elbow type	Universal type	Port size	Applicable tubing O.D.				
			Metric size				
			3.2	4	6	8	10
10-AS12□1FM-M5	10-AS13□1FM-M5	M5 X 0.8	●	●	●		
10-AS22□1FM-01	10-AS23□1FM-01	R1/8	●	●	●	●	
10-AS22□1FM-02	10-AS23□1FM-02	R1/4		●	●	●	●

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for drive control equipment.



### Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1.0MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (8 rotations <small>Note 1)</small> )
<b>Applicable tubing material</b> <small>Note 2)</small>	Nylon, Soft nylon, Polyurethane, Soft polyurethane
<b>Option</b> <small>Note 3)</small>	With sealant

Note 1) In case of 10-AS12□1FM and 10-AS13□1FM types.

Note 2) Take precautions regarding the maximum operating pressure with soft nylon, polyurethane and soft polyurethane. (For details, refer to pages 2.4-1 to 2.4-3 of Best Pneumatics ④.)

Note 3) Sealant is not available in case of types with M5 port.

Note 4) Brass parts are all electroless nickel plated.

The knob of the M5 type and the lock nut of the meter-in type are black zinc chromated.

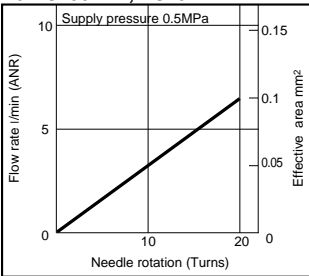
### Air Flow/Effective Area

Model		10-AS12□1FM 10-AS13□1FM	10-AS22□1FM-□01 10-AS23□1FM-□01		10-AS22□1FM-□02 10-AS23□1FM-□02		
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø3.2, ø4	ø6, ø8	ø4	ø6	ø8, ø10
Controlled flow	Flow rate /min (ANR)	7	12		38		
	Effective area mm <sup>2</sup>	0.1	0.2		0.6		
Free flow	Flow rate /min (ANR)	100	180	230	260	390	460
	Effective area mm <sup>2</sup>	1.5	2.7	3.5	4	6	7

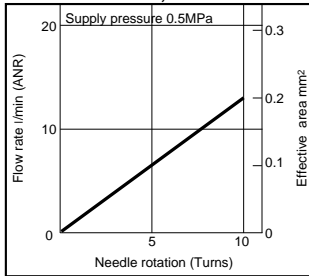
Note) Supply pressure: 0.5MPa, Temperature: 20°C.

### Needle Valve/Flow Characteristics

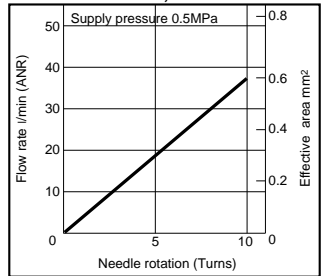
**10-AS1201FM, AS1211FM**  
**10-AS1301FM, AS1311FM**



**10-AS2201FM-□01, AS2211FM-□01**  
**10-AS2301FM-□01, AS2311FM-□01**

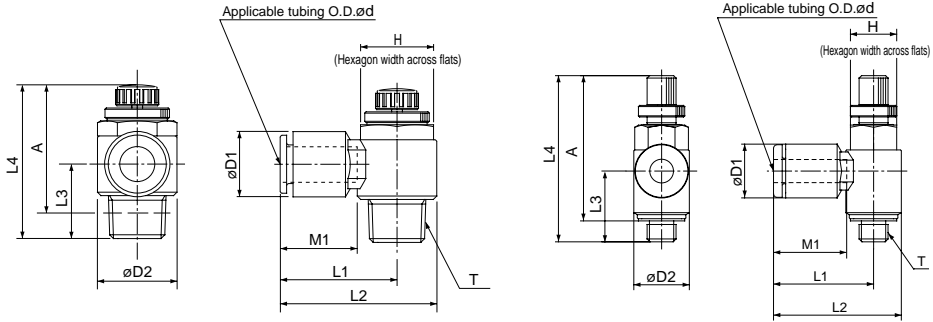


**10-AS2201FM-□02, AS2211FM-□02**  
**10-AS2301FM-□02, AS2311FM-□02**



**Dimensions/Elbow Type**

**M5 type**



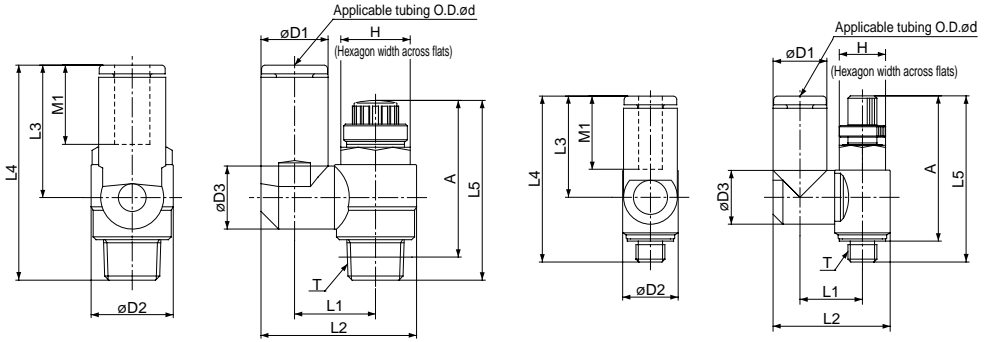
**Metric size**

Model	d	T	H	D1	D2	L1	L2	L3	L4		*A		M1	Weight g
									MAX.	MIN.	MAX.	MIN.		
10-AS12□1FM-M5-23	3.2			8.4		17.3	22.1	12.3					12.7	7
10-AS12□1FM-M5-04	4	M5 X 0.8	8	9.3	9.6	17.3	22.1		33.8	28.8	30.1	25.1	13.5	
10-AS12□1FM-M5-06	6			11.6		18.1	22.9	11.7					12.7	
10-AS22□1FM-01-23	3.2			9.3		20.4	27.5						13.5	17
10-AS22□1FM-01-04	4	R1/8	12	9.3	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	17	
10-AS22□1FM-01-06	6			11.6		20.4	27.5						18.5	
10-AS22□1FM-01-08	8			15.2		25.3	32.4						16	32
10-AS22□1FM-02-04	4			10.4		25.2	34.4						17	
10-AS22□1FM-02-06	6			12.8		25.2	34.4	18.2	40.4	35.4	34.4	29.4	18.5	
10-AS22□1FM-02-08	8	R1/4	17	15.2	18.5	27.2	36.4						21.0	36
10-AS22□1FM-02-10	10			18.5		33.9	43.2	20.0					21.0	

\*Reference dimensions of M5, R thread after being screwed in.

**Dimensions/Universal Type**

**M5 type**



**Metric size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		≠A		M1	Weight g		
											MAX.	MIN.	MAX.	MIN.				
10-AS13□1FM-M5-23	3.2	M5 X 0.8	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	33.8	28.8	30.1	25.1	12.7	8		
10-AS13□1FM-M5-04	4			9.3				20.3										
10-AS13□1FM-M5-06	6			11.6				21.4									20.6	31.8
10-AS23□1FM-01-23	3.2	R1/8	14.2	8.4	14.2	9.3	13.1	24.4	17.5	31.8	36.1	31.1	32.1	27.1	12.7	17		
10-AS23□1FM-01-04	4			9.3				24.9										
10-AS23□1FM-01-06	6			11.6				26.9									22.9	37.2
10-AS23□1FM-01-08	8	15.2	12.9	16.2	30.9	28.2	41.7								13.5	18		
10-AS23□1FM-02-04	4	R1/4	18.5	10.4	18.5	12.9	18.4	34	25.2	42.6	40.4	35.4	34.4	29.4	17	33		
10-AS23□1FM-02-06	6			10.9				30.6									21.9	40.1
10-AS23□1FM-02-08	8			12.9				18.3									35.2	28.2
10-AS23□1FM-02-10	10			20.2	38.7	31	48.4								18.5	21	40	

\*Reference dimensions of M5, R thread after being screwed in.

# Series 10-ASD-FM Dual Speed Controller for Low Speed Operation

## How to Order

10 – ASD 3 3 0 F M – 01 06 S

Clean series

**Body size**

2	M5 standard
3	1/8 standard
4	1/4 standard

**Type**

3	Universal
---	-----------

With One-touch fittings

For low speed operation

**Thread type**

Nil	Metric thread (M5)
	R

**Port size**


M5	M5 X 0.8
01	1/8
02	1/4

**With sealant**

\* S is not necessary in case of M5 types, which are not provided with sealant.

**Applicable tubing O.D. Metric size**

04	ø4
06	ø6
08	ø8
10	ø10



## Model

Model	Applicable tubing			
	Metric size			
	4	6	8	10
10-ASD230FM-M5	●	●		
10-ASD330FM-01		●	●	
10-ASD430FM-02		●	●	●

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.

### Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (20 rotations <sup>Note 1)</sup> )
<b>Applicable tubing material</b> <sup>Note 2)</sup>	Nylon, Soft nylon, Polyurethane, Soft polyurethane

Note 1) In case of type 10-ASD230FM.

Note 2) Take precautions regarding the maximum operating pressure with soft nylon, polyurethane and soft polyurethane. (For details, refer to pages 2.4-1 to 2.4-3 of Best Pneumatics (3.))

Note 3) Brass parts are all electroless nickel plated.

The knob of the M5 type and the lock nut of the meter-in type are black zinc chromated.

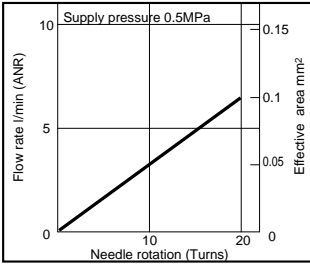
### Air Flow/Effective Area

Model		ASD230FM	ASD330FM	ASD430FM	
Tubing O.D.	Metric size	ø4, ø6	ø6, ø8	ø6	ø8, ø10
	Flow rate /min (ANR)	7	12	38	
Controlled flow	Effective area mm <sup>2</sup>	0.1	0.2	0.6	
	Flow rate /min (ANR)	75	175	295	350
Free flow	Effective area mm <sup>2</sup>	1.1	2.7	4.5	5.3

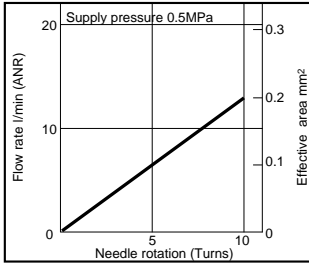
Note 1) Supply pressure: 0.5MPa, Temperature: 20°C

### Needle Valve/Flow Characteristics

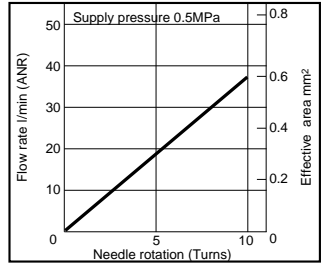
**10-ASD230FM**



**10-ASD330FM**

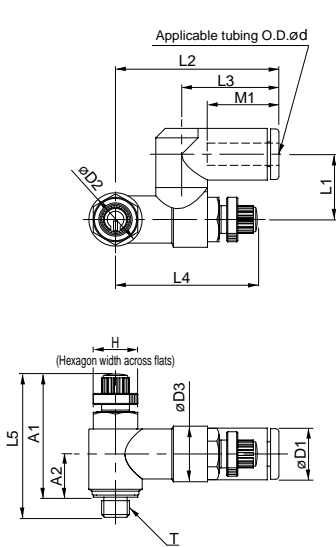


**10-ASD430FM**

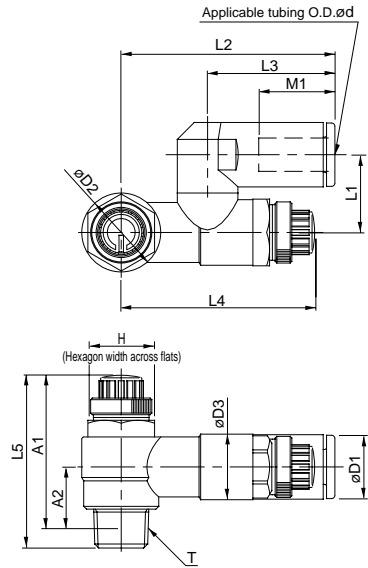


**Dimensions**

**10-ASD230FM**



**10-ASD330FM-430FM**



**Metric size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4		L5		*A1		*A2	M1	Weight g
										MAX.	MIN.	MAX.	MIN.	MAX.	MIN.			
10-ASD230FM-M5-04	4	M5 X 0.8	8	9.3	9.6	10	11.7	29.4	17.5	34.6	29.6	33.8	28.8	30.1	25.1	7.8	12.9	12
10-ASD230FM-M5-06	6			11.6				32.5	20.6								13.7	13
10-ASD330FM-01-06S	6	R1/8	12	11.6	14.2	11.8	14	38.5	22.9	39.6	34.6	36.1	31.1	32.1	27.1	10.6	13.7	29
10-ASD330FM-01-08S	8			15.2				44.8	28.2								38.9	33.9
10-ASD430FM-02-06S	6	R1/4	17	12.8	18.5	15	18	43.5	25.2	41.8	36.8	40.4	35.4	34.4	29.4	11	17	53
10-ASD430FM-02-08S	8			15.2				46.5	28.2								18.5	55
10-ASD430FM-02-10S	10			18.5				49.3	31								21	58

\*Reference dimensions of M5 X 0.8, R thread after being screwed in.



# Series 10-ASD-FG

Dual Speed Controller with One-touch Fittings  
Stainless Steel Series

## How to Order

10 – ASD 3 3 0 F G – 01 06 S

Clean series

**Body size**

2	M5 standard
3	1/8 standard
4	1/4 standard
5	3/8 standard
6	1/2 standard

**Type**

3	Universal
---	-----------

With One-touch fittings

Stainless steel specifications (SUS303)

**Thread type**

Nil	Metric thread (M5)
	R


**With sealant**  
\* Sealant is not available with the M5 type.

**Applicable tubing O.D. Metric size**

04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

**Port size**

M5	M5 X 0.8
01	1/8
02	1/4
03	3/8
04	1/2



## Model

Model	Port size	Applicable tubing O.D.				
		Metric size				
		4	6	8	10	12
10-ASD230FG-M5	M5 X 0.8	●	●			
10-ASD330FG-01	R1/8		●	●		
10-ASD430FG-02	R1/4		●	●	●	
10-ASD530FG-02	R1/4		●	●	●	●
10-ASD530FG-03	R3/8		●	●	●	●
10-ASD630FG-04	R1/2				●	●

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.



## Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1MPa
<b>Min. operating pressure</b>	0.1MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Number of needle rotations</b>	10 rotations (8 rotations <sup>Note 1)</sup> )
<b>Applicable tubing material</b> <sup>Note 2)</sup>	Nylon, Soft nylon, Polyurethane, Soft polyurethane

Note 1 ) In case of type 10-ASD230FG.

Note 2 ) Take precautions regarding the maximum operating pressure with soft nylon, polyurethane and soft polyurethane.  
(For details, refer to pages 2.4-1 to 2.4-3 of Best Pneumatics ③.)

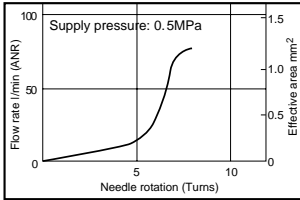
## Air Flow/Effective Area

Model		10-ASD230FG	10-ASD330FG	10-ASD430FG	10-ASD530FG		10-ASD630FG			
Tubing O.D.	Metric size	ø4, ø6	ø6, ø8	ø6	ø8, ø10	ø6	ø8 ø10, ø12	ø10	ø12	
	Controlled flow (Free)	Flow rate /min (ANR)	75	175	295	350	500	600	700	1200
Effective area mm <sup>2</sup>		1.1	2.7	4.5	5.3	7.6	9.1	10.7	18.3	19.8

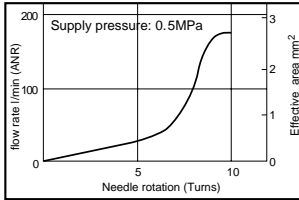
Note 1) Supply pressure: 0.5MPa. Temperature: 20°C.

## Needle Valve/Flow Characteristics

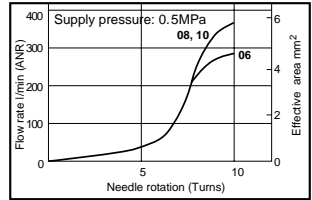
**10-ASD230FG**



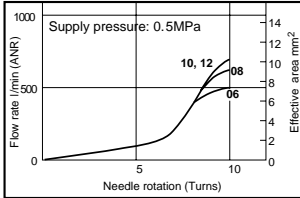
**10-ASD330FG**



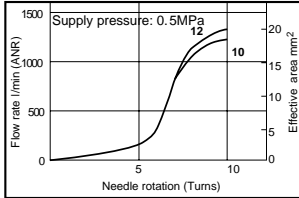
**10-ASD430FG**



**10-ASD530FG**

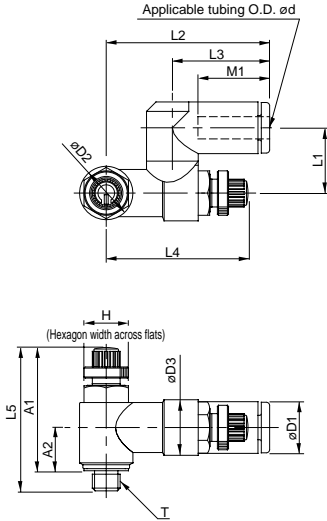


**10-ASD630FG**

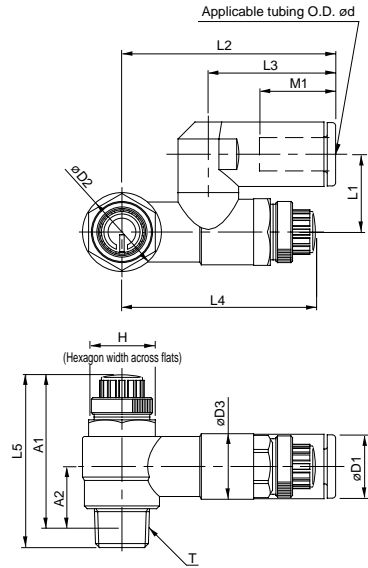


**Dimensions**

**10-ASD230FG**



**10-ASD330FG-430FG  
10-ASD530FG-630FG**



**Metric size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4		L5		*A1		*A2	M1
										MAX.	MIN.	MAX.	MIN.	MAX.	MIN.		
10-ASD230FG-M5-04	4	M5 X 0.8	8	9.3	9.6	10	11.7	29.4	17.5	28.3	25.5	28.6	25.8	25	22.2	7.8	12.9
10-ASD230FG-M5-06	6			11.6				32.5	20.6								13.7
10-ASD330FG-01-06S	6			11.6				38.5	22.9								13.7
10-ASD330FG-01-08S	8	R1/8	12	15.2	14.2	11.8	14	44.8	28.2	39.6	34.6	36.1	31.1	32.1	27.1	10.6	18.5
10-ASD430FG-02-06S	6			12.8				43.5	25.2								17
10-ASD430FG-02-08S	8			15.2				46.5	28.2								18.5
10-ASD430FG-02-10S	10	R1/4	17	18.5	18.5	15	18	49.3	31	41.7	36.7	40.4	35.4	34.4	29.4	11	21
10-ASD530FG-02-06S	6			12.8				48.3	25.2								17
10-ASD530FG-02-08S	8			15.2				51.3	28.2								18.5
10-ASD530FG-02-10S	10	R1/4	19	18.5	23	19.8	20.3	54.1	32.6	46.9	41.9	48.8	43.8	42.8	37.8	15.4	21
10-ASD530FG-02-12S	12			20.9				55.9	34.4								22
10-ASD530FG-03-06S	6			12.8				48.3	25.2								17
10-ASD530FG-03-08S	8	R3/8	19	15.2	23	19.8	20.3	51.3	28.2	46.9	41.9	48.8	43.8	40	35	14	18.5
10-ASD530FG-03-10S	10			18.5				54.1	32.6								21
10-ASD530FG-03-12S	12			20.9				55.9	34.4								22
10-ASD630FG-04-10S	10	R1/2	24	18.5	28.6	26.5	25.9	64.3	32.6	64.8	57.3	57.6	50.1	49.6	42.1	18.6	21
10-ASD630FG-04-12S	12			20.9				66.1	34.4								22

\*Reference dimensions of M5 X 0.8, R thread after being screwed in.

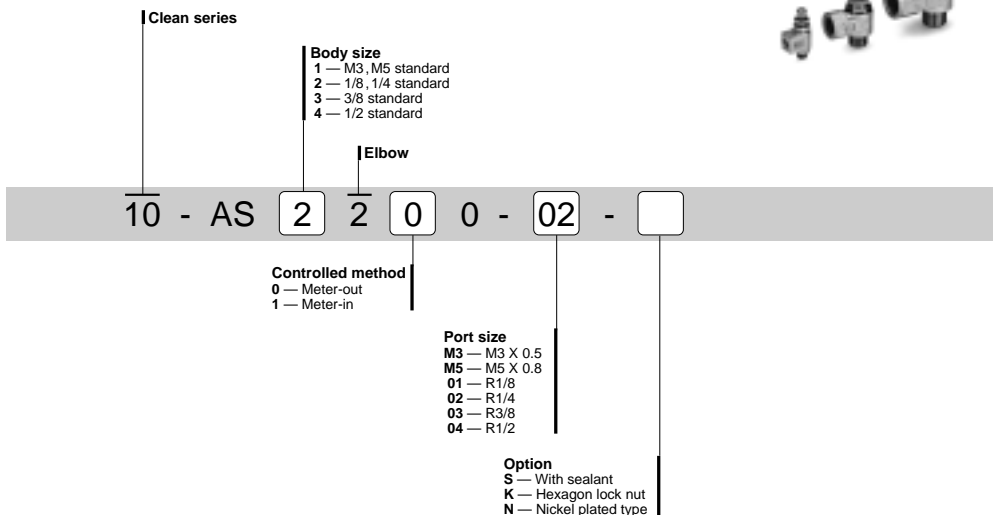


# Series 10-AS Speed Controller

## Cylinder Direct Mount Type Metal Elbow Type

AS1200, 2200, 3200, 4200

### How to Order



### Specifications

Model	10-AS1200-M3	10-AS12□0-M5	10-AS22□0-01	10-AS22□0-02	10-AS32□0-03	10-AS42□0-04	
Port size	M3 X 0.5	M5 X 0.8	R1/8	R1/4	R3/8	R1/2	
Applicable cylinder bore size (mm)	2.5, 4, 6	6, 10, 15, 20, 25	20, 25, 32, 40		32, 40, 50, 63	80, 100	
Proof pressure	1.05MPa		1.5MPa				
Max. operating pressure	0.7MPa		1MPa				
Min. operating pressure	0.1MPa		0.1MPa				
Ambient and fluid temperature	-5 to 60°C (No freezing)						
Number of needle rotations	10 rotations	8 rotations	10 rotations				
Option	Hexagon lock nut		With sealant, Hexagon lock nut, Nickel plated				
Weight g	3	10	29	64	106	181	
Controlled flow (Free flow)	Flow rate /min (ANR)	20	105	230	460	920	1700
	Effective area mm <sup>2</sup>	0.3	1.6	3.5	7	14	26

Note 1) Supply pressure: 0.5MPa, Temperature: 20°C.

Note 2) A meter-in type is not available with AS1200-M3.

Note 3) Visual distinction between meter-out and meter-in types

The meter-out and meter-in types can be visually determined by the lock nut.

The lock nut of the meter-out type is electroless nickel plated while that of the meter-in type is black zinc chromate plated.

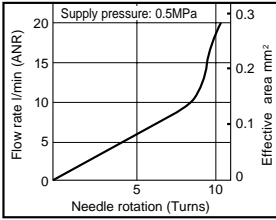
Note 4) The standard AS12□0 and AS22□0 types are nickel plated.

### ⚠ Caution

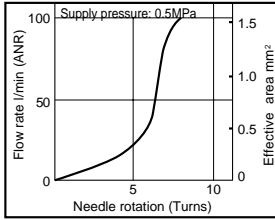
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.

**Needle Valve/Flow Characteristics**

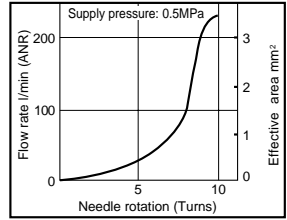
**10-AS1200-M3**



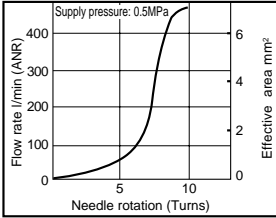
**10-AS12□0-M5**



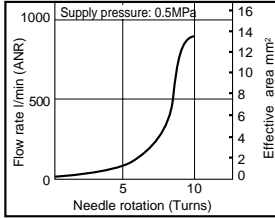
**10-AS22□0-01**



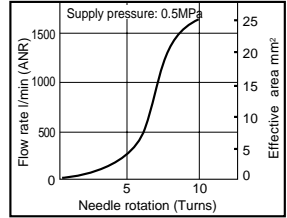
**10-AS22□0-02**



**10-AS32□0**



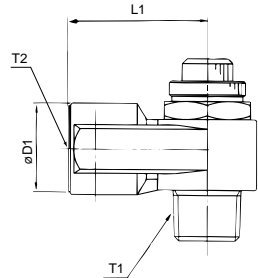
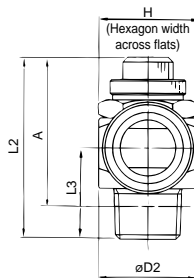
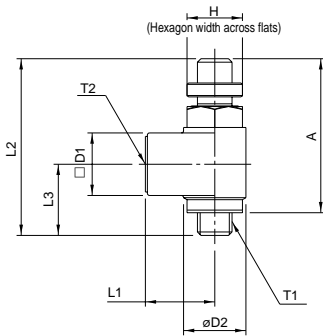
**10-AS42□0**



**Dimensions**

10-AS1200-M3  
10-AS12□0-M5

10-AS2200/3200/4200




**Dimensions**

Model	T1	T2	H	L1	L2		L3	D1	D2	A	
					MAX.	MIN.				MAX.	MIN.
10-AS1200-M3	M3 X 0.5	M3 X 0.5	4.5	6.6	23.5	21.5	8	5	5	20.5	18.5
10-AS12□0-M5	M5 X 0.8	M5 X 0.8	8	10	28.3	25.5	10.3	9	9	25	22.2
10-AS22□0-01	R1/8	Rc1/8	12	18	36.4	31.4	14.1	14.3	14.6	32.4	27.4
10-AS22□0-02	R1/4	Rc1/4	17	27.2	40.8	35.8	18	18	19.5	34.8	29.8
10-AS32□0-03	R3/8	Rc3/8	19	30	46.9	41.9	20.8	22.5	24.3	40.6	35.6
10-AS42□0-04	R1/2	Rc1/2	24	38.5	55.6	50.6	26.7	27.5	28.5	47.4	42.4

# Series 10-AS

Speed Controller/Inline Type  
AS1000,2000,3000,4000,5000

## How to Order



**Clean series**

**Body size**  
 1 — M3, M5 standard  
 2 — 1/8, 1/4 standard  
 3 — 3/8 standard  
 4 — 1/2 standard  
 5 — 1/2 standard

**Inline type**

10 - AS 1 000 - M5

**Port size**  
 M3 — M3 X 0.5  
 M5 — M5 X 0.8  
 01 — Rc1/8  
 02 — Rc1/4  
 03 — Rc3/8  
 04 — Rc1/2

## Model/Flow Rate,Effective Area

Model	Port size	Free flow		Controlled flow		Applicable cylinder bore size (mm)
		Flow rate /min (ANR)	Effective area mm <sup>2</sup>	Flow rate /min (ANR)	Effective area mm <sup>2</sup>	
10-AS1000-M3	M3 X 0.5	20	0.3	20	0.3	2.5, 4, 6
10-AS1000-M5	M5 X 0.8	90	1.4	80	1.2	6, 10, 15, 20, 25
10-AS2000-01	Rc1/8	340	5.2	250	3.8	20, 25, 30, 40
10-AS2000-02	Rc1/4	340	5.2	250	3.8	
10-AS3000-02	Rc1/4	810	12.3	810	12.3	30, 40, 50, 63
10-AS3000-03	Rc3/8	810	12.3	810	12.3	
10-AS4000-02	Rc1/4	1670	25.5	1670	25.5	40, 50, 63, 80, 100
10-AS4000-03	Rc3/8	1670	25.5	1670	25.5	
10-AS4000-04	Rc1/2	1670	25.5	1670	25.5	
10-AS5000-02	Rc1/4	2840	44	2840	44	40, 50, 63, 80, 100
10-AS5000-03	Rc3/8	4270	66	4270	66	
10-AS5000-04	Rc1/2	4270	66	4270	66	

Note) Supply pressure: 0.5MPa, Temperature: 20°C.

## Specifications

Proof pressure <sup>Note)</sup>	1.5MPa (1.05MPa)
Operating pressure range <sup>Note)</sup>	0.05 to 1.0MPa (0.1 to 0.7MPa)
Ambient and fluid temperature	-5 to 60°C (No freezing)
Number of needle rotations <sup>Note)</sup>	8 rotations (10 rotations)

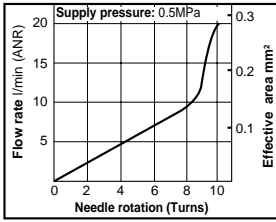
Note) Descriptions in parentheses are for 10-AS1000

## ⚠ Caution

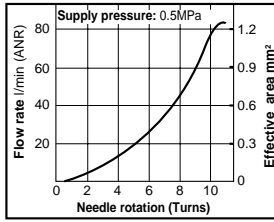
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for flow control equipment.

**Needle Valve/Flow Characteristics**

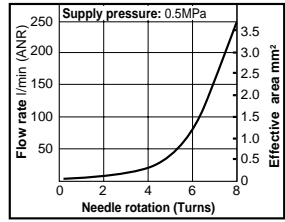
**10-AS1000-M3**



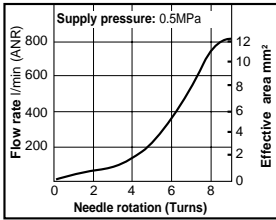
**10-AS1000-M5**



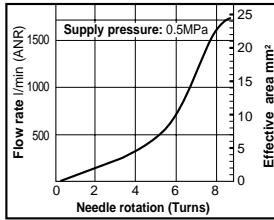
**10-AS2000**



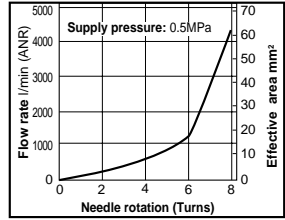
**10-AS3000**



**10-AS4000**



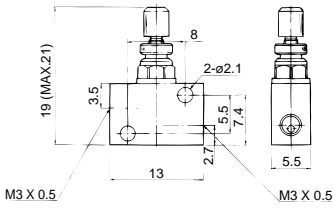
**10-AS5000**



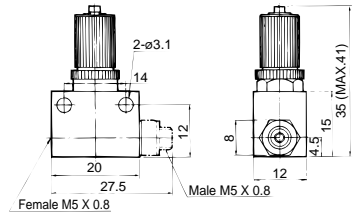
Air Line Equipment

**Dimensions**

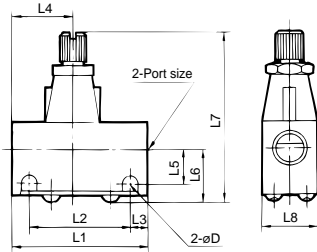
**10-AS1000-M3**



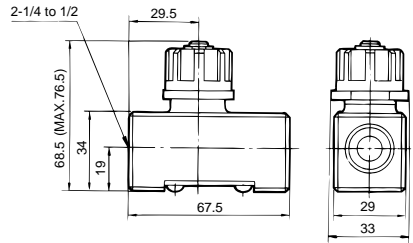
**10-AS1000-M5**



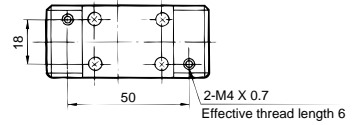
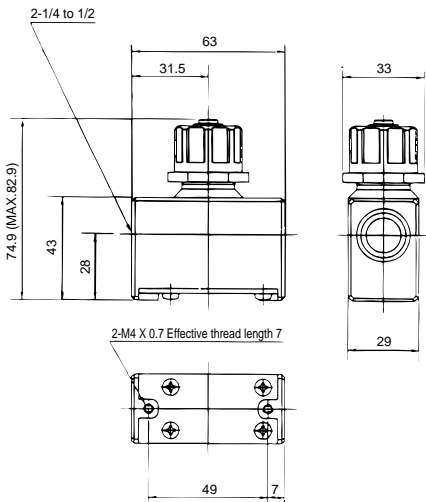
**10-AS2000/3000**



**10-AS4000**



**10-AS5000**



**Dimensions**

Model	Port size	L1	L2	L3	L4	L5	L6	L7		L8	D
								MAX.	MIN.		
10-AS2000-01	Rc1/8	40	30	5	17	10	15.5	54.5	50	16	4.5
10-AS2000-02	Rc1/4	40	30	5	23	11.5	17	56	51.5	20	4.5
10-AS3000-02,03	Rc1/4, 3/8	56	45.5	25	25	13.2	20.6	68	61	26	5.5







# Air Filter, Regulator/Common Precautions

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Precautions on Design

### Warning

- Standard resin bowl of air filter and filter regulator.**  
Because the product uses polycarbonate as the material, it cannot be used in an atmosphere with synthetic oil, organic solvents, chemicals, cutting lubricants or thread lock solutions, etc. or in an environment where such liquids may adhere to the product.
- Regulator and filter regulator**  
Be sure to provide a safety mechanism if an output pressure exceeding the set pressure value of the regulator or filter regulator is expected to cause damage or malfunction.

### Caution

- Air filter and filter regulator**  
Select an optimum model according to the required cleanliness

## Selection

### Warning

- The residual secondary pressure cannot be released with a regulator after the primary pressure is released.**  
Consult SMC to release the residual pressure.
- If a regulator or filter regulator is used in a secondary sealed circuit or in a balanced circuit:**  
Consult SMC because the product cannot be used in some cases.
- Set the secondary pressure of regulator within 85% of the supply pressure.**  
A large pressure drop may result.

## Mounting

### Caution

- To set a right pressure**
  - Pressure setting of the regulator or filter regulator should be achieved by increasing the pressure. Lock the handle after having achieved the set pressure.
  - Before connecting, confirm the ">" symbol indicating an inlet of air. A reverse connection may result in malfunction.
  - Mount the case of the air filter and filter regulator in the downward direction. It can cause malfunction of the drain exhaust.
  - Set the regulator and filter regulator while confirming the pressure indication on the primary and secondary pressure gauges. If the handle is rotated more than necessary, it may damage the internal parts.
- Regarding drain piping**
  - The drain guide case of a filter or filter regulator is not provided with a valve function to exhaust drainage. Install valves onto the drain guide before supplying air to discharge air and drainage.
  - When piping the drain guide case of the filter or filter regulator, first secure the drain guide with a wrench. Failure to secure the drain guide may result in case damage.

## Air Supply

### Caution

- When a lot of draining is expected**
  - Install air dryer and water separator before the air filter or filter regulator.



# Air Filter, Regulator/Common Precautions<sup>TM</sup>

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Maintenance

### Warning

- 1 **Inspect air filter and filter regulator periodically to find out degradation such as cracking, scratches, etc.**

If any deterioration phenomena such as cracks, scratches, etc. are observed, replace the bowl with a new one or a metal case. Otherwise, damage may result.

- 2 **Inspect air filter and filter regulator periodically to confirm dust on the standard resin bowl.**

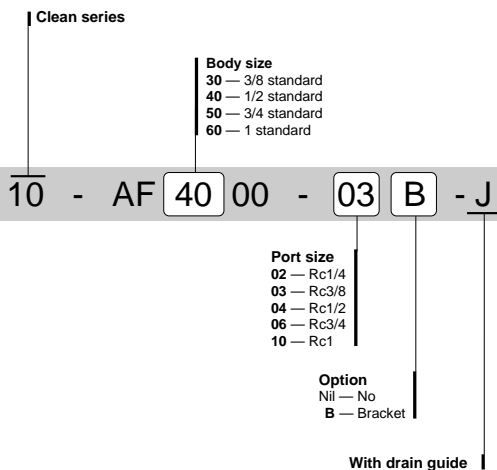
- If any dirt is observed, replace the bowl with a new one.
- When washing the product, only use household neutral detergent to prevent damage.

- 3 **Exhaust drains of the air filter and filter regulator so that accumulation will not exceed the upper limit.**

If the drain flows into the secondary side, malfunction may result.

# Series 10-AF Air Filter

## How to Order



## Model

Model	Port size Rc	Flow rate //min	Drain storage cm <sup>3</sup>	Filtration μm	Remark
10-AF3000-02-J	1/4	1100	23	5 (Standard)	With drain guide Rc1/4
10-AF3000-03-J	3/8	2100			
10-AF4000-02-J	1/4	1200	45		
10-AF4000-03-J	3/8	2600			
10-AF4000-04-J	1/2	4200			
10-AF4000-06-J	3/4	5000			
10-AF5000-06-J	3/4	5600			
10-AF5000-10-J	1	7500			
10-AF6000-10-J	1	7600			

\* At a primary side pressure of 0.5 MPa with a pressure drop of 0.05MPa

## Specifications

Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Fluid	Air
Ambient and fluid temperature	-5 to 60°C (No freezing)
Option	Bracket

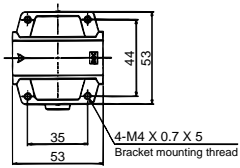
Note) Use the factory mounted bracket.

## ⚠ Caution

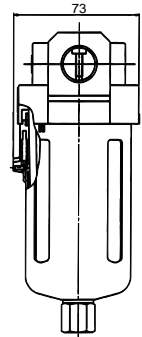
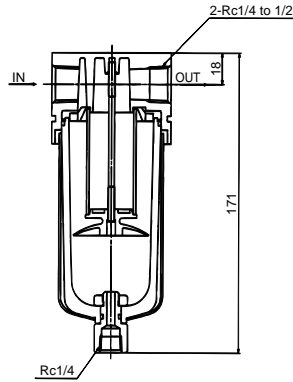
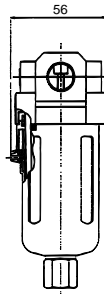
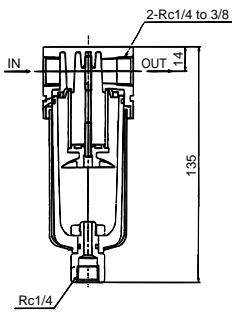
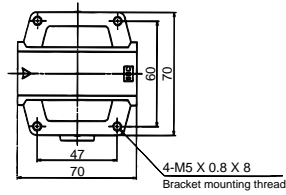
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 432 and 433 for common precautions for air line equipment.

**Dimensions**

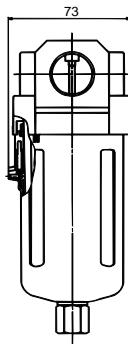
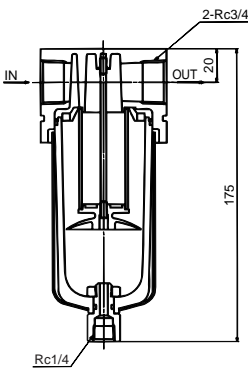
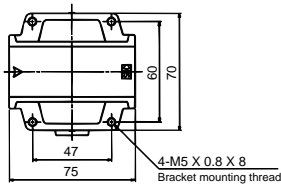
**10-AF3000-02 to 03-J**



**10-AF4000-02 to 04-J**



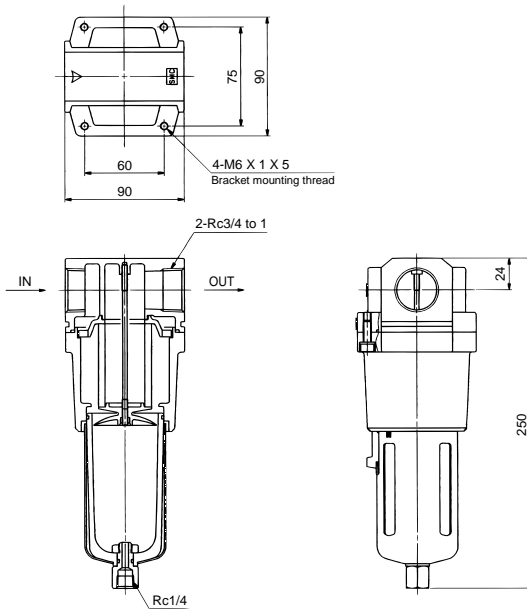
**10-AF4000-06-J**



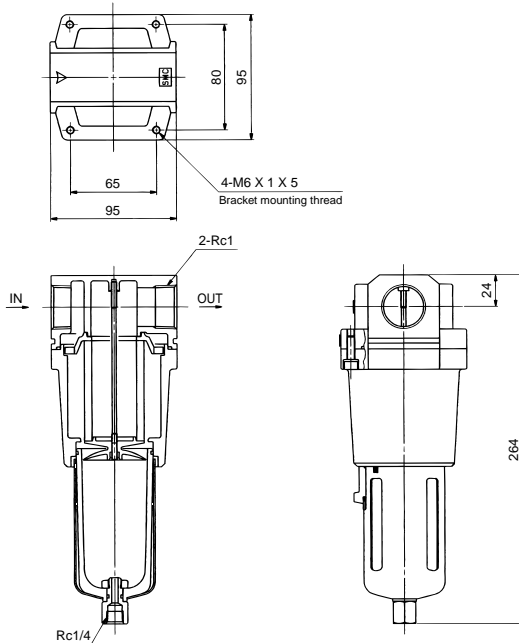
Air Line Equipment

**Dimensions**

**10-AF5000-06 to 10-J**



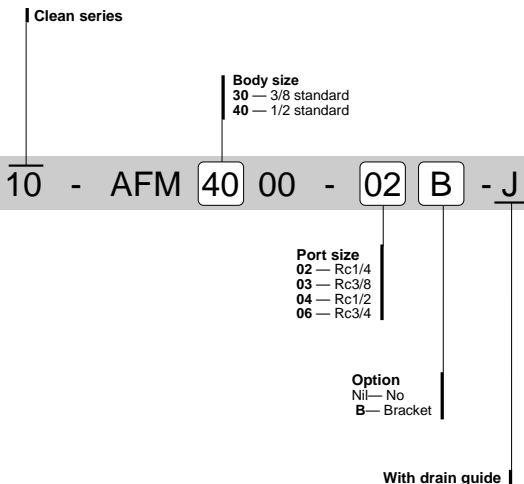
**10-AF6000-10-J**





# Series 10-AFM Mist Separator

## How to Order



## Model

Model	Port size Rc	(Note) Flow rate /min (ANR)	Drain storage cm <sup>3</sup>	Filtration μm	Remark
10-AFM3000-02	1/4	450	23	0.3 (95% particle size collection)	With drain guide Rc1/4
10-AFM3000-03	3/8				
10-AFM4000-02	1/4	1100	45		
10-AFM4000-03	3/8				
10-AFM4000-04	1/2				
10-AFM4000-06	3/4				

(Note) At a primary side pressure of 0.7 MPa. The rated flow rate will vary with the primary side pressure.

## Specifications

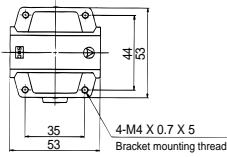
Model	AFM3000	AFM4000	AFM4000-06
Port size	1/4, 3/8	1/4, 3/8, 1/2	3/4
Fluid	Air		
Proof pressure	1.5MPa		
Max. operating pressure	1.0MPa		
Min. operating pressure	0.05MPa		
Ambient and fluid temperature	-5 to 60°C (No freezing)		
Oil mist density on secondary side	Max. 1.0mg/m <sup>3</sup> (ANR) (≒0.8ppm) <sup>Note)</sup>		
Element life	2 years or when the pressure drop reaches 0.1MPa		

(Note) At compressor exhaust density of 30mg/m<sup>3</sup> (ANR)

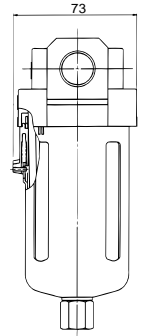
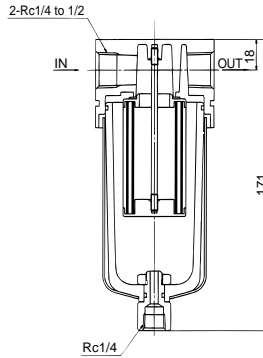
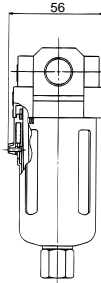
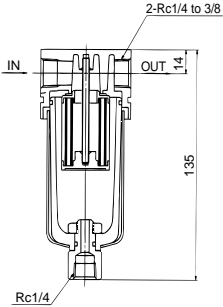
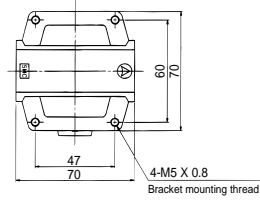


**Dimensions**

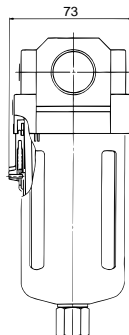
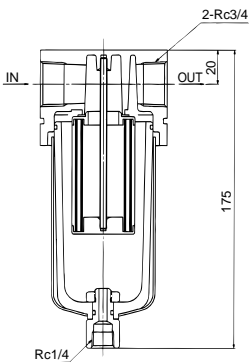
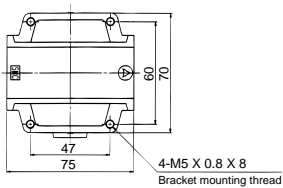
**10-AFM3000-02 to 03-J**



**10-AFM4000-02 to 04-J**



**10-AFM4000-06-J**



**⚠ Specific Product Precautions**

Be sure to read before handling.  
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

**Maintenance**

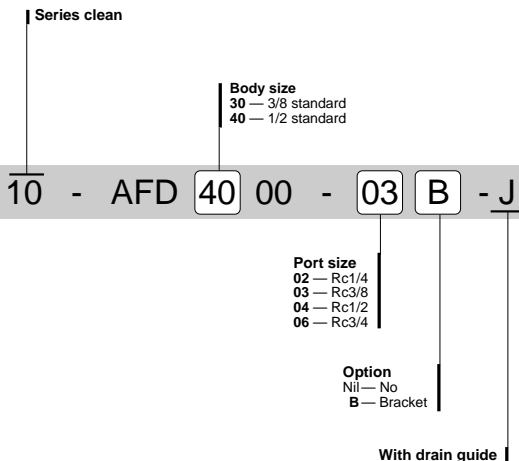
**⚠ Warning**

- ① Replace the element when the pressure drop reaches 0.1MPa or when two years have passed since the operation start, whichever is earlier. It can cause damage to the element.

Air Line Equipment

# Series 10-AFD Micro Mist Separator

## How to Order



## Model

Model	Port size Rc	Flow rate <sup>Note)</sup> /min (ANR)	Drain storage cm <sup>3</sup>	Filtration μm	Remark
10-AFD3000-02-J	1/4	240	23	0.01 (95% particle size collection)	With drain guide Rc1/4
10-AFD3000-03-J	3/8				
10-AFD4000-02-J	1/4	600	45		
10-AFD4000-03-J	3/8				
10-AFD4000-04-J	1/2				
10-AFD4000-06-J	3/4				

(Note) At a primary side pressure of 0.7MPa. The rated flow rate will vary with the primary side pressure.

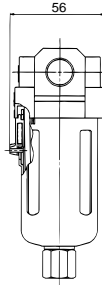
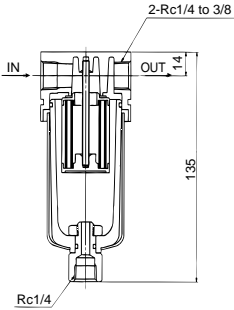
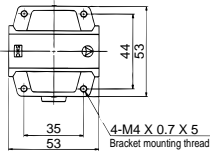
## Specifications

Model	AFD3000	AFD4000	AFD4000-06
Port size	1/4, 3/8	1/4, 3/8, 1/2	3/4
Fluid	Air		
Proof pressure	1.5MPa		
Max. operating pressure	1.0MPa		
Min. operating pressure	0.05MPa		
Ambient and fluid temperature	-5 to 60°C (No freezing)		
Oil mist density on secondary side <sup>Note)</sup>	Max. 0.1mg/m <sup>3</sup> (ANR) (0.01 mg/m <sup>3</sup> (ANR) or less ≒0.008 ppm before oil saturation)		
Element life	2 years or when the pressure drop reaches 0.1MPa		

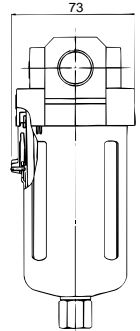
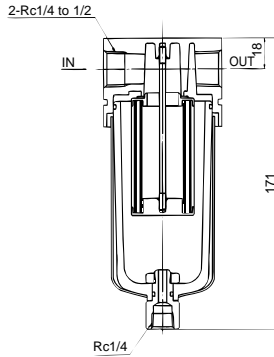
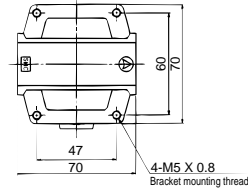
(Note) At compressor exhaust density of 30mg/m<sup>3</sup> (ANR)

**Dimensions**

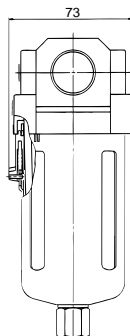
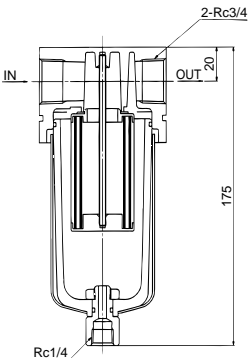
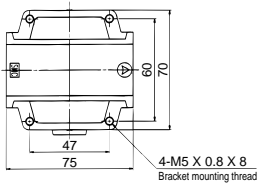
**10-AFD3000-02 to 03-J**



**10-AFD4000-02 to 04-J**



**10-AFD4000-06-J**



**⚠ Specific Product Precautions**

Be sure to read before handling.  
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

**Air Supply**

**⚠ Caution**

- ① To prevent premature clogging, install a mist separator (Series AFM), which serves as a prefilter, on the primary side of the micro mist separator regulator.
- ② A dryer should be installed on the secondary side. Installation of a dryer on the primary side may cause the filter element to be clogged prematurely.

**Maintenance**

**⚠ Warning**

- ① Replace the element when the pressure drop reaches 0.1MPa or when two years have passed since the operation start, whichever is earlier.

Air Line Equipment


# Series 10-AR Regulator

## How to Order

Clean series

**Body size**  
 20 — 1/8 standard  
 25 — 1/4 standard  
 30 — 3/8 standard  
 40 — 1/2 standard  
 50 — 3/4 standard  
 60 — 1 standard

**Port size**  
 02 — Rc1/4  
 03 — Rc3/8  
 04 — Rc1/2  
 06 — Rc3/4  
 10 — Rc1



10 - AR 40 00 - 04 BG9 - 1 N R

**Accessory (Option)**  
 Nil — No  
 B — Bracket  
 G9 — Pressure gauge

**Set pressure**  
 Nil — 0.85MPa settings  
 1 — 0.2MPa settings (Optional specification)  
 (Same as the 0.85MPa setting except for the adjustment spring.  
 The upper limit of the secondary pressure may be larger by 0.2 MPa or more.)

**Non-relief type**  
 (Standard specifications)

**Options**  
 Nil — Flow direction: Left → Right (Standard)  
 R — Flow direction: Right → Left

## Model

Model	Port size Rc	Set pressure range MPa	Remark
10-AR2000-01-N	1/8	0.05 to 0.85	Fitting attached to bonnet breathing hole (Applicable tubing O.D. ø6 )
10-AR2000-02-N	1/4		
10-AR2500-02-N	1/4		
10-AR2500-03-N	3/8		
10-AR3000-02-N	1/4		
10-AR3000-03-N	3/8		
10-AR4000-02-N	1/4		
10-AR4000-03-N	3/8		
10-AR4000-04-N	1/2		
10-AR4000-06-N	3/4		
10-AR5000-06-N	3/4	0.02 to 0.2 *	
10-AR5000-10-N	1		
10-AR6000-10-N	1		

\* Optional specifications

## Specifications

Proof pressure	1.5MPa
Max. operating pressure	1.0MPa
Gauge port size	Rc1/4
Ambient and fluid temperature	-5 to 60°C (No freezing)
Construction	Non-relief type

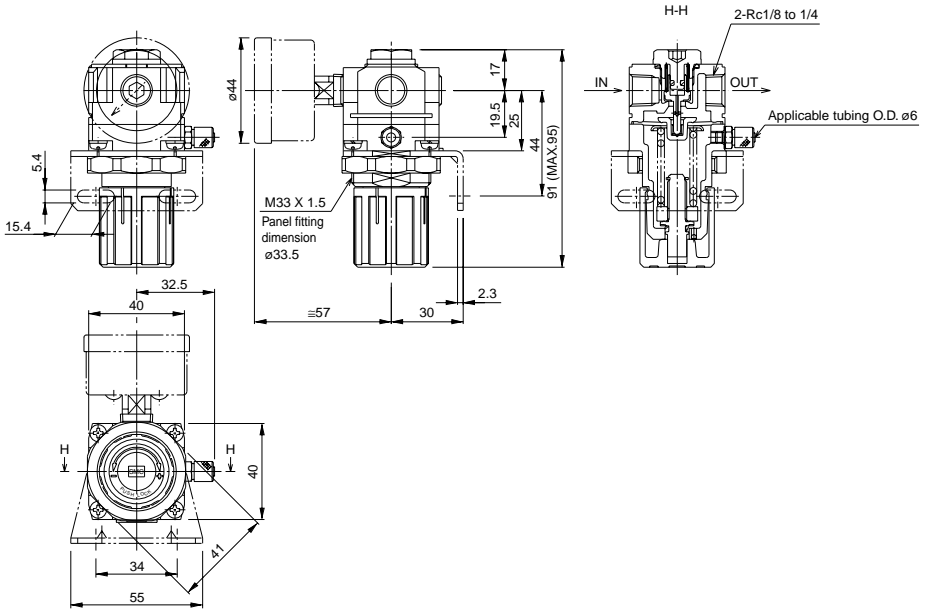
**Accessories (Option)/Part Number**

Description	Model	Part Number							
		For 10-AR2000	For 10-AR2500	For 10-AR3000	For 10-AR4000	For 10-AR4000-06	For 10-AR5000	For 10-AR6000	
Bracket		B220	B220	B320	B420	B420	B640A	B640A	
Accessory	Pressure gauge Note 1)	1.0MPa	G49-10-02	G49-10-02	G49-10-02	G49-10-02	G49-10-02	G49-10-02	G49-10-02
		0.2MPa	G49-4-02	G49-4-02	G49-4-02	G49-4-02	G49-4-02	G49-4-02	G49-4-02

Note 1) The pressure gauge for 0.2MPa settings is G49-4-02 for 0.4MPa.  
Use the factory mounted bracket and pressure gauge.

**Dimensions**

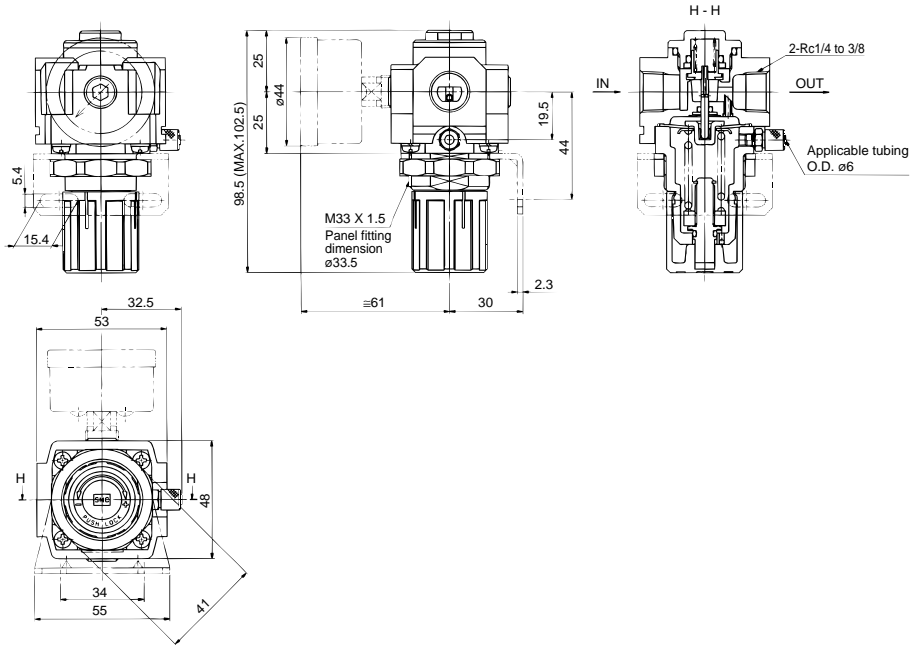
**10-AR2000-01 to 02-N**



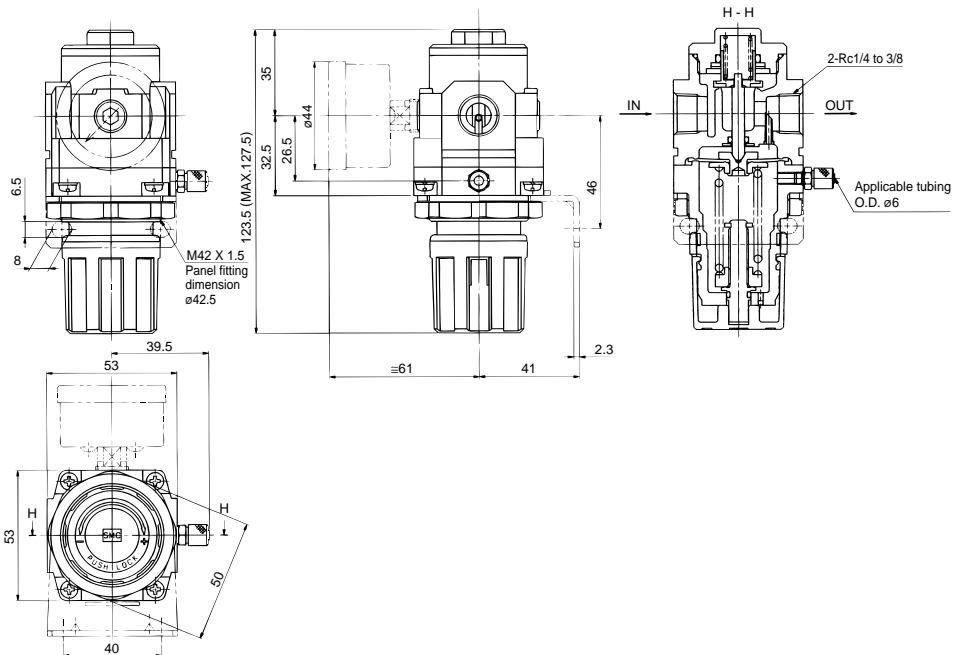
# Regulator 10-AR

## Dimensions

### 10-AR2500-02 to 03-N

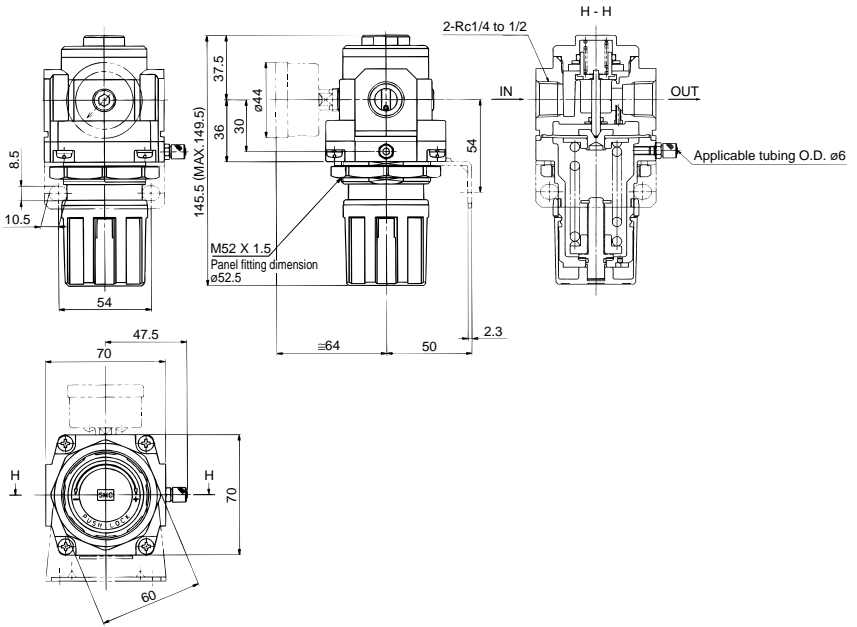


### 10-AR3000-02 to 03-N

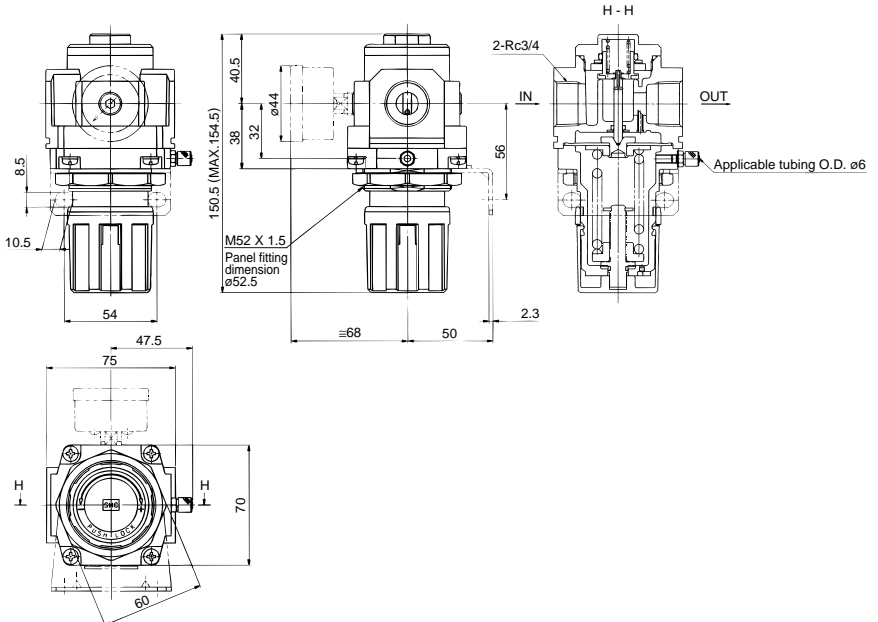


**Dimensions**

**10-AR4000-02 to 04-N**



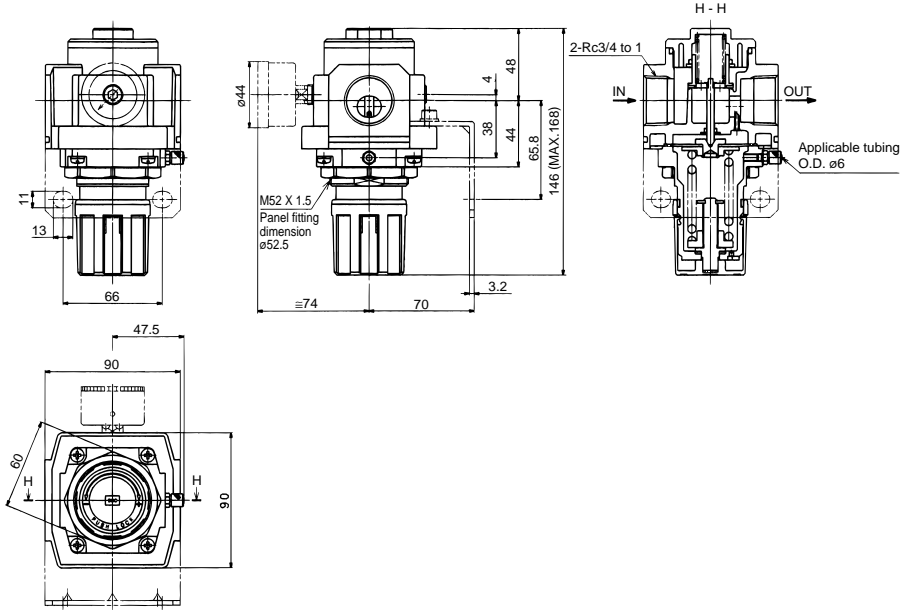
**10-AR4000-06-N**



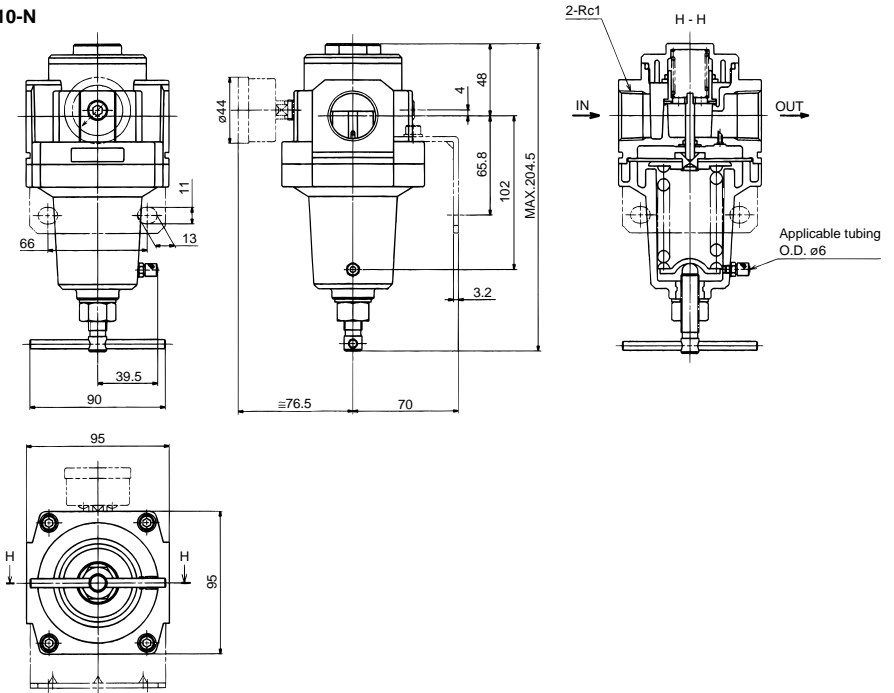
# Regulator 10-AR

## Dimensions

### 10-AR5000-06 to 10-N



### 10-AR6000-10-N







## Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

### Mounting and Adjustment

#### Warning

- ① The adjustment handle must be operated manually. Use of a tool to turn the handle could lead to damage.

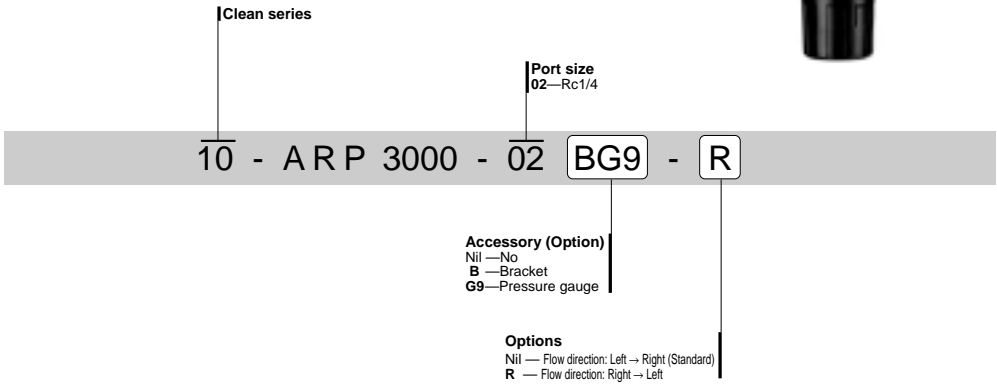
#### Caution

- ① Release the lock to adjust the pressure. After the adjustment, engage the lock.  
Failure to observe this procedure could damage the handle or cause the secondary pressure to fluctuate.
  - 1) To unlock AR2000 to AR2500 types, pull the pressure adjustment handle. Push the pressure regulation handle to engage the lock. If it will not be locked, rotate the handle to right and left before pushing.
  - 2) To unlock AR3000 to AR5000 types, pull the pressure regulation handle. (There is an orange line for visual confirmation on the lower part of the pressure regulation handle.) Push the pressure regulation handle to engage lock. If it will not be locked, rotate the handle slightly clockwise or counterclockwise before pushing.  
(The orange line will go out of sight.)
  - 3) To unlock AR6000 type, loosen the lock nut.
- ② Install a valve guide (on the opposite side of the handle) 60 mm away from the ground surface.  
It will make maintenance and inspection easy.
- ③ Consult SMC to use the product between the solenoid valve and the actuator.

# 10-ARP3000

Precision Direct Operated Regulator

## How to Order



## Model

Model	Port size Rc	Regulating pressure range MPa	Application
10-ARP3000-02	1/4	0.005 to 0.3	Fitting attached to bonnet breathing hole (Applicable tubing O.D. ø6, inside diameter ø4)

## Specifications

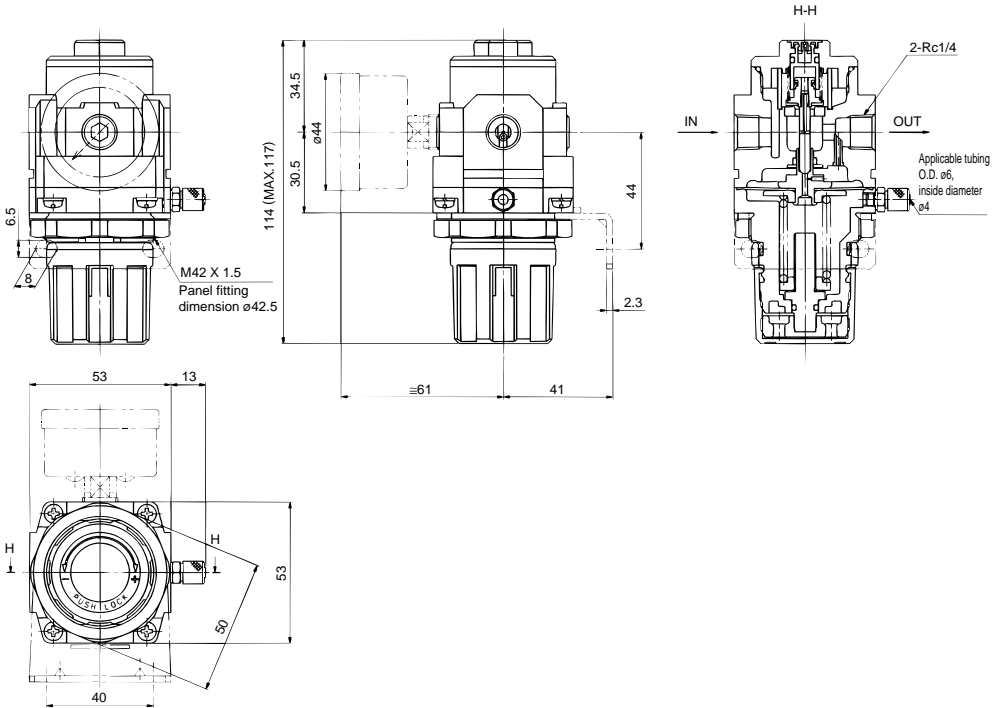
Proof pressure	1.2MPa
Max. operating pressure	0.8MPa
Set pressure	0.005 to 0.3MPa
Set sensitivity	0.001MPa
Air consumption	5/min (ANR) (When set at 0.3MPa)
Ambient and fluid temperature	-5 to 60°C (No freezing)
Construction	Bleed type

## Accessory (Option)/Part Number

Description		Part Number
Accessory	Bracket	B320
	Pressure gauge	G49-4-02

Note) Use the factory mounted bracket and pressure gauge.

**Dimensions**



**⚠ Specific Product Precautions**

Be sure to read before handling.  
 Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

**Selection**

**⚠ Caution**

- ① Set the secondary set pressure of the regulator within 90% or less the range of the primary set pressure.  
 A large pressure drop may result.

**Air Supply**

**⚠ Warning**

- ① Use a mist separator on the primary side.  
 If any drainage or debris is contained in the air, it may clog the bleed port to cause malfunction.
- ② Do not use a lubricator on the primary side. It could clog the bleed port to cause malfunction.

**Mounting and Adjustment**

**⚠ Warning**


- ① The adjustment handle must be operated manually. Use of a tool to turn the handle could lead to damage.

**⚠ Caution**

- ① Release the lock to adjust the pressure. After the adjustment, engage the lock.  
 Failure to observe this procedure could damage the handle or cause the secondary pressure to fluctuate.
  - 1) To unlock the regulator, pull the adjustment handle.  
 (An orange colored line is provided at the bottom of the adjustment handle for visual checking.)  
 Push the pressure regulation handle to engage the lock. If it does not lock easily, turn the handle slightly clockwise or counterclockwise until the orange colored line goes out of sight.
- ② Install a valve guide (on the opposite side of the handle) 60 mm away from the ground surface.  
 It will make maintenance and inspection easy.
- ③ Air is normally released from the bleed port.  
 The consumption is required by the direct-operated precision regulator construction.
- ④ Consult SMC to use the product between the solenoid valve and the actuator.

# Series 10-AR Regulator with Check Valve

## How to Order



**Clean series**

**Body size**  
 25—1/4  
 30—3/8  
 40—1/2

**Regulator with check valve**

**Port size**  
 02—Rc1/4  
 03—Rc3/8  
 04—Rc1/2  
 06—Rc3/4

**Accessory (Option)**  
 Nil—No  
 B—Bracket  
 G9—Pressure gauge

**Options**  
 Nil—Flow direction: Left → Right (Standard)  
 R—Flow direction: Right → Left

10 - AR 25 60 - 02 BG9 - R

## Model

Model	Port size Rc	Set pressure range	Remark
10-AR2560-02	1/4	0.1 to 0.85MPa	Fitting attached to bonnet breathing hole (Applicable tubing O.D. ø6 )
10-AR2560-03	3/8		
10-AR3060-02	1/4		
10-AR3060-03	3/8		
10-AR4060-02	1/4		
10-AR4060-03	3/8		
10-AR4060-04	1/2		
10-AR4060-06	3/4		

## Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1.0MPa
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Construction</b>	Relieving type

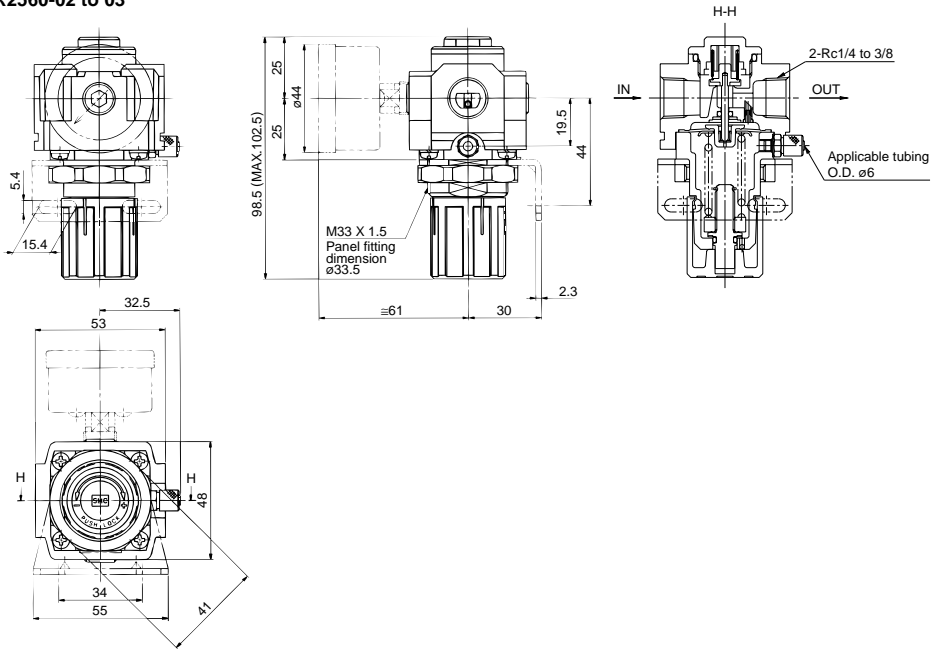
## Accessory (Option)/Part Number

Description	Model	Part Number			
		For 10-AR2560	For 10-AR3060	For 10-AR4060	For 10-AR4060-06
Accessory	Bracket	B220	B320	B420	B420
	Pressure gauge	G49-10-02	G49-10-02	G49-10-02	G49-10-02

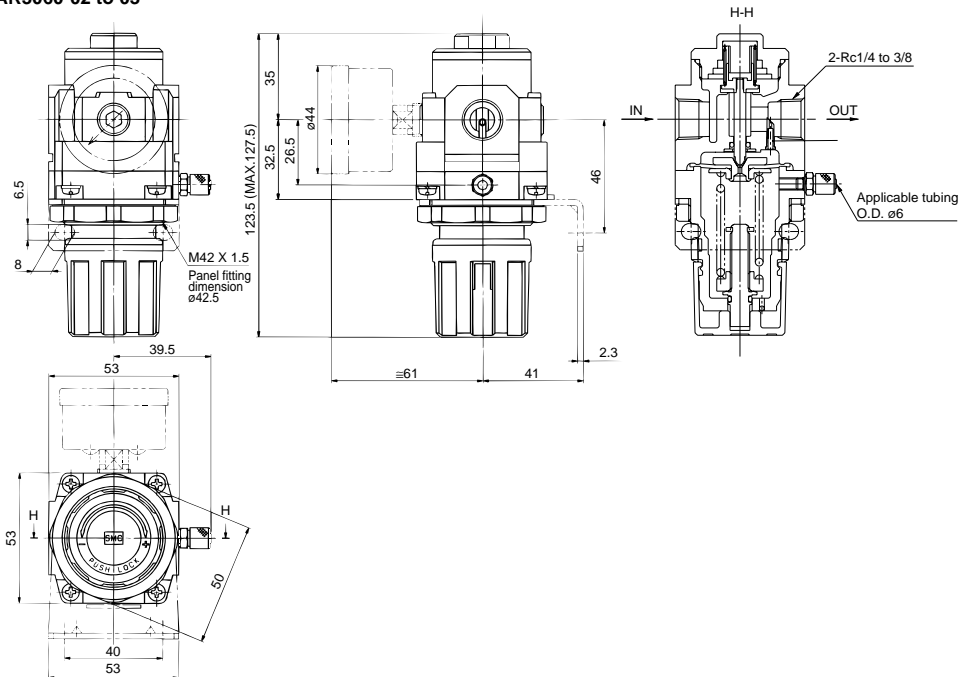
(Note) Use the factory mounted bracket and pressure gauge.

**Dimensions**

**10-AR2560-02 to 03**



**10-AR3060-02 to 03**

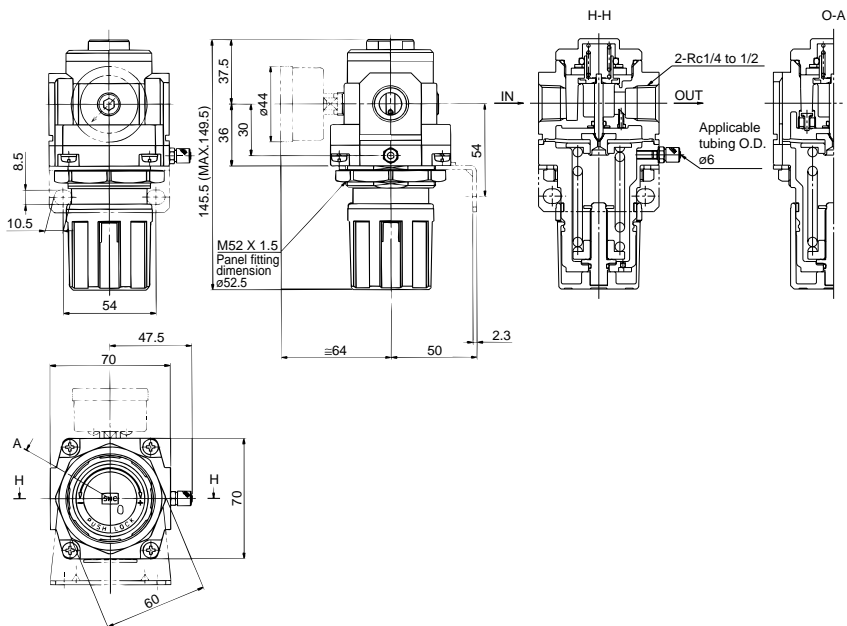


Air Line Equipment

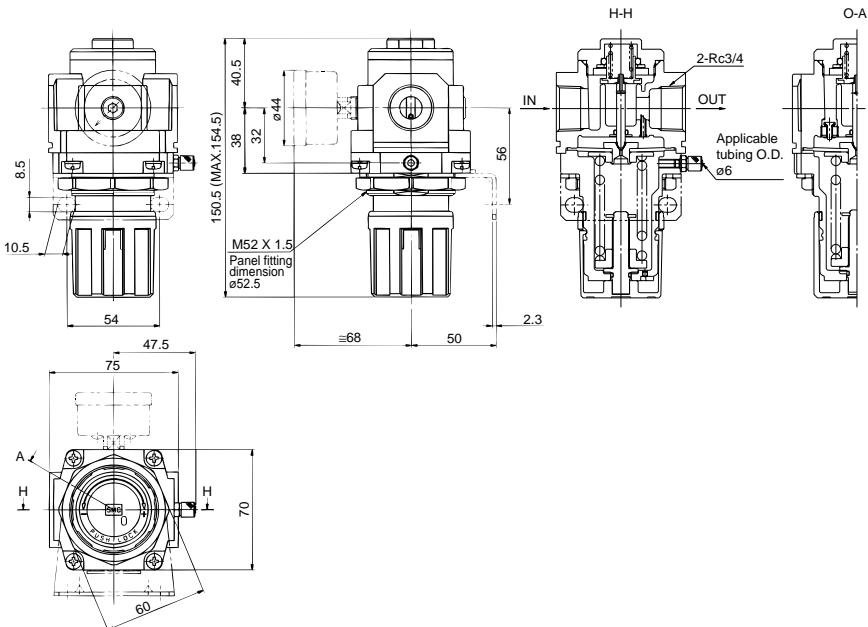
# Regulator 10-AR

## Dimensions

### 10-AR4060-02 to 04



### 10-AR4060-06



## Specific Product Precautions

**Be sure to read before handling.**

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

### Mounting and Adjustment

#### Warning

- ① The adjustment handle must be operated manually. Use of a tool to turn the handle could lead to damage.

#### Caution

- ① Release the lock to adjust the pressure. After the adjustment, engage the lock.  
Failure to observe this procedure could damage the handle or cause the secondary pressure to fluctuate.
  - 1) To unlock AR2560 types, pull the pressure adjustment handle. Push the pressure regulation handle to engage the lock. If it will not be locked, rotate the handle to right and left before pushing.
  - 2) To unlock AR3060 to AR4060 types, pull the pressure regulation handle. (There is an orange line for visual confirmation on the lower part of the pressure adjustment handle.)  
Push the pressure adjustment handle to engage the lock. If it will not be locked, rotate the handle slightly clockwise or counterclockwise before pushing.  
(The orange line will go out of sight.)
- ② Install a valve guide (on the opposite side of the handle) 60 mm away from the ground surface.  
It will make maintenance and inspection easy.

### Maintenance

#### Warning

- ① Perform a periodic inspection of the pressure gauge when it is installed and used between the solenoid valve and the actuator.  
Sudden pressure fluctuations may occur, resulting in shortened durability of the product. Under certain circumstances, use of an electronic pressure gauge is recommended.

# Series 10-AW Filter Regulator


## How to Order

**Clean series**

**Body size**  
30—3/8 standard  
40—1/2 standard

**Port size**  
02—Rc1/4  
03—Rc3/8  
04—Rc1/2  
06—Rc3/4

**Accessory (Option)**  
Nil—No  
B—Bracket  
G9—Pressure gauge



**10 - AW 40 00 - 03 BG9 - 1 J N R**

**Set pressure**  
Nil— 0.85MPa settings  
1— 0.2MPa settings (Optional specification)  
(Same as the 0.85MPa setting except for the adjustment spring.  
The upper limit of the secondary pressure may be larger by 0.2 MPa or more.)

**With drain guide**  
(Without valve mechanism)

**Non-relief type**  
(Standard specifications)

**Options**  
Nil — Flow direction: Left → Right (Standard)  
R — Flow direction: Right → Left

## Model

Model	Port size Rc	Drain storage (cm <sup>3</sup> )	Set pressure range MPa	Remark
10-AW3000-02-JN	1/4	23	0.05 to 0.85	<ul style="list-style-type: none"> <li>•With drain guide Rc1/4 (Without valve mechanism)</li> <li>•Fitting attached to bonnet breathing hole (Applicable tubing O.D. ø6 )</li> </ul>
10-AW3000-03-JN	3/8			
10-AW4000-02-JN	1/4	45		
10-AW4000-03-JN	3/8			
10-AW4000-04-JN	1/2			
10-AW4000-06-JN	3/4			

\* Optional specifications

## Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1.0MPa
<b>Gauge port size</b>	Rc1/4
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Filtration</b>	5µm
<b>Construction</b>	Non-relief type

## Accessory (Option)/Part Number

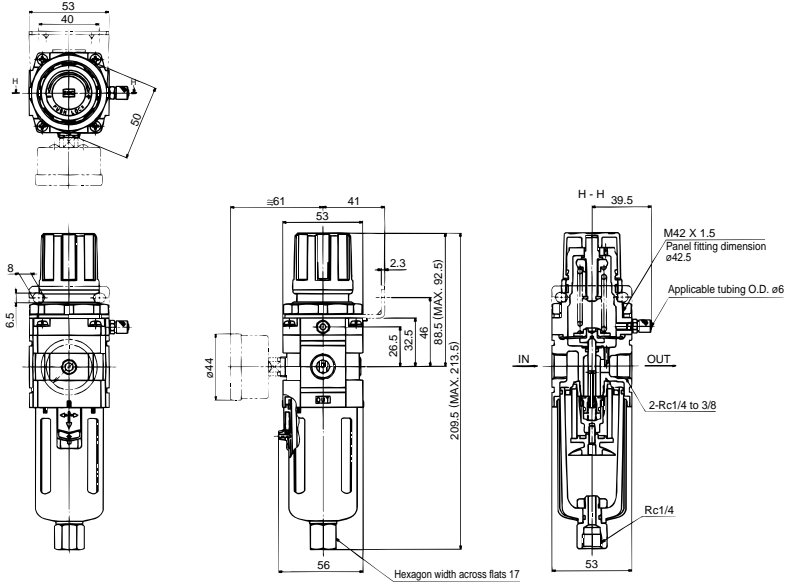
Description	Model	Part Number			
		For 10-AW3000	For 10-AW4000	For 10-AW4000-06	
Accessory	Bracket	B320	B420	B420	
	Pressure gauge	1.0MPa	G49-10-02	G49-10-02	G49-10-02
		0.2MPa	G49-4-02	G49-4-02	G49-4-02

(Note) The pressure gauge for 0.2MPa settings is G49-4-02 for 0.4MPa.  
Use the factory mounted bracket and pressure gauge.

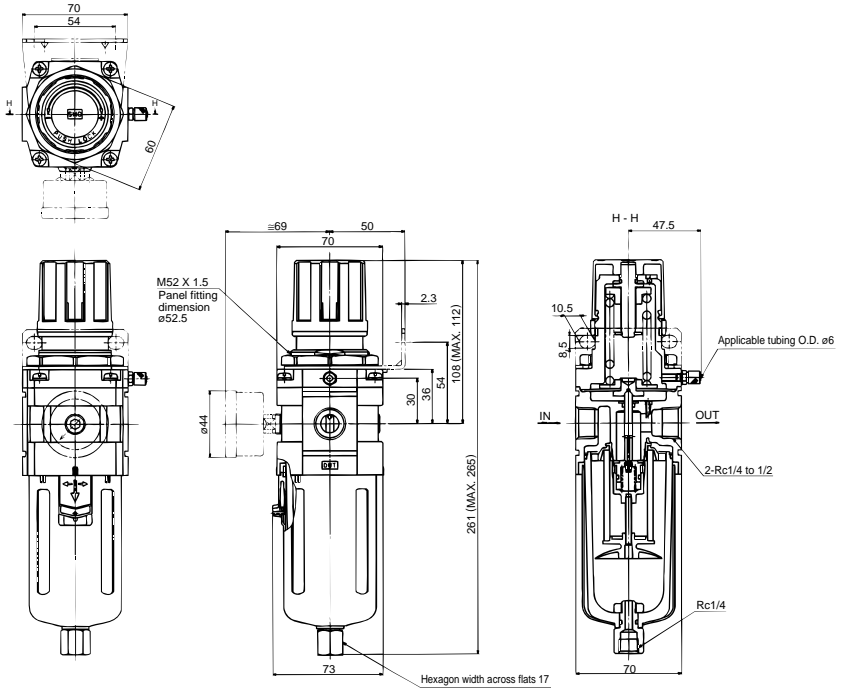


**Dimensions**

**10-AW3000-02 to 03-JN**



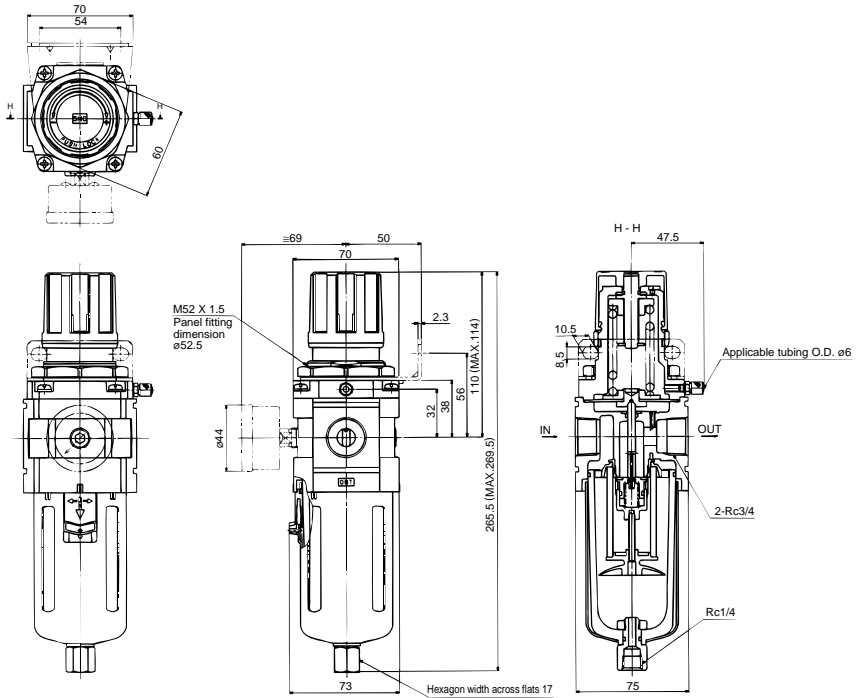
**10-AW4000-02 to 04-JN**



# Filter Regulator 10-AW

## Dimensions

### 10-AW4000-06-JN



## Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

### Selection

#### Warning

- ① The residual secondary pressure cannot be released by releasing the primary pressure.  
Consult SMC to release the residual pressure.

### Maintenance

#### Warning

- ① Replace the element when the pressure drop reaches 0.1 MPa or when two years have passed since the operation start, whichever is earlier. Failure to observe this precaution could cause damage to the filter element.

### Mounting and Adjustment

#### Warning

- ① The adjustment handle must be operated manually. Use of a tool to turn the handle could lead to damage.

#### Caution

- ① Release the lock to adjust the pressure. After the adjustment, engage the lock.  
Failure to observe this procedure could damage the handle or cause the secondary pressure to fluctuate.
  - To unlock the regulator, pull the adjustment handle.  
(An orange colored line is provided at the bottom of the adjustment handle for visual checking.)  
Push the pressure regulation handle to engage the lock. If it does not lock easily, turn the handle slightly clockwise or counterclockwise until the orange colored line goes out of sight.

# Series 10-AWM Mist Separator Regulator

## How to Order

Clean series	Body size 30—3/8 40—1/2	Port size 02—Rc1/4 03—Rc3/8 04—Rc1/2
--------------	-------------------------------	---

10 - AWM
30
00 -
02
BG9
-
1
J
N
R

**Accessory (Option)**  
 Nil — No  
**B** — Bracket  
**G9** — Pressure gauge

**Set pressure**  
 Nil — 0.85MPa settings  
 (Standard specifications)  
**1** — 0.2MPa settings  
 (Same as the 0.85MPa setting except for  
 the adjustment spring.  
 The upper limit of the secondary pressure may  
 be larger by 0.2 MPa or more.)

**With drain guide**  
 (Without valve mechanism)

**Non-relief type**  
 (Standard specifications)

**Options**  
 Nil — Flow direction: Left → Right (Standard)  
**R** — Flow direction: Right → Left

## Model

MODEL	Port size Rc	Flow rate <sup>Note 1)</sup> // min(ANR)	Drain storage cm <sup>3</sup>	Set pressure range MPa	Application		
10-AWM3000-02-JN	1/4	330	23	0.05 to 0.85	• With drain guide Rc1/4 (Without valve mechanism)		
10-AWM3000-03-JN	3/8						
10-AWM4000-02-JN	1/4	820	45			0.05 to 0.2 <sup>Note 2)</sup>	• Fitting attached to bonnet breathing hole (Applicable tubing O.D.φ6)
10-AWM4000-03-JN	3/8						
10-AWM4000-04-JN	1/2						

Note 1) Secondary side pressure: In case of 0.5 MPa. (The rated air flow rate varies with the set pressure.) Be careful if the flow exceeds the rated flow rate+C149, oil will flow out to the secondary side.  
 Note 2) Optional specification

## Specifications

<b>Fluid</b>	Air
<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1.0MPa
<b>Gauge port size</b>	Rc1/4
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Nominal filtration rating</b>	0.3μm (95% scavenging particle diameter)
<b>Oil mist density on secondary side</b>	Max. 1.0mgf/Nm <sup>3</sup> (≒0.8ppm) <sup>Note 1) Note 2)</sup>
<b>Element life</b>	2 years
<b>Construction</b>	Non-relief type

Note 1) At compressor exhaust density of 30mgf/Nm<sup>3</sup>

Note 2) Small amount of grease is used for O-ring of the case and other O-rings.

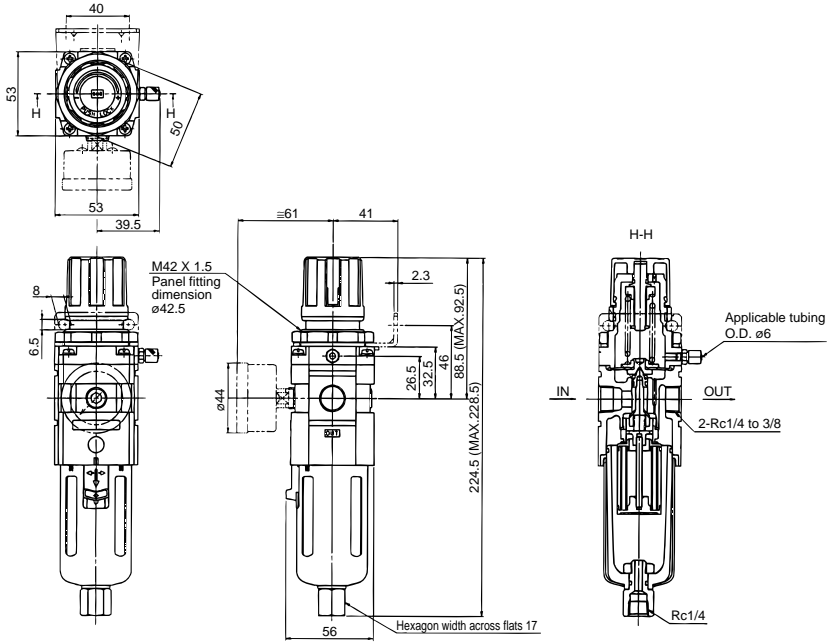
## Accessory (Option)/Part Number

Description		Model	Part Number	
			For 10-AWM3000	For 10-AWM4000
Accessory	Bracket		B320	B420
	Pressure gauge	1.0MPa	G49-10-02	G49-10-02
		0.2MPa	G49-4-02	G49-4-02

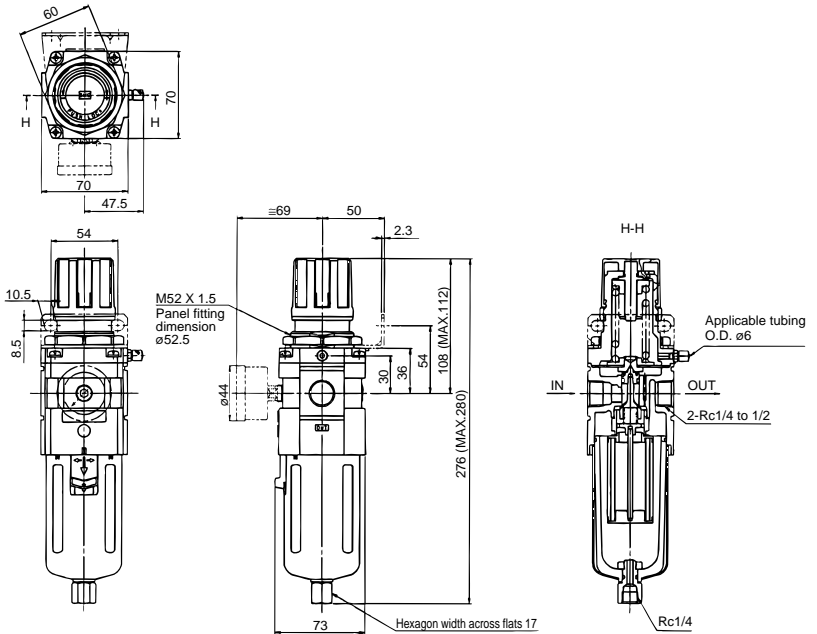
Note) The pressure gauge for 0.2MPa settings is G49-4-02 for 0.4MPa.  
 Use the factory mounted bracket and pressure gauge.

**Dimensions**

**10-AWM3000-02 to 03-JN**



**10-AWM4000-02 to 04-JN**



Air Line Equipment

## Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

### Selection

#### Warning

- ① The residual secondary pressure cannot be released by releasing the primary pressure.  
Consult SMC to release the residual pressure.

### Air supply

#### Caution

- ① To prevent premature clogging, install a mist separator (Series AF) as a prefilter on the primary side of the micro mist separator.

### Mounting and Adjustment

#### Warning

- ① The adjustment handle must be operated manually. Use of a tool to turn the handle could lead to damage.

#### Caution

- ① Release the lock to adjust the pressure. After the adjustment, engage the lock.  
Failure to observe this procedure could damage the handle or cause the secondary pressure to fluctuate.
  - To unlock the regulator, pull the adjustment handle. (An orange colored line is provided at the bottom of the adjustment handle for visual checking.)  
Push the pressure regulation handle to engage the lock. If it does not lock easily, turn the handle slightly clockwise or counterclockwise until the orange colored line goes out of sight.

### Maintenance

#### Warning

- ① Replace the element when the pressure drop reaches 0.1 MPa or when two years have passed since the operation start, whichever is earlier. Failure to observe this precaution could cause damage to the filter element.



# Series 10-AWD Micro Mist Separator Regulator

## How to Order

**Clean series**

**Body size**  
30 — 3/8  
40 — 1/2

**Port size**  
02 — Rc1/4  
03 — Rc3/8  
04 — Rc1/2

10 - AWD
40
00
- 02
BG9
-
1
J
N
R

**Accessory (Option)**  
Nil — No  
B — Bracket  
G9 — Pressure gauge

**Set pressure**  
Nil — 0.85MPa settings (Standard specifications)  
1 — 0.2MPa settings  
(Same as the 0.85MPa setting except for the adjustment spring.)  
The upper limit of the secondary pressure may be larger by 0.2 MPa or more.

**With drain guide**  
(Without valve mechanism)

**Non-relief type**  
(Standard specifications)

**Options**  
Nil — Flow direction: Left → Right (Standard)  
R — Flow direction: Right → Left

## Model

Model	Port size Rc	Note 1) Flow rate /min (ANR)	Drain storage cm <sup>3</sup>	Set pressure range MPa	Application
10-AWD3000-02-JN	1/4	180	23	0.05 to 0.85	<ul style="list-style-type: none"> <li>• With drain guide Rc1/4 (Without valve mechanism)</li> <li>• Fitting attached to bonnet breathing hole (Applicable tubing O.D.φ6)</li> </ul>
10-AWD3000-03-JN	3/8				
10-AWD4000-02-JN	1/4				
10-AWD4000-03-JN	3/8	450	45	Note 2) 0.05 to 0.2	
10-AWD4000-04-JN	1/2				

Note 1) Secondary side pressure: In case of 0.5 MPa. (The rated air flow rate varies with the set pressure.) Be careful if the flow exceeds the rated flow rate+C149, oil will flow out to the secondary side.  
Note 2) Optional specification.

## Specifications

<b>Proof pressure</b>	1.5MPa
<b>Max. operating pressure</b>	1.0MPa
<b>Gauge port size</b>	Rc1/4
<b>Ambient and fluid temperature</b>	-5 to 60°C (No freezing)
<b>Nominal filtration rating</b>	0.01μm (95% scavenging particle diameter)
<b>Oil mist density on secondary side</b>	Note 1) Note 2) Max.0.1mgf/Nm <sup>3</sup> (0.01 mgf/Nm <sup>3</sup> or less ±0.008 ppm before oil saturationm)
<b>Element life</b>	2 years
<b>Construction</b>	Non-relief type

Note 1) At compressor exhaust density of 30mgf/Nm<sup>3</sup>

Note 2) Small amount of grease is used for O-ring of the case and other O-rings.

## Accessory (Option)/Part Number

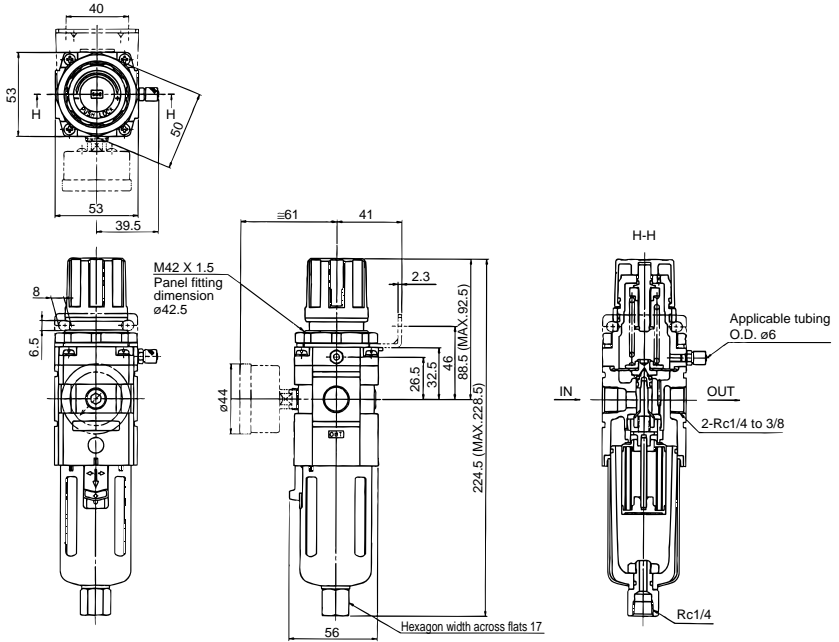
Description		Model	Part Number	
			For 10-AWD3000	For 10-AWD4000
Accessory	Bracket		B320	B420
	Pressure gauge	1.0MPa	G49-10-02	G49-10-02
		0.2MPa	G49-4-02	G49-4-02

Note) The pressure gauge for 0.2MPa settings is G49-4-02 for 0.4MPa.  
Use the factory mounted bracket and pressure gauge.

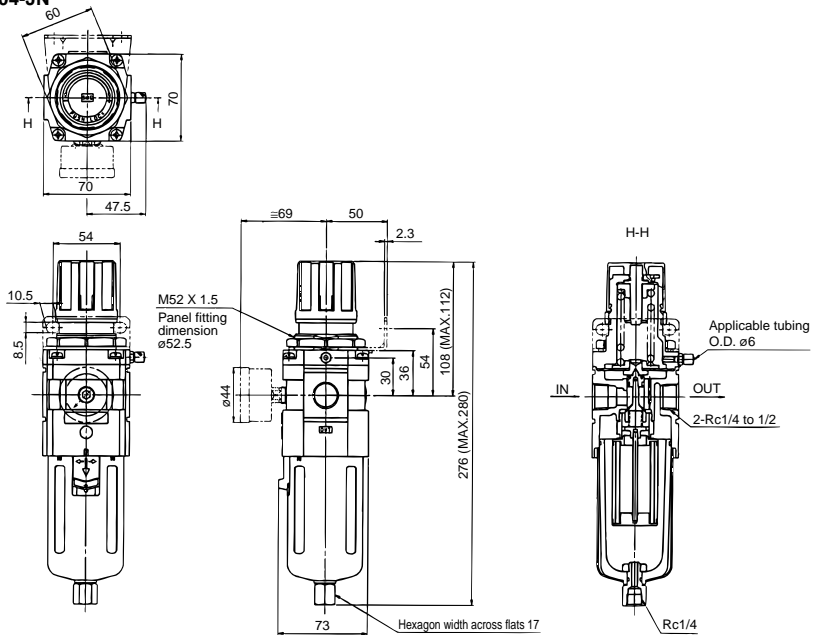


**Dimensions**

**10-AWD3000-02 to 03-JN**



**10-AWD4000-02 to 04-JN**



## Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

### Selection

#### Warning

- ① The residual secondary pressure cannot be released by releasing the primary pressure.  
Consult SMC to release the residual pressure.

### Air Supply

#### Caution

- ① To prevent premature clogging, install a mist separator (Series AFM), which serves as a prefilter, on the primary side of the micro mist separator regulator.

### Mounting and Adjustment

#### Warning

- ① The adjustment handle must be operated manually. Use of a tool to turn the handle could lead to damage.

#### Caution

- ① Release the lock to adjust the pressure. After the adjustment, engage the lock.  
Failure to observe this procedure could damage the handle or cause the secondary pressure to fluctuate.
  - To unlock the regulator, pull the adjustment handle. (An orange colored line is provided at the bottom of the adjustment handle for visual checking.)  
Push the pressure regulation handle to engage the lock. If it does not lock easily, turn the handle slightly clockwise or counterclockwise until the orange colored line goes out of sight.

### Maintenance

#### Warning

- ① Replace the element when the pressure drop reaches 0.1 MPa or when two years have passed since the operation start, whichever is earlier. Failure to observe this precaution could cause damage to the filter element.



# Series 10-IR1000/2000/3000 Precision Regulator

## How to Order

Clean series

10 — IR 2 0 0 0 — 0 2 — R

Precision regulator

Body size

1	IR1000 type
2	IR2000 type
3	IR3000 type

Type of setting

0	Basic (Handle)
1	Air operated (Only for series IR 2000/3000)

Set pressure range

Series 10-IR1000/2000

0	0.005 to 0.2MPa
1	0.005 to 0.4MPa
2	0.005 to 0.8MPa

Note) Only type IR2120 is applicable to the air operate type.

Series 10-IR3000

0	0.01 to 0.2MPa
1	0.01 to 0.4MPa
2	0.01 to 0.8MPa

Note) Only type IR3120 is applicable to the air operate type.

Suffix

R Note) Pressure gauge mounted on reverse side  
Note) The standard mounting position of the pressure gauge is on the front, when viewing the regulator with the SUP side to the left and the OUT side to the right.

Accessory (option)

Nil	—
B	With bracket
G	With pressure gauge

Port size

Symbol	Port size	Application		
		10-IR1000	10-IR2000	10-IR3000
01	1/8	●		
02	1/4		●	
03	3/8			●
04	1/2			●

Thread type

Nil	Rc
N	NPT
F	G

## Standard Specifications

Model	Basic type			Air operated type	
	10-IR10□0	10-IR20□0	10-IR30□0	10-IR2120	10-IR3120
Max. supply pressure	MAX.1.0MPa				
Min. supply pressure <sup>Note 1)</sup>	Set pressure+0.05MPa		Set pressure+0.1MPa	Set pressure+0.05MPa	Set pressure+0.1MPa
Set pressure range	10-IR1000: 0.005 to 0.2MPa 10-IR1010: 0.005 to 0.4MPa 10-IR1020: 0.005 to 0.8MPa	10-IR2000: 0.005 to 0.2MPa 10-IR2010: 0.005 to 0.4MPa 10-IR2020: 0.005 to 0.8MPa	10-IR3000: 0.01 to 0.2MPa 10-IR3010: 0.01 to 0.4MPa 10-IR3020: 0.01 to 0.8MPa	0.005 to 0.8MPa	0.01 to 0.8MPa
Input signal pressure <sup>Note 2)</sup>	—			0.005 to 0.8MPa	0.01 to 0.8MPa
Sensitivity	0.2% of full span				
Repeatability	±0.5% of full span				
Linearity <sup>Note 3)</sup>	—			±1% of full span	
Air consumption <sup>Note 4)</sup>	Within 5 /min (ANR) (Supply pressure: 1.0 MPa)	Within 4 /min (ANR) (Supply pressure: 1.0 MPa) Within 3 /min (ANR) (Supply pressure: 0.7 MPa)	Bleed port: Within 9.5 /min (ANR) (Supply pressure: 1.0 MPa) Exhaust port: Within 2 /min (ANR) (At max. set pressure)	Within 4 /min (ANR) (Supply pressure: 1.0 MPa) Within 3 /min (ANR) (Supply pressure: 0.7 MPa)	Bleed port: Within 9.5 /min (ANR) (Supply pressure: 1.0 MPa) Exhaust port: Within 2 /min (ANR) (At max. set pressure)
Port size	Rc1/8	Rc1/4	Rc1/4, 3/8, 1/2	Rc1/4	Rc1/4, 3/8, 1/2
Pressure gauge port	Rc1/8 (2 positions)				
Ambient and fluid temperature	-5 to 60°C (With no condensation)				
Weight (kg)	0.16	0.32	0.66	0.37	0.73
Cleanliness	Class10000				
Bleed port	With M5 fitting (Applicable tube O.D. ø6)				
EXH hole	With M5 fitting (Applicable tube O.D. ø6)		Rc1/2 female thread	With M5 fitting (Applicable tube O.D. ø6)	
Grease	Teflon® grease				

Note 1) With the condition of no flow on the output side. Be sure to observe the minimum differential pressure from the set pressure of 0.05 MPa for models IR1000 and IR2000, or 0.1 MPa for models IR3000.

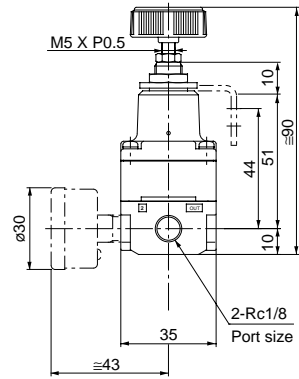
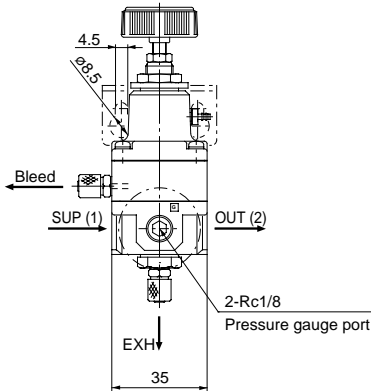
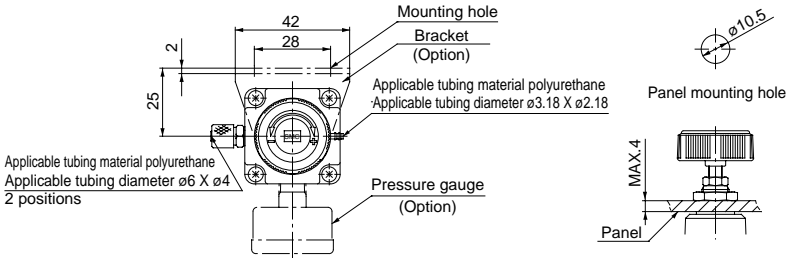
Note 2) Applicable only to air operated types IR2120 and IR3120. The basic type is excepted.

Note 3) Indicates the linearity of the output pressure with respect to the input signal pressure.

Note 4) Air is constantly discharged to the atmosphere.

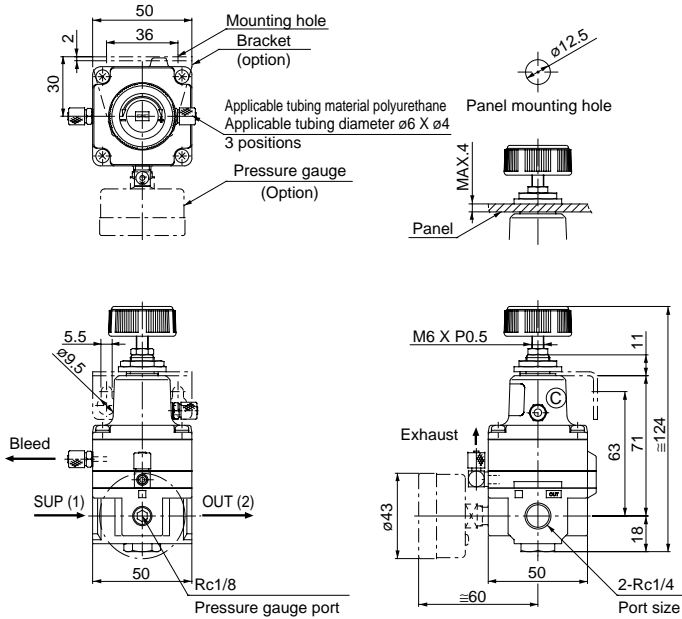
**Dimensions**

10-IR10□0-01□

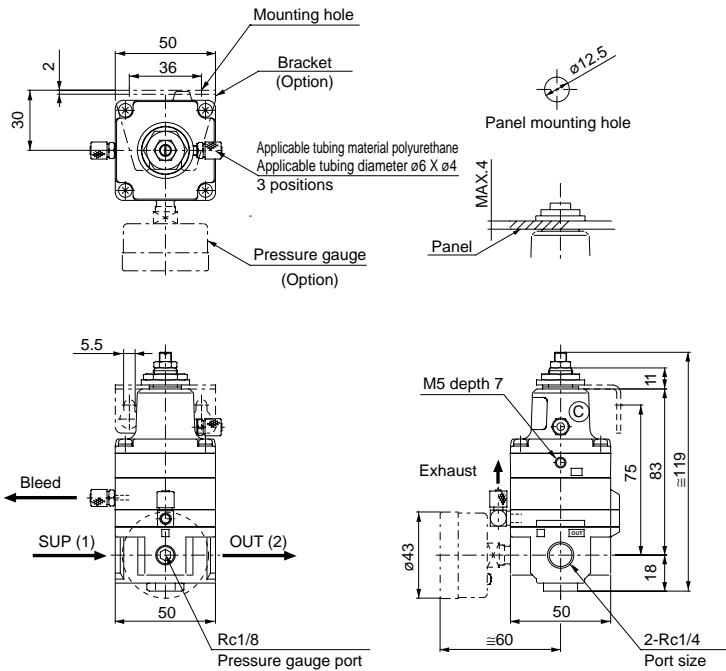


**Dimensions**

10-IR20□0-02□

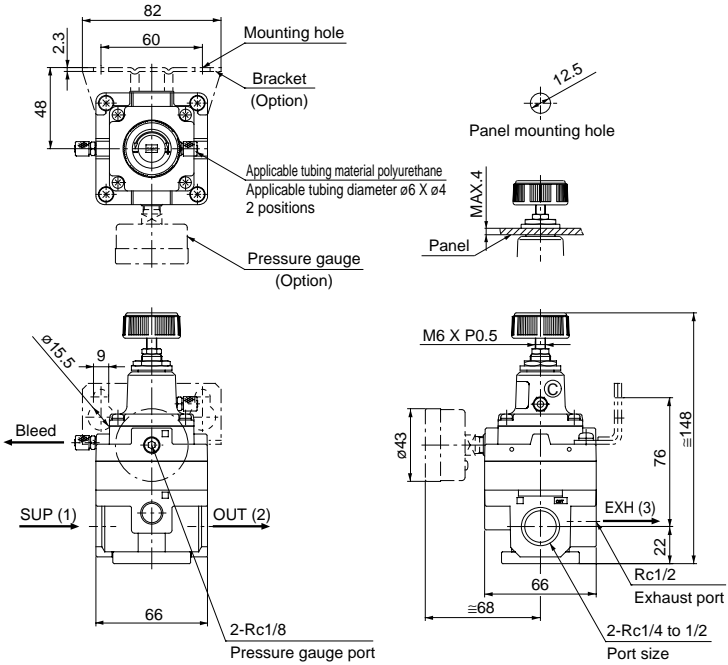


IR2120-02□

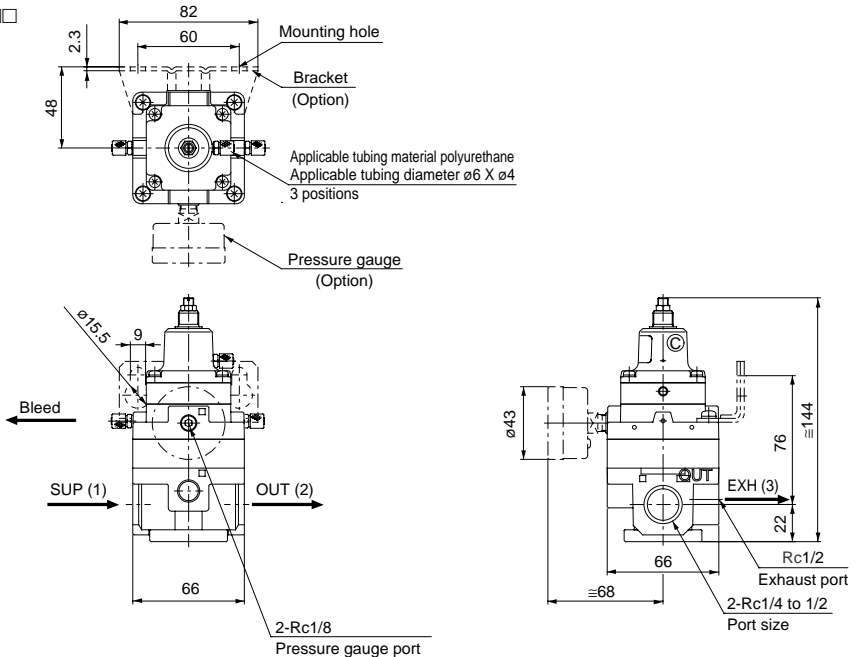


**Dimensions**

**10-IR30□0-0□□**



**10-IR3120-0□□**



## ⚠ Specific Product Precautions

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 472 and 473 for common precautions for air line equipment.

### Air Supply

#### ⚠ Caution

- ① If the supply pressure line contains drainage or dirt, etc., the fixed throttle can be clogged and malfunction. In addition to an air filter (SMC Series AF), be sure to use a mist separator (SMC Series AM, AFM).  
Refer to SMC's Compressed Air Cleaning Systems catalog regarding air quality.
- ② Never use a lubricator on the supply side of the regulator because this will inevitably cause the fixed throttle to be clogged, resulting in malfunction. If lubrication is required for terminal devices, connect a lubricator on the output side of the regulator.

### Maintenance

#### ⚠ Warning

- ① When the valve guide is to be removed during maintenance, first reduce the set pressure "0" and completely shut off the supply pressure.
- ② When installing a pressure gauge, lower the set pressure to "0" before removing the plug.

#### Precautions for 10-IR10□0 only

#### ⚠ Warning

- ① When remounting the valve guide after removing it for maintenance, use a tightening torque of 0.6Nm or smaller.  
Since the valve guide on this product is made of resin, there is a danger of damage if tightened with a torque exceeding the prescribe range.

### Operation

#### ⚠ Caution

- ① Do not use a precision regulator outside the range of its specifications. It can cause failure. (Refer to specifications.)
- ② In mounting, confirm the port indications before connecting.
- ③ If a directional switching valve (solenoid valve, mechanical valve, etc.) is mounted on the supply side of the regulator and repeatedly switched ON and OFF, wear of the nozzle/flapper section will be accelerated and a discrepancy in the setting value may result. Therefore, avoid using a directional switching valve on the supply side. If a directional switching valve is to be used, install it on the output side of the regulator.
- ④ Air is constantly discharged from the bleed port (the hole on the body's mid-section). This consumption of air is required by the construction of the precision regulator and is not an abnormality.
- ⑤ Be sure to tighten lock nut after pressure adjustment.

#### Precautions for 10-IR30□0, IR3120 only

#### ⚠ Caution

- ① If the supply pressure is relatively high (approx. 0.5 MPa or more) and the set pressure (approx. 0.1MPa or less) low, and if the output side is released to the atmosphere, pulsation in the set pressure may result. In such cases, operate at the lowest possible supply pressure or raise the set pressure slightly and restrict the output line (by using an additional stop valve, etc. for control).
- ② If the product is used for a relief function with a large capacity on the output side, there will be a large exhaust sound at the time of relief. Therefore, install a silencer (SMC Series AN) on the exhaust port (EHX port). The connection is Rc1/2.

#### Precautions for 10-IR2120, IR3120 (air operated type) only

#### ⚠ Caution

- ① The output pressure of model IR2120 and 3120 is the same as the input signal pressure. Select the type of regulator (general purpose or precision type) that matches the application to control the input signal.
- ② The screw on the topmost section is a zero point adjustment screw which is locked at the factory and requires no adjustment for operation.







# Fittings & Tubing/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Selection

### ⚠ Caution

- 1 Do not use in locations where the connecting threads and tubing connection will slide or rotate. The connecting threads and tubing connection will come apart under such conditions.
- 2 Observe the minimum bending radius of the tubing. If used with a bending radius below the minimum bending radius, the tube may be folded or flattened.
- 3 Do not use the tubing with flammable, explosive or toxic substances such as gas, gas fuel and coolant. The substance may permeate outside through the tubing.

## Mounting

### ⚠ Caution

- 1 Confirm the type, model and size before installation. Also confirm that there is no scratches, gouges or cracks on the product.
- 2 Allow extra length when connecting the tubing, considering changes in the tubing length due to pressure.
- 3 Do not allow twisting, twining or pulling force or moment load to be applied on the fittings or tubing. It can cause flattening, bursting or disconnection of the fittings or tubing.
- 4 Avoid wear-out of tubing, twisted piping or damage to tubing to prevent crushing, bursting or release of tubing.

## Operating Environment

### ⚠ Warning

- 1 Do not use standard fittings in an environment where static electric charge may cause a problem. Failure or malfunction of the system may result.

## Maintenance

### ⚠ Caution

- 1 Confirm the following items in periodic inspections and replace the fittings or tubing as required.
  - a) Scratches, gouge, wear, corrosion
  - b) Air leakage
  - c) Twisting, twining and flattening of tubing
  - d) Hardening, deterioration and softening of tubing
- 2 Do not use damaged or replaced fittings or tubing by reworking.

## Use of One-touch Fittings

### ⚠ Caution

- 1 Tubing insertion and removal on One-touch fittings
  - 1) Installation of tubing
    - 1 Take a tubing with no flaws on its periphery and cut it perpendicularly with tube cutters TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. The tubing might be cut diagonally, or flattened, making installation impossible or causing problems such as disconnection and leakage.
    - 2 Hold the tubing and push it slowly, inserting it securely all the way into the fitting.
    - 3 Pull the tubing gently to confirm that it will not come out. Insufficient insertion may cause leakage or disconnection.
  - 2) Removal of tubing
    - 1 Push the release button deeply while also pushing in the flange equally.
    - 2 Pull out the tubing while holding the release button so that it will not pop out. If the release button is not pressed sufficiently, there will be increased biting force that will hinder the tube removal.
    - 3 When a disconnected tubing is used again, first cut off the bitten portion of the tubing. Use of a bitten portion of tubing with no changes will result in air leakage or difficulty in removing the tubing.
- 2 To install One-touch fittings, tighten it with an appropriate wrench applied to the hexagon wrench flats on the body as close to the thread as possible. Use of a wrench not corresponding to the size of the hexagonal portion may crush the wrench flats.
- 3 Tightening the thread portion of an M3, M5 and M6 fittings
  - 1) With M3  
Add approximately 1/4 turn using a tool after fastening by hand.
  - 2) With M5, M6  
Add approximately 1/6 turn using a tool after fastening by hand.

Excessive tightening may damage the thread portion or deform the gasket and cause loosening or air leakage. Replace the gasket for each fastening.



# Fittings & Tube/Common Precautions 2

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Fittings with Sealant

### ⚠ Caution

- ① Tighten the fitting with an appropriate torque in the table below. For standard installation, add 2 to 3 turns using a tool after fastening by hand.

Connection thread size	Appropriate tightening torque Nm
NPT 1/16, NPT, R1/8	7 to 9
NPT, R1/4	12 to 14
NPT, R3/8	22 to 24
NPT, R1/2	28 to 30

- ② If the fitting is screwed in with excessive torque, a large amount of sealant will seep out. Remove the excess sealant.
- ③ Insufficient tightening may cause faulty sealing or loosening.
- ④ Reuse
  - 1) In most cases, two or three uses are possible.
  - 2) Remove the sealant sticking to the fittings by blowing air over the threaded portion to prevent the sealant from entering the equipment, which may result in air leakage.
  - 3) If the sealant no longer provides an effective seal, wrap sealing tape over sealant before reuse.
- ⑤ Once the fitting has been tightened backing it out to its original position often causes the sealant to become defective, resulting in air leakage.

## Precautions on Use of Other Brands

### ⚠ Caution

- ① When using tubing brands other than SMC, confirm that the outside diameter tolerances of the tubing satisfy the following specifications.

- 1) Nylon tubing      Within  $\pm 0.1\text{mm}$
- 2) Soft nylon tubing      Within  $\pm 0.1\text{mm}$
- 3) Polyurethane tubing      Within  $+0.15\text{mm}$ ,  
Within  $-0.2\text{mm}$

Do not use tubing if the outside diameter tolerance is not satisfied. It may not be possible to connect the tubing, or leakage or disconnection may occur after connection.

# Series KP

## Clean One-touch Fittings For Blowing



### Recommended Applicable Tubing

<b>Tubing material</b>	Polyolefin: Series TPH Soft polyolefin: Series TPS
<b>Tubing O.D.</b>	ø4, ø6, ø8, ø10, ø12

Note 1) Polyurethane tubing: Series TU, Nylon tubing: Series T

Soft polyurethane tubing: Series TS is also applicable. However, the cleanliness performance will decline.

Note 2) Polyurethane tubing may fold when inserted due to its softness. Hold the tube while keeping the insertion length at the end and insert it all the way in slowly and securely until its end is felt to touch the bottom.

### Specifications

<b>Particle generation grade</b>	Grade 1 <small>Note 1)</small>
<b>Fluid</b>	Air, Nitrogen gas, Water (Pure water) <small>Note 2)</small>
<b>Max. operating pressure (20°C)</b>	1MPa <small>Note 3)</small>
<b>Operating vacuum pressure</b>	-100kPa
<b>Proof pressure (20°C)</b>	3MPa
<b>Ambient and fluid temperature</b>	-20°C to 80°C, In case of water 0 to 60°C (No freezing)
<b>Threads</b>	JIS B0203 (Tapered pipe thread)

Note 1) Refer to particle generation grade classifications.(Front matter 14)

Note 2) Consult SMC regarding other fluids.

Note 3) The maximum operating pressure is the value at 20°C. Refer to the operating pressure curve for other temperatures.

### Main Parts Material

<b>Body</b>	Polypropylene resin
<b>Stud</b>	Polypropylene resin
<b>Chuck</b>	SUS304
<b>Guide, Stopper screw, Drive bushing</b>	SUS304
<b>Collet, Release button</b>	Polypropylene resin
<b>Seal, O-ring, Cushion</b>	EPDM

### ⚠ Caution

Series KP is a line of special one-touch fittings for use in **clean room blowing** and **washing lines**. Consult SMC regarding other types of applications.

Seal material: The durability of EPDM with respect to mineral oils is inferior, which makes it unsuitable for piping in general pneumatic equipment.

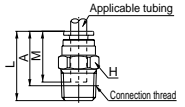
**Dimensions**

**Male Connector: KPH**



Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	L	A*	M	Effective area mm <sup>2</sup>		Weight g
							TPH	TPS	
4	1/8	KPH04-01	12	25.4	21.5	18	4	4	3
	1/4	KPH04-02	12	25.4	19.5				4
6	1/8	KPH06-01	14	25.9	22	19.5	10	10	4
	1/4	KPH06-02	14	26.4	20.5				5
8	1/8	KPH08-01	17	32.3	28.5	21.5	26	18	7
	1/4	KPH08-02	17	30.3	24.5				6
10	1/4	KPH10-02	19	37.5	32	24	41	29	10
	3/8	KPH10-03	19	33	27				11
12	3/8	KPH12-03	22	34	28	25	58	46	12
	1/2	KPH12-04	22	34.5	27				13

\*Reference dimensions of R thread after being screwed in.

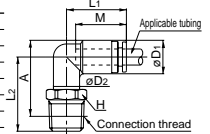


**Male Elbow: KPL**



Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) $\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area mm <sup>2</sup>		Weight g
									TPH	TPS	
4	1/8	KPL04-01	12	10.4	20.7	23.2	24.5	18	3.5	3.5	4
	1/4	KPL04-02	14	10	27.2	26.5	4				
6	1/8	KPL06-01	12	12.8	22.8	24.4	27	19.5	9	9	5
	1/4	KPL06-02	12	12.8	28.4	29	6				
8	1/8	KPL08-01	14	15.2	26.3	26.6	30	21.5	22	15	8
	1/4	KPL08-02	14	15.2	29.4	31.5	9				
10	1/4	KPL10-02	17	18.5	29.4	32.1	35.5	24	35	25	14
	3/8	KPL10-03	17	17	33.1	36.5	15				
12	3/8	KPL12-03	20.9	22	31.4	34.3	38.5	25	50	40	18
	1/2	KPL12-04	20.9	22	38.3	41.5	18				

\*Reference dimensions of R thread after being screwed in. Note 1)  $\phi D_1$  indicates the maximum diameter.

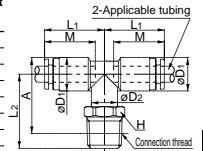


**Male Branch Tee: KPT**



Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area mm <sup>2</sup>		Weight g
										TPH	TPS	
4	1/8	KPT04-01	12	10.4	10	20.7	23.2	24.5	18	4.1	4.1	6
	1/4	KPT04-02	14	10.4	10	27.2	26.5	7				
6	1/8	KPT06-01	12	12.8	10	22.8	24.4	27	19.5	11	11	8
	1/4	KPT06-02	12	12.8	10	28.4	29	9				
8	1/8	KPT08-01	14	15.2	12	26.3	26.6	30	21.5	26.3	18.2	12
	1/4	KPT08-02	14	15.2	12	29.4	31.5	13				
10	1/4	KPT10-02	17	18.5	17	29.4	32.1	35.5	24	40.8	29	20
	3/8	KPT10-03	17	17	33.1	36.5	21					
12	3/8	KPT12-03	20.9	22	31.4	34.3	38.5	25	57.2	45.2	24	
	1/2	KPT12-04	20.9	22	38.3	41.5	27					

\*Reference dimensions of R thread after being screwed in. Note 1)  $\phi D_1$  indicates the maximum diameter.

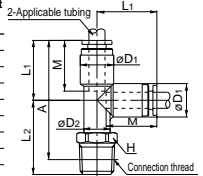


**Male Run Tee: KPY**



Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area mm <sup>2</sup>		Weight g
										TPH	TPS	
4	1/8	KPY04-01	12	10.4	10	20.7	23.2	40	18	7.5	7.5	6
	1/4	KPY04-02	14	10.4	10	27.2	42	7				
6	1/8	KPY06-01	12	12.8	10	22.8	24.4	43	19.5	11	11	8
	1/4	KPY06-02	12	12.8	10	28.4	45.5	9				
8	1/8	KPY08-01	14	15.2	12	26.3	26.6	49	21.5	21	21	12
	1/4	KPY08-02	14	15.2	12	29.4	50	13				
10	1/4	KPY10-02	17	18.5	17	29.4	32.1	56	24	45	45	19
	3/8	KPY10-03	17	17	33.1	56.5	20					
12	3/8	KPY12-03	20.9	22	31.4	34.3	59.5	25	57	57	24	
	1/2	KPY12-04	20.9	22	38.3	62.5	21					

\*Reference dimensions of R thread after being screwed in. Note 1)  $\phi D_1$  indicates the maximum diameter.

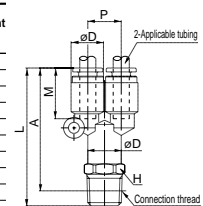


**Male Branch "Y": KPU**



Applicable tubing O.D. mm	Connection threads R	Model	H (Width across flats)	Note 1) $\phi D$	L	P	A*	M	Effective area mm <sup>2</sup>		Weight g
									TPH	TPS	
4	1/8	KPU04-01	12	10.4	45.4	10.4	41.5	18	7.5	7.5	7
	1/4	KPU04-02	14	10.4	49.4	43.5	8				
6	1/8	KPU06-01	12	12.8	49.6	12.8	45.5	19.5	18	18	9
	1/4	KPU06-02	12	12.8	52.4	46.5	10				
8	1/8	KPU08-01	17	15.2	56.7	15.2	52.5	21.5	26	26	15
	1/4	KPU08-02	17	15.2	61.3	55.5	17				
10	1/4	KPU10-02	19	18.5	64.5	18.5	59	24	45	45	23
	3/8	KPU10-03	19	17	67.5	61.5	24				
12	3/8	KPU12-03	22	20.9	69.7	20.9	63.5	25	70	70	29
	1/2	KPU12-04	22	20.9	72.7	65.5	30				

\*Reference dimensions of R thread after being screwed in. Note 1)  $\phi D$  indicates the maximum diameter.

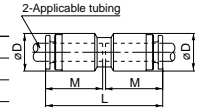


**Dimensions**

**Straight Union: KPH**



Applicable tubing O.D. mm	Model	Note 1) $\phi D$	L	M	Effective area mm <sup>2</sup>		Weight g
					TPH	TPS	
4	KPH04-00	10.4	37.4	18	4	4	4
6	KPH06-00	12.8	39.6	19.5	10	10	6
8	KPH08-00	15.2	44.4	21.5	26	18	10
10	KPH10-00	18.5	48.6	24	41	29	15
12	KPH12-00	20.9	50.6	25	58	46	18

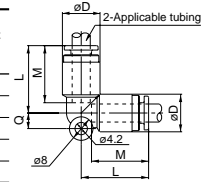


Note 1)  $\phi D$  indicates the maximum diameter.

**Elbow: KPL**



Applicable tubing O.D. mm	Model	Note 1) $\phi D$	L	Q	M	Effective area mm <sup>2</sup>		Weight g
						TPH	TPS	
4	KPL04-00	10.4	20.7	4.5	18	3.5	3.5	3
6	KPL06-00	12.8	22.8	5.3	19.5	9	9	7
8	KPL08-00	15.2	26.3	6	21.5	22	15	11
10	KPL10-00	18.5	29.4	6.8	24	35	25	16
12	KPL12-00	20.9	31.4	7.5	25	50	40	20

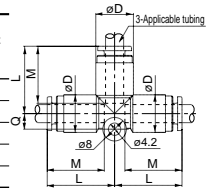


Note 1)  $\phi D$  indicates the maximum diameter.

**Union Tee: KPT**



Applicable tubing O.D. mm	Model	Note 1) $\phi D$	L	Q	M	Effective area mm <sup>2</sup>		Weight g
						TPH	TPS	
4	KPT04-00	10.4	20.7	4.5	18	4	4	7
6	KPT06-00	12.8	22.8	5.3	19.5	10	10	9
8	KPT08-00	15.2	26.3	6	21.5	26	18	16
10	KPT10-00	18.5	29.4	6.8	24	41	29	25
12	KPT12-00	20.9	31.4	7.5	25	58	46	29

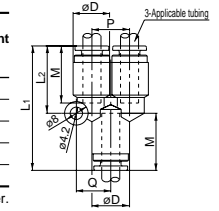


Note 1)  $\phi D$  indicates the maximum diameter.

**Union "Y": KPU**



Applicable tubing O.D. mm	Model	Note 1) $\phi D$	L <sub>1</sub>	L <sub>2</sub>	P	Q	M	Effective area mm <sup>2</sup>		Weight g
								TPH	TPS	
4	KPU04-00	10.4	38.8	20.6	10.4	9.7	18	4	4	7
6	KPU06-00	12.8	42.1	22.8	12.8	11.7	19.5	10	10	10
8	KPU08-00	15.2	48.7	27.5	15.2	13.7	21.5	26	18	17
10	KPU10-00	18.5	54	30.7	18.5	16.1	24	41	29	26
12	KPU12-00	20.9	57.2	32.9	20.9	18.1	25	58	46	32

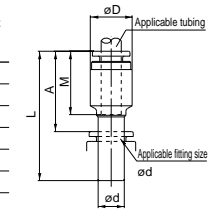


Note 1)  $\phi D$  indicates the maximum diameter.

**Plug-in Reducer: KPR**



Applicable tubing O.D. mm	Applicable fitting size $\phi d$	Model	Note 1) $\phi D$	L	A	M	Effective area mm <sup>2</sup>		Weight g
							TPH	TPS	
4	6	KPR04-06	10.4	39.4	20.1	18	4	4	3
		KPR04-08		41.9	20.2				
6	8	KPR06-08	12.8	42.5	20.8	19.5	10	10	4
		KPR06-10		45	21.2				
8	10	KPR08-10	15.2	47	23.2	21.5	26	18	5
		KPR08-12		48	23.2				
10	12	KPR10-12	18.5	50.5	25.7	24	41	29	9

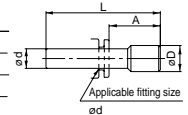


Note 1)  $\phi D$  indicates the maximum diameter.

**Plug: KPP**



Applicable fitting size $\phi d$	Model	$\phi D$	L	A	Weight g
4	KPP-04	6	32	13.8	0.4
6	KPP-06	8	35	15.7	0.7
8	KPP-08	10	39	17.3	1.1
10	KPP-10	12	43	19.2	1.7
12	KPP-12	14	45.5	20.7	2.5



## ⚠ Specific Product Precautions 1

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

### Selection

#### ⚠ Caution

- ① Do not use in locations where the connecting threads and tubing connection will slide or rotate. The connecting threads and tubing connection will come apart under such conditions.
- ② Observe the minimum bending radius of the tubing. If used with a bending radius below the minimum bending radius, the tube may be folded or flattened.
- ③ Consult SMC regarding fluids other than air, water or Nitrogen gas.
- ④ In case of liquid fluids, keep surge pressure at or below the maximum operating pressure. If the surge pressure exceeds the maximum operating pressure, this can cause damage to the fittings and tubing.

### Handling

#### ⚠ Caution

- ① Store away from direct sunlight at 40°C or lower.
- ② The inner bag of the double packaging should be opened in a clean room or other kinds of clean environments.

### Mounting

#### ⚠ Caution

- ① Confirm the type, model and size before installation. Also confirm that there is no scratches, gouges or cracks on the product.
- ② Allow extra length when connecting the tube, considering changes in the tube length due to pressure.
- ③ Do not allow twisting, twining or pulling force or moment load to be applied on the fittings or tubing. It can cause flattening, bursting or disconnection of the fittings or tubing.
- ④ Avoid wear-out tubing, twisted piping or damage to tubing to prevent crushing, bursting or release of tubing.

### Installation of Threads

#### ⚠ Caution

**Be sure to wrap a seal tape around the resin or metal threads. Use of fittings with no seal tape wrapped may result in air leakage.**

- ① Series KP (with resin threads)
  1. Wrapping of seal tape  
Wrap a seal tape 2 to 3 times around the threads, leaving 1.5 to 2 thread ridges exposed at the end.
  2. Tightening  
After tightening by hand, tighten approximately 2 to 3 turns further using a tightening tool.
- ② Series KPQ / KPG (with metal threads)
  1. With M5  
Add approximately 1/6 turn using a tool after fastening by hand. Excessive tightening may damage the thread portion or deform the gasket and cause loosening or air leakage.

### Installation of Threads

#### ⚠ Caution

##### 2. Taper thread

- 1) Wrapping the seal tape  
Wrap a seal tape 2 to 3 times around the threads, leaving 1.5 to 2 thread ridges exposed at the end.
- 2) Tighten the fitting with an appropriate torque in the table below. For standard installation, add 2 to 3 turns using a tool after manual fastening.

Connection threads	Appropriate tightening torque Nm
R1/8	7 to 9
R1/4	12 to 14
R3/8	22 to 24
R1/2	28 to 30

##### ③ Tightening tool

Tighten with an appropriate wrench using the hexagon wrench flats on the body. Position the wrench on the base as close to the threads as possible. If the size of the wrench is not suitable for the hexagon wrench flats, the wrench flats may be crushed.

### Installation and Removal of Tubing

#### ⚠ Caution

##### ① Installation of tubing

- 1) Using tube cutters TK-1, 2 or 3, take a tube having no flaws on its periphery and cut it off at a right angle. Do not use pinchers, nippers or scissors, etc. The tubing might be cut diagonally or flattened, making installation impossible or causing problems such as disconnection and leakage.
- 2) Hold the tube and push it slowly, inserting it securely all the way into the fitting
- 3) Pull the tubing gently to confirm that it will not come out. Insufficient insertion may cause leakage or disconnection.
- 4) Grease is not used due to the Series KP oil-free specifications. For this reason, greater insertion force is required when tubing is installed. In particular, polyurethane may fold when inserted due to its softness. Hold the end of the tubing, and insert it all the way in slowly and securely. Refer to dimension "M" in the dimension drawings for guidance on the insertion depth of tubing.

Tubing size	Tubing insertion length mm
ø4	18
ø6	19.5
ø8	21.5
ø10	24
ø12	25

## ⚠ Specific Product Precautions 2

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

- ② Removal of tubing
- 1) Push the release button deeply while also pushing in the flange equally.
  - 2) Pull out the tube while holding the release button so that it will not pop out. If the release button is not pressed sufficiently, there will be increased biting force that will hinder the tube removal.
  - 3) When a disconnected tubing is used again, first cut off the bitten portion of the tubing. Use of a bitten portion of tubing with no changes will result in air leakage or difficulty in removing the tubing.

### Operating Environment

#### ⚠ Warning

- ① Do not use in environments or locations where there is a danger of damage to fittings and tubing. For fitting and tubing materials, refer to specifications and construction drawings, etc.
- ② Provide shade in locations which receive direct sunlight.
- ③ Do not operate in locations where vibration or impact occurs. Since this can cause leakage and fitting damage, etc., contact SMC regarding use in this kind of environment.
- ④ Block off heat radiation from a heat source in the proximity. If a heat source is located nearby, the temperature of the product may rise to exceed the operating temperature range due to heat radiation. Block off the heat source with a cover.
- ⑤ Do not use in locations where static electrical charges will be a problem. Consult SMC regarding use in this kind of environment.
- ⑥ Do not use in locations where spatter occurs. There is a danger of spatter causing a fire. Consult SMC regarding use in this kind of environment.

#### ⚠ Caution

- ① Series KP is a line of special one-touch fittings for use in clean room blowing and washing lines. Consult SMC regarding other types of applications.

Series KP is a line of special one-touch fittings for use in clean room blowing and washing lines. Consult SMC regarding other types of applications.  
Use Series KPQ and KPG for piping to general pneumatic equipment.

### Maintenance

#### ⚠ Caution

- ① Pre-maintenance inspection  
When the product is to be removed, turn off the electric power, cut off the supply pressure without fail and confirm that fluid in the piping has been discharged.
- ② Post maintenance inspection  
After remounting and connection of piping, restore the fluid and electric power, and perform suitable function and leak tests. If leakage occurs or the equipment does not operate properly, stop operation immediately and confirm whether it is mounted correctly.
- ③ Further tightening of blow fittings (resin taper threads for piping)  
Since Series KP taper threads are made of resin, minute leakage may gradually occur due to stress relaxation. Perform periodic inspections, and if leakage is detected correct the problem by further tightening. If additional tightening becomes ineffective, replace the fitting with a new product.
- ④ Confirm the following items in periodic inspections and replace the fittings or tubing as required.
  - a) Scratches, gouge, wear, corrosion
  - b) Consult SMC regarding fluids other than air, water or Nitrogen gas.
  - c) Twisting, twining and flattening of tubing
  - d) Hardening, deterioration and softening of tubing
- ⑤ Do not use damaged or replaced fittings or tubing by reworking.

### Precautions on Use of Other Brands

#### ⚠ Caution

- ① When using tube brands other than SMC, confirm that the outside diameter tolerances of the tubing satisfy the following specifications.
 

1) Polyolefin tubing	Within $\pm 0.1$ mm
2) Polyurethane tubing	Within $+0.15$ mm Within $-0.2$ mm
3) Nylon tubing	Within $\pm 0.1$ mm
4) Soft nylon tubing	Within $\pm 0.1$ mm

Do not use tubing if the outside diameter tolerance is not satisfied. It may not be possible to connect the tubing, or leakage or disconnection may occur after connection. Polyolefine tubing is recommended for use with clean room fittings. Note that while other types of tubing will satisfy performance standards for leakage and tubing pull-out strength, etc., the degree of cleanliness will deteriorate.





# Series KPQ/KPG Clean One-touch Fittings For Drive System Air Piping



## Series KPQ

Brass (Electroless nickel plated)  
Release button color: Light gray



## Series KPG

Stainless steel (SUS304)  
Release button color: Light blue

## Recommended Applicable Tubing

<b>Tubing material</b>	Polyurethane: Series 10-
<b>Tubing O.D.</b>	ø4, ø6, ø8, ø10, ø12

Polyurethane tubing: Series TU, Nylon tubing: Series T,  
Soft nylon tubing: Series TS is also applicable. However, the cleanliness performance will decline.

## Specifications

<b>Particle generation grade</b>	Grade 1 Note 1)
<b>Fluid</b>	Air
<b>Max. operating pressure (20°C)</b>	1MPa Note 2)
<b>Operating vacuum pressure</b>	-100kPa
<b>Proof pressure (20°C)</b>	3MPa
<b>Ambient and fluid temperature</b>	-5°C to 60°C
<b>Threads</b>	JIS B0203 (Tapered pipe thread)

Note 1) Refer to particle generation grade classifications.(Front matter 14)

Since the internal seal materials have grease applied, they fall out of the scope of grading.

Note 2) The maximum operating pressure is the value at 20°C. Refer to the operating pressure curve for other temperatures.

## Main Parts Material

Model	Series KPQ	Series KPG
<b>Body</b>	Polypropylene resin	
<b>Stud</b>	Brass (Electroless nickel plated)	SUS304
<b>Chuck</b>	SUS304	
<b>Guide, Stopper</b>	Brass (Electroless nickel plated)	SUS304
<b>Collet, Release button</b>	Polypropylene resin	
<b>Seal, O-ring, Cushion</b>	NBR	

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.  
Refer to pages 517 and 518 for product specific precautions.

**Dimensions**

**Male connector: KPQH, KPGH**

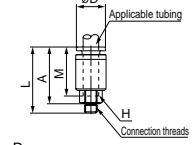
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Applicable tubing O.D. mm	Connection threads R	Model		H (Hexagon width across flats)	øD	L	A*	M	Effective area mm <sup>2</sup>		Weight g
		TPH	TPS								
4	M5	—	—	8	10	25.4	22.5	18	4	4	4
		—	—			25.9					
	1/8	KPQH04-01	KPGH04-01	10	—	25.4	19.5				
	1/4	KPQH04-02	KPGH04-02	14	—	22.9	17				
6	M5	—	—	8	12	26.3	23	19.5	10	10	5
		—	—			26.8					
	1/8	KPQH06-01	KPGH06-01	12	—	25.6	19.5				
8	1/4	—	—	14	—	26.1	20	21.5	26	18	14
		—	—			32.6	26.5				
10	1/4	—	—	14	—	30.6	24.5	24	41	29	24
		—	—			37.6	31.5				
12	3/8	—	—	17	—	33	26.5	25	58	46	23
		—	—			34.1	27.5				
12	1/2	—	—	22	—	34.1	26	25	58	46	46
		—	—			34.1	26				

\*Reference dimensions of R thread after being screwed in.

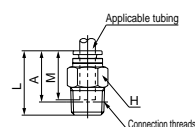
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**Male Elbow: KPQL, KPGL**

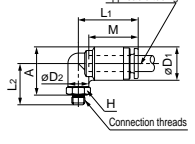
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Applicable tubing O.D. mm	Connection threads R	Model		H (Hexagon width across flats)	Note 1) øD1	øD2	L1	L2	A*	M	Effective area mm <sup>2</sup>		Weight g		
		TPH	TPS												
4	M5	KPQL04-M5	KPGL04-M5	8	10.4	8	10	20.7	15.3	17	18	4	4		
		KPQL04-01	KPGL04-01											10	20.7
	1/4	KPQL04-02	KPGL04-02	14	—	26	25								
	—	—	8	8	15.8	18.5									
6	M5	KPQL06-M5	KPGL06-M5	8	12.8	10	22.8	22.8	23.2	23.5	19.5	10	10		
		—	—											10	12.8
	1/4	KPQL06-02	KPGL06-02	14	—	27.2	27.5								
8	1/8	—	—	12	15.2	12	26.3	24.4	26	28.4	30	21.5	26	18	21
		—	—												
10	1/4	—	—	14	—	17	29.4	29.9	33	31.9	34.5	24	41	29	26
		—	—												
12	3/8	—	—	17	20.9	17	31.4	33.1	37	37.1	39.5	25	58	46	38
		—	—												
12	1/2	—	—	22	—	22	—	—	—	—	—	—	—	—	65
		—	—												

\*Reference dimensions of R thread after being screwed in. Note 1) øD1 indicates the maximum diameter.

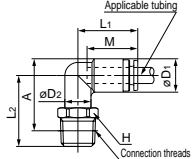
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**Union Tee: KPQT, KPGT**

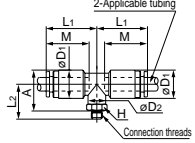
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Applicable tubing O.D. mm	Connection threads R	Model		H (Hexagon width across flats)	Note 1) øD1	øD2	L1	L2	A*	M	Effective area mm <sup>2</sup>		Weight g		
		TPH	TPS												
4	M5	KPQT04-M5	KPGT04-M5	8	10.4	8	10	20.7	15.3	17	18	4	4		
		KPQT04-01	KPGT04-01											10	20.7
	1/4	KPQT04-02	KPGT04-02	14	—	26	25								
	—	—	8	8	15.8	18.5									
6	M5	KPQT06-M5	KPGT06-M5	8	12.8	10	22.8	22.8	23.2	23.5	19.5	10	10		
		—	—											10	12.8
	1/4	KPQT06-02	KPGT06-02	14	—	27.2	27.5								
8	1/8	—	—	12	15.2	12	26.3	24.4	26	28.4	30	21.5	26	18	22
		—	—												
10	1/4	—	—	14	—	17	29.4	29.9	33	31.9	34.5	24	41	29	39
		—	—												
12	3/8	—	—	17	20.9	17	31.4	33.1	37	37.1	39.5	25	58	46	41
		—	—												
12	1/2	—	—	22	—	22	—	—	—	—	—	—	—	—	38
		—	—												

\*Reference dimensions of R thread after being screwed in. Note 1) øD1 indicates the maximum diameter.

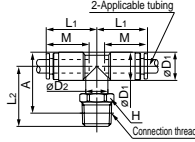
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Air Line Equipment

**Dimensions**

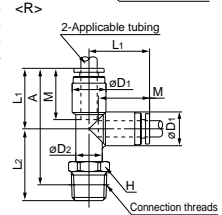
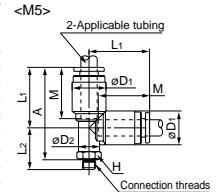
**Male Run Tee: KPQY, KPGY**

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Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area mm <sup>2</sup>		Weight g			
										TPH	TPS				
4	M5	KPQY04-M5 KPGY04-M5	8	10.4	8	20.7	15.3	32.5	18	4	4	6			
	1/8	KPQY04-01 KPGY04-01	10										22	36.5	13
	1/4	KPQY04-02 KPGY04-02	14										26	40.5	19
6	M5	KPQY06-M5 KPGY06-M5	8	12.8	8	22.8	15.8	35	19.5	10	10	7			
	1/8	KPQY06-01 KPGY06-01	10										23.2	40	14
	1/4	KPQY06-02 KPGY06-02	14										27.2	44	20
8	1/8	KPQY08-01 KPGY08-01	12	15.2	12	26.3	24.4	44.5	21.5	26	18	14			
	1/4	KPQY08-02 KPGY08-02	14										28.4	48.5	22
	1/4	KPQY10-02 KPGY10-02	17										29.9	53.5	29
10	3/8	KPQY10-03 KPGY10-03	17	18.5	17	29.4	31.9	55	24	41	29	39			
	3/8	KPQY12-03 KPGY12-03	22										33.1	58	41
	1/2	KPQY12-04 KPGY12-04	22										20.9	37.1	60.5

\*Reference dimensions of R thread after being screwed in. Note 1)  $\phi D_1$  indicates the maximum diameter.

<R>



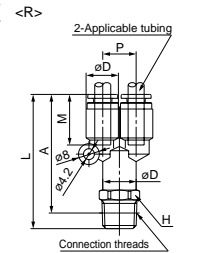
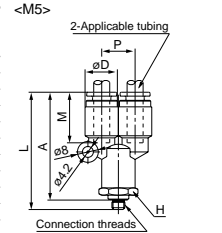
**Male Branch: KPQU, KPGU**

<M5>

Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) $\phi D$	L	P	A*	M	Effective area mm <sup>2</sup>		Weight g			
									TPH	TPS				
4	M5	KPQU04-M5 KPGU04-M5	11	10.4	10.4	10.4	38	18	4	4	10			
	1/8	KPQU04-01 KPGU04-01	11									41.7	38	11
	1/4	KPQU04-02 KPGU04-02	14									44.2	42	20
6	M5	KPQU06-M5 KPGU06-M5	11	12.8	12.8	12.8	41.5	19.5	10	10	12			
	1/8	KPQU06-01 KPGU06-01	13									44.9	41.5	21
	1/4	KPQU06-02 KPGU06-02	14									47.4	45.5	21
8	1/8	KPQU08-01 KPGU08-01	17	15.2	15.2	15.2	49.5	21.5	26	18	15			
	1/4	KPQU08-02 KPGU08-02	17									55.5	54.5	23
	1/4	KPQU10-02 KPGU10-02	19									60.6	58	30
10	3/8	KPQU10-03 KPGU10-03	19	18.5	18.5	18.5	55	24	41	29	40			
	3/8	KPQU12-03 KPGU12-03	22									63.8	60.5	40
	1/2	KPQU12-04 KPGU12-04	22									61.3	63.5	65
12	3/8	KPQU12-03 KPGU12-03	22	20.9	20.9	20.9	60.5	25	58	46	40			
	1/2	KPQU12-04 KPGU12-04	22									67	63.5	65
	1/2	KPQU12-04 KPGU12-04	22									71.4	63.5	65

\*Reference dimensions of R thread after being screwed in. Note 1)  $\phi D$  indicates the maximum diameter.

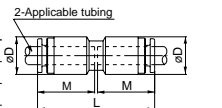
<R>



**Straight Union: KPQH, KPGH**

Applicable tubing O.D. mm	Model	Note 1) $\phi D$	L	M	Effective area mm <sup>2</sup>		Weight g
					TPH	TPS	
4	KPQH04-00 KPGH04-00	10.4	37.4	18	4	4	4
6	KPQH06-00 KPGH06-00	12.8	39.6	19.5	10	10	6
8	KPQH08-00 KPGH08-00	15.2	44.4	21.5	26	18	10
10	KPQH10-00 KPGH10-00	18.5	48.6	24	41	29	15
12	KPQH12-00 KPGH12-00	20.9	50.6	25	58	46	18

Note 1)  $\phi D$  indicates the maximum diameter.

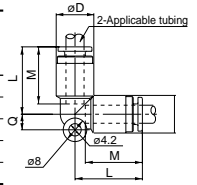


**Dimensions**

**Elbow: KPQL, KPGL**



Applicable tubing O.D. mm	Model		Note 1) $\phi D$	L	Q	M	Effective area mm <sup>2</sup>		Weight g
							TPH	TPS	
4	KPQL04-00	KPGL04-00	10.4	20.7	4.5	18	3.5	3.5	3
6	KPQL06-00	KPGL06-00	12.8	22.8	5.3	19.5	9	9	7
8	KPQL08-00	KPGL08-00	15.2	26.3	6	21.5	22	15	11
10	KPQL10-00	KPGL10-00	18.5	29.4	6.8	24	35	25	16
12	KPQL12-00	KPGL12-00	20.9	31.4	7.5	25	50	40	20

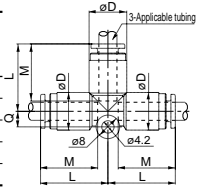


Note 1)  $\phi D$  indicates the maximum diameter.

**Union Tee: KPQT, KPGT**



Applicable tubing O.D. mm	Model		Note 1) $\phi D$	L	Q	M	Effective area mm <sup>2</sup>		Weight g
							TPH	TPS	
4	KPQT04-00	KPGT04-00	10.4	20.7	4.5	18	4	4	7
6	KPQT06-00	KPGT06-00	12.8	22.8	5.3	19.5	10	10	9
8	KPQT08-00	KPGT08-00	15.2	26.3	6	21.5	26	18	16
10	KPQT10-00	KPGT10-00	18.5	29.4	6.8	24	41	29	25
12	KPQT12-00	KPGT12-00	20.9	31.4	7.5	25	58	46	29

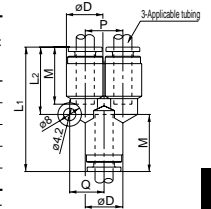


Note 1)  $\phi D$  indicates the maximum diameter.

**Union "Y": KPQU, KPGU**



Applicable tubing O.D. mm	Model		Note 1) $\phi D$	L <sub>1</sub>	L <sub>2</sub>	P	Q	M	Effective area mm <sup>2</sup>		Weight g
									TPH	TPS	
4	KPQU04-00	KPGU04-00	10.4	38.8	20.6	10.4	9.7	18	4	4	7
6	KPQU06-00	KPGU06-00	12.8	42.1	22.8	12.8	11.7	19.5	10	10	10
8	KPQU08-00	KPGU08-00	15.2	48.7	27.5	15.2	13.7	21.5	26	18	17
10	KPQU10-00	KPGU10-00	18.5	54	30.7	18.5	16.1	24	41	29	26
12	KPQU12-00	KPGU12-00	20.9	57.2	32.9	20.9	18.1	25	58	46	32

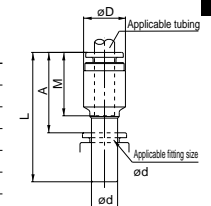


Note 1)  $\phi D$  indicates the maximum diameter.

**Plug-in Reducer: KPQR, KPGR**



Applicable tubing O.D. mm	Applicable fitting size $\phi d$	Model		Note 1) $\phi D$	L	A	M	Effective area mm <sup>2</sup>		Weight g
								TPH	TPS	
4	6	KPQR04-06	KPGR04-06	10.4	39.4	20.1	18	4	4	3
	8	KPQR04-08	KPGR04-08		41.9	20.2				
6	8	KPQR06-08	KPGR06-08	12.8	42.5	20.8	19.5	10	10	4
	10	KPQR06-10	KPGR06-10		45	21.2				
8	10	KPQR08-10	KPGR08-10	15.2	47	23.2	21.5	26	18	5
	12	KPQR08-12	KPGR08-12		48	23.2				
10	12	KPQR10-12	KPGR10-12	18.5	50.5	25.7	24	41	29	9

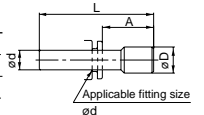


Note 1)  $\phi D$  indicates the maximum diameter.

**Plug: KPP**



Applicable fitting size $\phi d$	Model	$\phi D$	L	A	Weight g
4	KPP-04	6	32	13.8	0.4
6	KPP-06	8	35	15.7	0.7
8	KPP-08	10	39	17.3	1.1
10	KPP-10	12	43	19.2	1.7
12	KPP-12	14	45.5	20.7	2.5



\*The plug is common to series KPQ, KPG and KP.

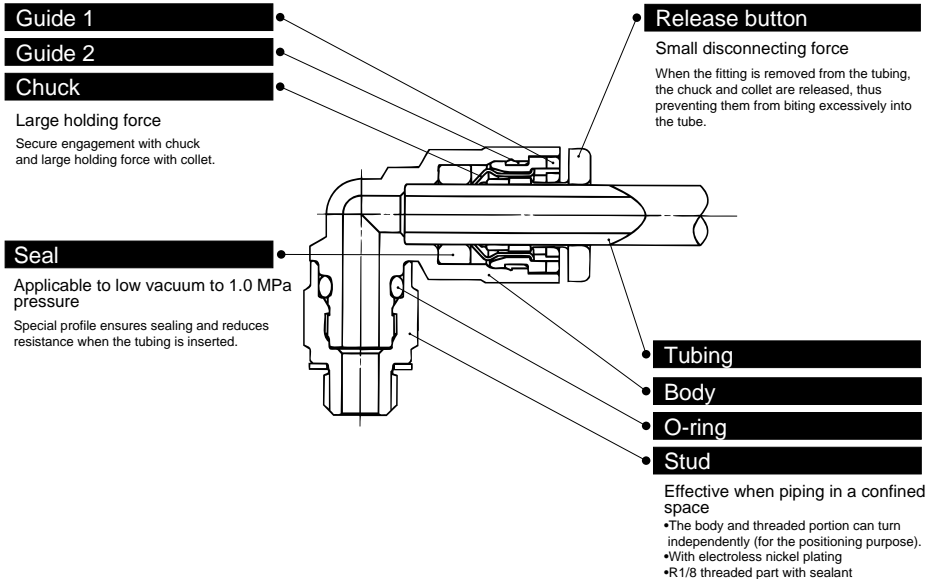
Air Line Equipment

# Series 10-KJ

## Miniature One-touch Fittings

Applicable Tube/ø3.2,ø4,ø6, Connection Thread/M3,M5,R1/8

### Construction



### Specifications

Fluid	Air
Max. operating pressure	1.0MPa
Operating vacuum pressure	-100kPa
Proof pressure	3.0MPa
Ambient and fluid temperature	-5 to 60 °C (No freezing)
Thread sealant	With sealant (Standard)

### Applicable Tubing

Tubing material	Polyurethane
Tubing O.D.	ø3.2, ø4, ø6

### Main Parts Material

Model	10-KJ
Body	SUS303, C3604BD With electroless nickel plated, PBT
Stud	C3604BD (Thread part) With electroless nickel plated
Chuck, Guide 2	SUS304
Release bush, Guide 1	POM
Seal, O-ring	NBR

### ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

**Model**

Hex. Socket Head Male Connector

**10-KJS**



The hexagon socket of the body is used to tighten the male connector with a hexagon wrench in a confined space.

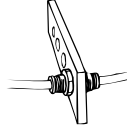


Bulkhead Union

**10-KJE**



Used for relay connection from one tubing to another across a panel.

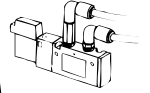


Extended Male Elbow

**10-KJW**



Used basically in the same way as a standard male elbow but also to extend the elbow over a standard one for ease of connection and disconnection of tubing.



Male Connector

**10-KJH**



Used to pipe in the same direction from a female threaded portion. Most common type.

Plug-in Elbow

**10-KJL**



Used to change the tubing entry of One-touch fittings by 90°.

Union "Y"

**10-KJU**



Used to branch a tubing in the same direction.

Female Connector

**10-KJF**



Used to pipe from the male threaded portion of a pressure gauge, etc.

Reducer Elbow

**10-KJL**



Used to change the tubing entry of One-touch fittings by 90° as well as to downsize the diameter.

Different Dia. Union "Y"

**10-KJU**



Used to branch a tubing into smaller tubings in the same direction.

Straight Union

**10-KJH**



Used to connect tubings in the same direction.

Male Branch Tee

**10-KJT**



Used for branching from a female threaded portion at 90° on both sides.

Plug-in "Y"

**10-KJU**



Used for branching from a One-touch fitting into the same direction.

Different Dia. Straight Union

**10-KJH**



Used to connect tubings of different sizes.

Union Tee

**10-KJT**



Used to branch a tubing into 2 directions at 90° on both sides.

Different Dia. Plug-in "Y"

**10-KJX**



Used for branching from a One-touch fitting into tubings of smaller diameters in the same direction.

Male Elbow

**10-KJL**



Used to pipe at a right angle from a female threaded portion. Most common type.

Different Dia. Union Tee

**10-KJT**



Used to branch a tubing into 2 smaller tubes at 90° on both sides.

Male Branch "Y"

**10-KJU**



Used for branching from a female threaded portion into the same direction.

Elbow

**10-KJL**



Used to connect tubings at right angles.

Male Run Tee

**10-KJY**



Used for branching into the same direction and at 90° either from male or female threaded portion.

Plug-in Reducer

**10-KJR**

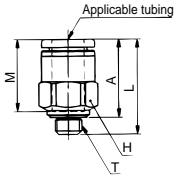


Used to change the diameter of One-touch fitting.

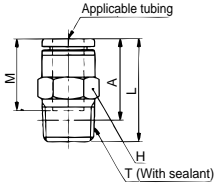
# Miniature One-touch Fittings 10-KJ

## Male Connector: 10-KJH

M3, M5



R1/8



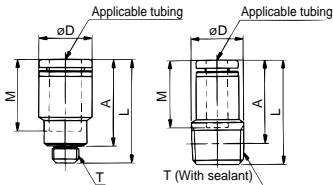
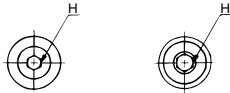
Applicable tubing O.D. (mm)	Connection threads T	Model	H (Hexagon width across flats)	L	A	M	Effective area (mm <sup>2</sup> )	
							Urethane rubber	Weight g
3.2	M3 X 0.5	10-KJH23-M3	7	16.3	13.7	12.7	0.9	1.6
	M5 X 0.8	10-KJH23-M5		16.7	13.6			2
	R1/8	10-KJH23-01S	10	13.8	9.8*		2.5	4.7
4	M3 X 0.5	10-KJH04-M3	8	16.3	13.7	12.7	0.9	1.9
	M5 X 0.8	10-KJH04-M5		17	13.9			4
	R1/8	10-KJH04-01S	10	14.8	10.8*		4	4.6
6	M5 X 0.8	10-KJH06-M5	10	17.8	14.7	13.5	4	3.3
	R1/8	10-KJH06-01S		19.4	15.4*			10

\*Reference dimensions of R thread after being screwed in.

## Hex. Socket Head Male Connector: 10-KJS

M3, M5

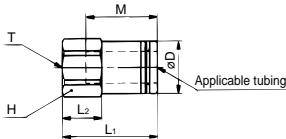
R1/8



Applicable tubing O.D. (mm)	Connection threads T	Model	H (Hexagon width across flats)	D (Note)	L	A	M	Effective area (mm <sup>2</sup> )	
								Urethane rubber	Weight g
3.2	M3 X 0.5	10-KJS23-M3	1.5	7	16.3	13.7	12.7	1.4	1.3
	M5 X 0.8	10-KJS23-M5	2		19.7	16.6		2.5	2.8
4	M3 X 0.5	10-KJS04-M3	1.5	8	16.3	13.7	12.7	1.4	1.6
	M5 X 0.8	10-KJS04-M5	2.5		18.7	15.6		4	2.7
	R1/8	10-KJS04-01S	3	9.8	19.7	15.7*		4	5.4
6	M5 X 0.8	10-KJS06-M5	2.5	10	19.5	16.4	13.5	4	3.3
	R1/8	10-KJS06-01S	4		20	16*		10	5.2

\*Reference dimensions of R thread after being screwed in.  
Note) øD indicates the maximum diameter.

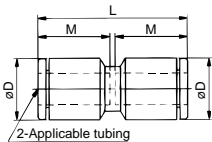
## Female Connector: 10-KJF



Applicable tubing O.D. (mm)	Connection threads T	Model	H (Hexagon width across flats)	D (Note)	L1	L2	M	Effective area (mm <sup>2</sup> )	
								Urethane rubber	Weight g
3.2	M3 X 0.5	10-KJF23-M3	7	7	16.5	6.8	12.7	2.5	2.6
	M5 X 0.8	10-KJF23-M5			18.8	7.9			2.8
4	M3 X 0.5	10-KJF04-M3	8	8	16.1	6.4	12.7	4	3.2
	M5 X 0.8	10-KJF04-M5			18.7	7.8			3.8
6	M5 X 0.8	10-KJF06-M5	10	10	18	7.5	13.5	10	5.3

Note) øD indicates the maximum diameter.

## Straight Union: 10-KJH

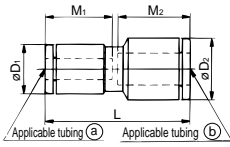


Applicable tubing O.D. (mm)	Model	D (Note)	L	M	Effective area (mm <sup>2</sup> )	Weight g
3.2	10-KJH23-00	8.4	26.3	12.7	2.5	1.4
4	10-KJH04-00	9.3	26.3	12.7	4	1.7
6	10-KJH06-00	11.6	28	13.5	10	2.5

Note) øD indicates the maximum diameter.



**Different Dia. Straight Union: 10-KJH**

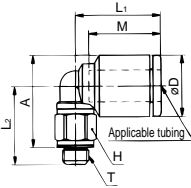


Applicable tubing O.D. (mm)		Model	Note)		L	M1	M2	Effective area (mm <sup>2</sup> ) Polyurethane tubing	Weight g
(a)	(b)		D1	D2					
3.2	4	10-KJH23-04	8.4	9.3	26.3	12.7	12.7	2.5	1.6
	6	10-KJH23-06		11.6					
4	6	10-KJH04-06	9.3	11.6	27.2	12.7	13.5	4	2.2

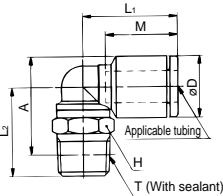
Note) øD1, øD2 indicates the maximum diameter.

**Male Elbow: 10-KJL**

M3,M5



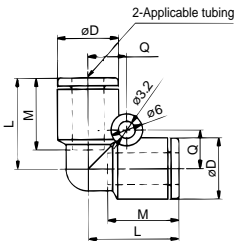
R1/8



Applicable tubing O.D. (mm)	Connection threads T	Model	H (Hexager with across face)	Note)		L1	L2	A	M	Effective area (mm <sup>2</sup> ) Polyurethane tubing	Weight g
				D	D						
3.2	M3 X 0.5	10-KJL23-M3	7	8.4	15.3	12.5	14.1	12.7	0.8	2.1	
	M5 X 0.8	10-KJL23-M5									
	R1/8	10-KJL23-01S	10								15.2
4	M3 X 0.5	10-KJL04-M3	7	9.3	15.6	13	15.1	12.7	0.8	2.2	
	M5 X 0.8	10-KJL04-M5									
	R1/8	10-KJL04-01S	10								15.7
6	M5 X 0.8	10-KJL06-M5	7	11.6	17.8	16.1	17.4	13.5	3.5	3.2	
	R1/8	10-KJL06-01S	10								16.7

\*Reference dimensions and R after installation  
Note) øD indicates the maximum diameter.

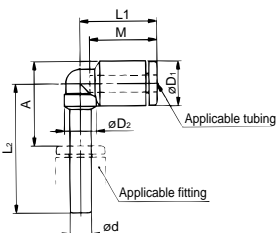
**Elbow: 10-KJL**



Applicable tubing O.D. (mm)	Model	Note) D	L	Q	M	Effective area (mm <sup>2</sup> ) Polyurethane tubing	Weight g
3.2	10-KJL23-00	8.4	15	5.8	12.7	2.2	1.6
4	10-KJL04-00	9.3	15.8	6.3	12.7	3.5	2
6	10-KJL06-00	11.6	17.1	7.3	13.5	9	3.1

Note) øD indicates the maximum diameter.

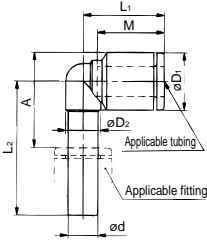
**Plug-in Elbow: 10-KJL**



Applicable tubing O.D. (mm)	Fitting size ød	Model	Note) D1	D2	L1	L2	A	M	Effective area (mm <sup>2</sup> ) Polyurethane tubing	Weight g
3.2	3.2	10-KJL23-99	8.4	6	14.5	23.8	15.3	12.7	2.2	1
4	4	10-KJL04-99	9.3	6	15.6	24.7	16.7	12.7	3.5	1.2
6	6	10-KJL06-99	11.6	7	16.3	26.8	19.1	13.5	9	2

Note) øD1 indicates the maximum diameter.

**Reducer Elbow: 10-KJL**

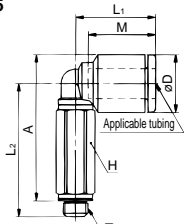


Applicable tubing O.D. (mm)	Applicable fitting size ød	Model	Note)		L1	L2	A	M	Effective area (mm <sup>2</sup> )		Weight g
			D1	D2					Polyurethane tubing		
3.2	4	10-KJL23-04	8.4	6	14.5	24.3	15.8	12.7	2.2	1.1	
	6	10-KJL23-06				25.3	16			1.2	
4	6	10-KJL04-06	9.3	6	15.6	25.7	16.9	12.7	3.5	1.4	

Note) øD1 indicates the maximum diameter.

**Extended Male Elbow: 10-KJW**

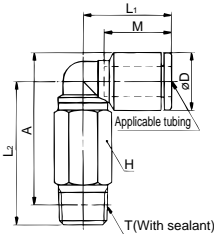
**M3, M5**



Applicable tubing O.D. (mm)	Connection thread T	Model	H (Hexagon width across flats)	Note)		L1	L2	A	M	Effective area (mm <sup>2</sup> )		Weight g
				D	D					Polyurethane tubing		
3.2	M3 X 0.5	10-KJW23-M3	7	8.4	15.3	22.5	24.1	12.7	2.2	0.8	5	
	M5 X 0.8	10-KJW23-M5	10			25.2	26.3			6.2		
	R1/8	10-KJW23-01S	10			25.4*	25.4*			13.4		
4	M3 X 0.5	10-KJW04-M3	7	9.3	15.6	23	25.1	12.7	3.5	0.8	5.1	
	M5 X 0.8	10-KJW04-M5	10			25.7	27.3			6.4		
	R1/8	10-KJW04-01S	10			26.4*	26.4*			13.6		
6	M5 X 0.8	10-KJW06-M5	7	11.6	17.8	26.7	29.4	13.5	9	3.5	6.9	
	R1/8	10-KJW06-01S	10			28.7	30.5*			13.2		

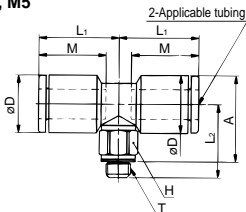
\*Reference dimensions of R after installation  
Note) øD indicates the maximum diameter.

**R1/8**



**Male Branch Tee: 10-KJT**

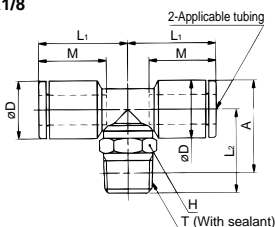
**M3, M5**



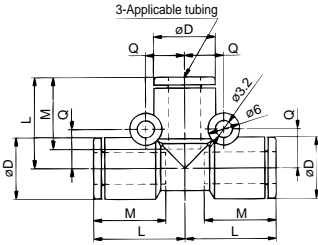
Applicable tubing O.D. (mm)	Connection thread T	Model	H (Hexagon width across flats)	Note)		L1	L2	A	M	Effective area (mm <sup>2</sup> )		Weight g
				D	D					Polyurethane tubing		
3.2	M3 X 0.5	10-KJT23-M3	7	8.4	15.3	12.5	14.1	12.7	0.9	2.8		
	M5 X 0.8	10-KJT23-M5				13.2	14.3			3.2		
	R1/8	10-KJT23-01S				10	15.2			15.4*	7.4	
4	M3 X 0.5	10-KJT04-M3	7	9.3	15.6	13	15.1	12.7	4.5	3.1		
	M5 X 0.8	10-KJT04-M5				13.7	15.3			3.5		
	R1/8	10-KJT04-01S				10	15.7			16.4*	7.7	
6	M5 X 0.8	10-KJT06-M5	7	11.6	17.8	16.1	17.4	13.5	11	4.5	4.4	
	R1/8	10-KJT06-01S				10	18.5*			18.5*	7.6	

\*Reference dimensions of R thread after being screwed in.  
Note) øD indicates the maximum diameter.

**R1/8**



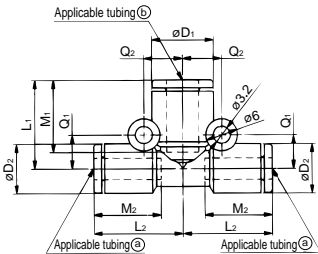
Union Tee: 10-KJT



Applicable tubing O.D. (mm)	Model	D <sup>(Note)</sup>	L	Q	M	Effective area (mm <sup>2</sup> )	Weight
						Polyurethane tubing	g
3.2	10-KJT23-00	8.4	15	5.8	12.7	2.7	2.5
4	10-KJT04-00	9.3	15.8	6.3	12.7	4.5	3
6	10-KJT06-00	11.6	17.1	7.3	13.5	11	4.6

(Note) øD indicates the maximum diameter.

Different Dia. Union Tee: 10-KJT

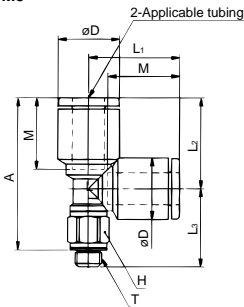


Applicable tubing O.D. (mm)		Model	D <sub>1</sub> <sup>(Note)</sup>	D <sub>2</sub> <sup>(Note)</sup>	L <sub>1</sub>	L <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	M <sub>1</sub>	M <sub>2</sub>	Effective area (mm <sup>2</sup> )	Weight
a	b										Polyurethane tubing	g
3.2	4	10-KJT23-04	9.3	8.4	15.3	15.8	5.8	6.3	12.7	12.7	4.5	2.8
4	6	10-KJT04-06	11.6	9.3	16.6	16.8	6.3	7.3	13.5	12.7	8	3.7

(Note) øD<sub>1</sub>, øD<sub>2</sub> indicates the maximum diameter.

Male Run Tee: 10-KJY

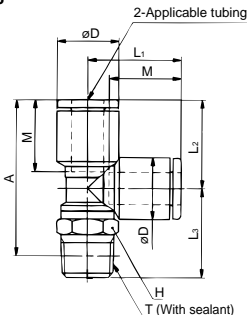
M3, M5



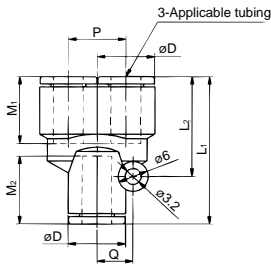
Applicable tubing O.D. (mm)	Connection threads T	Model	H <sup>(Heagon with across flats)</sup>	D <sup>(Note)</sup>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A	M	Effective area (mm <sup>2</sup> )	Weight	
										Polyurethane tubing	g	
3.2	M3 X 0.5	10-KJY23-M3	7	8.4	15.4	14.8	12.5	24.7	12.7	0.9	2.8	
	M5 X 0.8	10-KJY23-M5								13.2	24.9	2.7
	R1/8	10-KJY23-01S	10							15.2	26*	7.4
4	M3 X 0.5	10-KJY04-M3	7	9.3	15.6	14.8	13	25.2	12.7	0.9	3.1	
	M5 X 0.8	10-KJY04-M5								13.7	25.4	4.5
	R1/8	10-KJY04-01S	10							15.7	26.5*	7.7
6	M5 X 0.8	10-KJY06-M5	7	11.6	17.1	17.1	14.7	28.7	13.5	4.5	4.5	
	R1/8	10-KJY06-01S								10	17.5	16.6

\*Reference dimensions of R thread after being screwed in.  
(Note) øD indicates the maximum diameter.

R1/8



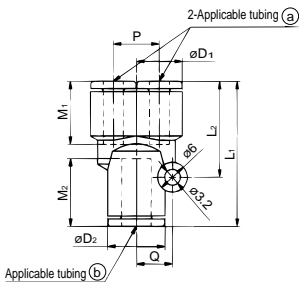
**Union "Y": 10-KJU**



Applicable tubing O.D. (mm)	Model	D <sup>Note)</sup>		L <sub>1</sub>	L <sub>2</sub>	P	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area (mm <sup>2</sup> )	
		D <sub>1</sub>	D <sub>2</sub>							Polyurethane tubing	
3.2	10-KJU23-00	8.4	28.5	19	8.4	5.8	12.7	12.9	2.7	2.6	
4	10-KJU04-00	9.3	27.9	18.3	9.3	6.3	12.7	12.9	4.5	3	
6	10-KJU06-00	11.6	31.2	21.6	11.6	7.3	13.5	13.7	11	4.7	

Note) øD indicates the maximum diameter.

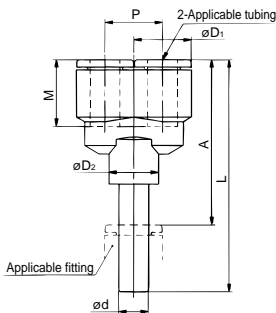
**Different Dia. Union "Y": 10-KJU**



Applicable tubing O.D. (mm)		Model	D <sup>Note)</sup>		L <sub>1</sub>	L <sub>2</sub>	P	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area (mm <sup>2</sup> )	
a	b		D <sub>1</sub>	D <sub>2</sub>							Polyurethane tubing	
3.2	4	10-KJU23-04	8.4	9.3	27.5	18.3	8.4	6.3	12.7	12.9	4.5	2.7
4	6	10-KJU04-06	9.3	11.6	29.2	19.3	9.3	7.3	12.7	13.7	8	3.7

Note) øD<sub>1</sub>, øD<sub>2</sub> indicates the maximum diameter.

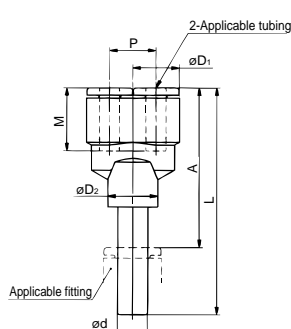
**Branch Union "Y": 10-KJU**



Applicable tubing O.D. (mm)	Applicable fitting size d	Model	D <sup>Note)</sup>		L	P	A	M	Effective area (mm <sup>2</sup> )	
			D <sub>1</sub>	D <sub>2</sub>					Polyurethane tubing	
3.2	3.2	10-KJU23-99	8.4	10	43.5	8.4	34.1	12.7	2.7	2.7
4	4	10-KJU04-99	9.3	10	44.7	9.3	35.3	12.7	4.5	3.2
6	6	10-KJU06-99	11.6	10	47.8	11.6	37.6	13.5	11	4.5

Note) øD<sub>1</sub> indicates the maximum diameter.

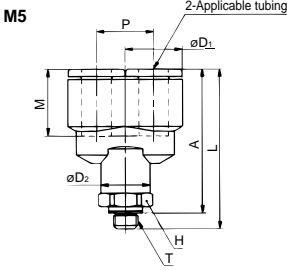
**Different Dia. Branch Union "Y": 10-KJX**



Applicable tubing O.D. (mm)	Applicable fitting size d	Model	D <sup>Note)</sup>		L	P	A	M	Effective area (mm <sup>2</sup> )	
			D <sub>1</sub>	D <sub>2</sub>					Polyurethane tubing	
3.2	4	10-KJX23-04	8.4	10	44	8.4	34.6	12.7	4.5	2.8
4	6	10-KJX04-06	9.3	10	45.7	9.3	35.5	12.7	8	3.5

Note) øD<sub>1</sub> indicates the maximum diameter.

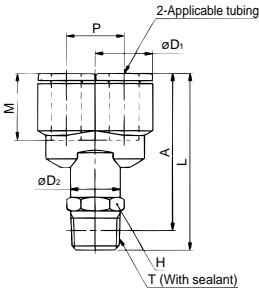
**Male Branch "Y": 10-KJU**



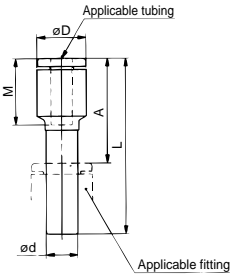
Applicable tubing O.D. (mm)	Connection thread T	Model	H (Hexagon width across flats)	(Note) D <sub>1</sub>	D <sub>2</sub>	L	P	A	M	Effective area (mm <sup>2</sup> ) Polyurethane tubing	Weight g
3.2	M5 X 0.8	10-KJU23-M5	10	8.4	10	30.6	8.4	27.5	12.7	2.2	5.9
	R1/8	10-KJU23-01S				34.1		*30.1		2.7	8.3
4	M5 X 0.8	10-KJU04-M5	10	9.3	10	31.3	9.3	28.2	12.7	2.2	6.4
	R1/8	10-KJU04-01S									
6	M5 X 0.8	10-KJU06-M5	10	11.6	10	33.4	11.6	30.3	13.5	2.2	7.4
	R1/8	10-KJU06-01S									

\*Reference dimensions of R thread after being screwed in.  
(Note)  $\phi D_1$  indicates the maximum diameter.

**R1/8**



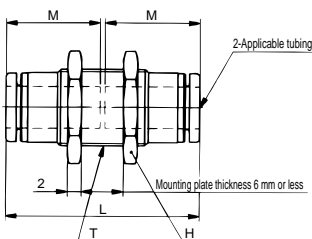
**Plug-in Reducer: 10-KJR**



Applicable tubing O.D. (mm)	Applicable fitting d	Model	D <sup>(Note)</sup>	L	A	M	Effective area (mm <sup>2</sup> ) Polyurethane tubing	Weight g
3.2	4	10-KJR23-04	8.4	32	19.3	12.7	2.5	0.9
	6	10-KJR23-06		33	19.5			1.1
4	6	10-KJR04-06	9.3	33.5	20	12.7	4	1.3

(Note)  $\phi D$  indicates the maximum diameter.

**Bulkhead Union: 10-KJE**



Applicable tubing O.D. (mm)	Model	T	H (Hexagon width across flats)	L	Mounting hole	M	Effective area (mm <sup>2</sup> ) Polyurethane tubing	Weight g
3.2	10-KJE23-00	M8 X 0.75	10	26	9	12.7	2.5	4.6
4	10-KJE04-00	M9 X 0.75	11	26	10	12.7	4	5.6
6	10-KJE06-00	M11 X 0.75	14	27.7	12	13.5	10	8.5

# Series 10-KQ One-touch Fittings

## Construction

### Guide

### Collet

### Chuck

#### Large holding force

Secure engagement with chuck and large holding force with collet.

### Release Button (White)

#### Small disconnecting force

Releases the chuck and collet when the fitting is removed. Also prevents the chuck from biting excessively into the tube.

### Seal

#### Applicable to low vacuum to 1.0 MPa pressure

Special profile ensures sealing and reduces resistance when the tube is inserted.

### Tubing

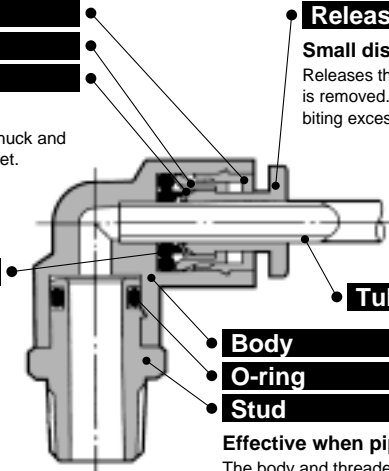
### Body

### O-ring

### Stud

#### Effective when piping in a confined space

The body and threaded portion can turn independently (for the positioning purpose).



## One-touch connection and removal. Applicable to vacuum to -100 kPa pressure.

### •Metric Size Tubing Application

### •Application Tubing Material Polyurethane



## Applicable Tubing

Tubing material	Polyurethane
Tubing O.D.	ø3.2, ø4, ø6, ø8, ø10, ø12

## Product Color

Series	Body	Release button
Series 10-KQ	White	White

## Specifications

Fluid		Air
Max. operating pressure		1.0MPa
Operating vacuum pressure		-100kPa
Proof pressure		3.0MPa
Ambient and fluid temperature		-5 to 60°C, In case of water : 0 to 40°C (No freezing)
Threads	Mounting part	JIS B0203 (Tapered pipe thread)
	Nut part	JIS B0211, 2 classes (Metric coarse screw thread)
Thread sealant		With or without sealant

## Main Parts Material

Body	C3604B With electroless nickel plated, PBT, PP
Stud	C3604BD (Thread part) With electroless nickel plated
Chuck	SUS304
Guide	SUS304, C3604BD With electroless nickel plated, POM
Collet, Release button	POM
Seal, Packing, O-ring	NBR
Gasket	SUS304, NBR

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

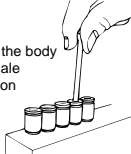
**Model**

**Hex. Socket Head Male Connector**

10-KQS



The hexagon socket of the body is used to tighten the male connector with a hexagon wrench in a confined space.

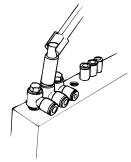


**Universal Male Elbow**

10-KQV



The hexagon socket of the body is used to tighten the male elbow with a box wrench in a confined space.

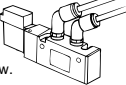


**45° Male Elbow**

10-KKW



Used for piping at 45° from a female threaded portion. An intermediate model between a male connector and male elbow.

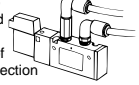


**Extended Male Elbow**

10-KQW



Used basically in the same way as a standard male elbow but also to extend the elbow over a standard one for ease of connection and disconnection of tubing.

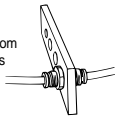


**Bulkhead Union**

10-KQE



Used for relay connection from one tubing to another across a panel.

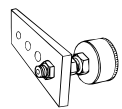


**Bulkhead Female Union**

10-KQE



Used to connect a male threaded portion and a tube across a panel.



**Nipple**

10-KQN



Used to connect One-touch fittings.

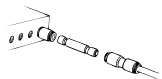


**Different Dia. Nipple**

10-KQN



Used to connect One-touch fittings of different diameters.



**Male Connector**

10-KQH



Used to pipe in the same direction from a female threaded portion. Most common type.

**Male Elbow**

10-KQL



Used† to pipe at a right angle from a female threaded portion. Most common type.

**Male Branch Tee**

10-KQT



Used for branching from a female threaded portion at 90° on both sides.

**Female Connector**

10-KQF



Used to pipe from the male threaded portion of a pressure gauge, etc.

**Elbow**

10-KQL



Used to connect tubings at right angles.

**Union Tee**

10-KQT



Used to branch a tubing into 2 directions at 90° on both sides.

**Straight Union**

10-KQH



Used to connect tubings in the same direction.

**Plug-in Elbow**

10-KQL



Used to change the tubing entry of One-touch fittings by 90°.

**Different Dia. Union Tee**

10-KQT



Used to branch a tubing into 2 smaller tubes at 90° on both sides.

**Different Dia. Straight Union**

10-KQH



Used to connect tubings of different sizes.

**Reducer Elbow**

10-KQL



Used to change the tubing entry of One-touch fittings by 90° as well as to downsize the diameter.

**Different Dia. Union Tee**

10-KQT



Used to branch a tubing into one in the same direction and another smaller one at 90°.

**Cross**

10-KQTV



Used to connect 4 tubings in 4 different directions.

**Different Dia. Cross**

10-KQTX



Used to connect 4 tubes at right angles, with 2 smaller tubings on both sides.

**Different Dia. Cross**

10-KQTY



Used to branch a tubing into 3 smaller tubes at right angles.

**Model**

**Hex. Socket Head**

**Universal Male Elbow**

**10-KQVS**



The hexagon socket of the body is used to tighten the male elbow with a hexagon wrench in a confined space.

**Triple Branch Universal Male Elbow**

**10-KQZT**



For 6-way branching at right angles from a female threaded portion. 3 individual parts rotate freely.

**Union "Y"**

**10-KQU**



Used to branch a tubing in the same direction.

**Male Branch Connector**

**10-KQLU**



Used for branching from a female threaded portion at right angles.

**Branch Elbow**

**10-KQLU**



Used to branch a tubing at right angles.

**Different Dia. Union "Y"**

**10-KQU**



Used to branch a tubing into smaller tubings in the same direction.

**Universal Female Elbow**

**10-KQVF**



Used for branching from a male or female threaded portion into the same direction and at a right angle. Possible to connect multiple pieces.

**Extended Plug-in Elbow**

**10-KQW**



Used to change the tubing entry of One-touch fittings by 90° as well as to extend the elbow over a standard plug-in elbow for ease of connection and disconnection of tubing.

**Plug-in "Y"**

**10-KQU**



Used for branching from a One-touch fitting into the same direction.

**Female Elbow**

**10-KQLF**



Used to pipe from a male threaded portion at a right angle.

**Male Delta**

**10-KQD**



Used for 2-way branching at right angles from a female threaded portion.

**Male Branch "Y"**

**10-KQU**



Used for branching from a female threaded portion into the same direction.

**Double Universal Elbow**

**10-KQVD**



Used for branching from a female threaded portion at right angles. 2 individual parts rotate freely.

**Delta**

**10-KQD**



Used to branch a tubing into 3 tubings at right angles.

**Plug-in Reducer**

**10-KQR**



Used to change the diameter of One-touch fitting.

**Triple Universal Male Elbow**

**10-KQVT**



Used for 3-way branching at right angles from a female threaded portion. 3 individual parts rotate freely.

**Double Branch**

**10-KQUD**



Used for 4-way branching in the same direction from a female threaded portion.

**Bulkhead Male Elbow**

**10-KQLE**



Used for relay connection from one tubing to another across a panel as well as to change the tubing entry by 90°

**Branch Universal Male Elbow**

**10-KQZ**



The hexagon socket of the body is used to tighten the male elbow with a box wrench. Used for branching.

**Different Dia. Double Union "Y"**

**10-KQUD**



Used to branch a tubing into 4 smaller tubings in the same direction.

**Adaptor**

**10-KQN**



Used to connect a One-touch fitting and an Rc female thread.

**Branch Universal Female Elbow**

**10-KQZF**



Used for 2-way branching into the same direction and at 90° either from a male or female threaded portion. Connection of multiple pieces is possible.

**Different Dia. Plug-in "Y"**

**10-KQX**



Used for branching from a One-touch fitting into tubings of smaller diameters in the same direction.

**Tubing**

**10-KQC**



Used to plug unused tubings.

**Double Branch Universal Male Elbow**

**10-KQZD**



Used for 4-way branching at right angles from a female threaded portion. 2 individual parts rotate freely.

**Double Plug-in "Y"**

**10-KQXD**



Used for branching from a One-touch fitting into 4 tubings of smaller diameters in the same direction.

**Color Cap**

**10-KQC**



Attached to release bushes to color-code them for ease of piping works.

**Male Run Tee**

**10-KQY**



Used for branching into the same direction and at 90° either from male or female threaded portion.

**Plug**

**10-KQP**



Used to plug unused One-touch fittings.



**Male Connector: 10-KQH**

M5, M6

Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) $\phi$ D	L	A*	M	Effective area mm <sup>2</sup>		Weight g
								Polyurethane tubing		
3.2	M5 X 0.8	10-KQH23-M5	7	7	16.7	13.6	12.7	2.5		2.1
	1/8	10-KQH23-01S	10	—	22	18	15.5	2.9		9
	1/4	10-KQH23-02S	14	—	19.5	13.5	—	—		16
4	M5 X 0.8	10-KQH04-M5	8	8	17	13.9	12.7	4		2.4
	M6 X 1.0	10-KQH04-M6	8		18	—	—	—		2.5
	1/8	10-KQH04-01S	10		—	22	18	16	4	
6	1/4	10-KQH04-02S	14	—	19.5	13.5	—	—		16
	M5 X 0.8	10-KQH06-M5	10	10	17.8	14.7	13.5	4		3.3
	M6 X 1.0	10-KQH06-M6	10		19	14.9	—	—		3.4
1/8	10-KQH06-01S	12	—		22.5	18.5	17	10.4		16
8	1/4	10-KQH06-02S	14	—	23	17	—	—		14
	3/8	10-KQH06-03S	17	—	22	15.5	—	—		27
	1/8	10-KQH08-01S	14	17	28	24	18.5	18.0		21
1/4	10-KQH08-02S	—	26.5		20.5	—	—		19	
3/8	10-KQH08-03S	17	22		15.5	—	—		26	
10	1/8	10-KQH10-01S	—	17	30	26	21	26.1		19
	1/4	10-KQH10-02S	—		33.5	27.5	—	—		30
	3/8	10-KQH10-03S	—		29	22.5	—	29.5		30
12	1/2	10-KQH10-04S	22	—	27	19	—	—		53
	1/4	10-KQH12-02S	19	—	34.5	28.5	22	46.1		42
	3/8	10-KQH12-03S	—		30	—	—	—		34
1/2	10-KQH12-04S	22	22		—	—	—		51	

M5, M6

R1/8

R

\*Reference dimensions of R thread after being screwed in.  
Note 1)  $\phi$ D indicates the maximum diameter.

**Hex. Socket Head Male Connector: 10-KQS**

M5, M6

Applicable tubing O.D. mm	Connection threads P	Model	H (Hexagon width across flats)	Note 1) $\phi$ D <sub>1</sub>	$\phi$ D <sub>2</sub>	L	A*	M	Effective area mm <sup>2</sup>		Weight g	
									Polyurethane tubing			
4	M5 X 0.8	10-KQS04-M5	2.5	8	—	18.7	15.6	12.7	4		2.7	
	M6 X 1.0	10-KQS04-M6	3			18.2	14.1		—	—		2.8
	1/8	10-KQS04-01S	9.8			23	19		16	3.6	8	
6	M5 X 0.8	10-KQS06-M5	2.5	10	—	19.5	16.4	13.5	4		3.3	
	M6 X 1.0	10-KQS06-M6	3			19.1	15		—	—		3.4
	1/8	10-KQS06-01S	4			11.8	24		20	17	9.9	
8	1/4	10-KQS06-02S	13.8	—	24	18	—	10.0		15		
	1/8	10-KQS08-01S	5	14	28	24	18.5	16.2		12		
	1/4	10-KQS08-02S	6		25.5	19.5	—	—		11		
3/8	10-KQS08-03S	17	27.5		21	—	—		24			
10	1/8	10-KQS10-01S	5	17	30	26	21	16.2		18		
	1/4	10-KQS10-02S	8		27.5	21.5	21	26.6		12		
	3/8	10-KQS10-03S	22		28	20	—	—		19		
12	1/2	10-KQS10-04S	22	—	28	20	—	—		35		
	1/4	10-KQS12-02S	8	19	33.5	27.5	22	44.5		20		
	3/8	10-KQS12-03S	10		29	22.5	—	—		18		
1/2	10-KQS12-04S	22	28		20	—	—		30			

M5, M6

R

KQS04 to 12 KQS16

R

\*Reference dimensions of R thread after being screwed in.  
Note 1)  $\phi$ D<sub>1</sub> indicates the maximum diameter.

**Female Connector: 10-KQF**

Applicable tubing O.D. mm	Connection threads Rc	Model	H (Hexagon width across flats)	Note 1) $\phi$ D <sub>1</sub>	$\phi$ D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	M	Effective area mm <sup>2</sup>		Weight g	
									Polyurethane tubing			
4	1/8	10-KQF04-01	14	—	10	27	11	16	4		15	
	1/4	10-KQF04-02	17			31	14		—	—		23
	1/8	10-KQF06-01	14			27.5	11		—	—		15
6	1/4	10-KQF06-02	17	—	12	31	13	17	10.4		22	
	3/8	10-KQF06-03	19			33.5	15		—	—		25
	1/8	10-KQF08-01	14			29	11		—	—		17
8	1/4	10-KQF08-02	17	—	14	32.5	13	18.5	18.0		24	
	3/8	10-KQF08-03	19			33.5	14		—	—		24
	1/4	10-KQF10-02	17			34.5	14		21	29.5		27
10	3/8	10-KQF10-03	19	—	17	36.5	15	—	—		30	
	1/4	10-KQF12-02	19	—	19	35	14	22	46.1		36	
	3/8	10-KQF12-03	37			—	—		31			
1/2	10-KQF12-04	24	41			18	—		—		52	

KQF04 to 12

KQF16

\*Reference dimensions of R thread after being screwed in.  
Note 1)  $\phi$ D<sub>2</sub> indicates the maximum diameter.

**Straight Union: 10-KQH**

Applicable tubing O.D. mm	Model	Note 1) $\phi$ D	L	M	Effective area	Weight g
					Polyurethane tubing mm <sup>2</sup>	
3.2	10-KQH23-00	9.6	31.5	15.5	2.9	3
4	10-KQH04-00	10.4	32.5	16	4	3
6	10-KQH06-00	12.8	34.5	17	10.4	4
8	10-KQH08-00	15.2	38.5	18.5	18.0	6
10	10-KQH10-00	18.5	42.5	21	29.5	11
12	10-KQH12-00	20.9	44.5	22	46.1	14



Note 1)  $\phi$ D indicates the maximum diameter.

**Different Dia. Straight Union: 10-KQH**

Applicable tubing O.D. mm		Model	Note) $\phi$ D	L	M <sub>1</sub>	M <sub>2</sub>	Effective area	Weight g
(a)	(b)						Polyurethane tubing mm <sup>2</sup>	
3.2	4	10-KQH23-04	10.4	32.5	15.5	16	2.9	3
4	6	10-KQH04-06	12.8	34.5	16	17	5.6	5
6	8	10-KQH06-08	15.2	38.5	17	18.5	10.4	6
8	10	10-KQH08-10	18.5	42	18.5	21	18.0	11
10	12	10-KQH10-12	20.9	44.5	21	22	29.5	14
12	16	10-KQH12-16	26.5	56.5	22	25	46.1	47



Note)  $\phi$ D indicates the maximum diameter.

**Male Elbow: 10-KQL**



Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) $\phi$ D <sub>1</sub>	$\phi$ D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area	Weight g
										Polyurethane tubing mm <sup>2</sup>	
3.2	M5 X 0.8	10-KQL23-M5	7	8.5	—	15.3	13.2	14.3	12.7	2.2	2.5
	1/8	10-KQL23-01S	10	9.6	10	17.5	21.5	22.5	15.5	2.5	8
	1/4	10-KQL23-02S	14	—	—	—	25.5	24.5	—	—	18
4	M5 X 0.8	10-KQL04-M5	7	9.3	—	15.6	13.7	15.3	12.7	3.5	2.7
	M6 X 1.0	10-KQL04-M6	8	—	—	—	14.7	—	—	—	3.6
	1/8	10-KQL04-01S	10	10.4	10	18	22	23	16	4.2	10
6	1/4	10-KQL04-02S	14	—	—	—	26	25	—	—	19
	M5 X 0.8	10-KQL06-M5	7	11.6	—	16.1	14.7	17.4	13.5	3.5	3.2
	M6 X 1.0	10-KQL06-M6	8	—	—	—	15.7	—	—	—	4.1
8	1/8	10-KQL06-01S	10	12.8	10	20	23	25.5	17	9.0	12
	1/4	10-KQL06-02S	14	—	—	—	27	27.5	—	—	22
	3/8	10-KQL06-03S	17	—	—	—	29	29	—	—	33
10	1/8	10-KQL08-01S	12	15.2	12	23	24.5	28	—	—	13
	1/4	10-KQL08-02S	14	—	—	—	28.5	30	18.5	14.9	21
	3/8	10-KQL08-03S	17	—	—	—	30.5	31.5	—	—	35
12	1/8	10-KQL10-01S	14	18.5	17	26.5	27	32	—	14.9	25
	1/4	10-KQL10-02S	17	—	—	—	30	33	—	—	26
	3/8	10-KQL10-03S	22	—	—	—	32	34.5	—	—	36
12	1/2	10-KQL10-04S	22	—	—	—	36	37	—	—	63
	1/4	10-KQL12-02S	17	—	—	—	31	35.5	—	—	28
	3/8	10-KQL12-03S	22	20.9	17	28.5	33	37	22	39.7	38
1/2	10-KQL12-04S	22	—	—	—	37	39.5	—	—	65	

**M5, M6**

**R**

\*Reference dimensions of R thread after being screwed in.



Note 1)  $\phi$ D indicates the maximum diameter.

**Male Branch Connector: 10-KQLU**

M5, M6



R



Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note) øD	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	P	Effective area	Weight g
											Polyurethane tubing mm <sup>2</sup>	
4	M5 X 0.8	10-KQLU04-M5	11	10.4	18.5	24	29.5	25.5	16	10.4	4.1	10
	M6 X 1.0	10-KQLU04-M6										
	1/8	10-KQLU04-01S										
	1/4	10-KQLU04-02S	14								4.1	12
												21
6	M5 X 0.8	10-KQLU06-M5	13	12.8	21	26.5	33	29.5	17	12.8	4.3	13
	M6 X 1.0	10-KQLU06-M6										
	1/8	10-KQLU06-01S										
	1/4	10-KQLU06-02S	14								11.0	22
												35
8	1/8	10-KQLU08-01S	17	15.2	24	34	41.5	38	18.5	15.2	18.2	27
	1/4	10-KQLU08-02S										
	3/8	10-KQLU08-03S										
												35
												41
												64
10	1/4	10-KQLU10-02S	19	18.5	27	40	49.5	43.5	21	18.5	29.0	42
	3/8	10-KQLU10-03S										
	1/2	10-KQLU10-04S										
												57
												64
12	1/4	10-KQLU12-02S	22	20.9	29	42.5	53	47	22	20.9	45.2	58
	3/8	10-KQLU12-03S										
	1/2	10-KQLU12-04S										
												65
												65

M5, M6

R

\*Reference dimensions of R thread after being screwed in.



Note) øD indicates the maximum diameter.

**45° Male Elbow: 10-KQK**

M5, M6

R

Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) øD <sub>1</sub>	øD <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area	Weight g
										Polyurethane tubing mm <sup>2</sup>	
4	M5 X 0.8	10-KQK04-M5	8	10.4	8	17	14.5	26	16	3.4	4
	M6 X 1.0	10-KQK04-M6									
	1/8	10-KQK04-01S									
	1/4	10-KQK04-02S									
6	M5 X 0.8	10-KQK06-M5	10	12.8	10	18	18.5	15	17	6.9	5
	M6 X 1.0	10-KQK06-M6									
	1/8	10-KQK06-01S									
	1/4	10-KQK06-02S									
8	3/8	10-KQK06-03S	17	15.2	12	20.5	26	39	18.5	13.7	10
	1/8	10-KQK08-01S									
	1/4	10-KQK08-02S									
	3/8	10-KQK08-03S									
10	1/8	10-KQK10-01S	17	18.5	17	24	24	42	21	23.2	25
	1/4	10-KQK10-02S									
	3/8	10-KQK10-03S									
	1/2	10-KQK10-04S									
12	1/4	10-KQK12-02S	22	20.9	17	25	27.5	45.5	22	35.1	28
	3/8	10-KQK12-03S									
	1/2	10-KQK12-04S									

M5, M6


R

\*Reference dimensions of R thread after being screwed in.



Note 1) øD<sub>1</sub> indicates the maximum diameter.

**Universal Male Elbow: 10-KQV**


M5	Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) øD <sub>1</sub>	øD <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	Effective area	Weight g	M5
												mm <sup>2</sup>		
	4	M5 X 0.8	10-KQV04-M5	8	10.4	9.8	20.5	11	18.5	15	16	2.9	6	R
			10-KQV04-01S			13.4	22	14.5	26.5	22.5			14	
	6	M5 X 0.8	10-KQV06-M5	8	12.8	9.8	23.5	12	18.5	15	17	3.8	7	R
			10-KQV06-01S			13.4	24	14.5	26.5	22.5			15	
	8	1/8	10-KQV08-02S	10	15.2	17.6	28.5	15.5	28.5	24.5	18.5	11.2	26	R
						10-KQV08-01S	15.4	23.5	18.5	31			25	
3/8		10-KQV08-03S	14	20.6	27.5	20.5	36.5	30	30	21	14.3	47	R	
						10-KQV10-02S	18.5	20.6	31			19.5		35.5
10	3/8	10-KQV10-03S	14	18.5	20.6	20.5	36.5	30	30	21	20.3	49	R	
						10-KQV12-03S	22	38.5	32			32		30
	1/2	10-KQV12-04S	17	20.9	25.2	34	25	41.5	33.5	22	30.8	80		

\*Reference dimensions of R thread after being screwed in.

Note 1) D<sub>1</sub> indicates the maximum diameter.



**Hex. Socket Head Universal Male Elbow: 10-KQVS**


M5	Applicable tubing O.D. mm	Connection threads R	Model	H (Hexagon width across flats)	Note 1) øD <sub>1</sub>	øD <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	Effective area	Weight g	M5
												mm <sup>2</sup>		
	4	M5	10-KQVS04-M5	4	10.4	9.8	20.5	10.5	18	15	16	2.9	6	R
			10-KQVS04-01S			13.4	22	14.5	26.5	22.5			14	
	6	M5	10-KQVS06-M5	4	12.8	9.8	23.5	12	18	15	17	3.8	7	R
			10-KQVS06-01S			13.4	24	14.5	26.5	22.5			15	
	8	1/8	10-KQVS08-02S	6	15.3	23.5	18.5	27	21	21	18.5	11.2	22	R
							10-KQVS08-01S	17.6	28.5	15.5			27	
3/8		10-KQVS08-03S	8	15.2	20.6	27.5	20.5	32.5	26	26	21	14.3	47	R
							10-KQVS10-02S	18.5	30	24			24	
10	1/4	10-KQVS10-02S	8	18.5	20.6	31	19.5	31.5	25	21	20.3	32	R	
						10-KQVS10-03S	20.5	32.5	26			26		30
12	3/8	10-KQVS12-03S	10	20.9	25.2	34	22	36	30	22	30.8	48	R	
							10-KQVS12-04S	25	39			31		31

\*Reference dimensions of R thread after being screwed in.

Note 1) øD<sub>1</sub> indicates the maximum diameter.



**Universal Female Elbow: 10-KQVF**


M5	Applicable tubing O.D. mm	Connection threads Rc R	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	Weight g	M5	
														R
	4	M5 X 0.8	10-KQVF04-M5	8	10.4	9.8	20.5	11	20	16	16	6	M5	
		1/8	10-KQVF04-01S	14		13.4	22	15.5	29.5	25.5		16		19
		M5 X 0.8	10-KQVF06-M5	8		9.8	23.5	12.5	20	16		7		
	6	1/8	10-KQVF06-01S	14	12.8	13.4	24.5	15.5	29.5	25.5	17	19	36	R
		1/4	10-KQVF06-02S	17	17.6	25	20	38.5	32.5	29				
		1/8	10-KQVF08-01S	8	15.2	17.6	28.5	17	31	27	37			
	8	1/4	10-KQVF08-02S	17	25.2	29.5	25.5	45.5	39	66	18.5	66	R	
		3/8	10-KQVF08-03S	22	20.6	31.5	22	41	35	21		48		
		1/4	10-KQVF10-02S	19	18.5	25.2	34	24.5	45.5	39		70		
	10	3/8	10-KQVF10-03S	22	20.9	25.2	34	24.5	45.5	39	22	70	R	
		1/2	10-KQVF12-04S	24	27	35	25.5	50	42	93				
		3/8	10-KQVF12-03S	22	20.9	25.2	34	24.5	45.5	39	22	93		

\*Reference dimensions of R thread after being screwed in.

Note)  $\phi D_1$  indicates the maximum diameter.




**Female Elbow: 10-KQLF**

M5	Applicable tubing O.D. mm	Connection threads Rc R	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	M	Effective area mm <sup>2</sup> Urethane rubber	Weight g	M5			
													R		
	4	M5 X 0.8	10-KQLF04-M5	8	10.4	8	18.5	14.5	16	3.5	5	M5			
		M6 X 1.0	10-KQLF04-M6	14		15.5		5							
		1/8	10-KQLF04-01	14		21		13							
	6	1/4	10-KQLF04-02	17	24.5	20	8	8	15	17	9.0	20	R		
		M5 X 0.8	10-KQLF06-M5	8	16	6									
		M6 X 1.0	10-KQLF06-M6	14	16	6									
	8	1/8	10-KQLF06-01	14	12.8	10	20.5	22	17	13	9.0	20	R		
		1/4	10-KQLF06-02	17	25.5	26	15.2	12	23.5	18.5				14.9	22
		3/8	10-KQLF06-03	19	26	23									
	1/8	10-KQLF08-01	14	23	16										
	10	1/4	10-KQLF08-02	17	15.2	12	23.5	26.5	21	27	14.9	22	R		
		3/8	10-KQLF08-03	19	27	23	18.5	17	26.5	28.5	21	25.0		27	
1/4		10-KQLF10-02	17	28	26										
3/8	10-KQLF10-03	19	28.5	26.5	28.5	21							25.0		46
12	1/2	10-KQLF10-04	24	32.5	46	20.9	17	28.5	30	22	39.7	29			
	1/4	10-KQLF12-02	17	29.5	29										
	3/8	10-KQLF12-03	19	29.5	30								22	39.7	29
1/2	10-KQLF12-04	24	34	48											

Note)  $\phi D_1$  indicates the maximum diameter.



**Double Universal Elbow: 10-KQVD**

M5	Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	P	Weight g	
														R
	4	1/8	10-KQVD04-01S	14	10.4	13.4	22	18.5	41	37	16	13.4	23	
		1/4	10-KQVD04-02S	17		21.5	44	38	29					
		3/8	10-KQVD04-03S	17		23.5	46	40	42					
	6	1/8	10-KQVD06-01S	14	12.8	13.4	24.5	18.5	41	37	24	17	13.4	30
		1/4	10-KQVD06-02S	17	23.5	46	40	42						
		3/8	10-KQVD06-03S	17	21	48	44	53						
	8	1/8	10-KQVD08-01S	19	15.2	17.6	28.5	24	51	45	51	18.5	15.9	60
		1/4	10-KQVD08-02S	19	25	52	45.5	60						
		3/8	10-KQVD08-03S	21	28.5	55.5	47.5	82						
	10	1/2	10-KQVD08-04S	21	28.5	55.5	47.5	82						
		1/4	10-KQVD10-02S	21	18.5	20.6	31.5	26.5	58	52	71	21	19.2	74
		3/8	10-KQVD10-03S	21	27.5	59	53	91						
1/2	10-KQVD10-04S	21	30.5	62	54	91								
12	1/4	10-KQVD12-02S	26	20.9	25.2	34	28.5	64.5	58.5	118	22	21.6	113	
	3/8	10-KQVD12-03S	26	29.5	65.5	59	125							
	1/2	10-KQVD12-04S	26	32.5	68.5	60	125							

\*Reference dimensions of R thread after being screwed in.

Note)  $\phi D_1$  indicates the maximum diameter.



**Triple Universal Male Elbow: 10-KQVT**

Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	P	Weight g
4	1/8	10-KQVT04-01S	14	10.4	13.4	22	18.5	54.5	50.5	16	13.4	29
	1/4	10-KQVT04-02S	14				21.5	57.5	51.5			34
	3/8	10-KQVT04-03S	17				23.5	59.5	53.5			48
6	1/8	10-KQVT06-01S	14	12.8	13.4	24.5	18.5	54.5	50.5	17	13.4	31
	1/4	10-KQVT06-02S	14				21.5	57.5	51.5			37
	3/8	10-KQVT06-03S	17				23.5	59.5	53.5			50
8	1/8	10-KQVT08-01S	19	15.2	17.6	28.5	21	64	60	18.5	15.9	71
	1/4	10-KQVT08-02S					24	67	61			66
	3/8	10-KQVT08-03S					25	68	61.5			75
	1/2	10-KQVT08-04S					21	28.5	71.5			63.5
10	1/4	10-KQVT10-02S	21	18.5	20.6	31.5	26.5	77.5	71.5	21	19.2	94
	3/8	10-KQVT10-03S					27.5	78.5	72			111
	1/2	10-KQVT10-04S					30.5	81.5	73.5			153
12	1/4	10-KQVT12-02S	26	20.9	25.2	34	28.5	86	80	22	21.6	142
	3/8	10-KQVT12-03S					29.5	87	80.5			154
	1/2	10-KQVT12-04S					32.5	90	82			

\*Reference dimensions of R thread after being screwed in.

Note)  $\phi D_1$  indicates the maximum diameter.



**Branch Universal Elbow: 10-KQZ**

M5



R



Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	P	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g					
4	M5 X 0.8	10-KQZ04-M5	8	10.4	9.8	19.5	11	18.5	15	16	10.4	3.4	8					
	1/8	10-KQZ04-01S	8									13.4	21	14.5	26.5	22.5	4.7	16
	1/8	10-KQZ06-01S	8									13.4	22	14.5	26.5	22.5		17
6	1/4	10-KQZ06-02S	14	12.8	20.6	25.5	19.5	35.5	29.5	17	12.8	8.6	39					
	3/8	10-KQZ06-03S	14										20.5	36.5	30	47		
	1/8	10-KQZ08-01S	12										15.5	28.5	24.5	27		
8	1/4	10-KQZ08-02S	14	15.2	20.6	27	18.5	31.5	25.5	18.5	15.2	14.2	33					
	3/8	10-KQZ08-03S	14										20.5	36.5	30	49		
	1/4	10-KQZ10-02S	14										18.5	35.5	29.5	46		
10	3/8	10-KQZ10-03S	14	18.5	20.6	29	20.5	36.5	30	21	18.5	22.6	54					
	3/8	10-KQZ12-03S	17										22	39	32.5	71		
	1/2	10-KQZ12-04S	17										20.9	25.2	32.5	25	42	34

\*Reference dimensions of R thread after being screwed in.

Note)  $\phi D_1$  indicates the maximum diameter.



**Branch Universal Male Elbow: 10-KQZF**

M5



R



Applicable tubing O.D. mm	Connection threads R Rc	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	P	Weight g					
4	M5 X 0.8	10-KQZF04-M5	8	10.4	9.8	19.5	11	20	16.5	16	10.4	8					
	1/8	10-KQZF04-01S	14									13.4	21	15.5	29.5	25.5	21
	1/8	10-KQZF06-01S	14									13.4	22	15.5	29.5	25.5	
6	1/4	10-KQZF06-02S	19	12.8	20.6	25.5	22	41	35	17	12.8	47					
	1/8	10-KQZF08-01S	17									17.6	25.5	17	31	27	32
	1/4	10-KQZF08-02S	19									20.6	27	22	41	35	18.5
10	1/4	10-KQZF10-02S	19	18.5	20.6	29	22	41	35	21	18.5	54					
	3/8	10-KQZF10-03S	22									25.2	31.5	24.5	45.5	39	74
	3/8	10-KQZF12-03S	22									25.2	32.5	24.5	45.5	39	77
12	1/2	10-KQZF12-04S	24	20.9	27	33	25	50	42	22	20.9	101					

\*Reference dimensions of R thread after being screwed in.

Note)  $\phi D_1$  indicates the maximum diameter.



**Double Branch Universal Elbow: 10-KQZD**



Applicable tubing O.D. mm	Connection threads	Model	H (Hex.)	Note) $\phi$ D <sub>1</sub>	$\phi$ D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	P <sub>1</sub>	P <sub>2</sub>	Weight g
4	1/8	10-KQZD04-01S	14				18.5	41	37				34
	1/4	10-KQZD04-02S	14	10.4	13.4	21	21.5	44	38	16	13.4	10.4	40
	3/8	10-KQZD04-03S	17				23.5	46	40				53
6	1/8	10-KQZD06-01S	14				18.5	41	37				38
	1/4	10-KQZD06-02S	14	12.8	13.4	22	21.5	44	38	17	13.4	12.8	43
	3/8	10-KQZD06-03S	17				23.5	46	40				57
8	1/8	10-KQZD08-01S	19				21	48	44				76
	1/4	10-KQZD08-02S	19	15.2	17.6	26	24	51	45	18.5	15.9	15.2	72
	3/8	10-KQZD08-03S	19				25	52	45.5				81
10	1/2	10-KQZD08-04S	21				28.5	55.5	47.5				102
	1/4	10-KQZD10-02S	21				26.5	58	52				111
	3/8	10-KQZD10-03S	21	18.5	20.6	29	27.5	59	53	21	19.2	18.5	128
12	1/2	10-KQZD10-04S	21				30.5	62	54				128
	1/4	10-KQZD12-02S	26				28.5	64.5	58.5				178
	3/8	10-KQZD12-03S	26	20.9	25.2	32	29.5	65.5	59	22	21.6	20.9	167
	1/2	10-KQZD12-04S	26				32.5	68.5	60				179

\*Reference dimensions of R thread after being screwed in.

Note)  $\phi$ D<sub>1</sub> indicates the maximum diameter.



**Triple Branch Universal Male Elbow: 10-KQZT**



Applicable tubing O.D. mm	Connection threads	Model	H (Hex.)	Note) $\phi$ D <sub>1</sub>	$\phi$ D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	P <sub>1</sub>	P <sub>2</sub>	Weight g
4	1/8	10-KQZT04-01S	14				18.5	54.5	50.5				25
	1/4	10-KQZT04-02S	14	10.4	13.4	21	21.5	57.5	51.5	16	13.4	10.4	31
	3/8	10-KQZT04-03S	17				23.5	59.5	53.5				44
6	1/8	10-KQZT06-01S	14				18.5	54.5	50.5				27
	1/4	10-KQZT06-02S	14	12.8	13.4	22	21.5	57.5	51.5	17	13.4	12.8	33
	3/8	10-KQZT06-03S	17				23.5	59.5	53.5				46
8	1/8	10-KQZT08-01S	19				21	64	60				56
	1/4	10-KQZT08-02S	19	15.2	17.6	26	24	67	61	18.5	15.9	15.2	54
	3/8	10-KQZT08-03S	19				25	68	61.5				62
10	1/2	10-KQZT08-04S	21				28.5	71.5	63.5				85
	1/4	10-KQZT10-02S	21				26.5	77.5	71.5				83
	3/8	10-KQZT10-03S	21	18.5	20.6	29	27.5	78.5	72	21	19.2	18.5	85
12	1/2	10-KQZT10-04S	21				30.5	81.5	73.5				102
	1/4	10-KQZT12-02S	26				28.5	86	80				134
	3/8	10-KQZT12-03S	26	20.9	25.2	32	29.5	87	80.5	22	21.6	20.9	130
	1/2	10-KQZT12-04S	26				32.5	90	82				141

\*Reference dimensions of R thread after being screwed in.

Note)  $\phi$ D<sub>1</sub> indicates the maximum diameter.



**Elbow: 10-KQL**



Applicable tubing O.D. mm	Model	Note 1) $\phi$ D	L	Q	M	Effective area	Weight g
						mm <sup>2</sup>	
3.2	10-KQL23-00	9.6	17.5	4.3	15.5	2.5	3
4	10-KQL04-00	10.4	18	4.5	16	4.2	6
6	10-KQL06-00	12.8	20	5.3	17	9.0	6
8	10-KQL08-00	15.2	23	6	18.5	14.9	10
10	10-KQL10-00	18.5	26.5	6.8	21	25.0	17
12	10-KQL12-00	20.9	28.5	7.5	22	39.7	21



Note 1)  $\phi$ D indicates the maximum diameter.

**Branch Elbow: 10-KQLU**



Applicable tubing O.D. mm	Model	Note) $\phi D$	L <sub>1</sub>	L <sub>2</sub>	Q <sub>1</sub>	Q <sub>2</sub>	M	P	Effective area mm <sup>2</sup>	Weight g
									Polyurethane tubing	
4	10-KQLU04-00	10.4	18.5	24	18.5	10	16	10.4	4.1	6
6	10-KQLU06-00	12.8	21	27.5	20.5	12	17	12.8	11.0	8
8	10-KQLU08-00	15.2	24	32	24.5	14	18.5	15.2	18.2	15
10	10-KQLU10-00	18.5	27	36.5	28	16	21	18.5	29.0	25
12	10-KQLU12-00	20.9	29	40	30	18	22	20.9	45.2	32

Note)  $\phi D$  indicates the maximum diameter.

**Plug-in Elbow: 10-KQL**



Applicable tubing O.D. mm	Applicable fitting size $\phi d$	Model	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A	M	Effective area mm <sup>2</sup>	Weight g
									Polyurethane tubing	
3.2	3.2	10-KQL23-99	9.6	7	17	24.5	14	15.5	2.5	2
4	4	10-KQL04-99	10.4	8	18	25	14.5	16	4.2	3
6	6	10-KQL06-99	12.8	10	20	27.5	17	17	9.0	3
8	8	10-KQL08-99	15.2	12	22.5	31.5	21	18.5	14.9	5
10	10	10-KQL10-99	18.5	14	25.5	35.5	23.5	21	25.0	9
12	12	10-KQL12-99	20.9	16	27	37.5	26	22	39.7	10

Note 1)  $\phi D_1$  indicates the maximum diameter.

**Extended Plug-in Elbow: 10-KQW**



Applicable tubing O.D. mm	Applicable fitting size $\phi d$	Model	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A	M	Effective area mm <sup>2</sup>	Weight g
									Polyurethane tubing	
3.2	3.2	10-KQW23-99	9.6	7	17.5	35	24.5	15.5	2.5	2
4	4	10-KQW04-99	10.4	8	18	37	26	16	4.2	3
6	6	10-KQW06-99	12.8	10	20	41.5	31	17	9.0	4
8	8	10-KQW08-99	15.2	12	22.5	48	37	18.5	14.9	6
10	10	10-KQW10-99	18.5	14	25.5	55	43.5	21	25.0	9
12	12	10-KQW12-99	20.9	16	27	59.5	48	22	39.7	13

Note)  $\phi D$  indicates the maximum diameter.

**Reducer Elbow: 10-KQL**









Applicable tubing O.D. mm	Applicable fitting size $\phi d$	Model	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A	M	Effective area mm <sup>2</sup>	Weight g
									Polyurethane tubing	
3.2	4	10-KQL23-04	9.6	7	17	25	13.5	15.5	2.5	2
4	6	10-KQL04-06	10.4	8	18	26	14.5	16	4.2	3
	8	10-KQL04-08		10	35	22				
6	8	10-KQL06-08	12.8	10	19.5	30.5	18	17	9.0	11
	10	10-KQL06-10		20	38.5	24				
8	10	10-KQL08-10	15.2	12	22.5	33.5	20.5	18.5	14.9	20
	12	10-KQL08-12		23	40.5	26				
10	12	10-KQL10-12	18.5	17	26.5	42	30	21	25.0	27
12	16	10-KQL12-16	20.9	17	28.5	49.5	34.5	22	39.7	53

Note)  $\phi D_1$  indicates the maximum diameter.







Extended Male Elbow: 10-KQW

M5	Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area	Weight g	M5
											Polyurethane tubing		
	3.2	M5 X 0.8	10-KQW23-M5	8	9.6	8	17.5	30	31	15.5	2.4	10	R
		1/8	10-KQW23-01S	10				37	38			19	
		1/4	10-KQW23-02S	14				43	42			41	
	4	M5 X 0.8	10-KQW04-M5	8	10.4	8	18	30	32	16	3.0	11	R
		1/8	10-KQW04-01S	10				37.5	38.5		23		
		1/4	10-KQW04-02S	14				43.5	42.5		38		
	6	M5 X 0.8	10-KQW06-M5	8	12.8	8	20	30.5	33.5	17	3	11	R
		1/8	10-KQW06-01S	10				40	42.5		26		
		1/4	10-KQW06-02S	14				46	46.5		41		
	8	3/8	10-KQW06-03S	17	15.2	12	23	48	48	18.5	14.2	67	R
		1/8	10-KQW08-01S	12				43.5	47			30	
		1/4	10-KQW08-02S	14				49.5	51			47	
	10	3/8	10-KQW08-03S	17	18.5	17	26.5	51.5	52.5	21	23.8	74	R
		1/4	10-KQW10-02S	17				56.5	59.5			66	
		1/2	10-KQW10-04S	22				65	66			145	
	12	1/4	10-KQW10-03S	22	20.9	17	28.5	57.5	62	22	37.7	68	R
		3/8	10-KQW12-03S	17				59.5	63.5			78	
		1/2	10-KQW12-04S	22				66	68.5			147	

\*Reference dimensions of R thread after being screwed in.  
 Note 1)  $\phi D_1$  indicates the maximum diameter.



Male Branch Tee: 10-KQT

M5	Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area	Weight g	M5, 6
											Polyurethane tubing		
	3.2	M5 X 0.8	10-KQT23-M5	7	8.4	—	15.3	13.2	14.3	12.7	2.7	3.2	R
		1/8	10-KQT23-01S	10				21.5	22.5			10	
		1/4	10-KQT23-02S	14				25.5	24.5			20	
	4	M5 X 0.8	10-KQT04-M5	7	9.3	—	15.6	13.7	15.3	12.7	4.5	3.5	R
		M6 X 1.0	10-KQT04-M6	8				14.7	14.7			4.4	
		1/8	10-KQT04-01S	10				22	23			13	
	6	1/4	10-KQT04-02S	14	10.4	10	18	26	25	16	4.1	19	R
		M5 X 0.8	10-KQT06-M5	7				14.7	17.4			4.4	
		M6 X 1.0	10-KQT06-M6	8				15.7	17.4			5.3	
	8	1/8	10-KQT06-01S	10	11.6	—	16.1	23	25.5	13.5	4.5	12	R
		1/4	10-KQT06-02S	14				27	27.5			20	
		3/8	10-KQT06-03S	17				29	29			34	
	10	1/8	10-KQT08-01S	12	12.8	10	20	24.5	28	17	11.0	14	R
		1/4	10-KQT08-02S	14				28.5	30			22	
		3/8	10-KQT08-03S	17				30.5	31.5			36	
	12	1/8	10-KQT10-01S	12	15.2	12	23	27	32	18.5	18.2	31	R
		1/4	10-KQT10-02S	17				30	33			29	
		3/8	10-KQT10-03S	22				32	34.5			39	
	12	1/2	10-KQT10-04S	22	18.5	17	26.5	36	37	21	29.0	66	R
		1/4	10-KQT12-02S	17				31	35.5			31	
		3/8	10-KQT12-03S	17				33	37			41	
	12	1/2	10-KQT12-04S	22	20.9	17	28.5	37	39.5	22	45.2	68	R

\*Reference dimensions of R thread after being screwed in.  
 Note 1)  $\phi D_1$  indicates the maximum diameter.



Air Line Equipment

**Union Tee: 10-KQT**

Applicable tubing O.D. mm	Model	Note 1) $\varnothing D$	L	Q	M	Effective area mm <sup>2</sup>	Weight g
						Polyurethane tubing	
3.2	10-KQT23-00	9.6	17.5	4.3	15.5	2.9	5
4	10-KQT04-00	10.4	18	4.5	16	4.4	7
6	10-KQT06-00	12.8	20	5.3	17	10.6	10
8	10-KQT08-00	15.2	23	6	18.5	17.7	15
10	10-KQT10-00	18.5	26.5	6.8	21	28.4	25
12	10-KQT12-00	20.9	28.5	7.5	22	45.4	29



Note 1)  $\varnothing D$  indicates the maximum diameter.

**Different Dia. Union Tee: 10-KQT**

Applicable tubing O.D. mm		Model	Note 1) $\varnothing D_1$		L <sub>1</sub>	L <sub>2</sub>	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area mm <sup>2</sup>	Weight g
a	b		$\varnothing D_1$	$\varnothing D_2$						Polyurethane tubing	
3.2	4	10-KQT23-04	10.4	9.6	18	17.5	4.3	16	15.5	3.5	5
4	6	10-KQT04-06	12.8	10.4	19.5	18	4.5	17	16	6.5	5
6	8	10-KQT06-08	15.2	12.8	22.5	20	5.3	18.5	17	16.4	8
8	10	10-KQT08-10	18.5	15.2	26.5	23	6	21	18.5	27.2	14
10	12	10-KQT10-12	20.9	18.5	28.5	26.5	6.8	22	21	44.5	21
12	16	10-KQT12-16	26.5	26.5	34	39	10	25	22	(92.2)	88



Note 1)  $\varnothing D_1$  indicates the maximum diameter.

**Different Dia. Union Tee: 10-KQT**

Applicable tubing O.D. mm		Model	Note) $\varnothing D$	L	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area mm <sup>2</sup>	Weight g
a	b							Polyurethane tubing	
6	4	10-KQT06-04	12.8	20	5.3	17	16	4.4	10
8	6	10-KQT08-06	15.2	23	6	18.5	17	10.6	15
10	8	10-KQT10-08	18.5	26.5	7.5	21	18.5	17.7	25
12	10	10-KQT12-10	20.9	28.5	7.5	22	21	28.4	29



Note)  $\varnothing D$  indicates the maximum diameter.

**Cross: 10-KQTW**

Applicable tubing O.D. mm	Model	Note) $\varnothing D$	L	Q	M	Effective area mm <sup>2</sup>	Weight g
						Polyurethane tubing	
4	10-KQTW04-00	10.4	18	8.7	16	4.4	9
6	10-KQTW06-00	12.8	20	9.9	17	10.6	13
8	10-KQTW08-00	15.2	23	11.1	18.5	17.7	20
10	10-KQTW10-00	18.5	26.5	12.8	21	28.4	33
12	10-KQTW12-00	20.9	28.5	13.9	22	45.4	39



Note)  $\varnothing D$  indicates the maximum diameter.

**Different Dia. Cross: 10-KQTX**

Applicable tubing O.D. mm		Model	Note) $\varnothing D$	L	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area mm <sup>2</sup>	Weight g
a	b							Polyurethane tubing	
6	8	10-KQTX06-08	15.2	23	11.1	18.5	17	10.6	13
8	10	10-KQTX08-10	18.5	26.5	12.8	21	18.5	17.7	27
10	12	10-KQTX10-12	20.9	28.5	13.9	22	21	28.4	36



Note)  $\varnothing D$  indicates the maximum diameter.

**Different Dia. Cross: 10-KQTY**



Applicable tubing O.D. mm		Model	Note) $\phi D$	L	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area mm <sup>2</sup>	Weight g
a	b								
6	8	10-KQTY06-08	15.2	23	11.1	17	18.5	10.6	15
8	10	10-KQTY08-10	18.5	26.5	12.8	18.5	21	17.7	23
10	12	10-KQTY10-12	20.9	28.5	13.9	21	22	28.4	35

Note)  $\phi D$  indicates the maximum diameter.

**Male Run Tee: 10-KQY**

**M5**



**M6**



**R**



Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	A*	M	Effective area mm <sup>2</sup>	Weight g
3.2	M5 X 0.8	10-KQY23-M5	7	8.4	—	15.4	13.2	14.8	24.9	12.7	2.7	3.2
	1/10	10-KQY23-01S	10	9.6	10	17.5	21.5	—	35	15.5	2.9	10
	1/4	10-KQY23-02S	14	—	—	—	25.5	—	37	—	—	20
4	M5 X 0.8	10-KQY04-M5	7	9.3	—	15.6	13.7	14.8	25.4	12.7	4.5	3.5
	M6 X 1.0	10-KQY04-M6	8	—	—	—	14.7	—	—	—	—	6
	1/8	10-KQY04-01S	10	10.4	10	18	22	—	36	16	4.4	13
6	1/4	10-KQY04-02S	14	—	—	—	26	—	38	—	—	19
	M5 X 0.8	10-KQY06-M5	7	11.6	—	17.1	14.7	17.1	28.7	13.5	4.5	4.5
	M6 X 1.0	10-KQY06-M6	8	—	—	—	15.7	—	—	—	—	7
8	1/8	10-KQY06-01S	10	—	—	—	23	—	39	—	—	12
	1/4	10-KQY06-02S	14	12.8	10	20	27	—	41	17	10.6	20
	3/8	10-KQY06-03S	17	—	—	—	29	—	42.5	—	—	34
10	1/8	10-KQY08-01S	12	—	—	—	24.5	—	43.5	—	—	14
	1/4	10-KQY08-02S	14	15.2	12	23	28.5	—	45.5	18.5	17.7	22
	3/8	10-KQY08-03S	17	—	—	—	30.5	—	47	—	—	36
12	1/8	10-KQY10-01S	17	—	—	—	27	—	49.5	—	—	31
	1/4	10-KQY10-02S	17	18.5	17	26.5	30	—	50.5	21	28.4	29
	3/8	10-KQY10-03S	22	—	—	—	32	—	52	—	—	39
12	1/2	10-KQY10-04S	22	—	—	—	36	—	54.5	—	—	66
	1/4	10-KQY12-02S	17	—	—	—	31	—	53.5	—	—	31
	3/8	10-KQY12-03S	17	20.9	17	28.5	33	—	55	22	45.4	41
	1/2	10-KQY12-04S	22	—	—	—	37	—	57.5	—	—	68

\*Reference dimensions of R thread after being screwed in.  
Note 1)  $\phi D_1$  indicates the maximum diameter.

**M5, 6**

**R**

## One-touch Fittings 10-KQ

### Male Delta: 10-KQD

M5, M6



R



Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note) øD	L <sub>1</sub>	L <sub>2</sub>	A*	M	Q	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g	
4	M5 X 0.8	10-KQD04-M5	11	10.4	18.5	24	25.5	16	8.7	2.2	10	
	M6 X 1.0	10-KQD04-M6				24.5	27.5			4.3		
	1/8	10-KQD04-01S				26.5	29.5			6.0		
	1/4	10-KQD04-02S	14			30.5	29.5			6.0	21	
	6	M5 X 0.8	10-KQD06-M5	13	12.8	20.5	26	28.5	17	9.9	4.3	12
		M6 X 1.0	10-KQD06-M6				26.5					
1/8		10-KQD06-01S	29				31.5	14				
	1/4	10-KQD06-02S	14			32.5	33			11.0	21	
	3/8	10-KQD06-03S	17			34.5	34.5			34	34	
	8	1/8	10-KQD08-01S	17	15.2	23.5	33.5	37	18.5	11.1	18.2	26
1/4		10-KQD08-02S	36.5				38	35				
3/8		10-KQD08-03S	37.5				38.5	35				
	1/4	10-KQD10-02S	19			39.5	43			39	39	
	10	3/8	10-KQD10-03S	19	18.5	26.5	40.5	43.5	21	12.8	29.0	40
		1/2	10-KQD10-04S				44	45			62	
1/4		10-KQD12-02S	22								42	
	12	3/8	10-KQD12-03S	22	20.9	28.5	43	47	22	13.9	45.2	56
		1/2	10-KQD12-04S				46	48.5			63	

M5, M6

R

\*Reference dimensions of R thread after being screwed in.  
Note) øD indicates the maximum diameter.

### Delta: 10-KQD



Applicable tubing O.D. mm	Model	Note) øD	L	Q	M	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g
4	10-KQD04-00	10.4	18.5	8.7	16	4.1	5
6	10-KQD06-00	12.8	20.5	9.9	17	11.0	7
8	10-KQD08-00	15.2	23.5	11.1	18.5	18.2	11
10	10-KQD10-00	18.5	26.5	12.8	21	29.0	19
12	10-KQD12-00	20.9	28.5	13.9	22	45.2	24

Note) øD indicates the maximum diameter.

### Male Branch "Y": 10-KQU

M5, M6



R



Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) øD	L	P	A*	M	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g	
3.2	M5 X 0.8	10-KQU23-M5	10	9.6	38	9.6	34.5	15.5	2.2	9	
	1/8	10-KQU23-01S	11				41		37		2.9
	1/4	10-KQU23-02S	14				44		38		14
	M5 X 0.8	10-KQU04-M5	11	10.4	39.5	10.4	36	16	2.2	4	
	M6 X 1.0	10-KQU04-M6			40		38		10		
	1/8	10-KQU04-01S			42		40		11		
	1/4	10-KQU04-02S	14		46		40		4.2	20	
	6	M5 X 0.8	10-KQU06-M5	13	12.8	12.8	42.5	17	39	2.2	12
		M6 X 1.0	10-KQU06-M6				43				
1/8		10-KQU06-01S	45.5				41.5		11		
	1/4	10-KQU06-02S	14		49		43		10.6	21	
	3/8	10-KQU06-03S	17		51		44.5		34	34	
	8	1/8	10-KQU08-01S	17	15.2	15.2	18.5	52.5	18.5	48.5	15
1/4		10-KQU08-02S	55.5					49.5		23	
3/8		10-KQU08-03S	56.5					50		35	
	1/4	10-KQU10-02S	19		61		55		30	30	
	10	3/8	10-KQU10-03S	19	18.5	18.5	62	21	55.5	28.4	40
		1/2	10-KQU10-04S				65		57	65	
1/4		10-KQU12-02S	22						64.5	58.5	32
	12	3/8	10-KQU12-03S	22	20.9	20.9	65.5	22	59	45.4	40
		1/2	10-KQU12-04S				68.5		60.5	65	

M5, M6

R

\*Reference dimensions of R thread after being screwed in.  
Note 1) øD indicates the maximum diameter.

**Double Branch: 10-KQUD**



Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	(Note) øD <sub>1</sub>	øD <sub>2</sub>	L	I	A*	Q	M	P	Effective area	Weight g
												Polyurethane tubing	
4	1/8	10-KQUD04-01S	13	10.4	12.8	43.5	21	39.5	9.7	16	10.4	4.2	17
	1/4	10-KQUD04-02S	14		47	41		25					
6	1/8	10-KQUD06-01S	17	12.8	15.2	50.5	26	46.5	11.7	17	12.8	10.6	29
	1/4	10-KQUD06-02S				53.5		47.5					

\* Reference dimensions of R thread after being screwed in.  
 (Note) øD<sub>1</sub> indicates the maximum diameter.



**Union "Y": 10-KQU**

Applicable tubing O.D. mm	Model	Note 1) øD	L <sub>1</sub>	L <sub>2</sub>	P	Q	M	Effective area	Weight g
								Polyurethane tubing	
3.2	10-KQU23-00	9.6	33	17.5	9.6	9	15.5	2.9	5
4	10-KQU04-00	10.4	34	18	10.4	9.7	16	4.2	7
6	10-KQU06-00	12.8	37	20	12.8	11.7	17	10.6	9
8	10-KQU08-00	15.2	42.5	24.5	15.2	13.7	18.5	17.7	11
10	10-KQU10-00	18.5	48	27.5	18.5	16.1	21	28.4	16
12	10-KQU12-00	20.9	51	30	20.9	18.1	22	45.4	23

(Note 1) øD indicates the maximum diameter.



**Different Dia. Double Union "Y": 10-KQU**



Applicable tubing O.D. mm		Model	(Note) øD <sub>1</sub>	(Note) øD <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	P	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area	Weight g
a	b										Polyurethane tubing	
3.2	4	10-KQU23-04	9.6	10.4	33.5	17.5	9.6	9	15.5	16	2.7	5
4	6	10-KQU04-06	10.4	12.8	35	18	10.4	9.7	16	17	4.2	6
6	8	10-KQU06-08	12.8	15.2	39.5	20	12.8	11.7	17	18.5	10.6	11
8	10	10-KQU08-10	15.2	18.5	45	24.5	15.2	13.7	18.5	21	17.7	18
10	12	10-KQU10-12	18.5	20.9	49	27.5	18.5	16.1	21	22	28.4	27
12	16	10-KQU12-16	26.5	26.5	66.5	41.5	26.5	23	22	25	45.4	100

(Note) øD<sub>1</sub>, øD<sub>2</sub> indicates the maximum diameter.



**Different Dia. Double Union "Y": 10-KQUD**



Applicable tubing O.D. mm		Model	(Note) øD <sub>1</sub>	(Note) øD <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	P	I	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area	Weight g
a	b											Polyurethane tubing	
4	6	10-KQUD04-06	10.4	12.8	35.5	18.2	10.4	21	9.7	16	17	4.2	10
6	8	10-KQUD06-08	12.8	15.2	40.5	20.3	12.8	26	11.7	17	18.5	10.6	17

(Note) øD<sub>1</sub>, øD<sub>2</sub> indicates the maximum diameter.



**Plug-in "Y": 10-KQU**



Applicable tubing O.D. mm	Applicable fitting size $\phi$ d	Model	Note 1)		L <sub>1</sub>	L <sub>2</sub>	P	Q	A	M	Effective area	Weight g
			$\phi$ D								mm <sup>2</sup>	
3.2	3.2	10-KQU23-99	9.6	50	17.5	9.6	9	35	15.5		2.9	6
4	4	10-KQU04-99	10.4	51.5	18	10.4	9.7	35.5	16		4.2	12
6	6	10-KQU06-99	12.8	55.5	20	12.8	11.7	38.5	17		10.6	18
8	8	10-KQU08-99	15.2	64.5	24.5	15.2	13.7	46	18.5		17.7	21
10	10	10-KQU10-99	18.5	71.5	27.5	18.5	16.1	50.5	21		28.4	26
12	12	10-KQU12-99	20.9	75.5	30	20.9	18.1	53.5	22		45.4	32



Note 1)  $\phi$ D indicates the maximum diameter.

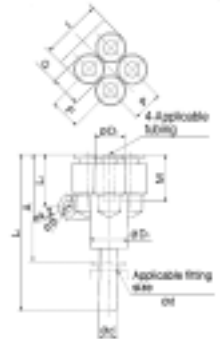
**Double Plug-in "Y": 10-KQXD**



Applicable tubing O.D. mm	Applicable fitting size $\phi$ d	Model	Note)		L <sub>1</sub>	L <sub>2</sub>	I	Q	A	P	M	Effective area	Weight g
			$\phi$ D1	$\phi$ D2								mm <sup>2</sup>	
4	6	10-KQXD04-06	10.4	12.8	54	18.2	21	9.7	37	10.4	16	4.2	10
6	8	10-KQXD06-08	12.8	15.2	62.5	20.3	26	11.7	44	12.8	17	10.6	23



Note)  $\phi$ D1 indicates the maximum diameter.



**Different Dia. Plug-in "Y": 10-KQX**




Applicable tubing O.D. mm	Applicable fitting size $\phi$ d	Model	Note)		L <sub>1</sub>	L <sub>2</sub>	A	P	Q	M	Effective area	Weight g
			$\phi$ D1	$\phi$ D2							mm <sup>2</sup>	
4	6	10-KQX04-06	10.4	12.8	53.5	18.5	36.5	10.4	9.7	16	4.2	7
6	8	10-KQX06-08	12.8	15.2	61.5	20.5	43	12.8	11.7	17	10.6	18
8	10	10-KQX08-10	15.2	18.5	68.5	24.5	47.5	15.2	13.7	18.5	17.7	28
10	12	10-KQX10-12	18.5	20.9	73.5	27.5	51.5	18.5	16.1	21	28.4	42



Note)  $\phi$ D1 indicates the maximum diameter.

**Plug-in Reducer: 10-KQR**

Applicable tubing O.D. mm	Applicable fitting size ød	Model	Note 1) øD	L	A	M	Effective area mm <sup>2</sup>		Weight g
							Polyurethane tubing		
3.2	4	10-KQR23-04	9.6	33.5	18.5	15.5	2.9		2
	6	10-KQR04-06	10.4	34.5	17.5	16	4		1.8
	8	10-KQR04-08	12.8	36.5	18				2.0
4	10	10-KQR04-10	12.8	39.5	18.5	16	4		3.3
	4	10-KQR06-04	12.8	37	21				2.5
	6	8	10-KQR06-08	12.8	37	18.5	17	10.4	
10		10-KQR06-10	12.8	39.5	18.5	3			
12		10-KQR06-12	15.2	42	20	18.5	18.0		4.7
10		10-KQR08-10	15.2	41	20				4.0
8	12	10-KQR08-12	15.2	42	20	21	32.8 (29.5)		4.6
	12	10-KQR10-12	18.5	44.5	23				33
10	16	10-KQR10-16	20.9	50.5	25.5	22	46.1		42
	12	10-KQR12-16	20.9	50.5	25.5				37


 Note 1) øD indicates the maximum diameter.

**Bulk Head Union: 10-KQE**

Applicable tubing O.D. mm	Model	T (M)	H (Hex.)	L	Mounting hole	M	Effective area Note) mm <sup>2</sup>		Weight g
							Polyurethane tubing		
3.2	10-KQE23-00	M12 X 1	14	31.5	13	15.5	2.9		26
4	10-KQE04-00	M12 X 1	14	32.5	13	16	4		26
6	10-KQE06-00	M14 X 1	17	34.5	15	17	10.4		33
8	10-KQE08-00	M16 X 1	19	38	17	18.5	18.0		52
10	10-KQE10-00	M20 X 1	24	42.5	21	21	29.5		70
12	10-KQE12-00	M22 X 1	27	44	23	22	46.1		90

**Bulkhead Union: 10-KQLE**

Applicable tubing O.D. mm	Model	T	H <sub>1</sub> (Hex.)	H <sub>2</sub> (Hex.)	B	E	Note) øD	Mounting hole	M	Effective area mm <sup>2</sup>		Weight g
										Polyurethane tubing		
4	10-KQLE04-00	M12 X 1	14	14	18.5	31	10.4	13	16	4.2		18
6	10-KQLE06-00	M14 X 1	17	17	20.5	34	12.8	15	17	9.0		25
8	10-KQLE08-00	M16 X 1	17	19	23.5	38.5	15.2	17	18.5	14.9		33
10	10-KQLE10-00	M20 X 1	22	24	26.5	43.5	18.5	21	21	25.0		63
12	10-KQLE12-00	M22 X 1	24	27	28.5	45.5	20.9	23	22	39.7		77

 Note 1) øD indicates the maximum diameter.

**Bulkhead Female Union: 10-KQE**

Applicable tubing O.D. mm	Applicable fitting size Rc	Model	T (M)	H <sub>1</sub> (Hex.)	H <sub>2</sub> (Hex.)	L <sub>1</sub>	L <sub>2</sub>	Mounting hole	M	Effective area mm <sup>2</sup>		Weight g
										Polyurethane tubing		
3.2	1/4	10-KQE23-02	M12 X 1	17	14	31.5	15	13	15.5	2.9		13
4	1/8	10-KQE04-01	M12 X 1	14	14	27.5	11	13	16	4		16
	1/4	10-KQE04-02		17	17	31	15					35
6	1/8	10-KQE06-01	M14 X 1	17	17	28	11	15	17	10.4		30
	1/4	10-KQE06-02				31.5	15					29
	3/8	10-KQE06-03				33.5	17					28
8	1/8	10-KQE08-01	M16 X 1	17	19	27.5	7.5	17	18.5	18.0		27
	1/4	10-KQE08-02				33	13					48
	3/8	10-KQE08-03				35	15					29
10	1/4	10-KQE10-02	M20 X 1	22	24	34.5	12.5	21	21	29.5		53
	3/8	10-KQE10-03				36.5	15					67
	1/2	10-KQE10-04				37	14					92
12	3/8	10-KQE12-03	M22 X 1	24	27	41	18	23	22	46.1		92
	1/2	10-KQE12-04										41

Air Line Equipment

**Adaptor: 10-KQN**

Applicable fitting size ød	Connection threads R	Model	H (Hex.)	L	A	M	ød	Weight g
4	M5 X 0.8	10-KQN04-M5	7	32	29	13	2.5	2
	1/8	10-KQN04-01S	10	34	30	14		6
6	M5 X 0.8	10-KQN06-M5	7	33	30	13	4.5	2
	1/8	10-KQN06-01S	10	35	31	14		5
	1/4	10-KQN06-02S	14	37.5	31.5	14.5	14	
8	1/4	10-KQN08-02S	14	39	33	14.5	6	17
	3/8	10-KQN08-03S	17	41	34.5	16		30
10	3/8	10-KQN10-03S	17	46	39.5	18.5	7.5	31

**Nipple: 10-KQN**

Applicable fitting øD	Model	L	M	ød	Weight g
4	10-KQN04-99	37	16	2.5	1
6	10-KQN06-99	39	17	4	2
8	10-KQN08-99	43	18.5	6	2
10	10-KQN10-99	49	21	7.5	4
12	10-KQN12-99	52	22	9	20.6

**Different Dia. Nipple: 10-KQN**

Applicable fitting		Model	L	M <sub>1</sub>	M <sub>2</sub>	ød	Weight g
a	b						
4	6	10-KQN04-06	38	17	16	2.5	2
6	8	10-KQN06-08	42	18.5	17	4	2
8	10	10-KQN08-10	47	21	18.5	6	13.2
10	12	10-KQN10-12	51	22	21	8	18.2
12	16	10-KQN12-16	55	25	22	9	29

**Tubing Cap: 10-KQC**

Applicable tubing O.D. mm	Model	Note) øD	L	M	Weight g
4	10-KQC04-00	10.4	17	16	3
6	10-KQC06-00	12.8	18.5	17	3
8	10-KQC08-00	15.2	20.5	18.5	4
10	10-KQC10-00	18.5	23	21	6
12	10-KQC12-00	20.9	24	22	8

Note) øD indicates the maximum diameter.

**Color Cap: 10-KQC**

Applicable tubing O.D. mm	Model	øD <sub>1</sub>	øD <sub>2</sub>	L	Weight g	Application
4	10-KQC-04□	10.1	5.2	2.9	0.1	
4	10-KQC-04A□	8.5	5	2.2	0.1	KQH,KQ2H04-M5,M6 KQS,KQ2S04-M5,M6
4	10-KQC-04B□	9.7	5	2.2	0.1	KQL,KQ2L04-M5,M6 KQT,KQ2T04-M5,M6 KQY,KQ2Y04-M5,M6
6	10-KQC-06□	12.1	7.2	2.9	0.1	
6	10-KQC-06A□	10.5	7	2.2	0.1	KQH,KQ2H06-M5,M6 KQS,KQ2S06-M5,M6
6	10-KQC-06B□	12.0	7	2.2	0.1	KQL,KQ2L06-M5,M6 KQT,KQ2T06-M5,M6 KQY,KQ2Y06-M5,M6
8	10-KQC-08□	14.1	9.2		0.1	
10	10-KQC-10□	17.1	11.2	2.9	0.2	
12	10-KQC-12□	19.1	13.2		0.2	

The color display in □ is B (Black), R (Red), YR (Orange), BR (Brown), Y (Yellow), G (Green), CB (Sky blue), GR (Gray), W (White), BU (Blue)

**Plug: 10-KQP**

Applicable fitting size ød	Model	øD	L	A	Weight g
3.2	10-KQP-23	5	31.5	16	1
4	10-KQP-04	6	32	16	1
6	10-KQP-06	8	35	18	1
8	10-KQP-08	10	39	20.5	2
10	10-KQP-10	12	43	22	3.5
12	10-KQP-12	14	45.5	24	5





# Series 10-KG One-touch Fittings Stainless Specifications

## Construction

**Guide**

**Collet**

**Chuck**

### Large holding force

Secure engagement with chuck and large holding force with collet.

**Release Button (White)**

### Small disconnecting force

Releases the chuck and collet when the fitting is removed. Also prevents the chuck from biting excessively into the tube.

**Seal**

### Applicable to low vacuum to 1.0 MPa pressure

Special profile ensures sealing and reduces resistance when the tube is inserted.

**Tubing**

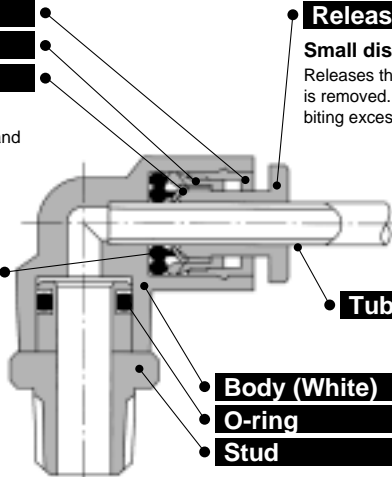
**Body (White)**

**O-ring**

**Stud**

### Effective when piping in a confined space

The body and threaded portion can turn independently.



Stainless specification compatible with anti-corrosive environment

SUS303 stainless steel adopted for metal elements

Suitable for use in CRT production lines where contact with copper must be avoided, food processing machines where water or salt water splashes and clean room where discoloration of copper material and corrosion must be avoided.



## Applicable Tubing

Tubing material	Polyurethane
Tubing O.D.	ø4, ø6, ø8, ø10, ø12

## Specifications

Fluid	Air	
Max. operating pressure	1.0MPa	
Operating vacuum pressure	-100kPa	
Proof pressure	3.0MPa	
Ambient and fluid temperature	-5 to 60°C, In case of water 0 to 40°C(No freezing)	
Threads	Mounting part	JIS B 0203 (Tapered pipe thread)
	Nut part	JIS B0211, 2 classes (Metric fine screw thread)
Thread seal	<sup>Note)</sup> With or without sealant	



(Note) Suffix "S" to the part number if sealant is desired.

## Main Parts Material

Body	SUS303, PBT
Stud	SUS303 (Thread part)
Chuck	SUS304
Guide	SUS304, SUS303, POM
Collet, Release button	POM
Seal, O-ring	NBR

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

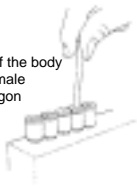
**Model**

**Hex. Socket Head Male Connector**

**10-KGS**



The hexagon socket of the body is used to tighten the male connector with a hexagon wrench in a confined space.

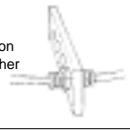


**Bulkhead Union**

**10-KGE**



Used for relay connection from one tubing to another across a panel.



**Universal Male Elbow**

**10-KGV**



The hexagon socket of the body is used to tighten the male elbow with a box wrench in a confined space.

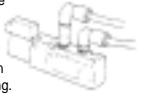


**Extended Male Elbow**

**10-KGW**



Used basically in the same way as a standard male elbow but also to extend the elbow over a standard one for ease of connection and disconnection of tubing.



**Bulkhead Female Union**

**10-KGE**



Used to connect a male threaded portion and a tubing across a panel.



**Male Connector**

**10-KGH**



Used to pipe in the same direction from a female threaded portion. Most common type.

**Male Elbow**

**10-KGL**



Used to pipe at a right angle from a female threaded portion. Most common type.

**Male Branch Tee**

**10-KGT**



Used for branching from a female threaded portion at 90° on both sides.

**Female Connector**

**10-KGF**



Used to pipe from the male threaded portion of a pressure gauge, etc.

**Elbow**

**10-KGL**



Used to connect tubings at right angles.

**Union Tee**

**10-KGT**



Used to branch a tubing into 2 directions at 90° on both sides.

**Straight Union**

**10-KGH**



Used to connect tubings in the same direction.

**Plug-in Elbow**

**10-KGL**



Used to change the tubing entry of One-touch fittings by 90°.

**Different Dia. Union Tee**

**10-KGT**



Used to branch a tubing into 2 smaller tubings at 90° on both sides.

**Different Dia. Straight Union**

**10-KGH**



Used to connect tubings of different sizes.

**Male Delta**

**10-KGD**



Used for 2-way branching at right angles from a female threaded portion.

**Male Run Tee**

**10-KGY**



Used for branching into the same direction and at 90° either from male or female threaded portion.

**Male Branch Connector**

**10-KGLU**



Used for branching from a female threaded portion into the same direction.

**Delta**

**10-KGD**



Used to branch a tubing into 3 tubings at right angles.

**Different dia. union "Y"**

**10-KGUD**



To branch a tubing into 4 tubes in the same direction.

**Branch Elbow**

**10-KGLU**



Used to branch a tubing at right angles.

**Double Branch**

**10-KGUD**



Used for 4-way branching in the same direction from a female threaded portion.

**Union "Y"**

**10-KGU**



Used to branch a tubing in the same direction.

**Model**

**Different Dia. union "Y"**

10-KGU



Used to branch a tubing into smaller tubes in the same direction.

**Plug-in Reducer**

10-KGR



Used to change the diameter of One-touch fitting.

**Tubing Cap**

10-KGC



Used to plug unused tubes.

**Male Branch "Y"**

10-KGU

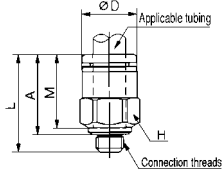


Used for branching from a female threaded portion into the same direction.

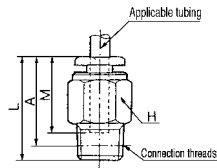


**Male Connector: 10-KGH**

M5



R



Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) øD	L	A*	M	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g
4	M5 X 0.8	10-KGH04-M5	8	8	17	13.9	12.7	4	2.4
	1/8	10-KGH04-01	10	—	22	18	16	4	9
	1/4	10-KGH04-02	14	—	19.5	13.5	16	4	3.3
6	M5 X 0.8	10-KGH06-M5	10	10	17.8	14.7	13.5	4	16
	1/8	10-KGH06-01	12	—	22.5	18.5	17	10.4	14
	1/4	10-KGH06-02	14	—	23	17	17	10.4	21
8	3/8	10-KGH06-03	17	—	22	15.5	18.5	18.0	27
	1/8	10-KGH08-01	14	—	28	24	18.5	18.0	19
	1/4	10-KGH08-02	17	—	26.5	20.5	18.5	18.0	26
10	3/8	10-KGH08-03	17	—	22	15.5	21	29.5	30
	1/8	10-KGH10-01	17	—	30	26	21	29.5	30
	1/4	10-KGH10-02	17	—	33.5	27.5	21	29.5	30
12	3/8	10-KGH10-03	17	—	29	22.5	22	46.1	53
	1/2	10-KGH10-04	22	—	27	19	22	46.1	42
	1/4	10-KGH12-02	19	—	34.5	28.5	22	46.1	34
12	3/8	10-KGH12-03	19	—	23.5	23.5	22	46.1	34
	1/2	10-KGH12-04	22	—	30	22	22	46.1	51

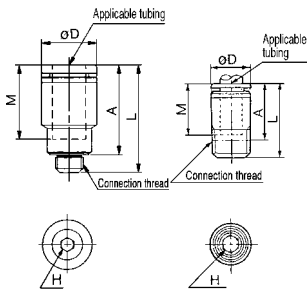
\*Reference dimensions of R thread after being screwed in.  
Note 1) øD indicates the maximum diameter.



**Hex. Socket Head Male Connector: 10-KGS**

M5

R



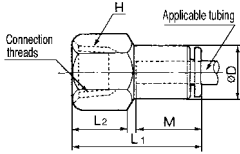
Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) øD	L	A*	M	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g
4	M5 X 0.8	10-KGS04-M5	2.5	8	18.7	15.6	12.7	4	2.7
	1/8	10-KGS04-01	3	9.8	23	19	16	3.6	8
6	M5 X 0.8	10-KGS06-M5	2.5	10	19.5	16.4	13.5	4	3.3
	1/8	10-KGS06-01	4	11.8	24	20	17	9.9	9
	1/4	10-KGS06-02	4	13.8	18	17	17	10.0	15
8	1/8	10-KGS08-01	5	14	28	24	18.5	16.2	12
	1/4	10-KGS08-02	6	17	25.5	19.5	18.5	16.2	11
	3/8	10-KGS08-03	6	17	27.5	21	18.5	16.2	24
10	1/8	10-KGS10-01	5	17	30	26	21	16.2	18
	1/4	10-KGS10-02	8	17	27.5	21.5	21	26.6	12
	3/8	10-KGS10-03	8	22	28	20	21	26.6	19
12	1/2	10-KGS10-04	8	22	28	20	22	26.6	35
	1/4	10-KGS12-02	8	19	33.5	27.5	22	44.5	23
	3/8	10-KGS12-03	10	19	29	22.5	22	44.5	18
12	1/2	10-KGS12-04	10	22	28	20	22	44.5	30

\*Reference dimensions of R thread after being screwed in.  
Note 1) øD indicates the maximum diameter.





**Female Connector: 10-KGF**

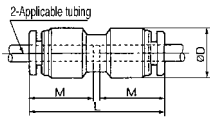


Applicable tubing O.D. mm	Connection threads Rc	Model	H (Hex.)	Note) $\phi D$	L <sub>1</sub>	L <sub>2</sub>	M	Effective area mm <sup>2</sup>	Weight g
								Polyurethane tubing	
4	1/8	10-KGF04-01	14	10	27	11	16	4	15
	1/4	10-KGF04-02	17		31	14			23
6	1/8	10-KGF06-01	14	12	27.5	11	17	10.4	15
	1/4	10-KGF06-02	17		31	13			22
	3/8	10-KGF06-03	19		33.5	15			25
8	1/8	10-KGF08-01	14	14	29	11	18.5	18.0	17
	1/4	10-KGF08-02	17		32.5	13			24
	3/8	10-KGF08-03	19		33.5	14			24
10	1/4	10-KGF10-02	17	17	34.5	14	21	29.5	27
	3/8	10-KGF10-03	19		36.5	15			30
12	1/4	10-KGF12-02	19	19	35	14	22	46.1	36
	3/8	10-KGF12-03	19		37				31
	1/2	10-KGF12-04	24		41				18

\*Reference dimensions of R thread after being screwed in.  
Note)  $\phi D$  indicates the maximum diameter.



**Straight Union: 10-KGH**

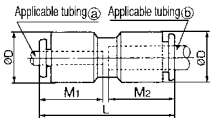


Applicable tubing O.D. mm	Model	Note) $\phi D$	L	M	Effective area mm <sup>2</sup>	Weight g
					Polyurethane tubing	
4	10-KGH04-00	10.4	32.5	16	4	3
6	10-KGH06-00	12.8	34.5	17	10.4	4
8	10-KGH08-00	15.2	38.5	18.5	18.0	6
10	10-KGH10-00	18.5	42.5	21	29.5	11
12	10-KGH12-00	20.9	44.5	22	46.1	14

Note)  $\phi D$  indicates the maximum diameter.



**Different Dia. Straight Union: 10-KGH**



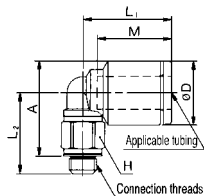
Applicable tubing O.D. mm		Model	Note) $\phi D$	L	M <sub>1</sub>	M <sub>2</sub>	Effective area mm <sup>2</sup>	Weight g
a	b						Polyurethane tubing	
4	6	10-KGH04-06	12.8	34.5	16	17	4	5
6	8	10-KGH06-08	15.2	38.5	17	18.5	10.4	6
8	10	10-KGH08-10	18.5	42	18.5	21	18.0	11
10	12	10-KGH10-12	20.9	44.5	21	22	29.5	14

Note)  $\phi D$  indicates the maximum diameter.

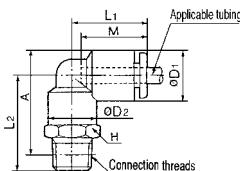


**Male Elbow: 10-KGL**

M5



R



Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area mm <sup>2</sup>	Weight g	
										Polyurethane tubing		
4	M5 X 0.8	10-KGL04-M5	7	9.3	—	15.6	13.7	15.3	12.7	3.5	2.7	
	1/8	10-KGL04-01	10	10.4	10	18	22	23	16	4.2	19	
	1/4	10-KGL04-02	14				26	25				
6	M5 X 0.8	10-KGL06-M5	7	11.6	—	16.1	14.7	17.4	13.5	3.5	3.2	
	1/8	10-KGL06-01	10	12.8	10	20	23	25.5	17	9.0	12	
	1/4	10-KGL06-02	14				27	27.5				10
	3/8	10-KGL06-03	17				29	29				33
1/8	10-KGL08-01	12	24.5				28	13				
8	1/4	10-KGL08-02	14	15.2	12	23	28.5	30	18.5	14.9	21	
	3/8	10-KGL08-03	17				30.5	31.5				35
	1/8	10-KGL10-01	14				27	32				25
10	1/4	10-KGL10-02	17	18.5	17	26.5	30	33	21	25.0	26	
	3/8	10-KGL10-03	17				32	34.5				36
	1/2	10-KGL10-04	22				36	37				63
12	1/4	10-KGL12-02	17	20.9	17	28.5	31	35.5	22	39.7	28	
	3/8	10-KGL12-03	19				33	37				38
	1/2	10-KGL12-04	22				37	39.5				65

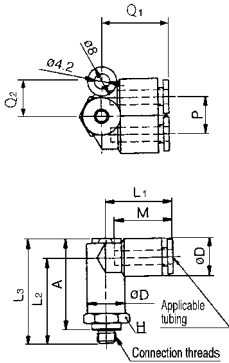
\*Reference dimensions of R thread after being screwed in.  
Note 1)  $\phi D_1$  indicates the maximum





**Male Branch Connector: 10-KGLU**

M5

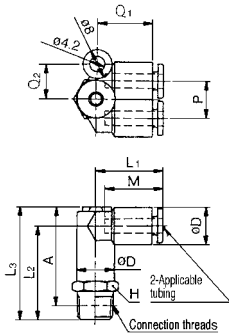


Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note	øD	L1	L2	L3	A*	M	P	Q1	Q2	Effective area	Weight
														mm <sup>2</sup>	
4	M5 X 0.8	10-KGLU04-M5	11	10.4	18.5	24	29.5	25.5	16	10.4	18.5	10	10	4.1	10
	1/8	10-KGLU04-01												4.1	12
	1/4	10-KGLU04-02												4.1	21
6	M5 X 0.8	10-KGLU06-M5	13	12.8	21	33	39.5	33.5	17	12.8	20.5	12	12	4.3	13
	1/8	10-KGLU06-01												4.3	15
	1/4	10-KGLU06-02												4.3	22
	3/8	10-KGLU06-03												11.0	35
	1/8	10-KGLU08-01												11.0	41
8	1/4	10-KGLU08-02	17	15.2	24	37	44.5	38.5	18.5	15.2	24.5	14	14	18.2	27
	3/8	10-KGLU08-03												18.2	35
	1/4	10-KGLU10-02												18.2	41
10	3/8	10-KGLU10-03	19	18.5	27	41	50.5	44	21	18.5	28	16	16	29.0	42
	1/2	10-KGLU10-04												29.0	64
	1/4	10-KGLU12-02												29.0	57
12	3/8	10-KGLU12-03	22	20.9	29	43.5	54	47.5	22	20.9	30	18	18	45.2	68
	1/2	10-KGLU12-04												45.2	55
	1/2	10-KGLU12-04												45.2	58

\*Reference dimensions of R thread after being screwed in.  
Note) øD indicates the maximum diameter.



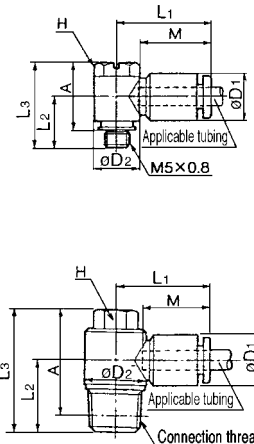
R



**Universal Male Elbow: 10-KGV**



M5



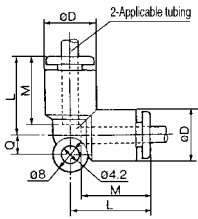
Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note	øD1	øD2	L1	L2	L3	A*	M	Effective area	Weight
												mm <sup>2</sup>	
4	M5 X 0.8	10-KGV04-M5	8	10.4	9.8	20.5	11	18.5	15	16	16	2.9	6
	1/8	10-KGV04-01										2.9	14
6	M5 X 0.8	10-KGV06-M5	8	12.8	9.8	23.5	12	18.5	15	17	17	3.8	7
	1/8	10-KGV06-01										3.8	15
	1/4	10-KGV06-02										5.9	26
	1/8	10-KGV08-01										5.9	24
8	1/4	10-KGV08-02	12	15.2	17.6	28.5	15.5	28.5	24.5	18.5	18.5	11.2	30
	3/8	10-KGV08-03										11.2	47
	1/4	10-KGV10-02										11.2	30
10	3/8	10-KGV10-03	14	18.5	20.6	31	20.5	36.5	30	21	21	20.3	40
	1/2	10-KGV10-04										20.3	49
	3/8	10-KGV12-03										20.3	63
12	1/2	10-KGV12-04	17	20.9	25.2	34	25	41.5	33.5	22	22	30.8	80
	1/2	10-KGV12-04										30.8	80

\*Reference dimensions of R thread after being screwed in.  
Note) øD1 indicates the maximum diameter.





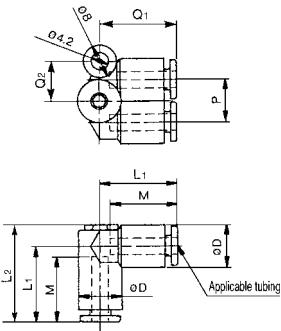
**Elbow: 10-KGL**



Applicable tubing O.D. mm	Model	Note 1) øD	L	Q	M2	Effective area	Weight g
						mm <sup>2</sup>	
4	10-KGL04-00	10.4	18	4.5	16	4.2	6
6	10-KGL06-00	12.8	20	5.3	17	9.0	6
8	10-KGL08-00	15.2	23	6	18.5	14.9	10
10	10-KGL10-00	18.2	26.5	6.8	21	25.0	17
12	10-KGL12-00	20.9	28.5	7.5	22	39.7	21

Note 1) øD indicates the maximum diameter.

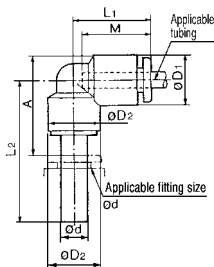
**Branch Elbow: 10-KGLU**



Applicable tubing O.D. mm	Model	Note) øD	L1	L2	Q1	Q2	M	P	Effective area	Weight g
									mm <sup>2</sup>	
4	10-KGLU04-00	10.4	18.5	24	18.5	10	16	10.4	4.1	6
6	10-KGLU06-00	12.8	21	27.5	20.5	12	17	12.8	11.0	8
8	10-KGLU08-00	15.2	24	32	24.5	14	18.5	15.2	18.2	15
10	10-KGLU10-00	18.5	27	36.5	28	16	21	18.5	29.0	25
12	10-KGLU12-00	20.9	29	40	30	18	22	20.9	45.2	32

Note) øD indicates the maximum diameter.

**Plug-in Elbow: 10-KGL**



Applicable tubing O.D. mm	Applicable fitting size ød	Model	Note 1) øD1	øD2	L1	L2	A	M	Effective area	Weight g
									mm <sup>2</sup>	
4	4	10-KGL04-99	10.4	8	18	25	14.5	16	4.2	8
6	6	10-KGL06-99	12.8	10	20	27.5	17	17	9.0	10
8	8	10-KGL08-99	15.2	12	22.5	31.5	21	18.5	14.9	14
10	10	10-KGL10-99	18.5	14	25.5	35.5	23.5	21	25.0	25
12	12	10-KGL12-99	20.9	16	27	37.5	26	22	39.7	28

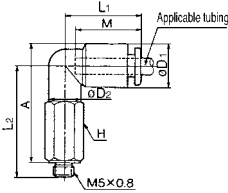
Note) øD1 indicates the maximum diameter.

Air Line Equipment

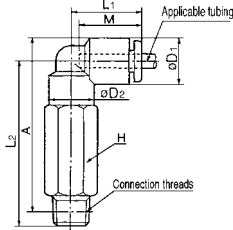


**Extended Male Elbow: 10-KGW**

M5



R



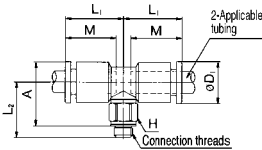
Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area		Weight g
										mm <sup>2</sup>		
4	M5 X 0.8	10-KGW04-M5	8	10.4	8	18	30	32	16	Polyurethane tubing		11
	1/8	10-KGW04-01	10				37.5	38.5		4.0	23	
	1/4	10-KGW04-02	14				43.5	42.5		3.8	31	
6	M5 X 0.8	10-KGW06-M5	8	12.8	10	20	40	42.5	17	Polyurethane tubing		26
	1/8	10-KGW06-01	10				46	46.5		8.6	41	
	1/4	10-KGW06-02	14				48	48		67	30	
	3/8	10-KGW06-03	17				43.5	47		47	30	
8	1/8	10-KGW08-01	12	15.2	12	23	49.5	51	18.5	Polyurethane tubing		47
	1/4	10-KGW08-02	14				51.5	52.5		74	47	
	3/8	10-KGW08-03	17				56.5	59.5		66	74	
10	1/4	10-KGW10-02	17	18.5	17	26.5	58.5	61	21	Polyurethane tubing		76
	3/8	10-KGW10-03	17				65	66		145	76	
	1/2	10-KGW10-04	22				57.5	62		68	145	
12	1/4	10-KGW12-02	17	20.9	17	28.5	59.5	63.5	22	Polyurethane tubing		78
	3/8	10-KGW12-03	17				66	68.5		147	78	
	1/2	10-KGW12-04	22									

\*Reference dimensions of R thread after being screwed in.  
Note)  $\phi D_1$  indicates the maximum diameter.

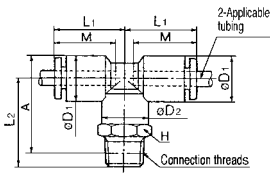


**Male Branch Tee: 10-KGT**

M5



R

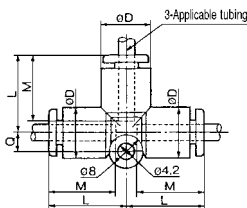


Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note 1) $\phi D_1$	$\phi D_2$	L <sub>1</sub>	L <sub>2</sub>	A*	M	Effective area		Weight g			
										mm <sup>2</sup>					
4	M5 X 0.8	10-KGT04-M5	7	9.3	—	15.6	13.7	15.3	12.7	Polyurethane tubing		3.5			
	1/8	10-KGT04-01	10				10.4	10		18	22	23	16	4.1	13
	1/4	10-KGT04-02	14				26	25		19					
6	M5 X 0.8	10-KGT06-M5	7	11.6	—	16.1	14.7	17.4	13.5	Polyurethane tubing		4.4			
	1/8	10-KGT06-01	10				23	25.5		12					
	1/4	10-KGT06-02	14				27	27.5		20	11.0	20			
	3/8	10-KGT06-03	17				29	29		34	14				
8	1/8	10-KGT08-01	12	15.2	12	23	24.5	28	18.5	Polyurethane tubing		14			
	1/4	10-KGT08-02	14				28.5	30		22	18.2				
	3/8	10-KGT08-03	17				30.5	31.5		36	36				
10	1/8	10-KGT10-01	17	18.5	17	26.5	27	32	21	Polyurethane tubing		31			
	1/4	10-KGT10-02	17				30	33		29	39				
	3/8	10-KGT10-03	17				32	34.5		66	39				
	1/2	10-KGT10-04	22				36	37		66	66				
12	1/4	10-KGT12-02	17	20.9	17	28.5	31	35.5	22	Polyurethane tubing		31			
	3/8	10-KGT12-03	17				33	37		41	41				
	1/2	10-KGT12-04	22				37	39.5		68	68				

\*Reference dimensions of R thread after being screwed in.  
Note 1)  $\phi D_1$  indicates the maximum diameter.



**Union Tee: 10-KGT**



Applicable tubing O.D. mm	Model	Note 1) $\phi D$	L	Q	M	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g
4	10-KGT04-00	10.4	18	4.5	16	4.4	7
6	10-KGT06-00	12.8	20	5.3	17	10.6	10
8	10-KGT08-00	15.2	23	6	18.5	17.7	15
10	10-KGT10-00	18.5	26.5	6.8	21	28.4	25
12	10-KGT12-00	20.9	28.5	7.5	22	45.4	29

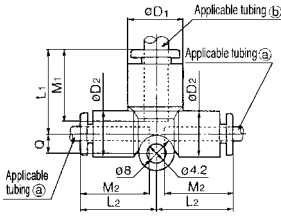
Note 1)  $\phi D$  indicates the maximum diameter.







**Different Dia. Union Tee: 10-KGT**



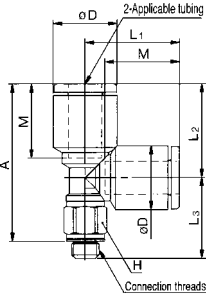
Applicable tubing O.D. mm		Model	Note) ØD1	ØD2	L1	L2	Q	M1	M2	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g
a	b										
4	6	10-KGT04-06	12.8	10.4	19.5	18	4.5	17	16	6.5	5
6	8	10-KGT06-08	15.2	12.8	22.5	20	5.3	18.5	17	16.4	8
8	10	10-KGT08-10	18.5	15.2	26.5	23	6	21	18.5	27.2	14
10	12	10-KGT10-12	20.9	18.5	28.5	26.5	6.8	22	21	44.5	21

Note) ØD1 indicates the maximum diameter.

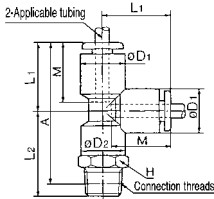


**Male Run Tee: 10-KGY**

M5



R



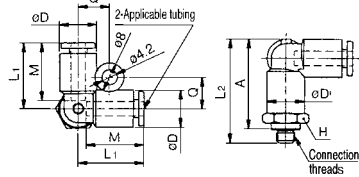
Applicable tubing O.D. mm		Connection threads R	Model	H (Hex.)	Note) ØD1	ØD2	L1	L2	L3	A*	M	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g
4	M5 X 0.8												
	1/8	10-KGY04-01	10	10.4	10	18	22	—	36	16	4.4	13	
	1/4	10-KGY04-02	14	—	—	26	—	38	16	4.4	19		
6	M5 X 0.8	10-KGY06-M5	7	11.6	—	17.1	14.7	17.1	28.7	13.5	4.5	4.5	
	1/8	10-KGY06-01	10	—	—	23	—	39	17	10.6	12		
	1/4	10-KGY06-02	14	12.8	10	20	27	41	17	20			
	3/8	10-KGY06-03	17	—	—	29	—	42.5	17	34			
8	1/8	10-KGY08-01	12	—	—	24.5	—	43.5	17	10.6	14		
	1/4	10-KGY08-02	14	15.2	12	23	28.5	45.5	18.5	17.7	22		
	3/8	10-KGY08-03	17	—	—	30.5	—	47	18.5	36			
10	1/8	10-KGY10-01	10	—	—	27	—	49.5	21	31			
	1/4	10-KGY10-02	17	18.5	17	26.5	30	50.5	21	28.4	29		
	3/8	10-KGY10-03	17	—	—	32	—	52	21	39			
12	1/2	10-KGY10-04	22	—	—	36	—	54.5	22	66			
	1/4	10-KGY12-02	17	—	—	31	—	53.5	22	31			
	3/8	10-KGY12-03	20.9	17	28.5	33	—	55	22	41			
	1/2	10-KGY12-04	22	—	—	37	—	57.5	22	68			

\*Reference dimensions of R thread after being screwed in.  
Note) ØD1 indicates the maximum diameter.

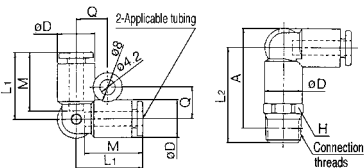


**Delta Union: 10-KGD**

M5



R

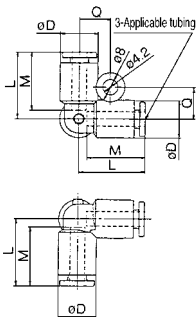


Applicable tubing O.D. mm		Connection threads R	Model	H (Hex.)	Note) ØD	L1	L2	A*	M	Q	Effective area mm <sup>2</sup> Polyurethane tubing	Weight g
4	M5 X 0.8											
	1/8	10-KGD04-01	10	—	—	26.5	27.5	—	—	6.0	12	
	1/4	10-KGD04-02	14	—	—	30.5	30	—	—	6.0	21	
6	M5 X 0.8	10-KGD06-M5	13	12.8	20.5	26	28.5	17	9.9	4.3	12	
	1/8	10-KGD06-01	10	—	—	29	31.5	—	—	11.0	14	
	1/4	10-KGD06-02	14	—	—	32.5	33	—	—	21		
	3/8	10-KGD06-03	17	—	—	34.5	34.5	—	—	34		
8	1/8	10-KGD08-01	10	—	—	33.5	37	—	—	26		
	1/4	10-KGD08-02	17	15.2	23.5	36.5	38	18.5	11.1	18.2	35	
	3/8	10-KGD08-03	17	—	—	37.5	38.5	—	—	39		
10	1/4	10-KGD10-02	19	—	—	39.5	43	—	—	40		
	3/8	10-KGD10-03	19	18.5	26.5	40.5	43.5	21	12.8	29.0	40	
	1/2	10-KGD10-04	22	—	—	44	45	—	—	62		
12	1/4	10-KGD12-02	17	—	—	42	46.5	—	—	55		
	3/8	10-KGD12-03	22	20.9	28.5	43	47	22	13.9	45.2	56	
	1/2	10-KGD12-04	22	—	—	46	48.5	—	—	63		

\*Reference dimensions of R thread after being screwed in.  
Note) ØD indicates the maximum diameter.



**Delta: 10-KGD**

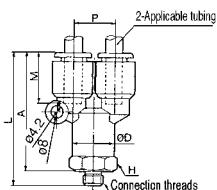


Applicable tubing O.D. mm	Model	Note) $\phi D$	L	Q	M	Effective area mm <sup>2</sup>	Weight g
						Polyurethane tubing	
4	10-KGD04-00	10.4	18.5	8.7	16	4.1	5
6	10-KGD06-00	12.8	20.5	9.9	17	11.0	7
8	10-KGD08-00	15.2	23.5	11.1	18.5	18.2	11
10	10-KGD10-00	18.5	26.5	12.8	21	29.0	19
12	10-KGD12-00	20.9	28.5	13.9	22	45.2	24

Note)  $\phi D$  indicates the maximum diameter.

**Male Branch "Y": 10-KGU**

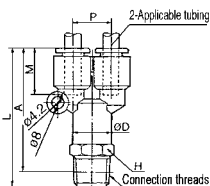
M5



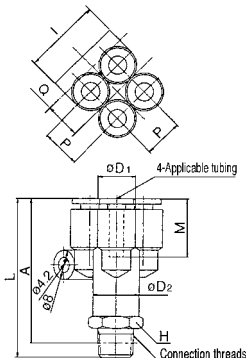
Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note) $\phi D$	L	P	A*	M	Effective area mm <sup>2</sup>	Weight g	
									Polyurethane tubing		
4	M5 X 0.8	10-KGU04-M5	11	10.4	39.5	36	36	16	2.2	4	
	1/8	10-KGU04-01	14		42	10.4			38	4.2	11
	1/4	10-KGU04-02	14		46	40			20		
6	M5 X 0.8	10-KGU06-M5	13	12.8	42.5	39	41.5	17	2.2	12	
	1/8	10-KGU06-01	14		45.5	12.8			43	11	
	1/4	10-KGU06-02	14		49	43			21		
	3/8	10-KGU06-03	17		51	44.5			34		
8	1/8	10-KGU08-01	17	15.2	52.5	48.5	55.5	18.5	15	23	
	1/4	10-KGU08-02	17		55.5	15.2			49.5	17.7	
	3/8	10-KGU08-03	17		56.5	50			35		
10	1/4	10-KGU10-02	19	18.5	61	55	55.5	21	30	40	
	3/8	10-KGU10-03	19		62	18.5			57	65	
	1/2	10-KGU10-04	22		65	57			32		
12	1/4	10-KGU12-02	22	20.9	64.5	58.5	60.5	22	40	40	
	3/8	10-KGU12-03	22		65.5	20.9			59	45.4	
	1/2	10-KGU12-04	22		68.5	60.5			65		

\*Reference dimensions of R thread after being screwed in.  
Note)  $\phi D$  indicates the maximum diameter.

R



**Double Branch: 10-KGD**

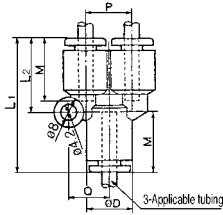


Applicable tubing O.D. mm	Connection threads R	Model	H (Hex.)	Note) $\phi D_1$	$\phi D_2$	L	I	A*	Q	M	P	Effective area mm <sup>2</sup>	Weight g
												Polyurethane tubing	
4	1/8	10-KGUD04-01	13	10.4	12.8	43.5	21	39.5	9.7	16	10.4	4.2	17
	1/4	10-KGUD04-02	14			47	41	25					
6	1/8	10-KGUD06-01	17	12.8	15.2	50.5	26	46.5	11.7	17	12.8	10.6	29
	1/4	10-KGUD06-02	17			53.5	47.5	29					

\*Reference dimensions of R thread after being screwed in.  
Note)  $\phi D_1$  indicates the maximum diameter.



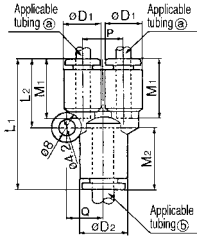
**Union "Y": 10-KGU**



Applicable tubing O.D. mm	Model	Note) $\phi D$	L <sub>1</sub>	L <sub>2</sub>	P	Q	M	Effective area	Weight g
								mm <sup>2</sup>	
4	10-KGU04-00	10.4	34	18	10.4	9.7	16	4.2	7
6	10-KGU06-00	12.8	37	20	12.8	11.7	17	10.6	9
8	10-KGU08-00	15.2	42.5	24.5	15.2	13.7	18.5	17.7	11
10	10-KGU10-00	18.5	48	27.5	18.5	16.1	21	28.4	16
12	10-KGU12-00	20.9	51	30	20.9	18.1	22	45.4	23

Note)  $\phi D$  indicates the maximum diameter.

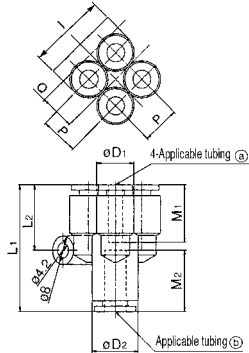
**Different Dia. Union "Y": 10-KGU**



Applicable tubing O.D. mm		Model	Note) $\phi D1$	Note) $\phi D2$	L <sub>1</sub>	L <sub>2</sub>	P	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area	Weight g
a	b										mm <sup>2</sup>	
4	6	10-KGU04-06	10.4	12.8	35	18	10.4	9.7	16	17	4.2	6
6	8	10-KGU06-08	12.8	15.2	39.5	20	12.8	11.7	17	18.5	10.6	11
8	10	10-KGU08-10	15.2	18.5	45	24.5	15.2	13.7	18.5	21	17.7	18
10	12	10-KGU10-12	18.5	20.9	49	27.5	18.5	16.1	21	22	28.4	27

Note)  $\phi D1$ ,  $\phi D2$  indicates the maximum diameter.

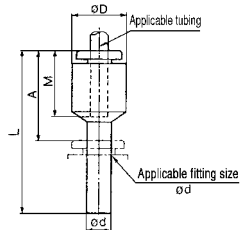
**Different Dia. Union "Y": 10-KGUD**



Applicable tubing O.D. mm		Model	Note) $\phi D1$	Note) $\phi D2$	L <sub>1</sub>	L <sub>2</sub>	P	I	Q	M <sub>1</sub>	M <sub>2</sub>	Effective area	Weight g
a	b											mm <sup>2</sup>	
4	6	10-KGUD04-06	10.4	12.8	35.5	18.2	10.4	21	9.7	16	17	4.2	10
6	8	10-KGUD06-08	12.8	15.2	40.5	20.3	12.8	26	11.7	17	18.5	10.6	17

Note)  $\phi D1$ ,  $\phi D2$  indicates the maximum diameter.

**Plug-in Reducer: 10-KGR**

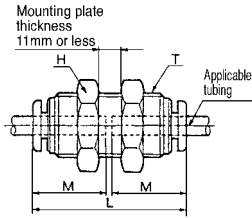


Applicable tubing O.D. mm	Applicable fitting size $\phi d$	Model	Note 1) $\phi D$	L	A	M	Effective area	Weight g
							mm <sup>2</sup>	
4	6	10-KGR04-06	10.4	34.5	17.5	16	4	1.8
	8	10-KGR04-08		36.5	18			2.0
	10	10-KGR04-10		12.8	39.5			18.5
6	4	10-KGR06-04	12.8	37	21	17	10.4	3
	8	10-KGR06-08		37	21			2.5
	10	10-KGR06-10		39.5	18.5			3
	12	10-KGR06-12		15.2	42			20
8	10	10-KGR08-10	15.2	41	20	18.5	18.0	4.0
	12	10-KGR08-12		42	20			4.6
10	12	10-KGR10-12	18.5	44.5	23	21	32.8	33
	16	10-KGR10-16		20.9	50.5			25.5
12	16	10-KGR12-16	20.9	50.5	25.5	22	(46.1)	37

Note 1)  $\phi D$  indicates the maximum diameter.

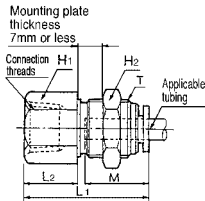


**Bulkhead Union: 10-KGE**



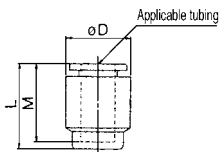
Applicable tubing O.D. mm	Model	T (M)	H (Hex.)	L	Mounting hole	M	Effective area mm <sup>2</sup>		Weight g
							Polyurethane tubing		
4	10-KGE04-00	M12 X 1	14	32.5	13	16	4		26
6	10-KGE06-00	M14 X 1	17	34.5	15	17	10.4		33
8	10-KGE08-00	M16 X 1	19	38	17	18.5	18.0		52
10	10-KGE10-00	M20 X 1	24	42.5	21	21	29.5		70
12	10-KGE12-00	M22 X 1	27	44	23	22	46.1		90

**Bulkhead Female Union: 10-KGE**



Applicable tubing O.D. mm	Connection thread R	Model	T (M)	H <sub>1</sub> (Hex.)	H <sub>2</sub> (Hex.)	L <sub>1</sub>	L <sub>2</sub>	Mounting hole	M	Effective area mm <sup>2</sup>		Weight g
										Polyurethane tubing		
4	1/8	10-KGE04-01	M12 X 1	14	14	27.5	11	13	16	4		16
	1/4	10-KGE04-02				31	15					35
6	1/8	10-KGE06-01	M14 X 1	17	17	28	11	15	17	10.4		30
	1/4	10-KGE06-02				31.5	15					29
	3/8	10-KGE06-03				33.5	17					27
8	1/8	10-KGE08-01	M16 X 1	17	19	27.5	7.5	17	18.5	18.0		28
	1/4	10-KGE08-02				33	13					27
	3/8	10-KGE08-03				35	15					48
10	1/4	10-KGE10-02	M20 X 1	22	24	34.5	12.5	21	21	29.5		53
	3/8	10-KGE10-03				36.5	14					67
12	3/8	10-KGE12-03	M22 X 1	24	27	37	14	23	22	46.1		92
	1/2	10-KGE12-04				41	18					59

**Tubing Cap: 10-KGC**



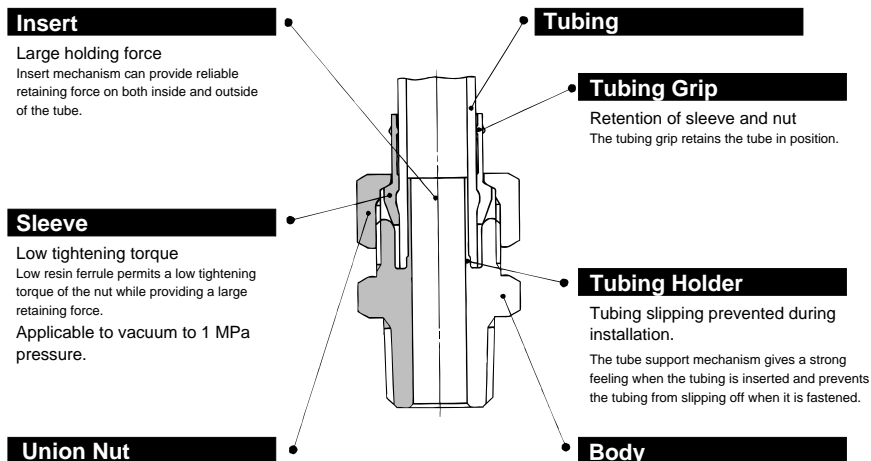
Applicable tubing O.D. mm	Model	Note) oD	L	M	Weight g
4	10-KGC04-00	10.4	17	16	3
6	10-KGC06-00	12.8	18.5	17	3
8	10-KGC08-00	15.2	20.5	18.5	4
10	10-KGC10-00	18.5	23	21	6
12	10-KGC12-00	20.9	24	22	8

Note) oD indicates the maximum diameter.



# Series 10-KF Insert Fittings

## Construction



## Specifications

Fluid	Air
Max. operating pressure	1.0MPa
Operating vacuum pressure	-101.3kPa
Proof pressure	7.0MPa
Ambient and fluid temperature	-5 to 60°C (No freezing)
Thread sealant	With or without sealant

Note) Male elbow, branch tee and male run tee are manufactured upon receipt of order.

## Applicable Tubing

Size	O.D.	4	6	8	10	12
	I.D.	2.5	4	5	6.5	8
Material	Polyurethane tubing	●	●	●	●	●

## Main Parts Material

Body	With electroless nickel plating C3371BE, C3604BD
Nut	With electroless nickel plating C360BD
Sleeve	Nylon 66

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

**Model**

**Male Connector**  
10-KFH



Used to pipe in the same direction from a female threaded portion. Most common type.

**Female Connector**  
10-KFF



Used to pipe from the male threaded portion of a pressure gauge, etc.

**Straight Union**  
10-KFH



Used to connect tubings in the same direction.

**Bulkhead Female Union**  
10-KFE



Used to connect a male threaded portion and a tubing across a panel.

**Male Elbow**  
10-KFL



Used to pipe at a right angle from a female threaded portion. Most common type.

**Bulkhead Union**  
10-KFF



Used for relay connection from one tubing to another across a panel.

**Tee Union**  
10-KFT



Used to branch a tubing into 2 directions at 90° on both sides.

**Male Run Tee**  
10-KFY



Used for branching into the same direction and at 90° either from male or female threaded portion.

**Male Branch Tee**  
10-KFT



Used for branching from a female threaded portion at 90° on both sides.

**Plug**  
10-KFP

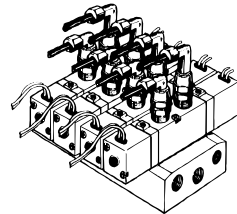


To plug unused insert fittings.

**Swivel Elbow**  
10-KFV



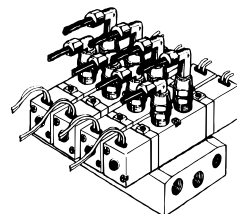
For piping at a right angle from the female thread. Swiveled at any direction.



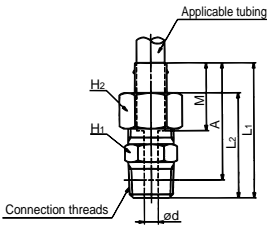
**Swivel Long Elbow**  
10-KFW



For piping at a right angle from the female thread. Swiveled at any direction. Solid piece moves fittings up from work piece.



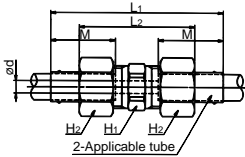
**Male Connector: 10-KFH**



Applicable tubing (mm)		Connection threads R	Model	H <sub>1</sub> (Hex.)	H <sub>2</sub> (Hex.)	L <sub>1</sub>	L <sub>2</sub>	M	d	A*	Effective area (mm <sup>2</sup> )	Weight g
O.D.	I.D.											
4	2.5	1/8	10-KFH04-01	10	10	30.5	23.8	15.5	1.5	26.5	1.6	13
		1/4	10-KFH04-02	14		34.5	27.8					23
6	4	1/8	10-KFH06-01	10	12	30.2	23.5	15.2	3	26.2	6	14
		1/4	10-KFH06-02	14		34.2	27.5					25
		3/8	10-KFH06-03	17		35.2	28.5					36
10	5	1/8	10-KFH08U-01	12	14	30.2	23.5	16.2	4	26.2	11	16
		1/4	10-KFH08U-02	14		34.2	27.5					25
		3/8	10-KFH08U-03	17		35.2	28.5					37
10	6.5	1/4	10-KFH10U-02	17	17	35.8	28.5	18.8	5.5	29.8	21	32
		3/8	10-KFH10U-03	17		36.8	29.5					40
		1/2	10-KFH10U-04	22		39.8	32.5					65
12	8	1/4	10-KFH12U-02	17	19	36.3	29.5	19.3	7	30.3	35	33
		3/8	10-KFH12U-03	17		37.3	30.5					41
		1/2	10-KFH12U-04	22		40.3	33.5					65

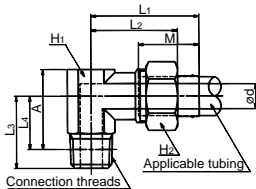
\*Reference dimensions of R thread after being screwed in.

**Straight Union: 10-KFH**



Applicable tubing (mm)		Model	H <sub>1</sub> (Hex.)	H <sub>2</sub> (Hex.)	L <sub>1</sub>	L <sub>2</sub>	M	d	Effective area (mm <sup>2</sup> )	Weight g
O.D.	I.D.									
4	2.5	10-KFH04-00	8	10	40.9	27.6	15.5	1.5	1.6	13
6	4	10-KFH06-00	10	12	40.3	27	15.2	3	6	17
8	5	10-KFH08U-00	12	14	41.3	28	16.2	4	11	23
10	6.5	10-KFH10U-00	17	17	44.6	30	18.8	5.5	21	36
12	8	10-KFH12U-00	17	19	45.5	32	19.3	7	35	42

**Male Elbow: 10-KFL**

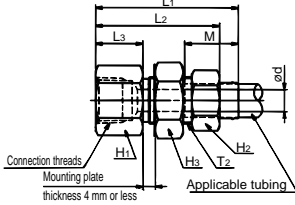


Applicable tubing (mm)		Connection threads R	Model	H <sub>1</sub> (Hex.)	H <sub>2</sub> (Hex.)	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	M	d	A*	Effective area (mm <sup>2</sup> )	Weight g					
O.D.	I.D.																		
4	2.5	1/8	10-KFL04-01	10	10	27.5	20.8	17	13	15.5	1.5	19.3	1.6	21					
		1/4	10-KFL04-02											19	25				
6	4	1/8	10-KFL06-01	10	12	27.2	20.5	17	13	15.2	3	19.3	6	22					
		1/4	10-KFL06-02											19	27				
		3/8	10-KFL06-03											12	30.2	23.5	20	13.7	38
8	5	1/8	10-KFL08U-01	12	14	28.2	21.5	18	14	16.2	4	21.3	9.5	30					
		1/4	10-KFL08U-02											21	15	32			
		3/8	10-KFL08U-03											12	30.2	23.5	20	13.7	39
10	6.5	1/4	10-KFL10U-02	12	17	31.8	24.5	22	16	18.8	5.5	22	20	44					
		3/8	10-KFL10U-03											14	33.8	26.5	25	16.8	66
		1/2	10-KFL10U-04											14	33.8	26.5	25	16.8	66
12	8	1/4	10-KFL12U-02	14	19	34.3	27.5	23	17	19.3	7	25.5	24	53					
		3/8	10-KFL12U-03											14	34.3	27.5	22	15.7	53
		1/2	10-KFL12U-04											14	34.3	27.5	22	15.7	68

\*Reference dimensions of R thread after being screwed in.

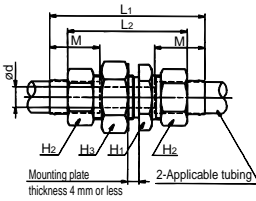


**Bulkhead Female Union: 10-KFE**



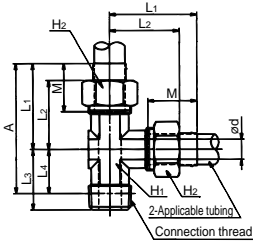
Applicable tubing (mm)		Connection threads Rc	Model	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	M	d	T <sub>2</sub>	Mounting hole	Effective area	Weight
O.D.	I.D.			(Hex.)	(Hex.)	(Hex.)								mm <sup>2</sup>	g
6	4	1/4	10-KFE06-02	17	12	17	44.2	37.5	16	15.2	3	M10 X1	11	6	41
8	5	3/8	10-KFE08U-03	19	14	19	46.2	39.5	17	16.2	4	M12 X1	13	11	49
10	6.5	3/8	10-KFE10U-03	19	17	22	48.8	41.5	17	18.8	5.5	M15 X1	16	21	63
12	8	3/8	10-KFE12U-03	22	19	24	51.3	44.5	17	19.3	7	M17 X1	18	35	93

**Bulk Head Union: 10-KFE**



Applicable tubing (mm)		Model	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	M	d	Mounting hole	Effective area	Weight
O.D.	I.D.		(Hex.)	(Hex.)	(Hex.)						mm <sup>2</sup>	g
4	2.5	10-KFE04-00	12	10	13	50.9	37.6	15.5	1.5	9	1.6	23
6	4	10-KFE06-00	14	12	17	51.3	38	15.2	3	11	6	34
8	5	10-KFE08U-00	17	14	19	52.3	39	16.2	4	13	11	47
10	6.5	10-KFE10U-00	19	17	22	56.6	42	18.8	5.5	16	21	67
12	8	10-KFE12U-00	22	19	24	59.5	46	19.3	7	18	35	87

**Male Run Tee: 10-KFY**



Applicable tubing (mm)		Connection threads Rc	Model	H <sub>1</sub>	H <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	M	d	A*	Effective area	Weight
O.D.	I.D.			(Hex.)	(Hex.)									mm <sup>2</sup>
4	2.5	1/8	10-KFY04-01	10	10	27.5	20.8	17	13	15.5	1.5	40.5	3.5	28
		1/4	10-KFY04-02				19						32	
6	4	1/8	10-KFY06-01	10	12	27.2	20.5	17	13	15.2	3	40.2	11	31
		1/4	10-KFY06-02				19						37	
		3/8	10-KFY06-03				12						45.8	13
8	5	1/8	10-KFY08U-01	12	14	30.2	23.5	23	17	16.2	4	47.2	15	48
		1/4	10-KFY08U-02				22						50	
		3/8	10-KFY08U-03				14						55	
10	6.5	1/4	10-KFY10U-02	12	17	31.8	24.5	23	17	18.8	5.5	47.4	30	58
		3/8	10-KFY10U-03				22						63	
		1/2	10-KFY10U-04				14						89	
12	8	1/4	10-KFY12U-02	14	19	34.3	27.5	25	19	19.3	7	53.3	34	79
		3/8	10-KFY12U-03				24						79	
		1/2	10-KFY12U-04				27						93	

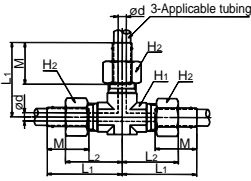
\*Reference dimensions of R thread after being screwed in.

**Plug: 10-KFP**



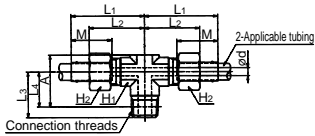
Applicable tubing O.D. (mm)	Model	L	D	Weight g
4	10-KFP-04	12	6.5	0.3
6	10-KFP-06	12	8.5	0.5
8	10-KFP-08	12	10.4	0.7
10	10-KFP-10	13.5	13	1.0
12	10-KFP-12	14	15	1.4

**Tee Union: 10-KFT**



Applicable tubing (mm)		Model	H1 (Hex.)	H2 (Hex.)	L1	L2	M	d	Effective area mm <sup>2</sup>	Weight g
O.D.	I.D.									
4	2.5	10-KFT04-00	10	10	27.5	20.8	15.5	1.5	1.6	33
6	4	10-KFT06-00		12	27.2	20.5	15.2	3	6	37
8	5	10-KFT08U-00	12	14	30.2	23.5	16.2	4	11	54
10	6.5	10-KFT10U-00	12	17	31.8	24.5	18.8	5.5	21	65
12	8	10-KFT12U-00	14	19	34.3	27.5	19.3	7	35	89

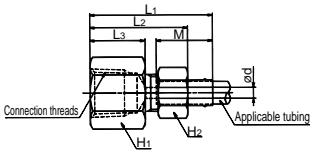
**Male Branch Tee: 10-KFT**



Applicable tubing (mm)		Connection threads R	Model	H1 (Hex.)	H2 (Hex.)	L1	L2	L3	L4	M	d	A*	Effective area mm <sup>2</sup>	Weight g	
O.D.	I.D.														
4	2.5	1/8	10-KFT04-01	10	10	27.5	20.8	17	13	15.5	1.5	19.3	3	29	
		1/4	10-KFT04-02					19							34
6	4	1/8	10-KFT06-01	10	12	27.2	20.5	17	13	15.2	3	19.3	10	32	
		1/4	10-KFT06-02					19							37
		3/8	10-KFT06-03					22							53
8	5	1/8	10-KFT08U-01	12	14	30.2	23.5	20	16	16.2	4	23.3	14	49	
		1/4	10-KFT08U-02					23							50
		3/8	10-KFT08U-03					22							56
		1/2	10-KFT08U-04					27							90
10	6.5	1/4	10-KFT10U-02	12	17	31.8	24.5	23	17	18.8	5.5	27.3	27	46	
		3/8	10-KFT10U-03					22							63
		1/2	10-KFT10U-04					27							90
12	8	1/4	10-KFT12U-02	14	19	34.3	27.5	25	19	19.3	7	27.5	31	79	
		3/8	10-KFT12U-03					24							81
		1/2	10-KFT12U-04					27							94

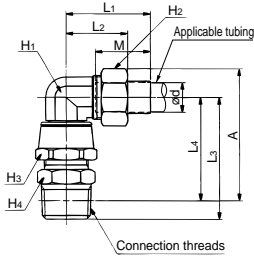
\*Reference dimensions of R thread after being screwed in.

**Straight Union: 10-KFF**



Applicable tubing (mm)		Connection threads R	Model	H1 (Hex.)	H2 (Hex.)	L1	L2	L3	M	d	Effective area mm <sup>2</sup>	Weight g
O.D.	I.D.											
4	2.5	1/4	10-KFF04-02	17	10	33.5	26.8	15	15.5	1.5	1.6	25
6	4	1/4	10-KFF06-02	17	12	33.2	26.5	15	15.2	3	6	27
		3/8	10-KFF06-03	19								
8	5	1/4	10-KFF08U-02	17	14	33.2	26.5	15	16.2	4	11	28
10	6.5	1/4	10-KFF10U-02	17	17	34.8	27.5	15	18.8	5.5	21	32
12	8	1/4	10-KFF12U-02	17	19	35.3	28.5	15	19.3	7	35	35

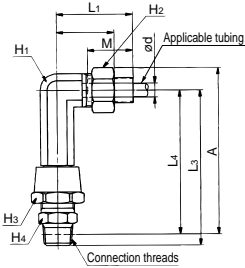
Swivel Elbow: 10-KFV



Applicable tubing (mm)		Connection threads R	Model	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	M	d	A*	Effective area mm <sup>2</sup>	Weight g				
O.D.	I.D.			(Hex.)	(Hex.)	(Hex.)	(Hex.)													
4	2.5	1/8	10-KFV04-01	10	10	14	10	26	19.3	33.7	29.7	15.5	1.5	35.5	1.4	40				
		1/4	10-KFV04-02	14	14	14	37.7										31.7	37.5		
6	4	1/8	10-KFV06-01	10	12	14	10	25.7	19	33.7	29.7	15.2	3	35.5	5	42				
		1/4	10-KFV06-02				14										14	37.7	31.7	37.5
		3/8	10-KFV06-03				17										17	38.7	32.4	38.2
8	5	1/8	10-KFV08U-01	12	14	17	12	27.2	20.5	34.7	30.7	16.2	4	37.6	9.4	52				
		1/4	10-KFV08U-02				14										14	38.7	32.7	39.6
		3/8	10-KFV08U-03				17										17	39.7	33.4	40.3
10	6.5	1/4	10-KFV10U-02	14	17	19	17	28.8	21.5	40.7	34.7	18.8	5.5	42.8	7	73				
		3/8	10-KFV10U-03				17										17	41.7	35.4	43.5
		1/2	10-KFV10U-04				22										22	44.7	36.5	44.6
12	8	1/4	10-KFV12U-02	17	19	22	17	30.3	23.5	41.7	35.7	19.3	7	45.7	9	104				
		3/8	10-KFV12U-03				22										22	42.7	36.4	46.7
		1/2	10-KFV12U-04				22										22	45.7	37.5	47.5

\*Reference dimensions of R thread after being screwed in.

Swivel Long Elbow: 10-KFW



Applicable tubing (mm)		Connection threads R	Model	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub>	M	d	A*	Effective area mm <sup>2</sup>	Weight g				
O.D.	I.D.			(Hex.)	(Hex.)	(Hex.)	(Hex.)													
4	2.5	1/8	10-KFW04-01	10	10	14	10	26	19.3	53.7	49.7	15.5	1.5	55.5	1.4	58				
		1/4	10-KFW04-02	14	14	14	57.7										51.7	63.5		
6	4	1/8	10-KFW06-01	10	12	14	10	25.7	19	54.7	50.7	15.2	3	60.5	5	61				
		1/4	10-KFW06-02				14										14	58.7	52.7	58.5
		3/8	10-KFW06-03				17										17	59.7	53.4	59.2
8	5	1/8	10-KFW08U-01	12	14	17	12	27.2	20.5	55.7	51.7	16.2	4	58.6	9.4	81				
		1/4	10-KFW08U-02				14										14	59.7	53.7	60.6
		3/8	10-KFW08U-03				17										17	60.7	54.4	61.3
10	6.5	1/4	10-KFW10U-02	14	17	19	17	28.8	21.5	61.7	55.7	18.8	5.5	63.8	18	106				
		3/8	10-KFW10U-03				22										22	62.7	56.4	64.5
		1/2	10-KFW10U-04				22										22	65.7	57.5	65.6
12	8	1/4	10-KFW12U-02	17	19	22	17	30.3	23.5	64.7	58.7	19.3	7	68.7	30	146				
		3/8	10-KFW12U-03				22										22	65.7	59.4	69.4
		1/2	10-KFW12U-04				22										22	68.7	60.5	70.5

\*Reference dimensions of R thread after being screwed in.

Air Line Equipment

# Series 10-M Miniature Fittings

## Construction



### Hose Nipple

#### Barb

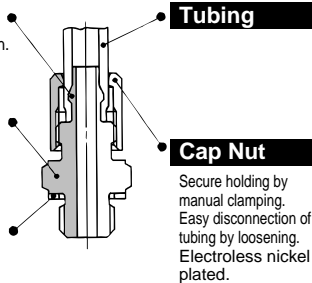
Easy tubing insertion.  
High retaining force.

#### Body

Electroless nickel plated.

#### Gasket

Low clamping torque.  
Secure sealing.



#### Tubing

#### Cap Nut

Secure holding by manual clamping.  
Easy disconnection of tubing by loosening.  
Electroless nickel plated.

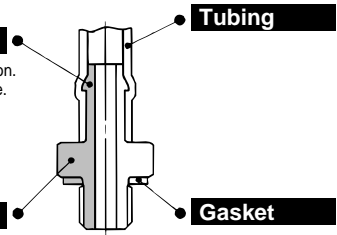
### Barb Fitting

#### Barb

Easy tubing insertion.  
High retaining force.

#### Body

Electroless nickel plated.



#### Tubing

#### Gasket

Low clamping torque.  
Secure sealing.

## Specifications

<b>Tubing material</b>		Polyurethane
<b>Applicable tubing</b>	<b>M3</b>	ø3.18/ø2, ø4/ø2.5
	<b>M5-R</b>	ø3.18/ø2
		ø4/ø2.5, ø6/ø4
<b>Max. operating pressure</b>		0.8MPa
<b>Connection size</b>		M3, R1/8, M5

## Main Parts Material








<b>Material</b>	<b>Body</b>	With electroless nickel plating C3604BD (Nipple M-3N, N-5N: SUS303)
	<b>Gasket</b>	PVC, Nylon 66/GF30%



## ⚠ Caution








Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.











Series Model/M3, R1/8

Series Model/M5

Series	Model	Description	Application	Note	
M3	10-M-3AU-3	Barb fitting for soft tubing 	To pipe polyurethane tubing	ø3.18/2 X M3	
	10-M-3AU-4			ø4/2.5 X M3	
	10-M-3ALU-3	Barb elbow for soft tubing 	Body rotates 360° around the stud axis. Position can be fixed after alignment.	To pipe polyurethane tubing	ø3.18/2 X M3
	10-M-3ALU-4			ø4/2.5 X M3	
	10-M-3UL	Universal elbow 	Body rotates 360° around the stud axis. Position can be fixed after alignment.		M3 female -M3 Male
	10-M-3UT	Universal tee 	Body rotates 360° around the stud axis. Position can be fixed after alignment.		M3 female -M3 female -M3 Male
	10-M-3N	Nipple 	To connect fittings and equipment or to connect 2 fittings		M3 Male -M3 Male
	10-M-3P	Plug 	Unused Block M3 port		
	10-M-3G	Gasket 	M3 screw seal		

Series	Model	Description	Application	Note
R 1/8	10-M-01AU-4	Barb fitting for soft tubing 	To pipe polyurethane tubing	ø4/2.5 X R1/8
	10-M-01AU-6			ø6/4 X R1/8
	10-M-01H-4	Hose nipple 		ø4/2.5 X R1/8
	10-M-01H-6			ø6/4 X R1/8

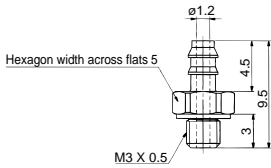
Series	Model	Description	Application	Note	
M5	10-M-5AU-3	Barb fittings for soft tubing 	To pipe polyurethane tubing	ø3.18/2 X M5	
	10-M-5AU-4			ø4/2.5 X M5	
	10-M-5AU-6			ø6/4 X M5	
	10-M-5ALU-3	Barb elbow for soft tubing 	Body rotates 360° around the stud axis. Position can be fixed after alignment.	To pipe polyurethane tubing	ø3.18/2 X M5
	10-M-5ALU-4			ø4/2.5 X M5	
	10-M-5ALU-6			ø6/4 X M5	
	10-M-5ALHU-3	Barb elbow for soft tubing (H) 	Body rotates 360° around the stud axis. Position can be fixed after alignment.	To pipe polyurethane tubing	ø3.18/2 X M5
	10-M-5ALHU-4			ø4/2.5 X M5	
	10-M-5ALHU-6			ø6/4 X M5	
	10-M-5H-4	Hose nipple 	To pipe polyurethane tubing		ø4/2.5 X M5
10-M-5H-6				ø6/4 X M5	
10-M-5HL-4	Hose elbow 	<ul style="list-style-type: none"> <li>To pipe polyurethane tubing</li> <li>Body rotates 360° around the stud axis. Position can be fixed after alignment.</li> </ul>		ø4/2.5 X M5	
10-M-5HLH-4	Hose elbow (H) 			ø4/2.5 X M5	
10-M-5HLH-6				ø6/4 X M5	
10-M-5L	Elbow 	Piping at 90° angle		M5 female -M5 female	

Series	Model	Description	Application	Note
M5	10-M-5T	Tee 	Perpendicular piping in both directions	M5 female -M5 female -M5 female
	10-M-5UL	Universal elbow 	Body rotates 360° around the stud axis. Position can be fixed after alignment.	M5 female -M5 male
	10-M-5UT	Universal tee 	Body rotates 360° around the stud axis. Position can be fixed after alignment.	M5 female -M5 female -M5 male
	10-M-5J	Extension fitting 	For 3D piping to prevent interference between fittings	M5 male -M5 male
	10-M-5N	Nipple 	To connect fittings and equipment or to connect 2 fittings	M5 male -M5 male
	10-M-5UN	Universal nipple 	Body rotates 360° around the stud axis.	M5 male X M5 male PAT.
	10-M-5B	Bushing 	Connection from R(PT)1/8 piping to M5 fittings	R1/8 X M5 female
	10-M-5P	Plug 	To plug unused M5 port	
	10-M-5G1	Gasket 	M5 screw seal	Material: PVC
	10-M-5GH	Gasket (H) 	10-M-5ALU-6 10-M-5ALHU-6 10-M-5HL-4, 6 10-M-5HLH-4, 6	Material: Nylon 66 GF30%

**Series M3**

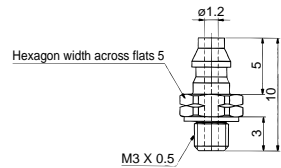
**Barb Fitting for Polyurethane Tubing: 10-M-3AU-3**

Effective area: 0.9mm<sup>2</sup>  
Weight: 0.6g



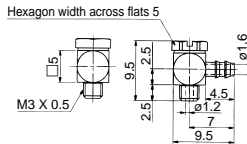
**Barb Fitting for Polyurethane Tubing: 10-M-3AU-4**

Effective area: 0.9mm<sup>2</sup>  
Weight: 0.7g



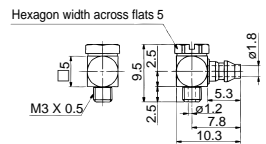
**Barb Elbow for Polyurethane Tubing: 10-M-3ALU-3**

Effective area: 0.6mm<sup>2</sup>  
Weight: 0.8g



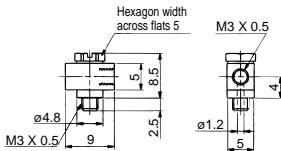
**Barb Elbow for Polyurethane Tubing: 10-M-3ALU-4**

Effective area: 0.6mm<sup>2</sup>  
Weight: 0.9g



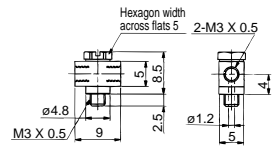
**Universal Elbow: 10-M-3UL**

Effective area: 0.6mm<sup>2</sup>  
Weight: 1.6g



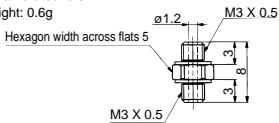
**Universal Tee: 10-M-3UT**

Effective area: 0.6mm<sup>2</sup>  
Weight: 1.4g



**Nipple: 10-M-3N**

Effective area: 0.9mm<sup>2</sup>  
Weight: 0.6g



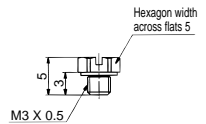
**Gasket: 10-M-3G**

Weight: 0.005g



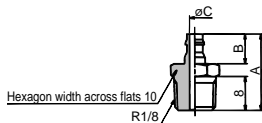
**Plug: 10-M-3P**

Weight: 0.5g



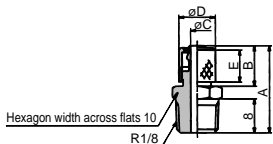
**Series R1/8**

**Barb Fitting for Polyurethane Tubing: 10-M-01AU-4,-6**

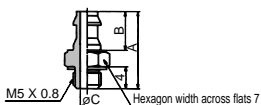


Applicable tube	Model	A	B	C	Effective area (mm <sup>2</sup> )	Weight (g)
Polyurethane tubing	10-M-01AU-4	16	5	1.8	2.1	6.5
	10-M-01AU-6	18	7	2.5	4.0	6.7

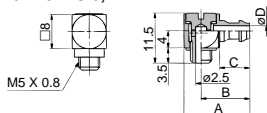
**Hose Nipple: 10-M-01H-4,-6**



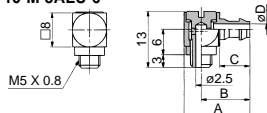
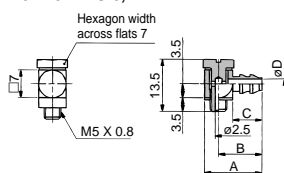
Model	A	B	C	D	E	Effective area (mm <sup>2</sup> )	Weight (g)
10-M-01H-4	19.5	8.5	1.8	6.7	7	2.1	7.1
10-M-01H-6	20.5	9.5	3	8.5	8	5.5	7.7

**Series M5**
**Barb Fitting for Polyurethane Tubing: 10-M-5AU-3, -4, -6**


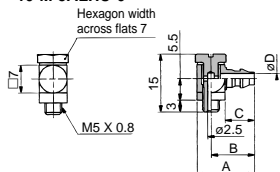
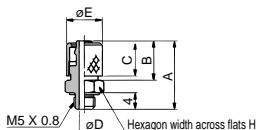
Model	A	B	C	Effective area (mm <sup>2</sup> )	Weight (g)
10-M-5AU-3	11.5	4.5	1.6	1.7	1.5
10-M-5AU-4	12	5	1.8	2.1	1.6
10-M-5AU-6	14	7	2.5	4.0	1.8

**Barb Elbow for Polyurethane Tubing: 10-M-5ALU-3, -4, -6**
**10-M-5ALU-3,-4**


Model	A	B	C	D	Effective area (mm <sup>2</sup> )	Weight (g)
10-M-5ALU-3	12.5	8.5	4.5	1.6	1.1	4.0
10-M-5ALU-4	13.3	9.3	5	1.8	1.4	4.1
10-M-5ALU-6	15.3	11.3	7	2.5	2.4	4.5

**10-M-5ALU-6**

**Barb Elbow for Polyurethane Tubing: 10-M-5ALHU-3, -4, -6**
**10-M-5ALHU-3,-4**


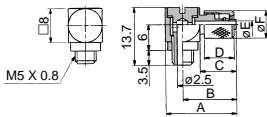
Model	A	B	C	D	Effective area (mm <sup>2</sup> )	Weight (g)
10-M-5ALHU-3	11.5	8	4.5	1.6	1.1	3.2
10-M-5ALHU-4	12.3	8.8	5	1.8	1.4	3.3
10-M-5ALHU-6	14.3	10.8	7	2.5	2.4	3.9

**10-M-5ALHU-6**

**Hose Nipple: 10-M-5H-4, -6**


Model	A	B	C	D	E	H	Effective area (mm <sup>2</sup> )	Weight (g)
10-M-5H-4	15.5	8.5	7	1.8	6.5	7	2.1	2.7
10-M-5H-6	16.5	9.5	8	2.5	8.5	8	4.0	3.9

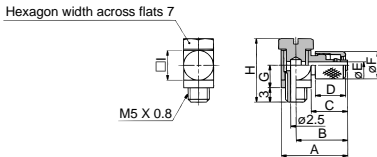
**Series M5**

**Hose Elbow: 10-M-5HL-4, -6**



Model	A	B	C	D	E	F	Effective area (mm <sup>2</sup> )	Weight (g)
10-M-5HL-4	16.5	12.5	8.5	7	1.8	6.5	1.4	4.4
10-M-5HL-6	17.5	13.5	9.5	8	2.5	8.5	2.4	5.2

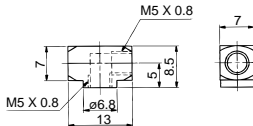
**Hose Elbow: 10-M-5HLH-4, -6**



Model	A	B	C	D	E	F	G	H	I	Effective area (mm <sup>2</sup> )	Weight (g)
10-M-5HLH-4	15.5	12	8.5	7	1.8	6.5	5.5	15	7	1.4	4.5
10-M-5HLH-6	17.5	13.5	9.5	8	2.5	8.5	6	16	8	2.4	6.6

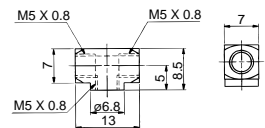
**Elbow: 10-M-5L**

Weight: 4.2g



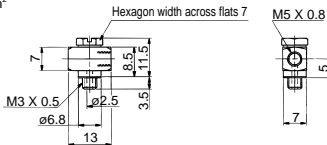
**Tee: 10-M-5T**

Weight: 3.5g



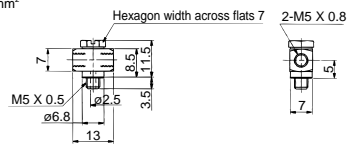
**Universal Elbow: 10-M-5UL**

Effective area: 2.4mm<sup>2</sup>  
Weight: 5.3g



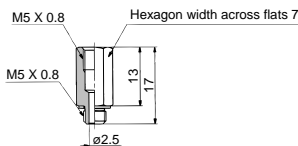
**Universal Tee: 10-M-5UT**

Effective area: 2.4mm<sup>2</sup>  
Weight: 4.8g



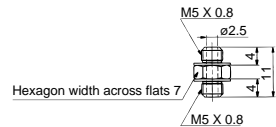
**Extension Fitting: 10-M-5J**

Effective area: 4.0mm<sup>2</sup>  
Weight: 3.6g



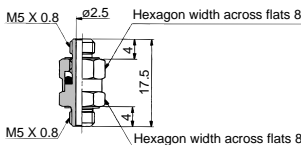
**Nipple: 10-M-5N**

Effective area: 4.0mm<sup>2</sup>  
Weight: 1.5g



**Universal Nipple: 10-M-5UN**

Effective area: 4.0mm<sup>2</sup>  
Weight: 3.9g

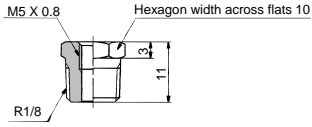




**Series M5**

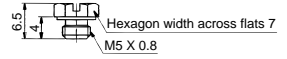
**Bushing: 10-M-5B**

Weight: 5.8g



**Plug: 10-M-5P**

Weight: 1.3g



**Gasket: 10-M-5G1**

Weight: 0.01g



**Gasket: 10-M-5GH**

Weight: 0.04g

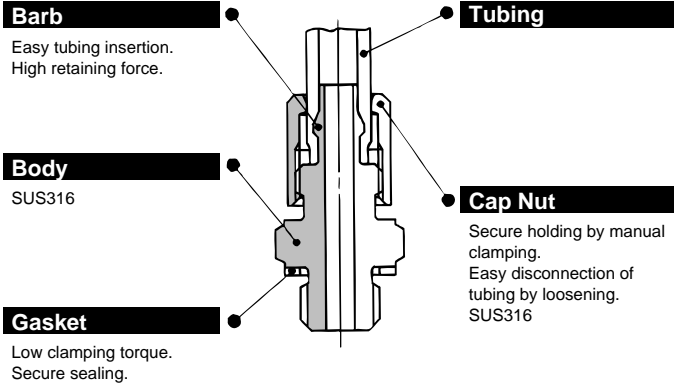


# Series 10-MS Stainless Miniature Fittings

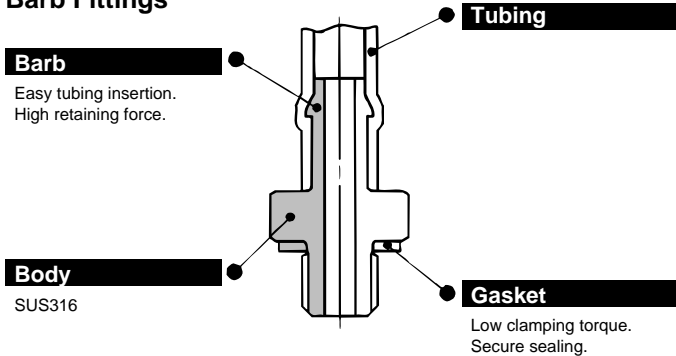
## Construction



### Hose Nipple



### Barb Fittings








### Specifications










Applicable tubing material	Polyurethane	
Applicable tubing diameter	$\varnothing 3,18 / \varnothing 2, \varnothing 4 / \varnothing 2.5, \varnothing 6 / \varnothing 4$	
Max. operating pressure	0.8MPa	
Connection size	M5, R1/8	
Material	Body	SUS316
	Gasket	PVC, Nylon 66/GF30%

### ⚠ Caution

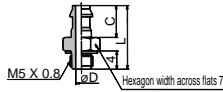
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

**Model**

Model	Description	Application	Note
10-MS-5AU-3	 Barb Fittings For Soft Tubing	To pipe polyurethane tubing	$\varnothing 3.18/\varnothing 2 \times M5$
10-MS-5AU-4			$\varnothing 4/\varnothing 2.5 \times M5$
10-MS-5AU-6			$\varnothing 6/\varnothing 4 \times M5$
10-MS-5ALHU-3	 Barb Elbow For Soft Tubing	•To pipe polyurethane tubing •Body rotates 360° around the stud axis. Position can be fixed after alignment.	$\varnothing 3.18/\varnothing 2 \times M5$
10-MS-5ALHU-4			$\varnothing 4/\varnothing 2.5 \times M5$
10-MS-5ALHU-6			$\varnothing 6/\varnothing 4 \times M5$
10-MS-5H-4	 Hose Nipple	•To pipe polyurethane tubing	$\varnothing 4/\varnothing 2.5 \times M5$
10-MS-5H-6			$\varnothing 6/\varnothing 4 \times M5$
10-MS-5HLH-4	 Hose Elbow	•To pipe polyurethane tubing •Body rotates 360° around the stud axis. Position can be fixed after alignment.	$\varnothing 4/\varnothing 2.5 \times M5$
10-MS-5HLH-6			$\varnothing 6/\varnothing 4 \times M5$
10-M-5G1	 Gasket	M5 screw seal	Material: PVC

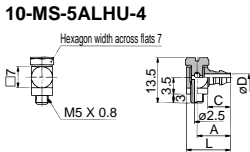
Model	Description	Application	Note
10-MS-5UL	 Universal Elbow	Body rotates 360° around the stud axis. Position can be fixed after alignment.	M5 female X M5 male
10-MS-5UT	 Universal Tee	Body rotates 360° around the stud axis. Position can be fixed after alignment.	M5 female X M5 female X M5 male
10-MS-5B	 Bushing	Connection from R1/8 piping to M5 fittings	R1/8 X M5 female
10-MS-5P	 Plug	To plug unused M5 port	
10-MS-5J	 Extension Fitting	For 3D piping to prevent interference between fittings	M5 male X M5 male
10-MS-5N	 Nipple	To connect fittings and equipment or to connect 2 fittings	M5 male X M5 male
10-MS-5UN	 Universal Nipple	Body rotates 360° around the stud axis.	M5 male X M5 male PAT.
10-MS-5ATHU-3	 Barb Fitting Tee For Soft Tubing	•To pipe polyurethane tubing •Body rotates 360° around the stud axis. Position can be fixed after alignment.	$\varnothing 3.18/\varnothing 2 \times M5$
10-MS-5ATHU-4			$\varnothing 4/\varnothing 2.5 \times M5$
10-MS-5ATHU-6			$\varnothing 6/\varnothing 4 \times M5$
10-M-5GH	 Gasket (H)	M5 screw seal 10-MS-5ALHU-6 10-MS-5ALH-4 10-MS-5ALH-6 10-MS-5ATHU-6 only	Material: Nylon 66 GF30%

**Barb Fitting for Soft Tubing: 10-MS-5AU-4,-6**

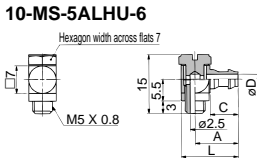


Model	C	D	L	Effective area (mm <sup>2</sup> )	Weight (g)
10-MS-5AU-3	4.5	1.6	11.5	1.7	1.4
10-MS-5AU-4	5	1.8	12	2.1	1.5
10-MS-5AU-6	7	2.5	14	4.0	1.7

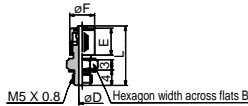
**Barb Elbow for Soft Tubing: 10-MS-5ALHU-4,-6**



Model	A	C	D	L	Effective area (mm <sup>2</sup> )	Weight (g)
10-MS-5ALHU-3	8	4.5	1.6	11.8	1.1	3.0
10-MS-5ALHU-4	8.8	5.0	1.8	12.6	1.4	3.1
10-MS-5ALHU-6	10.8	7.0	2.5	14.6	2.4	3.7

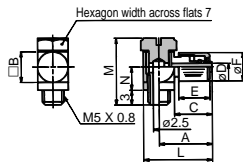


**Hose Nipple: 10-MS-5H-4,-6**



Model	B	D	L	E	F	Effective area (mm <sup>2</sup> )	Weight (g)
10-MS-5H-4	7	1.8	15.5	7	6.5	2.1	2.5
10-MS-5H-6	8	2.5	16.5	8	8.5	4.0	3.7

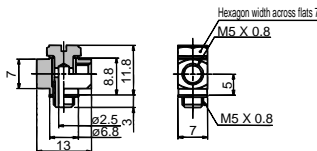
**Hose Elbow: 10-MS-5HLH-4,-6**



Model	A	B	C	D	E	F	L	M	N	Effective area (mm <sup>2</sup> )	Weight (g)
10-MS-5HLH-4	12	7	8.5	1.8	7	6.5	15.8	15.5	5.5	1.4	4.2
10-MS-5HLH-6	13.5	8	9.5	2.5	8	8.5	17.8	16.5	6	2.4	6.2

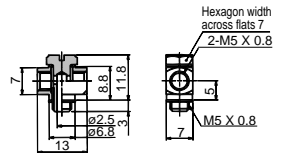
**Universal Elbow: 10-MS-5UL**

Effective area: 2.4mm<sup>2</sup>  
Weight: 5.0g



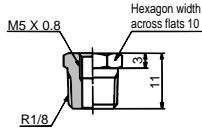
**Universal Tee: 10-MS-5UT**

Effective area: 2.4mm<sup>2</sup>  
Weight: 4.5g



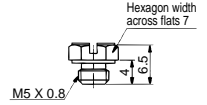
**Bushing: 10-MS-5B**

Effective area: 12mm<sup>2</sup>  
Weight: 5.5g



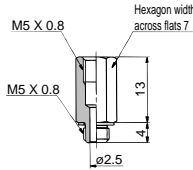
**Plug: 10-MS-5P**

Weight: 1.2g



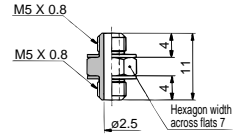
**Extension Fitting: 10-MS-5J**

Effective area: 4.0mm<sup>2</sup>  
Weight: 3.4g



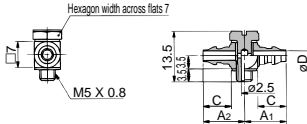
**Nipple: 10-MS-5N**

Effective area: 4.0mm<sup>2</sup>  
Weight: 1.4g

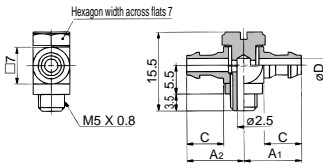


**Barb Tee for Soft Tubing: 10-MS-5ATHU-4,-6**

**10-MS-5ATHU-4**



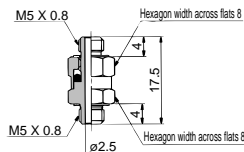
**10-MS-5ATHU-6**



Model	A1	A2	C	D	Effective area (mm <sup>2</sup> )	Weight (g)
10-MS-5ATHU-3	8	8.3	4.5	1.6	1.1	3.4
10-MS-5ATHU-4	8.8	8.8	5.0	1.8	1.4	3.6
10-MS-5ATHU-6	10.8	10.8	7.0	2.5	2.4	4.2

**Universal Nipple: 10-MS-5UN**

Effective area: 4.0mm<sup>2</sup>  
Weight: 3.7g



**Gasket: 10-M-5G1,10-M-5GH**

Weight: 0.01g

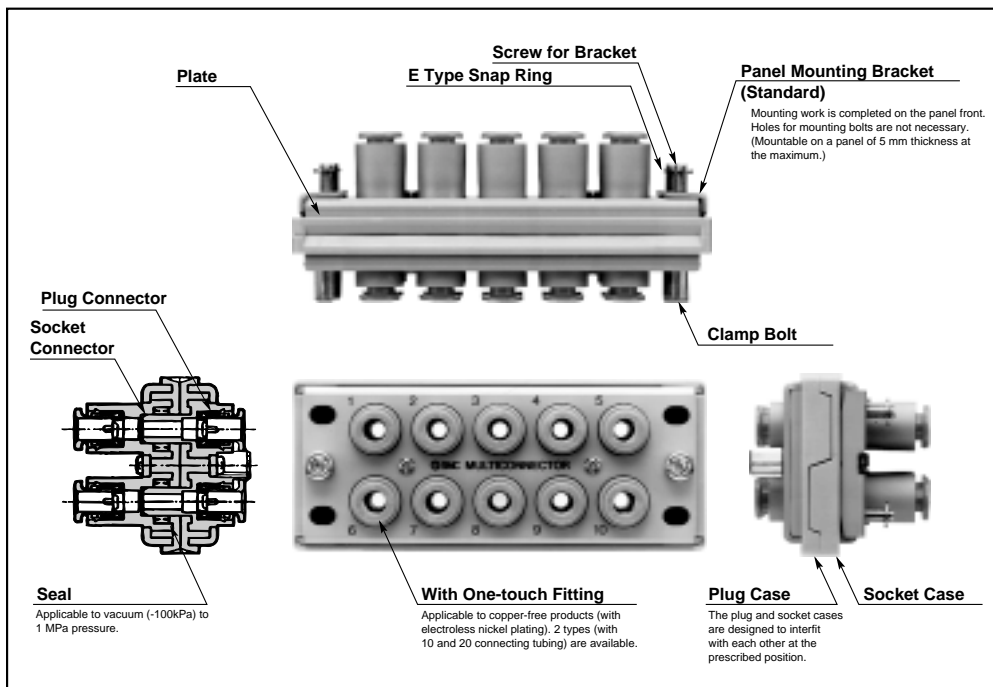
Weight: 0.04g



Air Line Equipment

# Series 10-KDM

Rectangular Multi-connector  
Connecting Tubing: 10, 20



## Model

No. of connecting tubing	Tubing O.D.		Model	Weight	Release button color
10	Metric size	$\phi 3.2$	10-KDM10-23	300g	White
		$\phi 4$	10-KDM10-04		
		$\phi 6$	10-KDM10-06	520g	
		$\phi 8$	10-KDM10-08		
20	Metric size	$\phi 3.2$	10-KDM20-23	520g	White
		$\phi 4$	10-KDM20-04		
		$\phi 6$	10-KDM20-06	950g	
		$\phi 8$	10-KDM20-08		

## Applicable Tubing Material

Tubing material	Polyurethane	
Tubing O.D.	Metric size	$\phi 3.2, \phi 4, \phi 6, \phi 8$

## Specifications

Fluid	Air
Max. operating pressure	1.0MPa
Operating vacuum pressure	-100kPa
Proof pressure	1.5MPa
Ambient and fluid temperature	-5 to 60 °C (No freezing)

**Part No.**

Connecting tubing	Tubing O.D.	Part No.		Release button color
		Plug	Socket	
10	ø3.2	<b>10-KDM10P-23</b>	<b>10-KDM10S-23</b>	White
	ø4	<b>10-KDM10P-04</b>	<b>10-KDM10S-04</b>	
	ø6	<b>10-KDM10P-06</b>	<b>10-KDM10S-06</b>	
	ø8	<b>10-KDM10P-08</b>	<b>10-KDM10S-08</b>	
20	ø3.2	<b>10-KDM20P-23</b>	<b>10-KDM20S-23</b>	
	ø4	<b>10-KDM20P-04</b>	<b>10-KDM20S-04</b>	
	ø6	<b>10-KDM20P-06</b>	<b>10-KDM20S-06</b>	
	ø8	<b>10-KDM20P-08</b>	<b>10-KDM20S-08</b>	

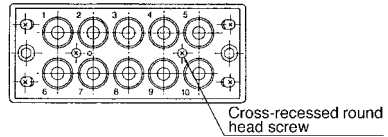
**Mixed Sizes of Plug Connectors and Socket Connectors**

The rectangular multi-connector allows connector replacement at any desired position, thus allowing use of different sizes of tubing.

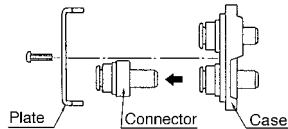
**Part No.**

Connector type	Tubing O.D.	Part No.	Release button color
Plug connector	ø3.2	<b>10-KDMP-23</b>	White
	ø4	<b>10-KDMP-04</b>	
	ø6	<b>10-KDMP-06</b>	
	ø8	<b>10-KDMP-08</b>	
Socket connector (With seal)	ø3.2	<b>10-KDMS-23</b>	
	ø4	<b>10-KDMS-04</b>	
	ø6	<b>10-KDMS-06</b>	
	ø8	<b>10-KDMS-08</b>	

① Loosen the cross-recessed round head screws using a Phillips screwdriver to remove the plate from the case.



② After replacing connectors at desired positions, remount the plate with a Phillips screwdriver onto the case.



## Main Parts Material

Plugcase, socket case		POM
Plate, bracket		SPCC sintering coating
Plug connector, socket connector	Body	PBT, C3604BD electroless nickel plated (ø8, ø5/16)
	Chuck	SUS304
	Guide	C3604BD electroless nickel plated, POM (ø8, ø5/16)
	Collet, release button	POM
	Seal	NBR
Clampbolt, Bracket thread, Cross-recessed head screw		SWRM Nickel plated
E type snap ring		SUS304

## ⚠ Specific Product Precautions

Be sure to read before handling.

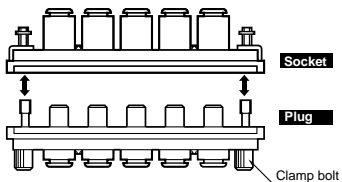
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

## How to Use

### ⚠ Caution

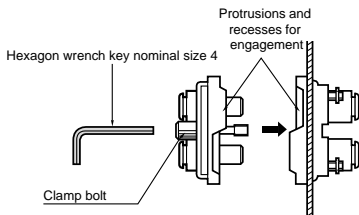
#### ① Separation

Loosen the clamp bolt to separate the plug side from the socket side.



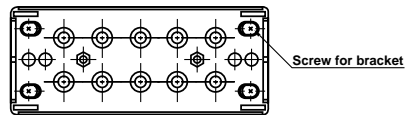
#### ② Connection

Interfit the both surfaces and connect the plug case to the socket. After tightening the clamp bolt by hand, tighten it further with a hexagon wrench key with a nominal width across flats of 4.

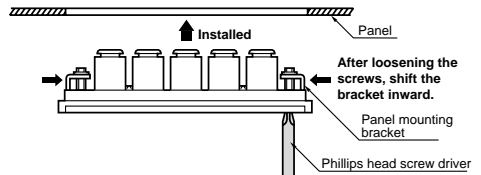


#### ③ Panel mounting

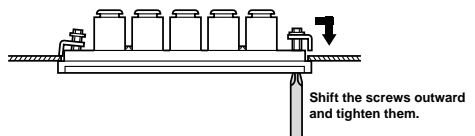
1) Loosen 4 bracket mounting screws on the socket side using a Phillips screwdriver (JIS nominal No. 2) until the bracket contacts the retaining ring.



2) Shift the panel mounting screws inward (Move the screws for bracket in the longitudinal direction of the slot) and put the connector in the panel mounting hole. (See "Dimensions," for the panel mounting hole dimensions.)



3) Shift the bracket mounting screws outward and fasten them with a Phillips screwdriver to secure the socket case.

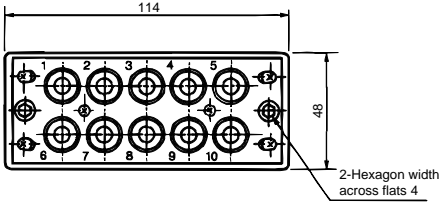
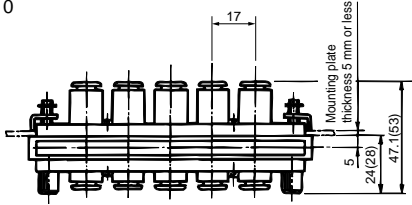


4) To remove the connector from the panel, loosen the bracket mounting screws until the bracket contacts the snap ring and shift the screws inward before removal.

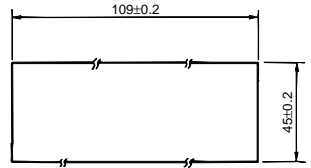


**Dimensions**

10-KDM10

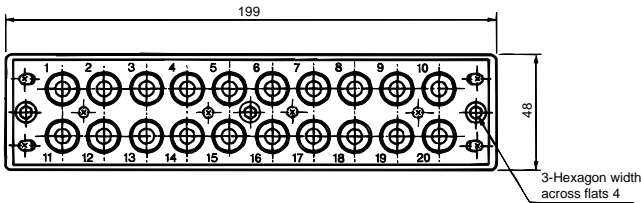
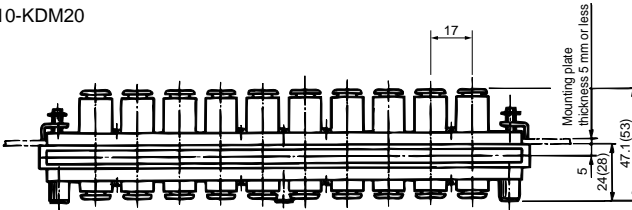


Dimensions in parentheses are for 10-KDM10-08.

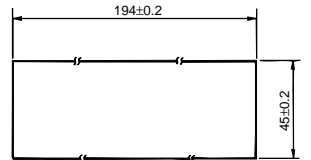


Panel mounting hole

10-KDM20



Dimensions in parentheses are for 10-KDM20-08.



Panel mounting hole

**Made to Order**

Contact SMC for detailed specifications, dimensions and delivery.

■ **Mixed tubing sizes**

When manifolds for mixed tube sizes are ordered, use the specification documents.

# Series TPH Clean Tubing Polyolefin Tubing

## How to Order



TPH0604 B 20

Tubing designation

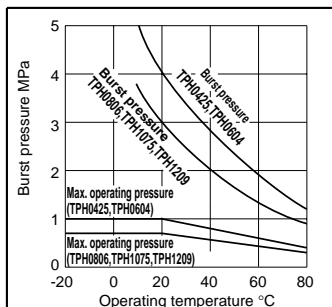
Color Indication

Symbol	Color
W	White
B	Black
R	Red
BU	Blue
Y	Yellow
G	Green

Length per roll

Symbol	Length
20	20m bundle
100	100m bundle

## Burst Pressure Characteristics Curve



## Series Table

●—20m bundle □—100m bundle

Model	TPH0425	TPH0604	TPH0806	TPH1075	TPH1209
O.D. mm	4	6	8	10	12
I.D. mm	2.5	4	6	7.5	9

White (W)	●	●	●	□	□
Black (B)	●	●	●	●	●
Red (R)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Yellow (Y)	●	●	●	●	●
Green (G)	●	●	●	●	●

## Specifications

Fluid	Air, Nitrogen, Water (Pure water) <sup>Note 1)</sup>				
Max. operating pressure (20°C)	1.0MPa <sup>Note 2)</sup>		0.7MPa <sup>Note 2)</sup>		
Min. bending radius mm	15	25	35	45	55
Burst pressure	Refer to the burst pressure characteristics curve				
Operating temperature	-20 to 80°C, In case of water 5 to 80°C				
Material	Polyolefine resin				

Note 1) Consult SMC regarding other fluids.

Note 2) The maximum operating pressure is a value at 20°C. Refer to the burst pressure characteristics curve for other temperatures. Abnormal temperature rises due to adiabatic expansion may cause tubing to burst.

Note 3) The minimum bending radius is a bending radius at which the outside diameter's rate of change is kept not larger than 10% at 20°C. At higher temperatures, the outside diameter's rate of change may exceed 10% even at a value larger than the minimum bending radius.

## ⚠ Caution

Series TPH is a line of tubing specially designed for clean blowing and washing lines. Consult SMC for use in other types of applications.  
 Materials: The durability of polyolefine resin with respect to mineral oils is inferior, which makes it unsuitable for piping in general pneumatic equipment.  
 Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

# Series **TPS** Clean Tubing

## Soft Polyolefin Tubing

### How to Order



TPS0604 B 20

Tubing designation

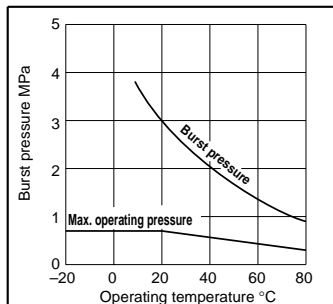
Color Indication

Symbol	Color
W	White
B	Black
R	Red
BU	Blue
Y	Yellow
G	Green

Length per roll

Symbol	Length
20	20m bundle
100	100m bundle

### Burst Pressure Characteristics Curve



### Series Table

●—20m bundle □—100m bundle

Model	TPS0425	TPS0604	TPS0805	TPS1065	TPS1208
O.D. mm	4	6	8	10	12
I.D. mm	2.5	4	5	6.5	8
White (W)	●	●	●	●	●
Black (B)	●	●	●	●	●
Red (R)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Yellow (Y)	●	●	●	●	●
Green (G)	●	●	●	●	●

### Specifications

Fluid	Air, Nitrogen, Water (Pure water) <sup>Note 1)</sup>				
Max. operating pressure (20°C)	0.7MPa <sup>Note 2)</sup>				
Min. bending radius mm	10	20	25	30	40
Burst pressure	Refer to the burst pressure characteristics curve				
Operating temperature	-20 to 80°C, In case of water 5 to 80°C				
Material	Polyolefine resin				

Note 1) Consult SMC regarding other fluids.

Note 2) The maximum operating pressure is a value at 20°C. Refer to the burst pressure characteristics curve for other temperatures. Abnormal temperature rises due to adiabatic expansion may cause tubing to burst.

Note 3) The minimum bending radius is a bending radius at which the outside diameter's rate of change is kept not larger than 10 % at 20°C. At higher temperatures, the outside diameter's rate of change may exceed 10% even at a value larger than the minimum bending radius.

### ⚠ Caution

Series TPH is a line of tubing specially designed for clean blowing and washing lines. Consult SMC for use in other types of applications.

Materials: The durability of polyolefine resin with respect to mineral oils is inferior, which makes it unsuitable for piping in general pneumatic equipment.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

# Series 10-TU Polyurethane Tubing

## How to Order

For general pneumatic piping  
Flexible  
Polyurethane tubing



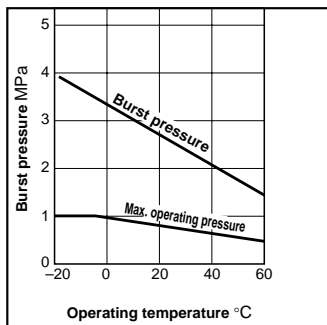
10 - TU0425 BU - 20

Clean series | Tubing designation

Color indication  
**B** —Black  
**W** —White  
**R** —Red  
**BU** —Blue  
**Y** —Yellow  
**G** —Green  
**C** —Clear  
**YR** —Orange

Length per roll  
 20 — 20m bundle

### Burst Pressure Characteristics Curve



### Series Table

● — 20m bundle

Model	Tubing size				
	Metric size (Series TU)				
	10-TU0425	10-TU0604	10-TU0805	10-TU1065	10-TU1208
O.D. mm	4	6	8	10	12
I.D. mm	2.5	4	5	6.5	8

Black (B)	●	●	●	●	●
White (W)	●	●	●	●	●
Red (R)	●	●	●	●	●
Blue (BU)	●	●	●	●	●
Yellow (Y)	●	●	●	●	●
Green (G)	●	●	●	●	●
Clear (C)	●	●	●	●	●
Orange (YR)	●	●	●	●	●

### Specifications

Max. operating pressure (20°C)	0.8MPa				
Burst pressure	Refer to the burst pressure characteristics curve				
Min. bending radius mm	10	15	20	27	35
Operating temperature	-20 to 60°C				
Material	Polyurethane				

(Note) The minimum bending radius is a bending radius at which the tube flattens at 20°C. At higher temperatures, flattening may occur even at a value larger than the minimum bending radius.

## ⚠ Caution

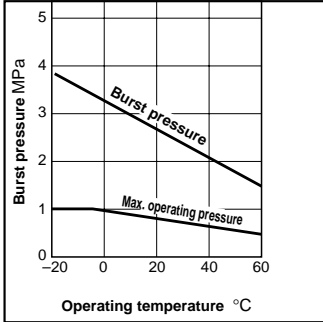
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

# Series 10-TCU Polyurethane Coil Tubing

For flexible piping  
Compact piping possible



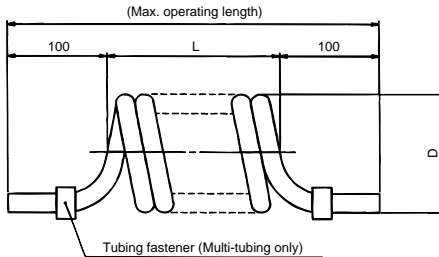
Burst pressure characteristics curve



Specifications

Model	10-TCU 0425B-1	10-TCU 0425B-2	10-TCU 0425B-3	10-TCU 0604B-1	10-TCU 0604B-2	10-TCU 0604B-3	10-TCU 0805B-1
Number of cores	1	2	3	1	2	3	1
Tubing O.D. mm	4			6			8
Tubing I.D. mm	2.5			4			5
Max. operating pressure (20°C)	0.8MPa						
Burst pressure	Refer to the burst pressure characteristics curve						
Operating temperature	-20 to 60°C						
Material	Polyurethane						
Color	Black						

Dimensions



Specifications Model	Tubing size mm		Coil dimension mm		Number of tubes	No. of coil windings per tubing length	Max. operating length m
	O.D.	I.D.	L	D			
10-TCU0425B-1	4	2.5	210	18	1	52	1.5
10-TCU0425B-2			280	28	2	35	
10-TCU0425B-3			265		3	22	
10-TCU0604B-1	6	4	325	24	1	54	2
10-TCU0604B-2			305	37	2	27	1.5
10-TCU0604B-3			305		3	17	1
10-TCU0805B-1	8	5	330	31	1	41	2

## ⚠ Caution

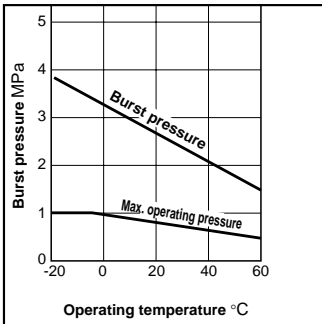
Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

# Series 10-TFU Polyurethane Flat Tubing

Compact piping possible



Burst pressure characteristics curve



## Specifications

Model	10-TFU 0425B-2	10-TFU 0425B-3	10-TFU 0604B-2	10-TFU 0604B-3	10-TCU 0805B-2	10-TCU 0805B-3
Number of cores	2	3	2	3	2	3
Tubing O.D. mm	4		6		8	
Tubing I.D. mm	2.5		4		5	
Max. operating pressure (20°C)	0.8MPa					
Burst pressure	Refer to the burst pressure characteristics curve					
Operating temperature	-20 to 60°C					
Material	Polyurethane					
Color	Black					
Min. bending radius mm	10		15		20	
Tubing length per roll m	10					

## ⚠ Caution

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 512 and 513 for common precautions for fittings.

# Clean series Air Preparation Equipment

**10-AM** Mist Separator  
Series AM  
P.592

**10-AMD** Micro Mist Separator  
Series AMD  
P.596

**10-AME** Super Mist Separator  
Series AME  
P.600

**10-AMF** Odor Removal Filter  
Series AMF  
P.604

**10-IDG** Hollow Fiber Membrane Air Dryer  
Series IDG  
P.608

**AMP** Exhaust Cleaner for Clean Room  
Series AMP  
P.610



# Air Preparation Equipment/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Design

Adopt a safety design to prevent occurrence of unexpected accidents as listed below.

### ⚠ Caution

- 1 **Design a layout which will prevent occurrence of reverse pressure and reverse flow.**  
Reverse pressure or reverse flow will cause malfunction or damage to equipment. Implement safety measures including those for handling procedures.

## Selection

### ⚠ Warning

- 1 **To select the equipment, thoroughly verify the purpose, specification requirements and the operating conditions (Such as pressure, flow rate, temperature, environment and power supply) and make your selection based on the latest catalog. Be sure not to exceed specification ranges. If there is anything that is not clear, contact SMC before making a selection.**
- 2 **Do not use this product for breathing, medical use, for medicine that is injected by humans, or for blowing air on food products.**  
The air preparation equipment is designed exclusively for industrial compressed air, and it should not be used for any other purpose. Due to unavoidable circumstances, if it must be used for other purposes, be sure to take safety measures and contact SMC beforehand.

### ⚠ Caution

- 1 **Do not introduce a flow larger than the rated flow rate.**  
If the rated flow rate is exceeded even momentarily, it could cause drainage or oil to splash to the secondary side, leading to equipment damage.
- 2 **Do not use with low air pressure (Blower).**  
Air preparation equipment, which operates at a specific minimum operating pressure in accordance with the equipment to be used, is designed to be used exclusively with compressed air. Using it below the minimum operating pressure could lower its performance or cause a malfunction. If it must be used under such conditions due to unavoidable circumstances, contact SMC beforehand.

## Mounting

### ⚠ Caution

- 1 **Confirm the mounting orientation.**  
Because the mounting orientation differs with the model, confirm it in this catalog or in the instruction manual. If the equipment is installed slanted, it could lead to improper drainage, causing the auto drain to malfunction, or damage the equipment.
- 2 **Maintenance space**  
Install and mount the equipment while providing sufficient space for maintenance and inspection. Refer to the instruction manual of the respective equipment for details on the maintenance space.

## Piping

### ⚠ Caution

- 1 **Preparation before connecting the piping**  
Use an air blower to thoroughly flush the piping or wash the piping to remove any cutting chips, cutting oil, or debris from inside the piping before connecting them.
- 2 **Wrapping the seal tape**  
When screwing in the pipes or fittings, be sure to prevent cutting chips or sealing material on the threaded portion of the pipe from entering the piping.
- 3 **Take measures to prevent drainage from accumulating in the piping.**  
Design the piping so that a drain relief is provided at the bottom of a rise pipe, or a slight taper is provided along the flow to prevent the drainage from accumulating.
- 4 **Confirmation of IN and OUT**  
When connecting the piping, be sure to avoid mistakes in connecting the water and air sides as well as the IN and the OUT sides.





## Air Preparation Equipment/Common Precautions 2

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

### Air Supply

#### Warning

- 1 **Do not operate with anything other than compressed air.**

The air preparation equipment is designed to be used exclusively with compressed air. To use fluids instead of compressed air, contact SMC beforehand.

- 2 **Do not use compressed air that contains chemicals, organic solvents, salt or corrosive gases.**  
Do not use compressed air that contains chemicals, organic solvents, salt or corrosive gases because they could damage the equipment or cause it malfunction.
- 3 **Operating pressure range**  
The fluid temperature and the ambient temperature are established according to the equipment. Using the equipment out of the specified range could cause it to be damaged, malfunction.

### Environment

#### Warning

- 1 **Do not operate in the conditions listed below due to a risk of malfunction.**  
In an environment that is exposed to corrosive gases, organic solvents, and chemical solutions. or in a location in where these elements are likely to adhere to the equipment.
- 2 **Observe the specified fluid temperature and ambient temperature ranges.**  
The fluid temperature and the ambient temperature are established according to the equipment. Using the equipment out of the specified range could cause it to be damaged, malfunction.

### Maintenance

#### Warning

- 1 **Set the pressure of the compressed air at zero before an inspection.**

Before disassembling the equipment on the compressed air side to inspect the auto drain or to replace the filter element, make sure that the pressure is set at zero.

#### Caution

- 1 **Do not place a heavy object on top or use the equipment as a step stool.**


Failure to observe this precaution could cause the equipment to become deformed or damaged, or loss of balance could cause a fall or injury.

- 2 **Discharge the drainage on a regular basis.**

If drainage remains accumulated in the equipment or in the piping, it could cause the equipment to malfunction, or the drainage could splash over to the secondary side, leading to unexpected accidents. Therefore, be sure to check the drainage volume and the operation of the auto drain on a daily basis.

# Series 10-AM Mist Separator

## How to Order



Clean series

Body size  
 150—1/8  
 250—1/4  
 350—3/8  
 450—1/2  
 550—3/4  
 650—1  
 850—1 1/2

10 - AM 250 - 03 B - J

Port size  
 01—1/8  
 02—1/4  
 03—3/8  
 04—1/2  
 06—3/4  
 10—1  
 14—1 1/2  
 20—2

Option  
 Nil—No  
 B—Bracket

With drain guide

## Model

Model	10-AM150	10-AM250	10-AM350	10-AM450	10-AM550	10-AM650	10-AM850
Air flow capacity /min (ANR)	300	750	1500	2200	3500	6000	12000
Pressure drop (MPa)	0.025	0.025	0.02	0.027	0.025	0.029	0.025
Port size	Rc1/8, 1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/8, 1/2, 3/4	Rc1/2, 3/4, 1	Rc3/4, 1	Rc1, 1 1/2	Rc1 1/2, 2

## Specifications

Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Fluid	Air
Filtration	0.3μm (95% scavenging particle diameter)
Ambient and fluid temperature	5 to 60°C
Oil mist density on secondary side	*Max. 1.0mg/m <sup>3</sup> (ANR) (≒0.8ppm)
Element life	2 years or when the pressure drop reaches 0.1 MPa

\*At compressor projection oil mist density of 30 mg/m<sup>3</sup> (ANR)

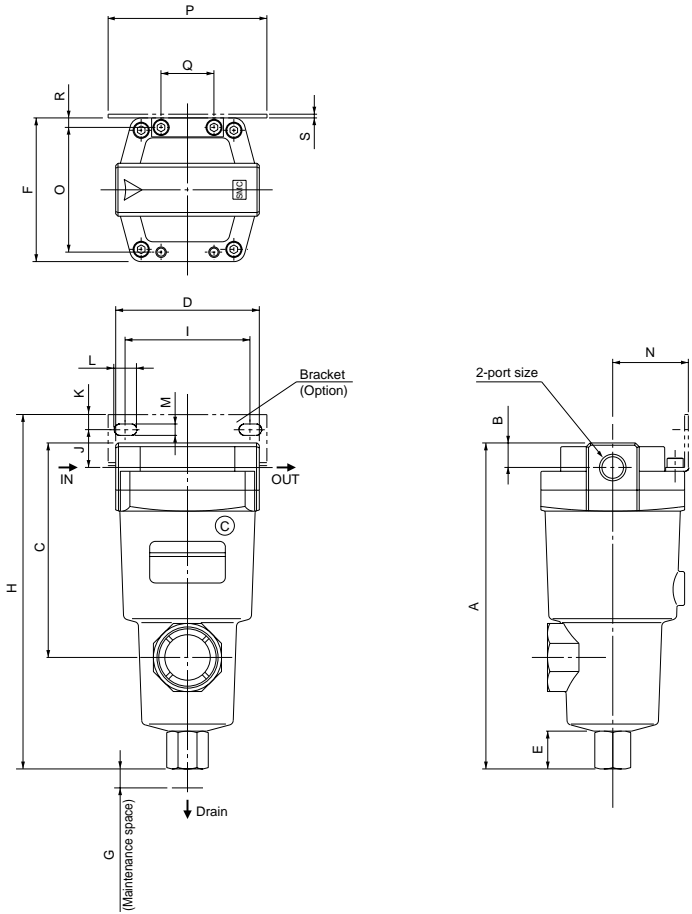
## Replacement Parts

Description	Material	Model						
		10-AM150	10-AM250	10-AM350	10-AM450	10-AM550	10-AM650	10-AM850
Element assembly	Glass fiber NBR	10-AM-EL150	10-AM-EL250	10-AM-EL350	10-AM-EL450	10-AM-EL550	10-AM-EL650	10-AM-EL850

\*Gasket, with O-ring

**Dimensions**

**10-AM150 to 650**

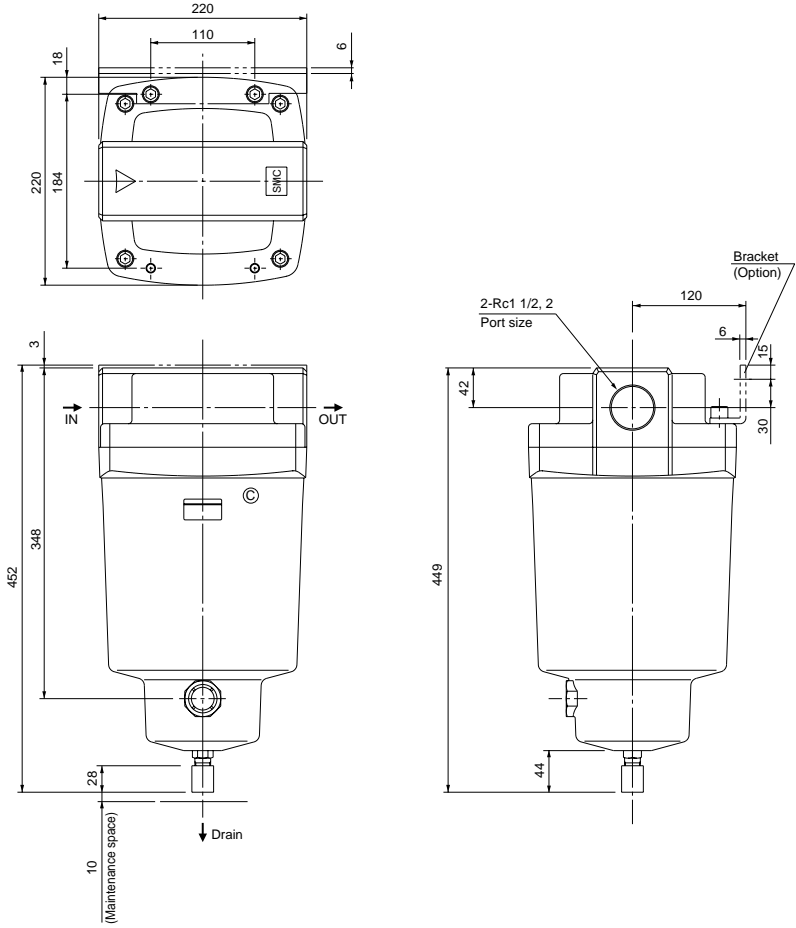


Model	Port size Rc	A	B	C	D	E	F	G	Dimensions with bracket											
									H	I	J	K	L	M	N	O	P	Q	R	S
10-AM150	1/8, 1/4, 3/8	159	13	100	63	20	63	10	166	56	15	5	9	5.5	35	54	70	26	4.5	1.6
	1/4, 3/8	172	13	113	76	20	76	10	187	66	20	8	12	6	40	66	84	28	5	2.0
10-AM250	1/2	178	16	119	76	20	76	10	187	66	17	8	12	6	40	66	84	28	5	2.0
	3/8, 1/2	204	16	145	90	20	90	10	218	80	22	8	14	7	50	80	100	34	5	2.3
10-AM350	3/4	210	19	151	90	20	90	10	218	80	19	8	14	7	50	80	100	34	5	2.3
	1/2, 3/4	225	19	166	106	20	106	10	241	90	25	10	14	9	55	88	110	50	9	3.2
10-AM450	1	232	22	173	106	20	106	10	241	90	21	10	14	9	55	88	110	50	9	3.2
	3/4, 1	259	22	200	122	20	122	10	277	100	30	10	16	9	65	102	130	60	10	4.5
10-AM650	1, 1 1/2	311	32	253	160	20	160	10	334	150	40	15	20	11	85	136	180	76	12	4.5

Air Preparation Equipment

**Dimensions**

10-AM850



## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to pages 590 and 591 for common precautions for air preparation equipment.

### Design

#### ⚠ Caution

- ① Design a layout so that the mist separator is installed in an area that is less susceptible to pulsation. The element could be damaged if the difference in internal and external pressures exceeds 0.1 MPa.
- ② Use 10-AM as a prefilter of 10-AME and 10-AMF. (The air from 10-AM outlet cannot be used in a clean room.)
- ③ The bracket provided with the product is for supporting the product body. It cannot support the piping or other connection items. If these items need to be supported, provide an additional support.

### Maintenance

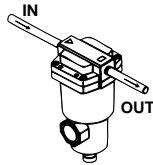
#### ⚠ Caution

- ① The element must be replaced when the pressure drop reaches 0.1 MPa or when two years have passed since the operation start, whichever is earlier.
- ② When it is time to replace the element, immediately replace it with a new one. At the same time, also replace the O-ring and gasket with new parts.
- ③ Discard the drainage before the drainage level reaches the center of the sight glass. If the drainage is not discarded properly, it will flow over to the secondary side.

### Mounting

#### ⚠ Caution

- ① Confirm the compressed air flow direction and the "▷" mark indicating the inlet of the product before piping works. It cannot be used if connected in the opposite direction.
- ② Make sure to install this product on horizontal piping. If it is installed diagonally, laterally or upside down, the drainage that is separated by the element will splash on the secondary side.
- ③ Since the drain exhaust port is designed for the drain guide specification (Symbol -J), installation of a ball valve and piping for drain exhaust will be necessary.



# Series 10-AMD Micro Mist Separator

## How to Order



Clean series

Body size

150—1/8  
250—1/4  
450—1/2  
550—3/4  
650—1  
850—1 1/2

10 - AMD 250 - 03 B - J

Port size

01—1/8  
02—1/4  
03—3/8  
04—1/2  
06—3/4  
10—1  
14—1 1/2  
20—2

Option

Nil—No  
B—Bracket

With drain guide

## Model

Model	10-AMD150	10-AMD250	10-AMD350	10-AMD450	10-AMD550	10-AMD650	10-AMD850
Air flow capacity /min (ANR)	200	500	1000	2000	3500	6000	12000
Pressure drop (MPa)	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Port size	Rc1/8,1/4,3/8	Rc1/4,3/8,1/2	Rc3/8,1/2,3/4	Rc1/2,3/4,1	Rc3/4,1	Rc1,1 1/2	Rc1 1/2,2

## Specifications

Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Fluid	Air
Filtration	0.01μm (95% scavenging particle diameter)
Ambient and fluid temperature	5 to 60°C
Oil mist density on secondary side	* Max.0.1mg/m <sup>3</sup> (ANR) (≒0.08ppm) [0.01mg/m <sup>3</sup> (ANR) or less before oil saturation (≒0.008ppm)]
Element life	2 years or when the pressure drop reaches 0.1 MPa

\*At compressor exhaust oil mist density of 30 mg/m<sup>3</sup> (ANR)

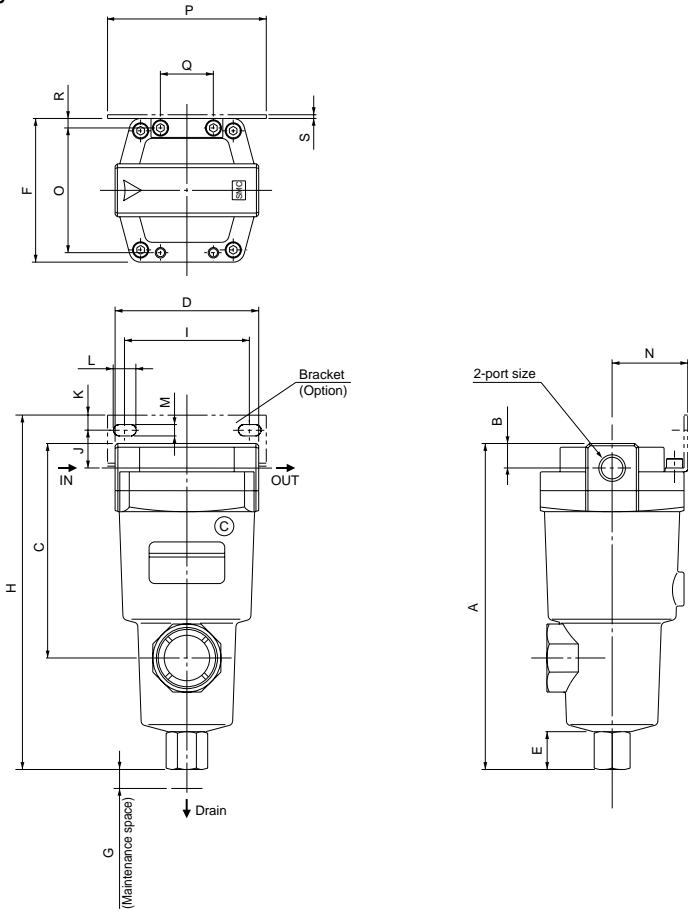
## Replacement Parts

Description	Material	Model						
		10-AMD150	10-AMD250	10-AMD350	10-AMD450	10-AMD550	10-AMD650	10-AMD850
Element assembly	Glass fiber NBR	10-AMD-EL150	10-AMD-EL250	10-AMD-EL350	10-AMD-EL450	10-AMD-EL550	10-AMD-EL650	10-AMD-EL850

\*Gasket, with O-ring

**Dimensions**

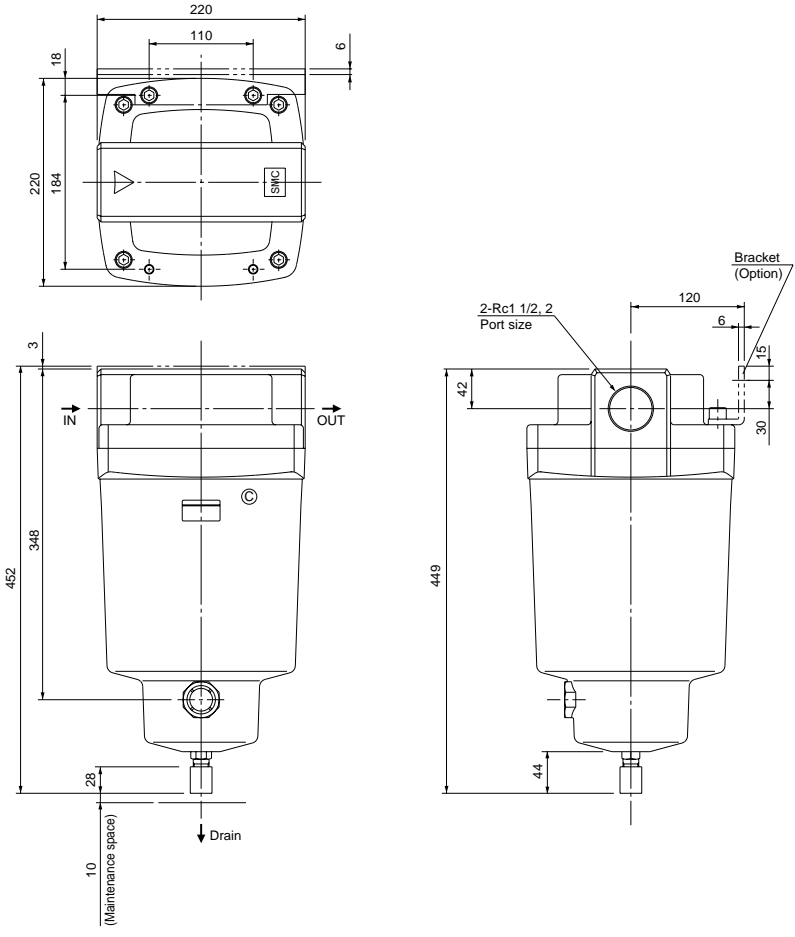
**10-AMD150 to 650**



Model	Port size Rc	A	B	C	D	E	F	G	Dimensions with bracket											
									H	I	J	K	L	M	N	O	P	Q	R	S
10-AMD150	1/8, 1/4, 3/8	159	13	100	63	20	63	10	166	56	15	5	9	5.5	35	54	70	26	4.5	1.6
10-AMD250	1/4, 3/8	172	13	113	76	20	76	10	187	66	20	8	12	6	40	66	84	28	5	2.0
	1/2	178	16	119	76	20	76	10	187	66	17	8	12	6	40	66	84	28	5	2.0
10-AMD350	3/8, 1/2	204	16	145	90	20	90	10	218	80	22	8	14	7	50	80	100	34	5	2.3
	3/4	210	19	151	90	20	90	10	218	80	19	8	14	7	50	80	100	34	5	2.3
10-AMD450	1/2, 3/4	225	19	166	106	20	106	10	241	90	25	10	14	9	55	88	110	50	9	3.2
	1	232	22	173	106	20	106	10	241	90	21	10	14	9	55	88	110	50	9	3.2
10-AMD550	3/4, 1	259	22	200	122	20	122	10	277	100	30	10	16	9	65	102	130	60	10	4.5
10-AMD650	1, 1 1/2	311	32	253	160	20	160	10	334	150	40	15	20	11	85	136	180	76	12	4.5

**Dimensions**

**10-AMD-850**





## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to pages 590 and 591 for common precautions for air preparation equipment.

### Design

#### ⚠ Caution

- ① Design a layout so that the mist separator is installed in an area that is less susceptible to pulsation. The element could be damaged if the difference in internal and external pressures exceeds 0.1 MPa.
- ② The bracket provided with the product is for supporting the product body. It cannot support the piping or other connection items. If these items need to be supported, provide an additional support.

### Maintenance

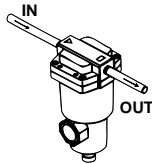
#### ⚠ Caution

- ① The element must be replaced when the pressure drop reaches 0.1 MPa or when two years have passed since the operation start, whichever is earlier.
- ② When it is time to replace the element, immediately replace it with a new one. At the same time, also replace the O-ring and gasket with new parts.
- ③ Discard the drainage before the drainage level reaches the center of the sight glass. If the drainage is not discarded properly, it will flow over to the secondary side.

### Mounting

#### ⚠ Caution

- ① Confirm the compressed air flow direction and the "▷" mark indicating the inlet of the product before piping works. It cannot be used if connected in the opposite direction.
- ② Make sure to install this product on horizontal piping. If it is installed diagonally, laterally or upside down, the drainage that is separated by the element will splash on the secondary side.
- ③ Since the drain exhaust port is designed for the drain guide specification (Symbol -J), installation of a ball valve and piping for drain exhaust will be necessary.



# Series 10-AME Super Mist Separator

## How to Order

Clean series

Body size

150—1/8  
250—1/4  
350—3/8  
450—1/2  
550—3/4  
650—1  
850—1 1/2



10 - AME 250 - 03 B

Port size

01—1/8  
02—1/4  
03—3/8  
04—1/2  
06—3/4  
10—1  
14—1 1/2  
20—2

Option

Nil—No  
B—Bracket

## Model

Model	10-AME150	10-AME250	10-AME350	10-AME450	10-AME550	10-AME650	10-AME850
Air flow capacity /min (ANR)	200	500	1000	2000	3500	6000	12000
Pressure drop (MPa)	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Port size	Rc1/8, 1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/8, 1/2, 3/4	Rc1/2, 3/4, 1	Rc3/4, 1	Rc1, 1 1/2	Rc1 1/2, 2

## Specifications

Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Fluid	Air
Secondary side cleanliness	3.5 or less particles of 0.3μm diameter/(ANR) (100 particles/ft <sup>3</sup> or less)
Ambient and fluid temperature	5 to 60°C
Element life	Element color indication (•When red spots appear on the element surface •2 years or when the pressure drop reaches 0.1 MPa)

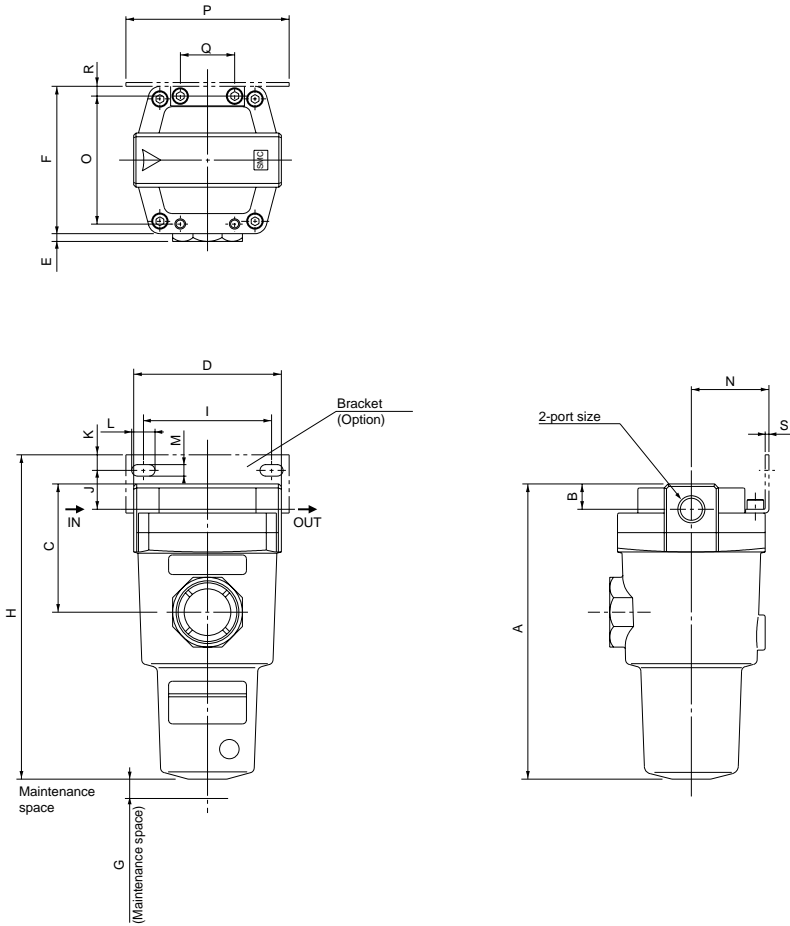
## Replacement Parts

Description	Material	Model						
		10-AME150	10-AME250	10-AME350	10-AME450	10-AME550	10-AME650	10-AME850
Element assembly	Glass fiber NBR	10-AME-EL150	10-AME-EL250	10-AME-EL350	10-AME-EL450	10-AME-EL550	10-AME-EL650	10-AME-EL850

\*Gasket, with O-ring

**Dimensions**

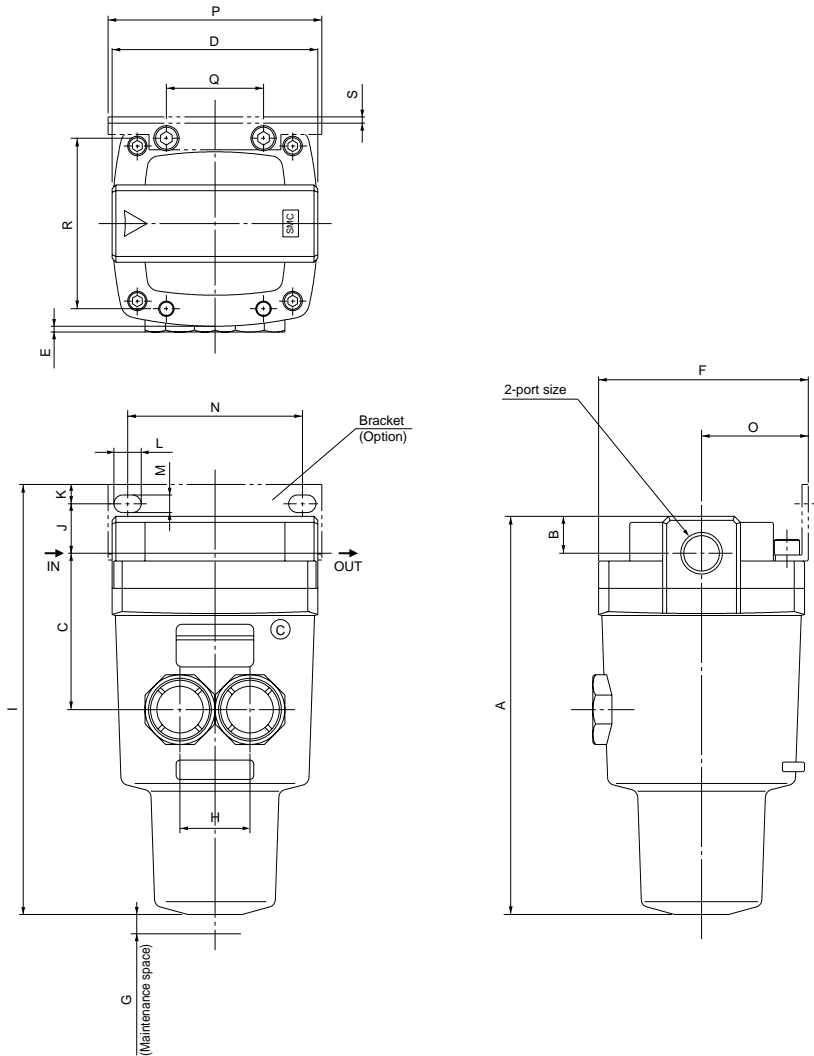
**10-AME150 to 350**



Model	Port size Rc	A	B	C	D	E	F	G	Dimensions with bracket											
									H	I	J	K	L	M	N	O	P	Q	R	S
<b>10-AME150</b>	1/8,1/4,3/8	139	13	55	63	7.5	63	10	146	56	15	5	9	5.5	35	54	70	26	4.5	1.6
<b>10-AME250</b>	1/4,3/8	152	13	66	76	4	76	10	167	66	20	8	12	6	40	66	84	28	5	2.0
	1/2	158	16	72	76	4	76	10	167	66	17	8	12	6	40	66	84	28	5	2.0
<b>10-AME350</b>	3/8,1/2	184	16	92	90	5	90	10	198	80	22	8	14	7	50	80	100	34	5	2.3
	3/4	190	19	98	90	5	90	10	198	80	19	8	14	7	50	80	100	34	5	2.3

**Dimensions**

**10-AME450 to 850**



Model	Port size Rc	Dimensions with bracket																		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
10-AME450	1/2,3/4	205	19	100	106	3	106	10	36	221	25	10	14	9	90	55	110	50	88	3.2
	1	212	22	107	106	3	106	10	36	221	21	10	14	9	90	55	110	50	88	3.2
10-AME550	3/4,1	239	22	128	122	3	122	10	44	257	30	10	16	9	100	65	130	60	102	4.5
10-AME650	1,1 1/2	291	32	167	160	—	160	10	66	314	40	15	20	11	150	85	180	76	136	4.5
10-AME850	1 1/2,2	403	42	235	220	—	220	10	96	406	30	15	24	13	180	120	220	110	184	6

## ⚠ Specific Product Precautions

**Be sure to read before handling.**

**Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to pages 590 and 591 for common precautions for air preparation equipment.**

### Design

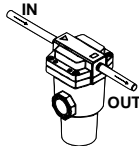
#### ⚠ Caution

- ① Do not use this product in a line where there is a high frequency of pressure pulsation cycles. If it must be used under such conditions owing to unavoidable circumstances, Contact SMC beforehand.
- ② The product is exclusively designed to be used with dry air. If it is used with air containing moisture, a flow of drainage will hinder the color change indicator function.
- ③ Be sure to install a micro mist separator (Series AMD), a micro mist separator with a prefilter (Series AMH) or a super mist separator (Series AME) on the primary side.
- ④ The bracket provided with the product is for supporting the product body. It cannot support the piping or other connection items. If these items need to be supported, provide an additional support.
- ⑤ Please see Front Matters P. 8 • 9 for the clean-up system of air source used inside the clean room.

### Mounting

#### ⚠ Caution

- ① Confirm the compressed air flow direction and the "▷" mark indicating the inlet of the product before piping works. It cannot be used if connected in the opposite direction.
- ② Make sure to install this product on horizontal piping. If it is installed diagonally, laterally or upside down, the indicator will not operate normally.



### Maintenance

#### ⚠ Caution

- ① Red spots appear on the surface of the element when it has reached the replacement stage. Immediately replace it with a new one. At the same time, also replace the O-ring and gasket with new parts.  
The element is visible through the glass window on the front of the body. Be sure to inspect it at least once a day. Pay special attention when it is around the time to replace the element. Installation of a check filter is recommended to ensure observation of red spots on the element surface. (Example: Add another piece of AME and install the 2 pieces in series.)
- ② The element must be replaced, even if no red spot is observed on the surface, when the pressure drop reaches 0.1 MPa or when two years have passed since the operation start, whichever is earlier.
- ③ If the element continues to be used past its replacement stage, the element could be damaged. If the element continues to be used after red spots have appeared on its surface, the red-dyed oil mist will splash over to the secondary side, leading to unexpected accidents.

# Series 10-AMF Odor Removal Filter

## How to Order



Clean series

Body size  
 150 — 1/8  
 250 — 1/4  
 350 — 3/8  
 450 — 1/2  
 550 — 3/4  
 650 — 1  
 850 — 1 1/2

10 - AMF 250 - 03 B

Port size  
 01—1/8  
 02—1/4  
 03—3/8  
 04—1/2  
 06—3/4  
 10—1  
 14—1 1/2  
 20—2

Option  
 Nil—No  
 B—Bracket

## Model

Model	10-AMF150	10-AMF250	10-AMF350	10-AMF450	10-AMF550	10-AMF650	10-AMF850
Air flow capacity /min (ANR)	200	500	1000	2000	3500	6000	12000
Pressure drop MPa	0.008	0.01	0.01	0.014	0.01	0.01	0.01
Port size	Rc1/8, 1/4, 3/8	Rc1/4, 3/8, 1/2	Rc3/8, 1/2, 3/4	Rc1/2, 3/4, 1	Rc3/4, 1	Rc1, 1 1/2	Rc1 1/2, 2

## Specifications

Max. operating pressure	1.0MPa
Min. operating pressure	0.05MPa
Fluid	Air
Oil mist density on secondary side	3.5 or less particles of 0.3μm diameter/(ANR)
Ambient and fluid temperature	5 to 60°C

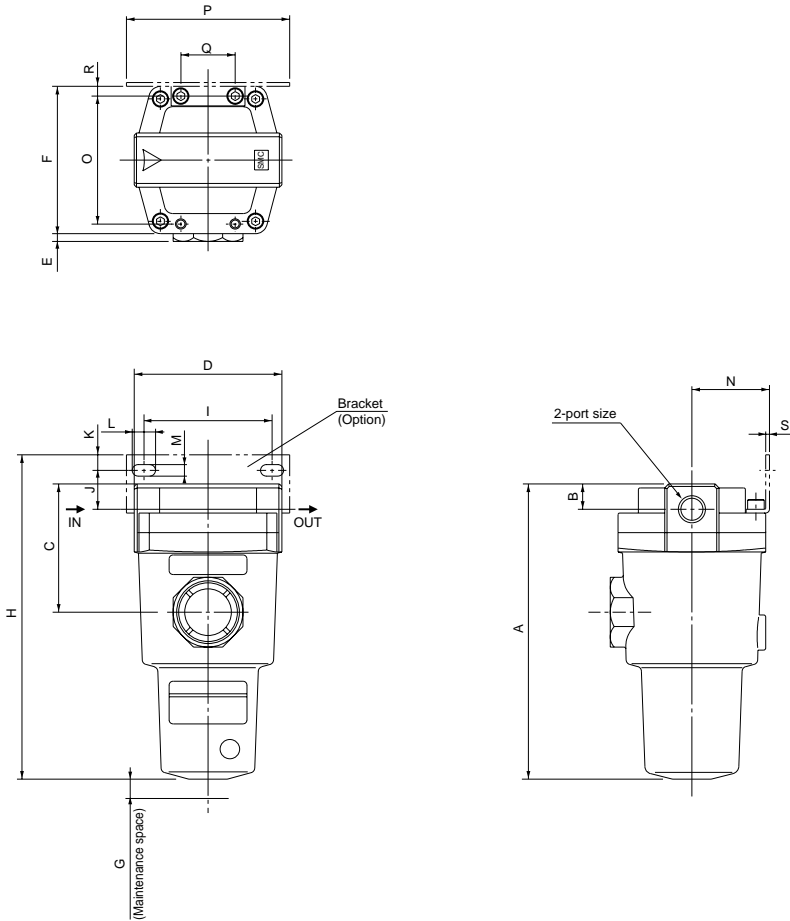
## Replacement Parts

Description	Material	Model						
		10-AMF150	10-AMF250	10-AMF350	10-AMF450	10-AMF550	10-AMF650	10-AMF850
Element assembly	Glass fiber NBR	10-AMF-EL150	10-AMF-EL250	10-AMF-EL350	10-AMF-EL450	10-AMF-EL550	10-AMF-EL650	10-AMF-EL850

\* Gasket, with O-ring

**Dimensions**

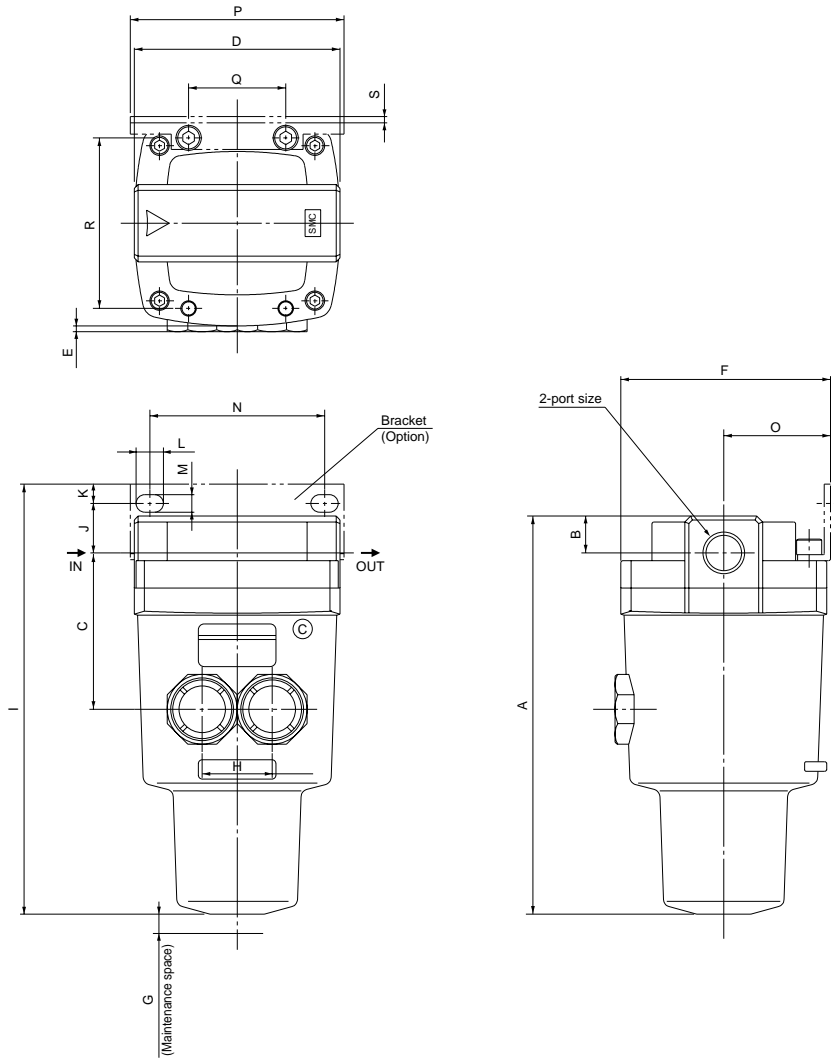
**10-AMF150 to 350**



Model	Port size Rc	A	B	C	D	E	F	G	Dimension with bracket												
									H	I	J	K	L	M	N	O	P	Q	R	S	
10-AMF150	1/8, 1/4, 3/8	139	13	55	63	7.5	63	10	146	56	15	5	9	5.5	35	54	70	26	4.5	1.6	
	1/4, 3/8	152	13	66	76	4	76	10	167	66	20	8	12	6	40	66	84	28	5	2.0	
10-AMF250	1/2	158	16	72	76	4	76	10	167	66	17	8	12	6	40	66	84	28	5	2.0	
	3/8, 1/2	184	16	92	90	5	90	10	198	80	22	8	14	7	50	80	100	34	5	2.3	
10-AMF350	3/4	190	19	98	90	5	90	10	198	80	19	8	14	7	50	80	100	34	5	2.3	

**Dimensions**

**10-AMF450 to 850**



Model	Port size Rc	A	B	C	D	E	F	G	H	Dimensions with bracket										
										I	J	K	L	M	N	O	P	Q	R	S
10-AMF450	1/2,3/4	205	19	100	106	3	106	10	36	221	25	10	14	9	90	55	110	50	88	3.2
	1	212	22	107	106	3	106	10	36	221	21	10	14	9	90	55	110	50	88	3.2
10-AMF550	3/4,1	239	22	128	122	3	122	10	44	257	30	10	16	9	100	65	130	60	102	4.5
10-AMF650	1,1 1/2	291	32	167	160	—	160	10	66	314	40	15	20	11	150	85	180	76	136	4.5
10-AMF850	1 1/2,2	403	42	235	220	—	220	10	96	406	30	15	24	13	180	120	220	110	184	6



## ⚠ Specific Product Precautions

**Be sure to read before handling.**

**Refer to pages 7 to 16 of Front matter for safety instructions and common precautions with clean series. Refer to pages 590 and 591 for common precautions for air preparation equipment.**

### Design

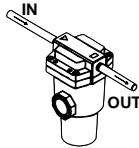
#### ⚠ Caution

- ① Design a layout so that the mist separator is installed in an area that is less susceptible to pulsation. The element could be damaged if the difference in internal and external pressures exceeds 0.1 MPa.
- ② Do not use the product with anything other than dry air (Such as air containing moisture).
- ③ Be sure to install a micro mist separator (Series AMD), a micro mist separator with a prefilter (Series AMH) or a super mist separator (Series AME) on the primary side.
- ④ The bracket provided with the product is for supporting the product body. It cannot support the piping or other connection items. If these items need to be supported, provide an additional support.
- ⑤ Please see Front Matters P. 8 - 9 for the clean-up system of air source used inside the clean room.

### Mounting

#### ⚠ Caution

- ① Confirm the compressed air flow direction and the ">" mark indicating the inlet of the product before piping works. It cannot be used if connected in the opposite direction.



- ② Make sure to install this product on horizontal piping.

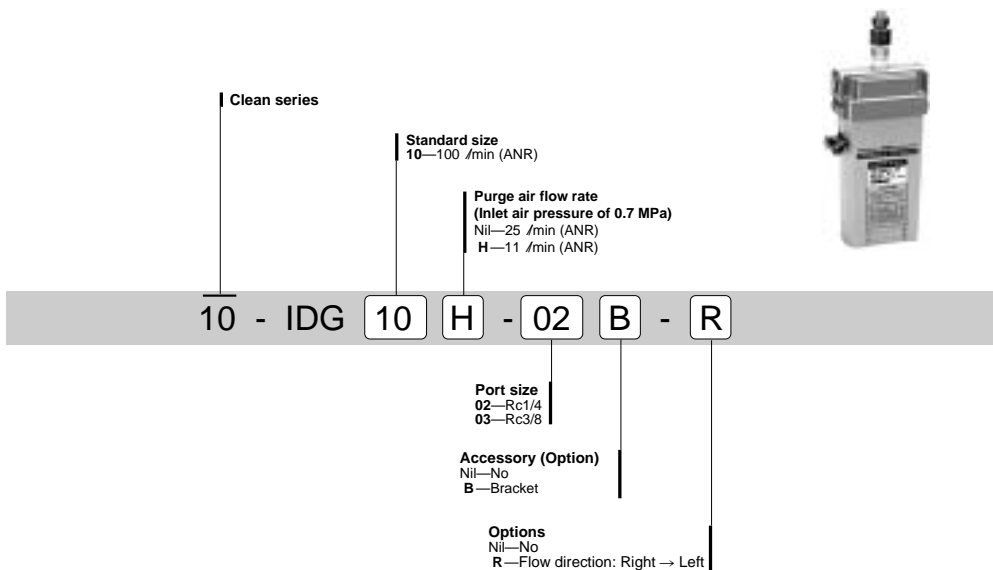
### Maintenance

#### ⚠ Caution

- ① The replacement time of element cannot be provided explicitly because it depends on the odor density of compressed air. Confirm the effective period of deodorization and replace the element periodically thereafter.
- ② When using the odor removal filter for the first time, confirm the effective deodorization time. Thereafter, replace the element on a regular basis.
  - 1) Record the date on which the odor removal filter is put into operation.
  - 2) Calculate the total length of time that has elapsed from the time it was put into operation until it has started to emit oil odor.
  - 3) Use the time obtained in (2) as the guideline of deodorization performance retention period. If there is any change in the operating conditions, please reconfirm the deodorization performance retention period.
- ③ The element must be replaced when the pressure drop reaches 0.1 MPa or when two years have passed since the operation start, whichever is earlier.
- ④ When it is time to replace the element, immediately replace it with a new one. When replacing the element, also replace the O-ring and the gasket with new parts.

# Series 10-IDG Hollow Fiber Membrane Air Dryer

## How to Order

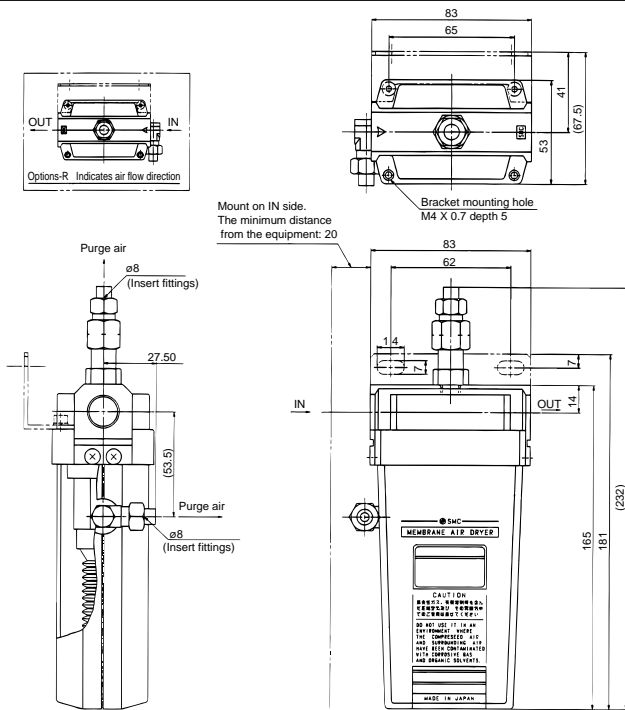


## Specifications

<b>Max. operating pressure</b>	0.85MPa
<b>Min. operating pressure</b>	0.15MPa
<b>Ambient and fluid temperature</b>	-5 to 55°C (No freezing)
<b>Outlet air flow rate</b>	20 to 120 /min (ANR)*
<b>Outlet air atmospheric pressure dew point</b>	-20°C (10-IDG10), -15°C (10-IDG10H)**
<b>Purge air flow of dew point indicator</b>	1 /min (ANR) [Inlet air pressure 0.7MPa]
<b>Purge air exhaust port</b>	With insert fittings (Tubing O.D.ø8)
<b>Port size</b>	Rc1/4, 3/8

\*ANR indicates a flow rate converted into values in an atmospheric pressure at 20°C.

\*\*Conditions: Inlet air pressure 0.7MPa  
Inlet air temperature 25°C  
Ambient temperature 25°C  
Inlet air flow rate 125 /min (ANR) (10-IDG10), 111 /min (ANR) (10-IDG10H)  
Outlet air flow rate 100 /min (ANR)  
Purge air flow rate 25 /min (ANR) (10-IDG10), 11 /min (ANR) (10-IDG10H) (including purge air flow of dew point indicator)

**Dimensions**

**! Specific Product Precautions**

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to pages 590 and 591 for common precautions for air preparation equipment.

**Operating Conditions**
**! Caution**

- ① Be sure to use the product within the specified ranges.
- ② Read the instruction manual included with the product thoroughly before actually using the product.
- ③ Avoid use of corrosive gases and compressed air containing organic solvents or use of the product in an environment where such substances are present.

**Mounting**
**! Caution**

- ① The mounting orientation is free.
- ② Be sure to install a mist separator and micro mist separator at the inlet of the membrane air dryer. Any oil mist or water drops contained in the inlet air will lower the performance.
- ③ When a drain piping is connected to the mist separator or micro mist separator installed at the inlet of the membrane air dryer, use a tube with an O.D. of 10 mm (With I.D. of 6.5 or more) and a length of 5 m or less. Do not fold the tube or bend it in the upward direction.
- ④ Do not obstruct the purge air discharge outlet.
- ⑤ Install a regulator on the secondary side of the membrane dryer.
- ⑥ Use a tube with an O.D. of 8mm (An I.D. at least 5mm) and a length not exceeding 10m.

**Maintenance**
**! Caution**

- ① Set the pressure of the compressed air at zero before maintenance or inspection.
- ② Verify whether the membrane air dryer is functioning normally by observing the color of the dew point indicator.  
[When the color of the dew point indicator is blue: The equipment is functioning normally.]  
[When the color of the dew point indicator is pink: The dew point temperature is high.] (Outlet air flow is humid.) (Note) The atmospheric pressure dew point is  $-10^{\circ}\text{C}$  or higher.  
It takes approximately 1 hour after air is introduced for the color or the dew point indicator to change.
- ③ If the color of the dew point indicator is brown, it indicates a large amount of oil contamination in the membrane air dryer. In such a case, replace the dew point indicator and the membrane module. If the particles inside the dew point indicator have been crushed, replace the dew point indicator.
- ④ Confirm that the drainage accumulated between the mist separator and micro mist separator installed on the inlet side of the membrane air dryer is properly exhausted.
- ⑤ Replace the elements of the mist separator or the micro mist separator installed on the inlet side of the membrane air dryer approximately 2 years after they are put to use. Even within this period, they must be replaced if the unit's pressure drop reaches 0.2 MPa.
- ⑥ For the purpose of maintenance and inspection, install a pressure gauge at the inlet and outlet sides of the membrane air dryer (Combination unit).

# Series AMP Exhaust Cleaner for Clean Room

## How to Order

AMP **2** **2** 0 — **03** — —

**Body size**

2	1/4 basic
3	3/8 basic
4	1/2 basic

**Element construction**

2	2 stage
---	---------

**Thread type**

Nil	Rc
N	NPT
F	G

**Options**

Nil	—
R	Flow direction: Right → Bottom
T	With element service indicator


**Accessory (Option)**

Nil	—
B	With bracket

Note) Bracket is not installed.

**Port size**

Symbol	Port size	Body size		
		2	3	4
02	1/4	●	—	—
03	3/8	●	●	—
04	1/2	—	●	●
06	3/4	—	—	●



## Model

Model	AMP220	AMP320	AMP420
Maximum flow capacity /min (ANR)	200	500	1000
Port size Rc	1/4, 3/8	3/8, 1/2	1/2, 3/4
Weight kg	0.43	0.68	1.15

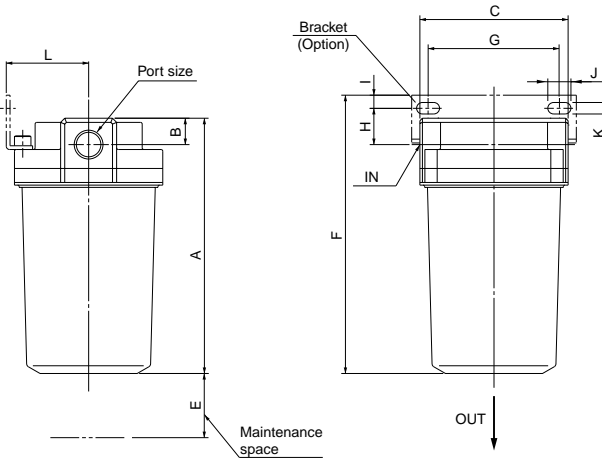
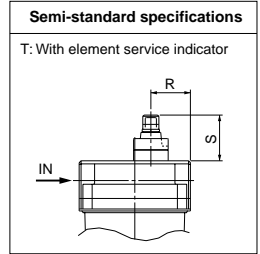
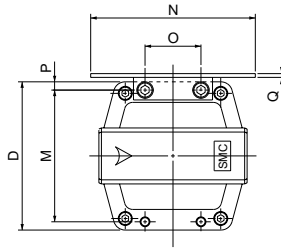
## Specifications

Fluid	Compressed air
Element primary side pressure	0.1MPa or less
Ambient and fluid temperature	5 to 50°C
Filtration	0.01μm (95% scavenging particle diameter)
Downstream cleanliness	3.5 or less particles of 0.3μm diameter/(ANR) (100 particles/ft <sup>3</sup> or less)
Element life	One year after the first operation (or when the primary pressure reaches 0.2MPa even within 1 year from the first operation).
Element life indication (At the time of oil saturation)	Element color indication (Replace if red spots appear on the element surface, even within 1 year from first use.)
Element construction	2 stage element
Noise reduction	40dB (A) or more

## Accessory (Option)

Applicable model	AMP220	AMP320	AMP420
Bracket assembly (With spring washer) (With cap bolt)	BM66	BM67	BM68

**Dimensions**



(mm)

Model	Port size Rc	A	B	C	D	E	Dimensions with bracket													Element service indicator dimensions	
							F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
<b>AMP220</b>	1/4,3/8	108	13	76	76	80	123	66	20	8	12	6	40	66	84	28	5	2	26	37	
<b>AMP320</b>	3/8,1/2	155	16	90	90	120	169	80	22	8	14	7	50	80	100	34	5	2.3	32	37	
<b>AMP420</b>	1/2,3/4	221	19	106	106	180	237	90	25	10	14	9	55	88	110	50	9	3.2	37	37	

Air Preparation Equipment



# Series AMP Model Selection Method

## Selection

### ⚠ Caution

1. The selection method for an exhaust cleaner may differ between exhaust air from driving system such as actuator and that from the ejector. Please refer to the procedures described below.

Take note that an exhaust flow rate exceeding the specification of the model selected can cause a decline in exhaust air cleanliness, reduced performance of drive equipment and ejectors, etc., and damage to the element.

#### 2. Exhaust from drive systems

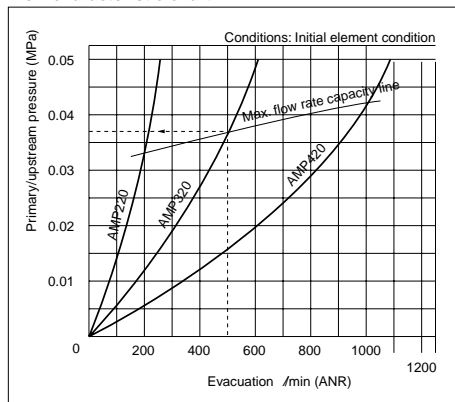
- ① Find the air flow required for the actuator to be used. When operating with common piping, total the required air flows for all actuators that will be operated simultaneously to find the maximum air flow.

- ② Select a model of which the maximum amount of required air will not exceed the maximum flow curve.

#### 3. Exhaust from ejector

- ① If the performance of the equipment is influenced by back pressure applied to the exhaust air, as in case of an ejector, please confirm the range of back pressure that will not cause effect to the equipment.
- ② In case of ejectors, the exhaust flow rate is the total of the maximum suction flow rate and the air consumption. Since the exhaust flow rate calculation method differs among equipment, confirm it in the catalog or instruction manual of the equipment to be used.
- ③ When operating with common piping, total the exhaust flow rates for all equipment that will be exhausted simultaneously to find the maximum exhaust flow rate.
- ④ Calculate the primary pressure from the flow characteristic diagram using the maximum exhaust flow rate obtained in ③ as the exhaust flow rate.

### Flow characteristic chart



Viewing the graph: Values when using AMP320 at a flow rate of 500 /min, the upstream pressure is 0.037 MPa.

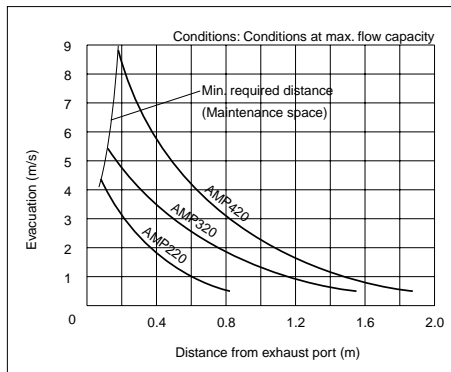
### ⚠ Caution

4. Exhaust flow speed characteristics are shown in graph 2.

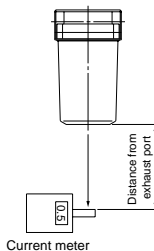
① When operating, consider the effects of turbulence of dust, etc., that has accumulated on the floor or other areas.

② If there is concern about turbulence of dust, install the equipment in a location where it is free from dust.

### Evacuation



### <Measurement method>



## ⚠ Specific Product Precautions

**Be sure to read before handling.**

**Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to pages 590 and 591 for common precautions for air preparation equipment.**

### Mounting

#### ⚠ Caution

- ① Air piping must be thoroughly flushed or cleaned before mounting.
- ② When screwing in the pipes or fittings, be sure to prevent cutting chips or sealing material on the threaded portion of the pipe from entering the piping.  
When a seal tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.
- ③ Mount the unit vertically. Holding the resin housing while screwing in the piping will damage the housing. Hold the die-cast aluminum body instead with a wrench (or some other tool) to screw in the piping.
- ④ In cases such as common piping, a reverse flow may occur due to switching of a solenoid valve, etc. In this situation, install a check valve on the upstream side.
- ⑤ Provide sufficient space required for maintenance and inspection. (Confirm the dimensions on the drawing on page 635.)

### Environment

#### ⚠ Warning

- ① Do not use in an atmosphere or space which can damage the case or clogging checker (Semi-standard specifications: T).
- ② Because the case material is nylon, avoid use of chemicals such as alcohol, thinner, carbon tetrachloride, chloroform, aniline, cyclohexane, trichloroethylene, sulfuric acid, lactic acid, water soluble cutting lubricant (Alkaline) or use in an atmosphere.  
Use a neutral detergent to clean the housing.
- ③ Do not use in an environment where static electric charge may cause a problem.
- ④ Block off heat radiation from a heat source in the proximity. If a heat source is located nearby, the temperature of the product may rise to exceed the operating temperature range due to heat radiation. Block off the heat source with a cover.

### Supply Air

#### ⚠ Caution

- ① The product cannot be used with air containing moisture.
- ② Install a mist separator (Series AM), micro mist separator (Series AMD) or micro mist separator with pre-filter (Series AMH) on the air supply side.
- ③ When using and ejector, do not suction liquid such as water and oil with air.

### Maintenance

#### ⚠ Caution

- ① Replace the element after one year of use, or when the upstream pressure reaches 0.1 MPa even if one year has not elapsed. Note) If operation is continued without replacing the element, the cleanliness of the exhaust air will decline. When replacing the element, also install a new O-ring. (When equipped with an element service indicator (semi-standard specification: T), the condition of the element can be easily confirmed.)
- ② When oil saturates, red dots appear on the surface of the first element. Check it once a day and replace it immediately with a new element when red dots appear. If operation is continued after red dots have appeared, the second element will also be saturated with oil, and oil mist imbued with red dye will be mixed with the exhaust air, contaminating the surrounding air.

Note) The upstream pressure here indicates the pressure which arises on the upstream side of the element when air of a certain flow rate flows through the exhaust cleaner. The relation between the upstream pressure and the air flow rate can be confirmed in the flow characteristics graph on page 5 of Overview.

### Operation in a Clean Room

#### ⚠ Caution

- ① Open the inside bag of a double sealed package in a clean room or clean atmosphere.
- ② Mount the product in a down flow area with its exhaust port facing downward.
- ③ Avoid mounting in locations where exhaust air will blow directly against the work pieces.
- ④ Confirm the exhaust flow speed and consider the effect of turbulence of dust, etc., in a clean room.





# Clean Series Pressure Switch

**10-  
PSE**

High Precision Remote Type  
Digital Pressure Switch  
**P.618**

**10-  
ZSE40(F)  
ISE40**

High Precision  
Digital Pressure Switch  
**P.626**

**10-  
ZSE5B  
ISE5B**

Digital Pressure Switch  
With Backlight  
**P.632**

**10-  
ZSE6B  
ISE6B**

Digital Pressure Switch  
With Backlight  
**P.636**

Pressure Switch



# Pressure Switch/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Design and Selection

### Warning

- Operate the switch only within the specified supply voltage limits.**  
Use of the switch outside the range of the specified voltage can cause not only malfunction and damage to the switch but also electric shocks and fire.
- Never use a load exceeding the maximum load capacity.**  
A load exceeding the max. load specification can lead to immediate damage to the switch or shorten its operating life span considerably.
- Do not use a load that generates surge voltage.**  
Although the output circuit of the switch is provided with surge protection, repeated application of surge voltages can damage the switch.  
When directly driving a surge generating load such as a relay or solenoid valve, use a switch with build-in surge absorbing elements.
- The variety of compatible fluids differ among products. Be sure to verify the process medium.**  
The switch does not have an explosion proof construction. Do not use flammable gas or fluid to prevent possible fire hazard. It may cause disaster of fires.
- Be sure to observe the set pressure range and the maximum operating pressure.**  
Operation under pressure out of the specified range can cause malfunction.  
The switch may be damaged if it is subjected to higher pressures than its design parameters.

## Mounting

### Warning

- If air leakage is present or increasing or the equipment is not operating properly, do not continue to use the equipment.**  
Verify proper installation after air and power are connected. The switch should be checked for proper operation and possible air leaks after the initial installation, repair or reform.
- Mount switches using the proper tightening torque.**  
When a switch is tightened beyond the specified tightening torque range, the mounting screws, mounting brackets or switch may be damaged.  
Insufficient tightening may allow the connecting thread portion to come loose.  
Connecting thread: M5, Rc, NPT, NPTF

Thread	Appropriate tightening torque Nm
M5	1/6 turn after manual tightening
1/8	7 to 9
1/4	12 to 14
3/8	22 to 24

- Apply a wrench to the metal flats of the main housing integrated with piping when installing the pressure switch onto the system piping.**  
Never apply a wrench to the resin part of the main housing of the switch. It may cause the switch to be damaged.

## Wiring

### Warning

- Verify the color and terminal number when wiring.**  
Incorrect wiring can cause the switch to be damaged or malfunction. Verify the colors and terminal numbers in the operation manual when wiring.
- Do not apply repeated bending stress or stretching force to the lead wire.**  
Disconnection may result from wiring that applies repeated bending stress or stretching force to lead wires. Replace any lead wire that is damaged and can possibly cause malfunction.
- Confirm proper insulation of wiring.**  
Make sure that there is no faulty wiring insulation (Contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may be caused due to excess current flow into the switch.

## Environment

### Warning

- Never use in an atmosphere with explosive gases.**  
The switch does not have an explosion proof construction. Never use the switch in an environment with explosive gases as it may lead to disaster of explosion.

## Maintenance

### Warning

- Verify proper operation of the switch on a regular basis.**  
Unexpected malfunctions or a mistake in operation can cause possible danger.
- Be careful when using the equipment in an interlock circuit.**  
When using the equipment in an interlock circuit, make the circuit multiplex to be prepared for failure as well as conduct periodical inspection to confirm normal operation.



# Pressure Switch (Solid State Type)/Common Precautions 1

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series. Refer to the main text for precautions for each series.

## Selection

### ⚠ Warning

#### ① Watch for internal voltage drops of the switch.

When the switch is used below the specified voltage, the load sometimes may not operate even if the pressure switch operates normally. Confirm the operating voltage of the load and adjust it to satisfy the equation below.

$$\text{Power voltage} - \text{Internal drop voltage} > \text{Load operating voltage}$$

### ⚠ Caution

#### ① Data on the digital pressure switch will be stored even after the power is turned off.

Input data (set pressure, etc.) will be stored on the EEPROM and will not disappear even after the digital pressure switch is turned off (100,000 hours after the power is off).

## Mounting

### ⚠ Warning

#### ① Do not drop or bump.

Do not drop, bump or apply excessive impacts (100m/s<sup>2</sup>) while handling. Although the body of the switch may not be damaged, the internal parts could be damaged and cause a problem.

#### ② Hold the body of the switch when handling.

The tensile strength of the connection from cable to switch is 49N. If the applied force exceeds this specification, the switch will be damaged.

#### ③ Key button operation

Refer to the operation manual on how to calibrate the switch using the push buttons.

#### ④ Do not touch the LCD.

Do not touch the LCD of an LCD type pressure switch in operation because it may cause the display to be changed by static pressure.

#### ⑤ Pressure port

Do not insert a wire or a similar item into the pressure port. It may damage the pressure sensor and cause it malfunction.

## Wiring

### ⚠ Warning

#### ① Do not wire with power lines or high voltage lines.

Wire separately from power lines and high voltage lines because noise can cause malfunction of the control circuit including the switch.

#### ② Do not allow short circuits of loads.

A digital pressure switch displays an overcurrent error when the load is short-circuited. This function, however, cannot protect the circuit from every incorrect wiring. Therefore take special precautions in wiring.  
Other pressure switches will be instantly damaged if the load is short-circuited. Especially, be careful not to mistake the power supply cord (Brown) for the power output cord (Black).

## Piping

### ⚠ Caution

#### ① Piping of hoses

In a panel application, the switch may receive excessive stress on the body from piping like hoses, etc. Avoid excessive force by following proper installation procedures.

## Pressure Source

### ⚠ Warning

#### ① Stay within the specified range of fluid and ambient temperature.

The ambient and fluid temperature range is 0 to 50°C for digital pressure switches and 0 to 60°C for other types of pressure switches. If the temperature is 5°C or below, take measures against freezing because the water in the circuit may freeze to cause malfunction. Installation of an air dryer is recommended to remove drain and moisture. Do not use the switch in an environment with sudden temperature changes even if the ambient temperature range complies with the specifications.

#### ② Vacuum switch

An instant positive pressure pulse of up to 0.5 MPa will not affect the performance of the switch (At the time of vacuum destruction). However, avoid a continuous positive pressure of 0.2 MPa or above since it will cause damage to the switch.

## Operating Environment

### ⚠ Warning

#### ① Do not use in an area where there are surge or static electricity sources.

Installation of the switch in an area with surge voltage generating equipment, such as electromagnetic lifters, high frequency furnaces, motors or equipment that generates static electricity, etc., can cause immediate damage to the switch internal circuit elements or cause the switch to malfunction after a period of time. Apply surge protection measures as well as anti-static measures to the source of the surge and keep the lines apart from each other.

#### ② Operating environment

Avoid using the standard digital pressure switches in an environment with water or oil splashes because they are not protected against external substances. Use of dustproof and dripproof types are recommended in such an environment.

## Maintenance

### ⚠ Caution


#### ① Cleaning the body

Wipe off dirt with soft cloth. In case of heavy dirt, soak the cloth in neutral detergent diluted with water, wring the water out, wipe off the dirt with the cloth and finish with dry cloth.

# Series 10-PSE High Precision Remote Type Digital Pressure Switch

## Pressure Sensor for General Pneumatic Applications

### How to Order



Clean series

Pressure specifications  
**0**—High pressure (0 to 1MPa)  
**1**—Vacuum (-101 to 0kPa)  
**2**—Low pressure (0 to 100kPa)

10 - PSE 51 0 - 01

Piping specifications  
**R06**—ø6 plug-in reducer  
**M5**—M5 X 0.8  
**01**—R1/8,M5 X 0.8  
**T01**—NPTF1/8,M5 X 0.8

### Sensor Specifications/General Pneumatic Applications

Model	10-PSE510-□	10-PSE511-□	10-PSE512-□
Operating pressure range	0 to 1MPa	-101 to 0kPa	0 to 100kPa
Max. operating pressure	1MPa	200kPa	
Fluid	Air, Non-corrosive gas		
Output specifications	Analog output (1 to 5V Load impedance;10kΩ or more)		
Power supply voltage	2 to 24VDC (Ripple10% or less)		
Current consumption	10mA or less		
Operating temperature range	0 to 50°C (With no condensation)		
Temperature characteristics (25°C standard)	25±10°C	±1%F.S. or less	
	0 to 50°C	±1.5%F.S. or less	
Repeatability	±0.3%F.S. or less		
Withstand voltage	Between external terminals and case 1000VAC 50/60Hz 1 minute		
Insulation resistance	Between external terminals and case 2MΩ(Measured with a 500 VDC megameter)		
Vibration resistance	1.5 mm amplitude in 10 to 500 Hz or acceleration of 98 m/s <sup>2</sup> , whichever is smaller for 2 h in X, Y, Z direction each		
Shock resistance	980 m/s <sup>2</sup> in X, Y, Z directions, 3 times each		
Enclosure	IP40		

### Process Connection

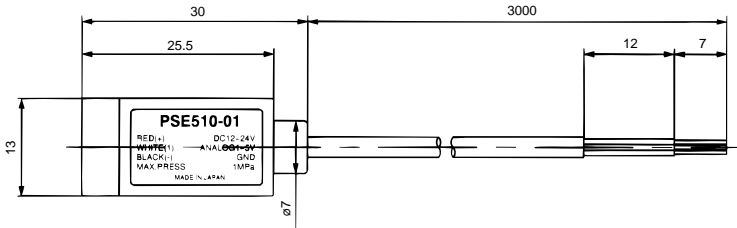
Part No.	R06	M5	01	T01
Material	Case Resin case: PBT	Resin case: PBT Fitting: SUS303	Resin case: PBT Fitting: C3604BD (Electroless nickel plated)	Resin case: PBT Fitting: C3604BD (Electroless nickel plated)
	Pressure sensor area	Pressure sensor: Silicon, O ring: NBR		
Lead wire	Oil resistant heavy duty vinyl cord ø2.55 0.15mm <sup>2</sup> 3 wire (Red, Black, White) 3000mm			
Port size	ø6 plug-in reducer	M5 X 0.8	Rc1/8,M5 X 0.8	NPTF1/8,M5 X 0.8
Weight (Without lead wire)	Approx.7g	Approx.10g	Approx.12g	

### ⚠ Caution

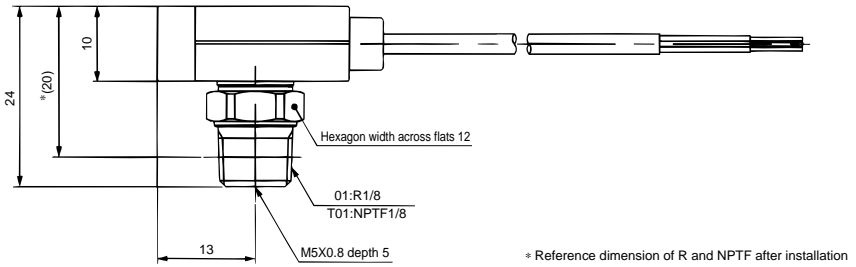
This product is Series PSE51□ blown with air and double packed in a Class 100 clean room.

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 616 and 617 for common precautions for pressure switches.

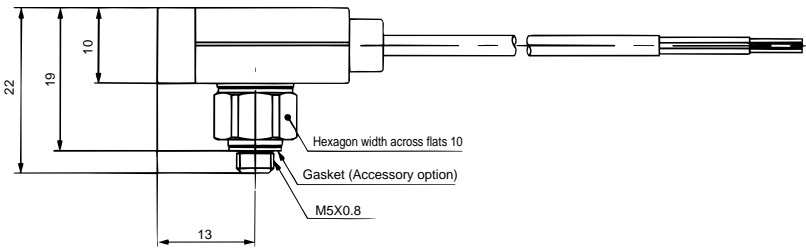
**Dimensions**



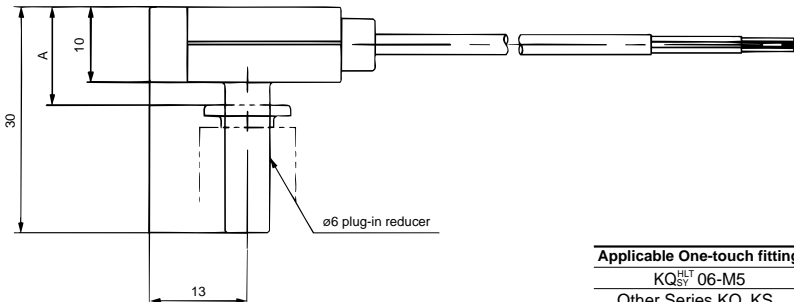
**01,T01**



**M5**



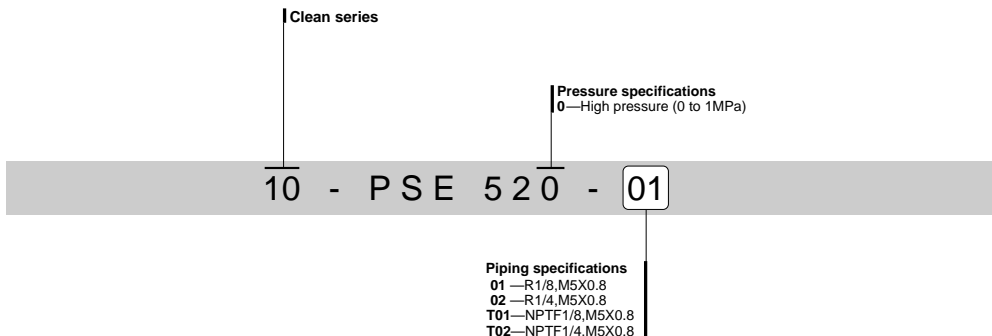
**R06**



Applicable One-touch fittings	A
KQ <sub>ST</sub> <sup>HLT</sup> 06-M5	16
Other Series KQ, KS	13
Series KJ	14.5
Series KJ (-X20)	16

**Pressure Sensor for General Fluids**

**How to Order**



**Sensor Specifications/For General Fluids**

Model	10-PSE520-01	10-PSE520-02	10-PSE520-T01	10-PSE520-T02
Operating pressure range	0 to 1MPa			
Max. operating pressure	2MPa			
Fluid	Fluids that will not corrode SUS304, SUS630			
Output specifications	Analog output (1 to 5V Load impedance;10kΩ or more)			
Power supply voltage	12 to 24VDC (Ripple10% or less)			
Current consumption	15mA or less			
Operating temperature range	-10 to 70°C (With no freezing or condensation)			
Temperature characteristics (25°C standard)	25±10°C	±1%F.S. or less		
	-10 to 70°C	±3%F.S. or less		
Repeatability	±0.3%F.S. or less			
Withstand voltage	Between GND terminal and case 250VAC 1 minute			
Insulation resistance	Between external terminals and case 100MΩ (Measured with a 500 VDC megameter)			
Vibration resistance	1.5 mm amplitude in 10 to 55 Hz for 2 h in X, Y, Z direction each			
Shock resistance	294m/s <sup>2</sup> (11ms or less) in X, Y, Z direction, 3 times each			
Enclosure	IP65			
Material	Case	Case:SUS304, Fitting: SUS304		
	Pressure sensor area	Diaphragm: SUS630		
Lead wire	Special elastic polyvinyl chloride ø6 0.34 mm2 3 wire (Red, Black, White) 3000 mm			
port size	R1/8, M5 X 0.8	R1/4, M5 X 0.8	NPTF1/8, M5 X 0.8	NPTF1/4, M5 X 0.8
Weight	Approx.220g			

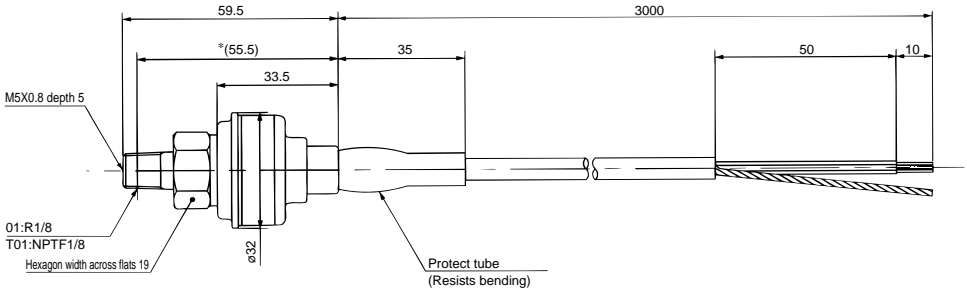
**⚠ Caution**

This product is Series PSE520 blown with air and double packed in a Class 100 clean room.

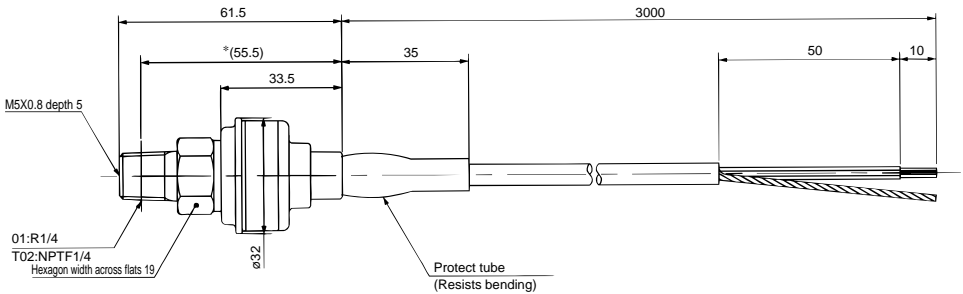
Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 616 and 617 for common precautions for pressure switches.

**Dimensions**

**10-PSE520-01,T01**



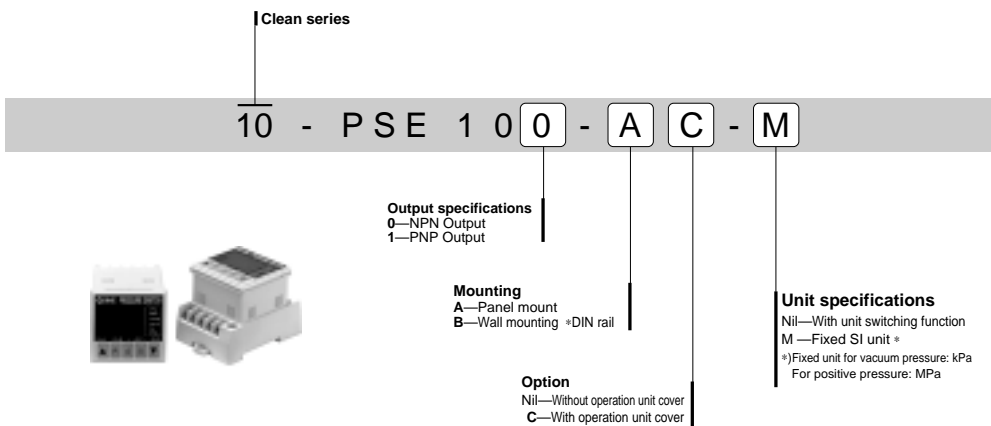
**10-PSE520-02,T02**



\*Reference dimension of R and NPTF after installation

**Controller**

**How to Order**



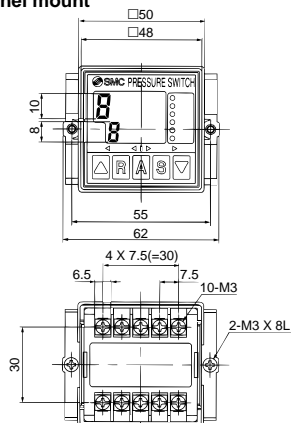
**Specifications**

Model		10-PSE100-□	10-PSE101-□
<b>Output specifications</b>		NPN open collector 30V 80mA MAX.	PNP open collector 80mA MAX.
<b>Output points</b>		2CH X 2 Output	
<b>Power supply voltage</b>		12 to 24VDC (Ripple10% or less)	
<b>Current consumption</b>		250mA or less	
<b>Pressure display range</b>		-99.9 to 10kPa (For vacuum), -10 to 100kPa (Low pressure), -0.1 to 1MPa (High pressure)	
<b>Display resolution</b>		0.1kPa (Vacuum, Low pressure), 1kPa (High pressure)	
<b>Display unit</b>	Vacuum, Low pressure	kPa, mmHg, kgf/cm <sup>2</sup> , bar, InHg	
	High pressure	kPa, MPa, kgf/cm <sup>2</sup> , bar	
<b>Hysteresis</b>		Hysteresis mode: Variable, Window comparator mode: Fix(2%F.S.)	
<b>Display specifications</b>		4-digit x 2, 7-segment indicator, Sampling frequency 4/sec	
<b>Indicator light</b>		Lights up when ON: Switch output: Green Switch output 2: Red	
<b>Error display</b>		Error display on 7-segment indicator	
<b>Self diagnosis function</b>		Overpressure, Overcurrent, Sensor not connected, Data error, Presence of pressure at the time of zero clear (all with display function)	
<b>Additional function</b>		Auto preset: Absorption verification can be set with a single key Auto shift: Zero clear is possible with an input terminal	
<b>Response frequency</b>		100Hz (10ms)	
<b>Operating temperature range</b>		0 to 50°C (With no condensation)	
<b>Temperature characteristics</b> (25°C standard)	25±10 °C	±0.3%F.S. or less	
	0 to 50 °C	±0.5%F.S. or less	
<b>Repeatability</b>		±0.2%F.S. or less	
<b>Noise resistance</b>		500Vp-p Pulse width 1μs Rise 1ns	
<b>Withstand voltage</b>		Between external terminals and case 1000VAC 50/60Hz 1 minute	
<b>Insulation resistance</b>		Between external terminals and case 2MΩ(Measured with a 500 VDC megameter)	
<b>Vibration resistance</b>		1.5 mm amplitude in 10 to 500 Hz or acceleration of 98 m/s <sup>2</sup> , whichever is smaller for 2 h in X, Y, Z direction each	
<b>Shock resistance</b>		980 m/s <sup>2</sup> in X, Y, Z directions, 3 times each	
<b>Enclosure</b>		Panel mount type: IP66 (Only operation panel has gasket), Wall mounting, DIN rail type: IP40	
<b>Mounting</b>		A: Panel mount B: Wall mounting, DIN rail	
<b>Weight</b>		A: approx.90g B: approx.110g	
<b>Sensor connection</b>	Supply voltage	Same as power supply voltage	
	Voltage input	1 to 5V (Inputimpedance; 100kΩ)	
	Vurrent input	4 to 20mA (Inputimpedance; 250Ω)	

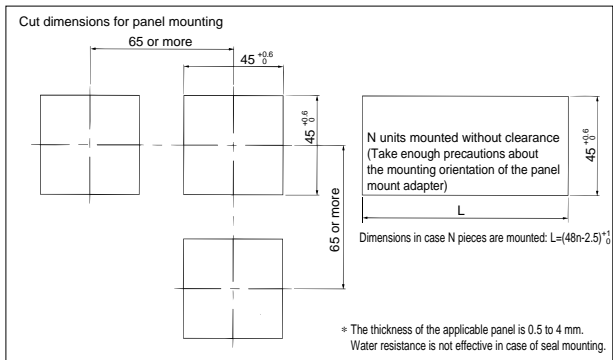
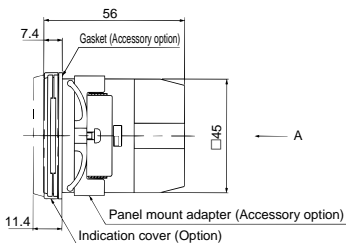


**Dimensions**

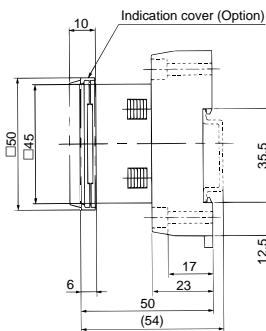
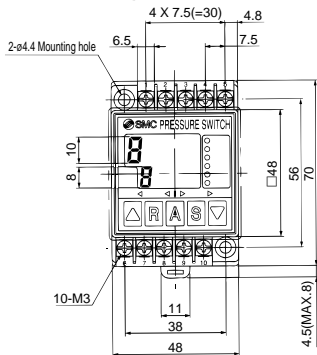
**A: Panel mount**



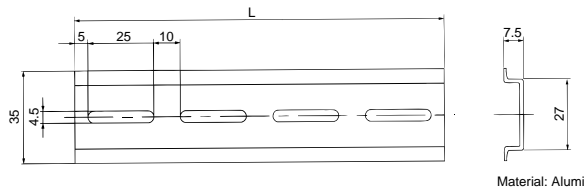
A view



**B: Wall mounting, DIN rail**



**DIN rail**



Material: Alumi

**DIN Rail Part No.**

Part no.	L
ISA-2-1	105
ISA-2-2	140
ISA-2-3	175
ISA-2-4	210
ISA-2-5	245
ISA-2-6	280
ISA-2-7	315

## ⚠ Specific Product Precautions

**Be sure to read before handling.**

Refer to pages 7 to 16 of **Front matter** for safety instructions and common precautions for clean series and pages 616 and 617 for common precautions for pressure switches.

### Wiring

#### ⚠ Warning

- ① If a switching regulator is to be used for the power supply, ground the FG.
- ② Keep the input signal ON for 10 ms or longer.

### Other

#### ⚠ Caution

- ① The delay for power on reset of the controller is 0.5 seconds. The output circuit is not active immediately after the power is connected.

### Mounting

#### ⚠ Caution

- ① The front plate is equivalent to IP66 rating. However, water may invade if the panel mount adapter is not secured firmly with screws. Tighten the screws as shown in the figure below.
- ② As illustrated below, hook the nail on the bottom of the body on the DIN rail and press down in the direction of the arrow. To remove the body from the DIN rail, lift the switch up with a bladed screwdriver, etc. in the direction of the arrow. Refer to figure 2b.
- ③ Be careful not to apply excessive force to the wiring during mounting on panel or DIN rail.

#### Panel mount

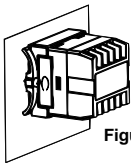


Figure 1

Tighten another 1/4 to 1/2 turn after contacting the panel.

#### Mounting on DIN rail

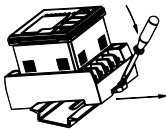


Figure 2a

#### Removal from DIN rail

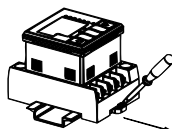


Figure 2b



# Series 10-ZSE40/ISE40

High Precision Digital Pressure Switch

## How to Order

**Set pressure range**

Nil	-0.100 to 1.000MPa	For positive pressure
-----	--------------------	-----------------------

**For Positive Pressure**  
10 — ISE40

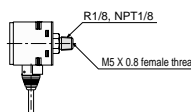
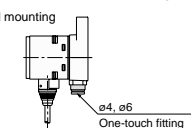
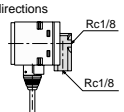
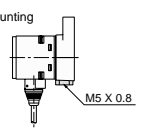
**For Vacuum Pressure or Compound Pressure**  
10 — ZSE40

**Series clean**

**Set pressure range**

Nil	10.0 to -101.3kPa	For vacuum pressure
F	-100.0 to 100.0kPa	For compound pressure

**Piping specifications**

<p><b>01:</b> R1/8 (With M5 female thread) <b>T1:</b> NPT1/8 (With M5 female thread)</p>  <p style="text-align: center;">R1/8, NPT1/8 M5 X 0.8 female thread</p> <p>*C4: With ø4 One-touch fitting *C6: With ø6 One-touch fitting</p> <p>Wall mounting</p>  <p style="text-align: center;">ø4, ø6 One-touch fitting</p>	<p><b>W1:</b> Rc1/8</p> <p>Piping in 2 directions</p>  <p style="text-align: center;">Rc1/8 Rc1/8</p> <p>*M5: M5 X 0.8(Female thread)</p> <p>Wall mounting</p>  <p style="text-align: center;">M5 X 0.8</p>
---	---

\*Optional

**Piping specifications/Option combinations**

Description	Symbol	Piping specifications					
		01	T1	W1	C4	C6	M5
Bracket A	A	○	○	○	×	×	×
Bracket B	B	×	×	○	×	×	×
Bracket D	D	○	○	○	×	×	×
Panel mount	E	○	○	○	○	○	○
Panel mount + Front protection cover	F	○	○	○	○	○	○

○ : Possible combination, × : Impossible combination

**Option**

Nil	—
A	Bracket A (ZS-24-A)
B	Bracket B (ZS-24-B)
D	Refer to the dimensions of bracket D (ZS-24-D).
E	Panel mount (ZS-22-A)
F	Panel mount + Front protection cover (ZS-24-C)

\*If only optional parts are required, order by the part numbers in parentheses.

**I/O specifications**

22	NPN open collector 2 outputs + Analog output
30	NPN open collector 2 outputs + Auto shift input
*62	PNP open collector 2 outputs + Analog output
*70	PNP open collector 2 outputs + Auto shift input

\* Option

**Note**

The possible setting ranges of auto shift function types are as follows.

Set pressure range	Possible set range
-100.0 to 100.0kPa	-100.0 to 100.0kPa
10.0 to -101.3kPa	-101.3 to 101.3kPa
-0.1 to 1.000MPa	-1.000 to 1.000MPa

**Unit specifications**

Nil	With unit switching function
M	Fixed SI unit *

\*Fixed unit for vacuum pressure or compound pressure: kPa  
For positive pressure: MPa

**Lead wire length**

Nil	0.6m
L	3m

Ordering Example: 10-ZSE40-01-22-□-M-□

10: Series 10  
ZSE40: ZSE40 series  
01: Piping specification 01  
22: I/O specification 22  
□: Option (Nil)  
M: Unit specification M  
□: Lead wire length (Nil)

**Specifications**

	10-ZSE40F (Compound pressure)	10-ZSE40 (Vacuum pressure)	10-ISE40 (Positive pressure)
Rated voltage range	-100.0 to 100.0kPa	0.0 to -101.3kPa	0.000 to 1.000MPa
Operating pressure range/Set pressure range	-100.0 to 100.0kPa	10.0 to -101.3kPa	-0.100 to 1.000MPa
Proof Pressure	500kPa		1.5MPa
Set pressure resolution (Note1)	kPa	0.1	—
	MPa	—	0.001
	kgf/cm <sup>2</sup>	0.001	0.01
	bar	0.001	0.01
	psi	0.02	0.01
	mmHg	1	—
	InHg	0.1	—
Fluid	Air, Non-corrosive gas, Non-flammable gas		
Power supply voltage	12 to 24VDC±10%, ripple (p-p)10% or less		
Current consumption	55mA or less		
Switch output	NPN or PNP output, Max. load pressure: 80mA Maximum applied voltage: 30VDC (For NPN Output) Residual voltage : 1V or less (For load current 80mA)		
Repeatability	±0.2%F.S. ±1digit or less		
Hysteresis	Hysteresis mode	Variable	
	Window comparator mode	Fix (3digit) (Note4)	
Response time (With anti-chattering function)	2.5ms or less (24ms, 192ms, 768ms with anti-chattering function)		
Output short circuit protection	Yes		
Display	3 1/2 digit LED (Sampling frequency: 5 cycles/1 sec)		
Display accuracy	±2%F.S. ±1digit or less (At ambient pressure of 25 ± 3°C)		
Indicator light	Green LED(OUT1): Lights up when ON Red LED (OUT2): Lights up when ON		
Analog output (Note2)	Output voltage: 1 to 5V ±5%F.S. or less (Within rated voltage range) Linearity: ±1%F.S. or less Output impedance: approx.1kΩ	Output voltage: 1 to 5V±2.5%F.S. or less (Within rated voltage range) Linearity: ±1%F.S. or less Output impedance: approx.1kΩ	
Auto shift input (Note3)	No-voltage input (Solid state switch or reed switch), 5 ms or longer input		
Environmental resistance	Enclosure	IP65	
	Ambient temperature range	Operating: 0 to 50°C, Stored: -10 to 60°C (With no freezing and condensation)	
	Ambient humidity range	Operating and store: 35 to 85% RH (With no condensation)	
	Withstand voltage	1000VAC for 1 minute, between entire lead wires and enclosure	
	Insulation resistance	50 MΩ or more (Measured with 500VDC megameter), between entire lead wires and enclosure	
	Vibration resistance	10 to 500 Hz double vibration with 1.5 mm width or 98m/s <sup>2</sup> (10G), whichever is smaller, and in X, Y, Z direction each (Without energization)	
Shock resistance	980m/s <sup>2</sup> (100G) in X, Y, Z direction each (Without energization)		
Temperature characteristics	±2% F.S. or less against measured pressure at 25°C in the temperature range of 0 to 50°C		
Port size	O1: R1/8, M5 X 0.8 T1: NPT1/8, M5 X 0.8 W1: Rc1/8 C4: ø4 With One-touch fitting C6: ø6 With One-touch fitting M5: M5 female thread		
Lead wire	5 wire oil-proof heavy duty cable (0.15mm <sup>2</sup> )		
Weight (Weight)	O1/T1 type: Approx. 60g, W1 type: Approx. 80g, C4/C6/M5 types: Aprox. 92g (Each including 0.6m as lead wire length)		

Note 1) For the type with unit switching function

(For a type without unit conversion function, the unit is fixed on the SI unit (kPa or MPa).)

Note 2) In case of 10-ZSE40(F)/ISE40-□-<sup>22</sup>/<sub>62</sub>

Note 3) In case of 10-ZSE40(F)/ISE40-□-<sup>30</sup>/<sub>70</sub>

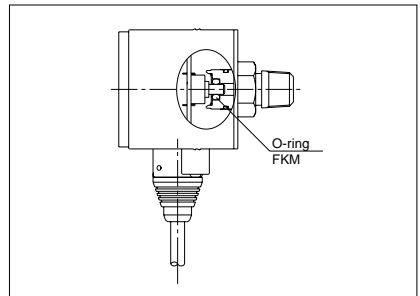
Note 4) The value is represented as 0.03 to 0.04psi in the 10-ZSE40F (Compound pressure) psi notation.

Note 5) The value is within the range ±0.01psi in thr 10-ZSE40F (Compound pressure) psi notation.

Note

The possible setting ranges of auto shift function types are as follows.

Set pressure range	Possible set range
-100.0 to 100.0kPa	-100.0 to 100.0kPa
10.0 to -101.3kPa	-101.3 to 101.3kPa
-0.1 to 1.000MPa	-1.000 to 1.000MPa

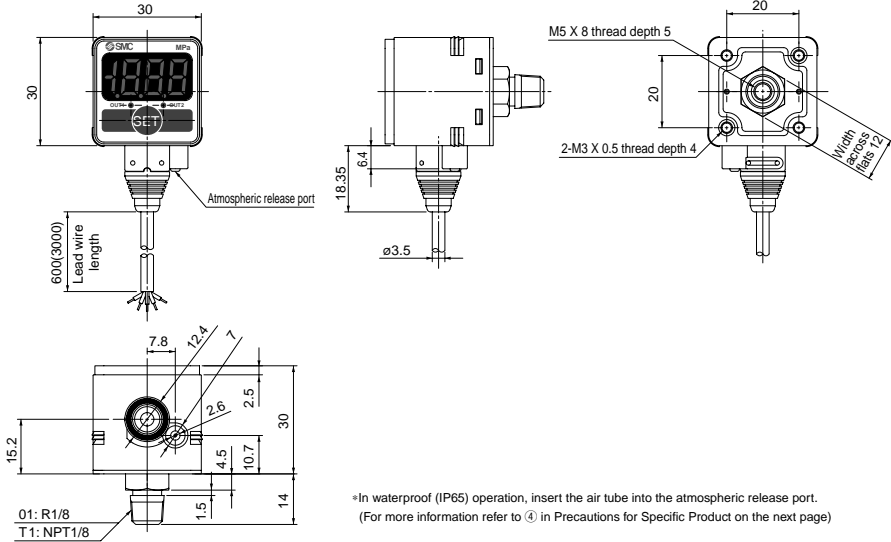
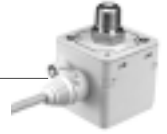


Pressure Switch

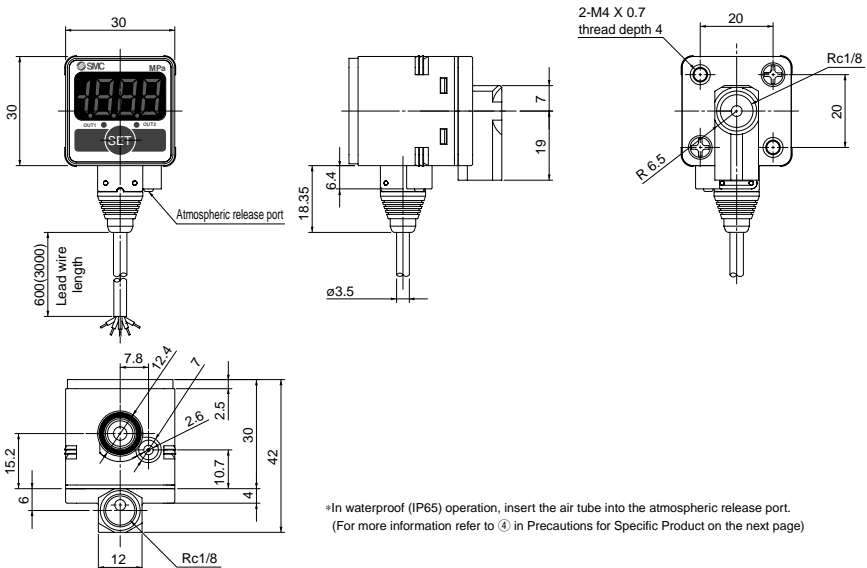
# High Precision Digital Pressure Switch 10-ZSE40/ISE40

## Dimensions

### 10-ZSE40(F)/ISE40-<sup>01</sup><sub>T1</sub>

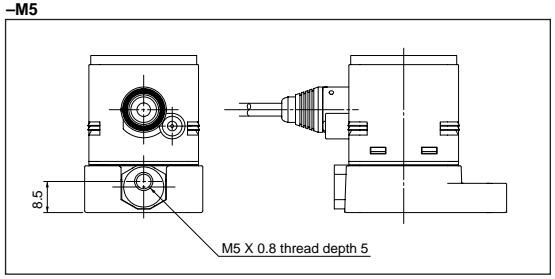
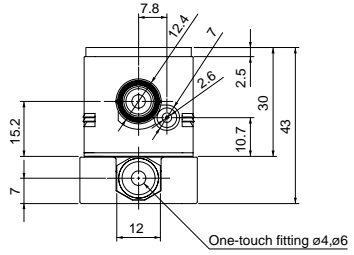
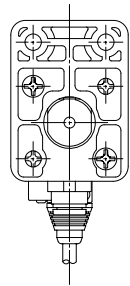
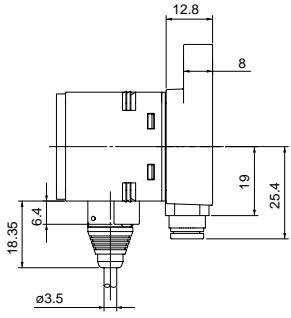
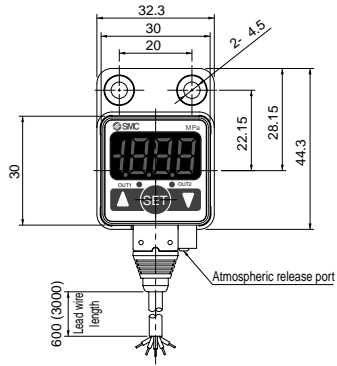


### 10-ZSE40(F)/ISE40-W1



**Dimensions**

**10-ZSE40(F)/ISE40** — C4  
— G $\frac{1}{8}$   
— M5



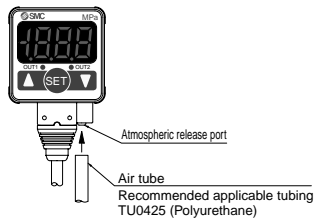
\*In waterproof (IP65) operation, insert the air tube into the atmospheric release port.  
(For more information refer to ④ in Precautions for Specific Product on the next page)

**⚠ Specific Product Precautions**

**⚠ Caution**

Be sure to read before handling. Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 616 and 617 for common precautions for pressure switches.

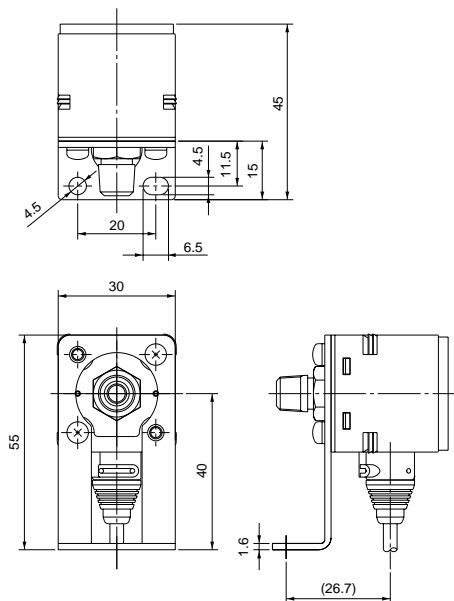
- ① A drift of approx.  $\pm 0.5\%$ F.S. immediately follows the initial power supply. When operating with a subtle or small pressure, take 20 to 30 minutes for a warm-up.
- ② Do not use in an environment where liquid containing oil or solvents splashes onto the equipment.
- ③ When using a switching regulator purchased on the market, be sure to ground the FG terminal.
- ④ In an environment where the switch is exposed to water or dust, prevent water or dust invasion through the atmospheric release port. Insert a tube (Of  $\phi 2.5$  I.D.) into the atmospheric release port and connect the other end of the tube in a safe location with no water splashes or dust turbulence. To ensure accuracy in pressure measurement, do not fold or plug the tube.
- ⑤ This product is equivalent to Series ZSE40(F)/ISE40 but is blown with air and double packed in a Class 100 clean room.



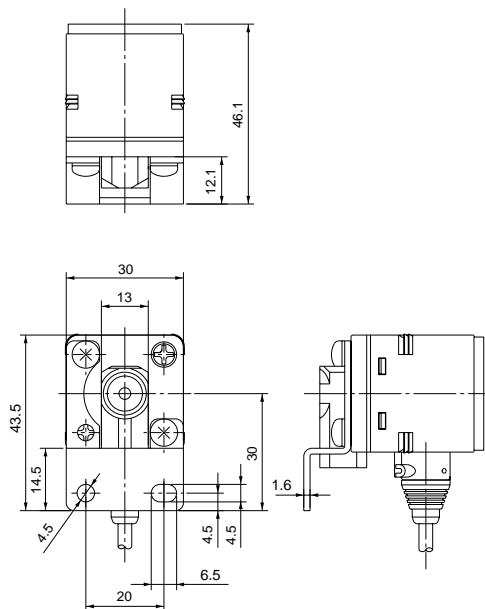
Pressure Switch

**Dimensions**

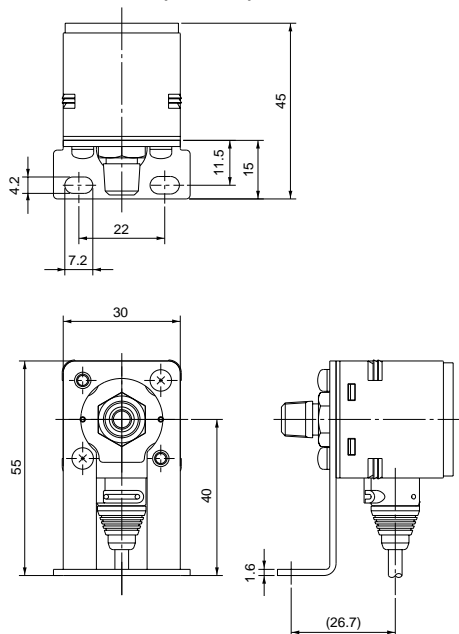
**With Bracket A (ZS-24-A)**



**With Bracket B (ZS-24-B)**



**With Bracket D (ZS-24-D)**







# Series 10-ZSE5B/ISE5B

Digital Pressure Switch with Backlight

## How to Order

**Clean series**

**Piping specifications**  
**02** — Direct piping R1/4  
**T2** — Direct piping NPTF 1/4  
 (Note) M5 X 0.8 threads are cut inside the piping.

**For Vacuum** 10 - ZSE5B - **T2** - **27** L - **M**

**For Positive Pressure** 10 - ISE5B - **02** - **26** L - **M**

**Output specifications**  
**26** —Analog output(1 to 5V)  
**27** —NPN open collector(2 outputs)  
**67** —PNP open collector(2 outputs)


**Unit specifications**  
**Nil**—With unit switching function  
**M**—Fixed SI unit \*  
 \*) Fixed units: For vacuum pressure or compound pressure: kPa  
 For positive pressure: Mpa

**Lead wire length**  
**L** —3m

**Part number of panel mounting adapter**  
 (Panel adapter A + Panel adapter B + Mounting bracket)  
**ZS-22-E**  
 Panel adapter A.....ZS-22-03  
 Panel adapter B.....ZS-22-02  
 Mounting bracket.....ZS-22-04

**ZS-22-D**  
 M3 tapping screw 4 pcs

**Option bracket**



## Model

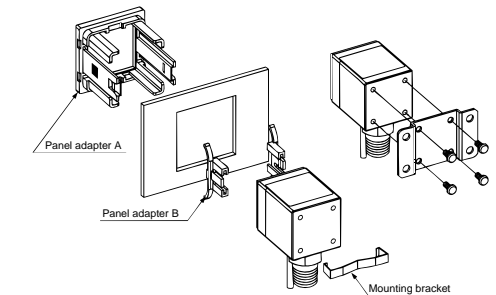
	Model	Output type	Output specifications
For vacuum	ZSE5B-□-26L	Analog output	1 to 5V(5%F.S.)
	ZSE5B-□-27L	Switch 2 output	NPN open collector 30V, 80mA
	ZSE5B-□-67L		PNP open collector, 80mA
For positive pressure	ISE5B-□-26L	Analog output	1 to 5V(5%F.S.)
	ISE5B-□-27L	Switch 2 output	NPN open collector 30V, 80mA
	ISE5B-□-67L		PNP open collector, 80mA

## Specifications

Model		Vacuum 10-ZSE5B	Positive pressure 10-ISE5B
<b>Set pressure range</b>		-100 to 100kPa	-0.1 to 1MPa
<b>Max. operating pressure</b>		200kPa	1.5MPa
<b>Leak quantity</b>		1 X 10 <sup>-9</sup> Pam <sup>3</sup> /s	
<b>Min. display</b>	kPa	2	—
	MPa	—	0.01
	mmHg	10	—
	kgf/cm <sup>2</sup>	0.02	0.1
	PSI	0.2	1
	bar	0.02	0.1
<b>Indicator light</b>		Lights up when ON(OUT1: Green OUT2: Red)	
<b>Response frequency</b>		200Hz (5ms)	
<b>Hysteresis</b>	<b>Hysteresis mode</b>	Variable (2digit or more)	Variable (3digit or more)
	<b>Window comparator mode</b>	Fix (2digit)	Fix (3digit)

Note1) **Hysteresis mode**  
 In case of ZSE The hysteresis is automatically set to 2 digits against the set value of P1 if the values of P1 and P2 are equal or P1>P2 applies with 2 digits or less hysteresis.  
 In case of ISE: The hysteresis is automatically set to 3 digits against the set value of P1 if the values of P1 and P2 are equal or P1>P2 applies with 3 digits or less hysteresis.

**Window comparator mode**  
 In case of ZSE: Set P1 and P2 5 digits or more apart because the hysteresis is 2 digits.  
 In case of ISE: Set P1 and P2 7 digits or more apart because the hysteresis is 3 digits.  
 \*1 digit refers to the minimum unit of pressure indication (See the above table).

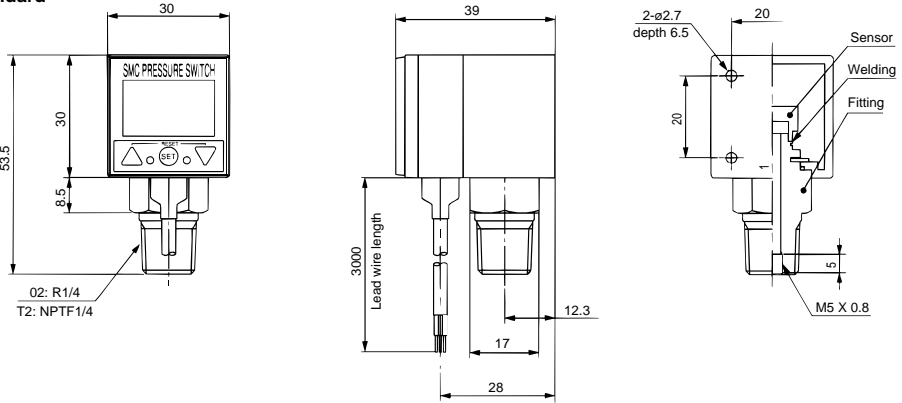


<b>Fluid</b>	Fluids that will not corrode SUS304, SUS630
<b>Temperature characteristics</b>	±3%F.S. or less
<b>Repeatability</b>	±1%F.S. or less
<b>Operating voltage</b>	12 to 24V DC (Ripple10% or less)
<b>Current consumption</b>	45mA or less
<b>Emergency display</b>	Indicator light: Red lightening, Error display on LCD
<b>Pressure indication</b>	3 1/2 digit LED (Height of character 10 mm)
<b>Self diagnosis function</b>	Over current (Note2), Excess pressure, Data error, Presence of pressure at the time of zero clear
<b>Operating temperature range</b>	0 to 50°C (With no condensation)
<b>Noise resistance</b>	500Vp-p, Pulse width 1μs, Rise1ns
<b>Withstand voltage</b>	Between external terminal and case 250V AC 50/60Hz 1 minute
<b>Insulation resistance</b>	Between external terminal and case 2MΩ(Measured with 50 V DC megameter)
<b>Vibration resistance</b>	1.5 mm amplitude in 10 to 500 Hz or acceleration of 98 m/s <sup>2</sup> , whichever is smaller for 2 h in X, Y, Z direction each
<b>Shock resistance</b>	980m/s <sup>2</sup> in X, Y, Z direction, 3 times each
<b>Weight</b>	126g (including 3m lead wire)
<b>Port size</b>	02: R1/4, M5 X 0.8 T2: NPTF1/4, M5 X 0.8
<b>Enclosure</b>	IP40

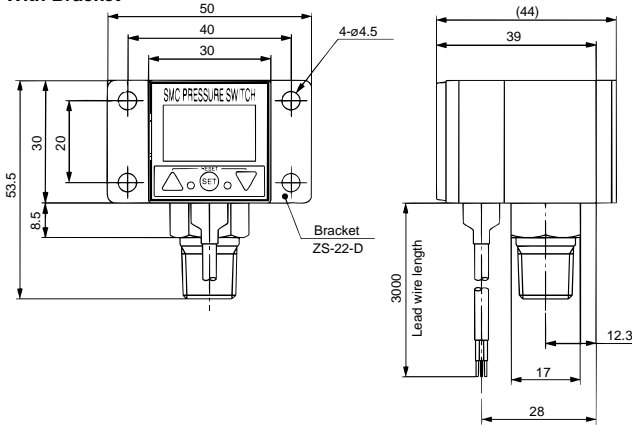
Note2) Not available with analog output types.

**Dimensions**

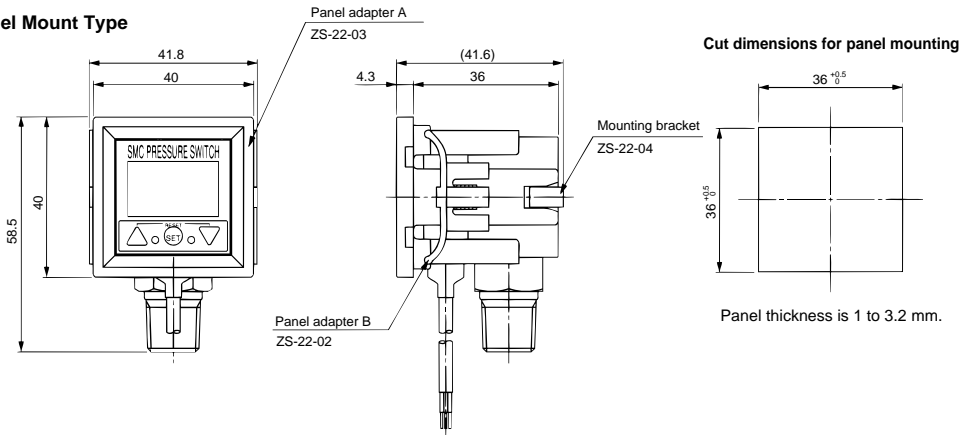
**Standard**



**With Bracket**



**Panel Mount Type**



## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 616 and 617 for common precautions for pressure switches.

### Wiring

#### ⚠ Warning

① **Voltage resistance**

Voltage resistance between the metal fitting and the lead wire of the switch is 250V. Do not apply voltage potential in excess of 250 V.

#### ⚠ Caution

- ① Ground the piping when induction noise is expected to be generated from the piping.

### Pressuresource

#### ⚠ Warning

① **Operating fluid**

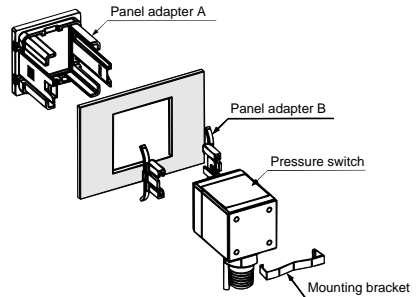
The fluid contact portions are made of SUS630 (pressure sensor) and SUS304 (fittings). Use fluid that will not corrode these materials. The anti-corrosive performance of SUS630 and that of SUS304 are approximately at the same level. For reference, fluid and gases that will not corrode SUS 304 are shown below.

Dryingair	○
Air containing drainage	○
Hydraulic fluid (JIS-K2213)	○
Silicon oil (JIS-K2213)	○
Lubricating oil (JIS-K6301)	○
Fluoro carbon	○
Carbon dioxide	○
Ammonia	○
Argon	○
Nitrogen gas	○

### Other

#### ⚠ Caution

- ① This product is equivalent to Series ZSE5B/ISE5B but is blown with air and double packed in a Class 100 clean room.
- ② **Mounting the panel**
- 1) Insert the panel adapter A from the front of the panel.
  - ↓
  - 2) Fix Adapter A firmly with Adapter B from the back of the panel.
  - ↓
  - 3) Insert the pressure switch into the panel adapter A from the rear side of the panel.
  - ↓
  - 4) Secure the pressure switch with the mounting bracket.





# Series 10-ZSE6B/ISE6B

Digital Pressure Switch with Backlight

## How to Order

**Clean series**

**Piping specifications**  
**A2** — URJ 1/4 \*  
**B2** — TSJ 1/4 \*  
 \* URJ 1/4 is equivalent to VCR®.  
 TSJ 1/4 is equivalent to Swagelok®.  
 Be careful that VCR® and Swagelok® are special fittings for semiconductor equipment.

For Vacuum **10 - ZSE6B - A2 - 27 L - M**

Positive Pressure **10 - ISE6B - B2 - 67 L - M**

**Output specifications**  
**26** — Analog output (1 to 5V)  
**27** — NPN open collector (2 outputs)  
**67** — PNP open collector (2 outputs)

**Unit specifications**  
 Nil — With unit conversion function  
**M** — Fixed SI unit \*  
 \*) Fixed unit for vacuum pressure or compound pressure: kPa  
 For positive pressure: MPa

**Lead wire length**  
 L — 3m



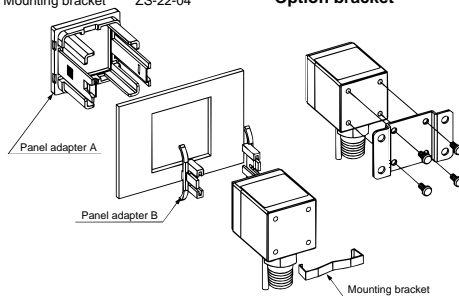
### Part number of panel mounting adapter

(Panel adapter A + Panel adapter B + Mounting bracket)

**ZS-22-E**  
 Panel adapter A .....ZS-22-03  
 Panel adapter B .....ZS-22-02  
 Mounting bracket .....ZS-22-04

**ZS-22-D**  
 M3 tapping screw 4 pcs

**Option bracket**



## Model

	Model	Output type	Output specifications
For vacuum	ZSE6B-□-26L	Analog output	1 to 5V(5%F.S.)
	ZSE6B-□-27L	Switch 2 output	NPN open collector 30V, 80mA
	ZSE6B-□-67L	Switch 2 output	PNP open collector, 80mA
Positive pressure	ISE6B-□-26L	Analog output	1 to 5V(5%F.S.)
	ISE6B-□-27L	Switch 2 output	NPN open collector 30V, 80mA
	ISE6B-□-67L	Switch 2 output	PNP open collector, 80mA

## Specifications

Model		Vacuum 10-ZSE6B	Positive pressure 10-ISE6B
<b>Set pressure range</b>		-100 to 100kPa	-0.1 to 1MPa
<b>Max. operating pressure</b>		200kPa	1.5MPa
<b>Leak quantity</b>		1 X 10 <sup>-6</sup> Pam <sup>3</sup> /s	
<b>Min. display unit</b>	kPa	2	—
	MPa	—	0.01
	mmHg	10	—
	kgf/cm <sup>2</sup>	0.02	0.1
	PSI	0.2	1
	bar	0.02	0.1
<b>Indicator light</b>		Lights up when ON (OUT1: Green OUT2: Red)	
<b>Response frequency</b>		200Hz (5ms)	
<b>Hysteresis</b>	hysteresis mode	Variable(2digit or more)	Variable(3digit or more)
	Window comparator mode	Fix (2digit)	Fix (3digit)

Note1) **Hysteresis mode**  
 In case of ZSE: The hysteresis is automatically set to 2 digits against the set value of P1 if the values of P1 and P2 are equal or P1>P2 applies with 2 digits or less hysteresis.  
 In case of ISE: The hysteresis is automatically set to 3 digits against the set value of P1 if the values of P1 and P2 are equal or P1>P2 applies with 3 digits or less hysteresis.

### Window comparator mode

In case of ZSE: Set P1 and P2 5 digits or more apart because the hysteresis is 2 digits.  
 In case of ISE: Set P1 and P2 7 digits or more apart because the hysteresis is 3 digits.  
 +1 digit refers to the minimum unit of pressure indication (See the above table).

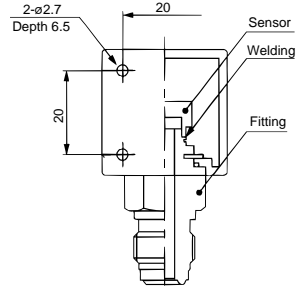
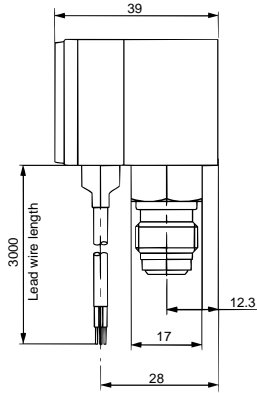
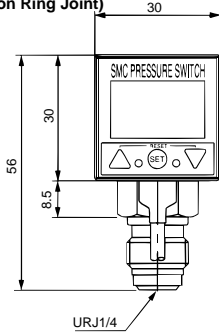
<b>Fluid</b>	Fluids that will not corrode SUS304, SUS630
<b>Temperature characteristics</b>	±3%F.S. or less
<b>Repeatability</b>	±1%F.S. or less
<b>Operating voltage</b>	12 to 24VDC (Ripple10% or less)
<b>Current consumption</b>	45mA or less
<b>Emergency display</b>	Indicator light: Red lightning, Error display on LCD
<b>Pressure indication</b>	3 1/2 digit LED (Height of character 10 mm)
<b>Self diagnosis function</b>	(Over current <sup>Note2)</sup> , Excess pressure, Data error, Presence of pressure at the time of zero clear
<b>Operating temperature range</b>	0 to 50°C(With no condensation)
<b>Noise resistance</b>	500Vp-p, Pulse width 1μs, Rise 1nS
<b>Withstand voltage</b>	Measured with 50 VDC megger meter 250VAC 50/60Hz 1 minute
<b>Insulation resistance</b>	Measured with 50 VDC megger meter 2MΩ(Measured with 50 VDC megameter)
<b>Vibration resistance</b>	1.5 mm amplitude in 10 to 500 Hz or acceleration of 98 m/s <sup>2</sup> , whichever is smaller for 2 h in X, Y, Z direction each
<b>Shock resistance</b>	980m/s <sup>2</sup> in X, Y, Z direction, 3 times each
<b>Weight</b>	126g (Including 3m lead wire)
<b>Port size</b>	A2: URJ1/4, B2: TSJ1/4
<b>Enclosure</b>	IP40

Note 2) Not available with analog output types.

**Dimensions**

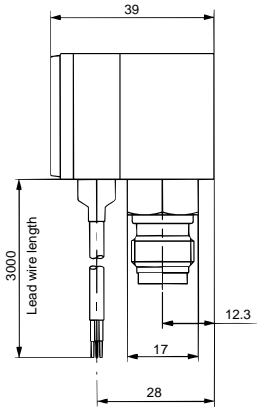
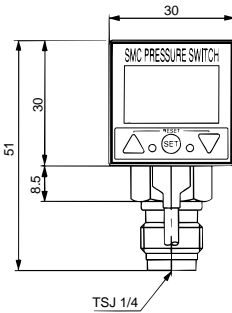
**URJ 1/4**

(Union Ring Joint)

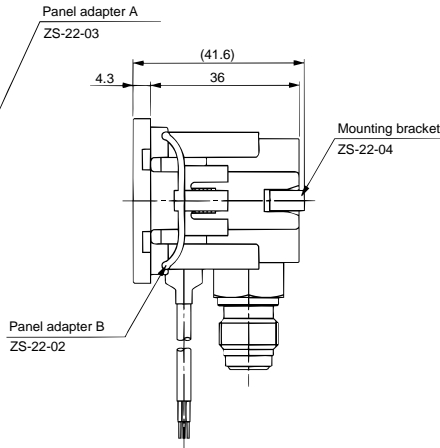
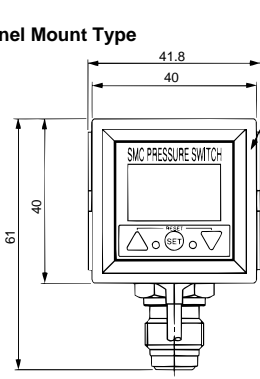


**USJ 1/4**

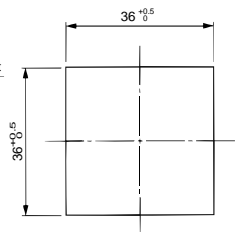
(Tube Swage Joint)



**Panel Mount Type**



**Cut dimensions for panel mounting**



Panel thickness is 1 to 3.2mm

## ⚠ Specific Product Precautions

**Be sure to read before handling.**

**Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series and pages 616 and 617 for common precautions for pressure switches.**

### Wiring

#### ⚠ Warning

① **Voltage resistance**

Voltage resistance between the metal fitting and the lead wire of the switch is 250V. Do not apply voltage potential in excess of 250V.

#### ⚠ Caution

- ① Ground the piping when induction noise is expected to be generated from the piping.

### Pressure source

#### ⚠ Warning

① **Use of toxic, corrosive or flammable gases**

The pressure sensor and fittings of the switch are made of SUS630 and SUS304. Do not use toxic or corrosive gases with the switch. Since the switch is not rated as explosion proof, also do not use flammable gases.

② **Operating fluid**

The fluid contact portions are made of SUS630 (pressure sensor) and SUS304 (fittings). Use fluid that will not corrode these materials. The anti-corrosive performance of SUS630 and that of SUS304 are approximately at the same level. For reference, fluid and gases that will not corrode SUS 304 are shown below.

Dryingair	○
Air containing drainage	○
Hydraulic fluid (JIS-K2213)	○
Silicon oil (JIS-K2213)	○
Lubricating oil (JIS-K6301)	○
Fluoro carbon	○
Carbon dioxide	○
Ammonia	○
Argon	○
Nitrogen gas	○

③ **Helium leak test**

The welded section is helium leak tested. SMC recommends TSJ fittings such as ferrules by Crawford Fittings (Swagelok®) or URJ fittings (With seal, gland, etc.) such as packing or glands by Cajon (VCR® fittings). When using fittings of other brands, apply a helium leak test at the welded section.

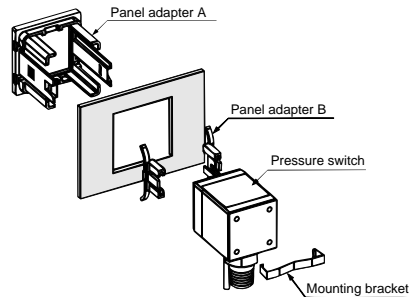
### Other

#### ⚠ Caution

- ① **This product is equivalent to Series ZSE6B/ISE6B but is blown with air and double packed in a Class 100 clean room.**

② **Mounting the panel**

- 1) Insert the panel adapter A from the front of the panel.
- ↓
- 2) Fix Adapter A firmly with Adapter B from the back of the panel.
- ↓
- 3) Insert the pressure switch into the panel adapter A from the rear side of the panel.
- ↓
- 4) Secure the pressure switch with the mounting bracket.





# Clean Series Clean Regulator


**SRH** Clean Regulator  
SRH3000/4000  
P.640

**SRP** Precision Clean Regulator  
SRP1000  
P.644

Clean Regulator

# Series **SRH** Clean Regulator

## How to Order



**SRH 3 0 0 0 02 R**

**Body size**

3	1/4
4	3/8

**Washing grade**

0	Grade A
1	Grade B

**Set pressure**

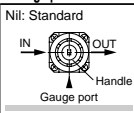
0	0.01 to 0.2MPa
1	0.05 to 0.7MPa

**Relief mechanism**

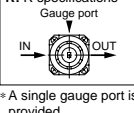
0	Non-relieving
1	Relief

**Gauge port orientation**

Nil: Standard



R: R specifications



\* A single gauge port is provided.

**Port size**

Symbol	Port size	SRH3000	SRH4000
01	Rc1/8	●	—
02	Rc1/4	●	●
03	Rc3/8	—	●
04	Rc1/2	—	●
A2	With metal gasket seal fitting	9/16-18UNF	—
A3	With metal gasket seal fitting	—	7/8-14UNF

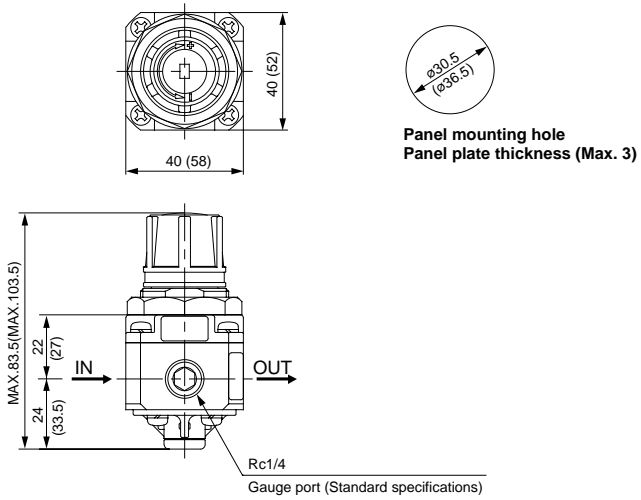
Note) The pressure gauge is optional. Refer to option specifications on page 642.

## Specifications

Model		SRH3□□0	SRH4□□0	SRH3□□1	SRH4□□1
<b>Relief mechanism</b>		Non-relieving		Relief	
<b>Port size</b>		Rc1/8, 1/4 9/16-18UNF	Rc1/4, 3/8, 1/2 7/8-14UNF	Rc1/8, 1/4	Rc1/4, 3/8, 1/2
<b>Fluid</b>	<b>Grade A</b>	Clean air, N <sub>2</sub> , Ar, CO <sub>2</sub> , Pure water		Clean air, N <sub>2</sub>	
	<b>Grade B</b>	Air, N <sub>2</sub> , Ar, CO <sub>2</sub> , Water		Air, N <sub>2</sub>	
<b>Proof pressure</b>		1.5MPa			
<b>Max. operating pressure</b>		1MPa			
<b>Set pressure</b>	Low pressure type	0.01 to 0.2MPa			
	High pressure type	0.05 to 0.7MPa			
<b>Ambient and fluid temperature</b>		0 to 60°C (With no condensation)			
<b>Fluid contact material (metal)</b>		SUS316 (Body: SUS316L)			
<b>Diaphragm material</b>	<b>Grade A</b>	PTFE			
	<b>Grade B</b>	Fluoro rubber			
<b>Weight</b>		360g	730g	360g	730g

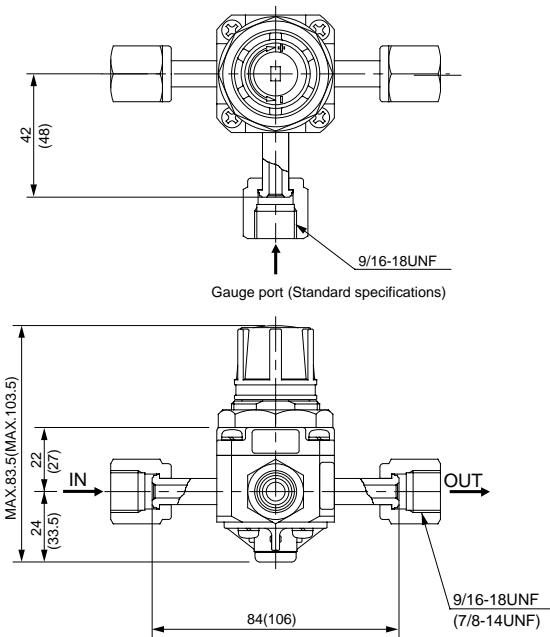
## Dimensions

### Rc Thread Type



Dimensions in parentheses are for SRH4000.

### Metal Gasket Seal Fitting Type

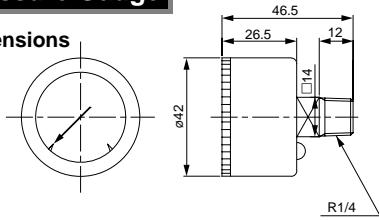


Dimensions in parentheses are for SRH4000.

Option

**Pressure Gauge**

Dimensions



Specifications

Item	Model	G46-□-02-SRA	G46-□-02-SRB
Port size		R1/4	
Operating temperature range		0 to 60°C (With no condensation)	
Accuracy		±3%F.S.	
Calibration angle		270°	
Parts washing (Fluid contact parts)		Precision wash	General degrease
Assembly and adjustment environment		Clean room	General manufacturing line
Oil free/Water free		Oil free/Water free	
Material	Fluid contact parts	SUS316	
	Case	SUS304 (Black melamine coating)	
	Clear cover	Polycarbonate (Hard coated) Part No.: G46-00-00-2	
	Internal parts	Brass	
Weight		80g	

Note) Consult SMC regarding supply of types with metal gasket seal fittings.

Model

Model	Pressure range		Indicator unit
	MPa	kgf/cm <sup>2</sup>	
G46-2-02-SRA	0 to 0.2	0 to 2	MPa
G46-2-02-SRB			
G46-4-02-SRA	0 to 0.4	0 to 4	
G46-4-02-SRB			
G46-7-02-SRA	0 to 0.7	0 to 7	
G46-7-02-SRB			
G46-10-02-SRA	0 to 1.0	0 to 10	
G46-10-02-SRB			

Handling Instructions for Pressure Gauge with Limit Gauge Indicators

●Removing the cover

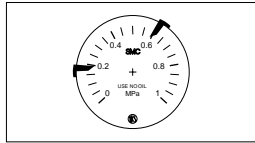
Hold the outer edge of the front cover with the fingers. Push and turn it counterclockwise (about 6 to 7mm) until it stops, and then pull it out.



●Setting the indicator needles

Movement of the indicator needles should be done with the finger tips. If a small screw driver or similar item is used, take care not to bend the indicator needles or scratch the gauge dial.

There are two green indicator needles which are to be adjusted to the upper (Up to 0.6MPa) and lower limits of the pressure gauge.



●Installing the cover

After setting the indicator needles, the cover is replaced to its original position. This is accomplished by aligning the notch at the top of the black case with the cutout in the cover, and then pushing the cover back into position.

Rotate the cover clockwise until it stops (Approx. by 6 to 7mm). Confirm that it is secured.



Bracket

	For SRH3000	For SRH4000
Model	B21-1-T1	1350112-T1
Material	Rolled steel plate (Electroless nickel plated)	
Dimensions		

## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series.

### Design and Selection

#### ⚠ Warning

- ① **Confirm the fluids.**  
Because the fluid to be used differs among products, be sure to confirm the specifications. Use of incompatible fluids will cause malfunction due to changes in special characteristics.
- ② **Residual pressure relief is not possible without supply pressure.**  
In the SRH series, if the supply pressure is cut off while pressure still remains on the downstream side, it is not possible to eliminate the downstream pressure (residual pressure relief). If it will be necessary to eliminate pressure from the downstream side, a circuit should be provided for residual pressure relief.

#### ⚠ Caution

##### Pressure gauge

- ① Avoid use in an environment where pulsation in pressure or a lot of vibration is generated.
- ② Consult SMC regarding high frequency operation of the product.

### Mounting

#### ⚠ Caution

- ① **The sealed package should be opened in a clean room.**  
The product is sealed in a double bag in a clean room. It is recommended that the inner bag should be opened in a clean room or other clean environments.
- ② **Ensure sufficient space for maintenance.**  
Provide enough space for maintenance and inspection. For ease of maintenance and inspection, it is recommended to provide a clearance of 60 mm or more on the valve guide side.
- ③ **Flush out the piping.**  
Flush and clean the products before connecting them. If debris or scale remains in the piping, it can cause malfunction or failure.
- ④ **Do not allow the sealing material to enter the piping.**  
When screwing in the pipes and joints, make sure that cutting dust from the pipe, threads, sealing material, etc. do not enter the piping. If debris or scale, etc. remains inside the piping, failure or malfunction may result. Also, when thread tape is used, leave 1.5 to 2 threads exposed at the end of the pipe.
- ⑤ **Confirm the mounting orientation.**  
The mark IN indicates the inlet of fluid and the mark OUT the outlet. The equipment will not operate normally if mounted in the reverse direction.

### Mounting

##### Pressure gauge

#### ⚠ Caution

- ① Do not apply impacts to the regulator by dropping or hitting it during transfer or installation.  
It can cause inaccuracy in indication.
- ② Do not install the regulator in an environment of high pressure or high humidity.  
It will cause malfunction or failure.
- ③ When screwing in the pressure gauge, be sure to apply the wrench to the 2 flat chamfered sides of the square.  
Holding other parts to screw in the pressure gauge may cause air leakage or damage.

### Pressure Adjustment

#### ⚠ Warning

- ① **Do not use tools to turn the pressure regulator knob.**  
The pressure regulator knob may be damaged if handled with tools. Be sure to handle the knob manually.

#### ⚠ Caution

- ① **Perform pressure adjustments only after releasing the lock.**  
The pressure regulator knob will not rotate when it is locked. To release the lock, pull out the pressure regulator knob. The knob will be damaged if turned with excessive force.
- ② **Adjust pressure in an upward direction.**  
A correct pressure setting cannot be achieved by adjusting the pressure downward. Turning the pressure regulator knob clockwise will increase the downstream pressure and turning the knob counterclockwise will decrease it.
- ③ **In case of the non-relief type, the pressure cannot be reduced by turning the pressure regulator knob counterclockwise.**  
In case of the non-relief type, the downstream pressure will not decrease even if the knob is turned to the left unless there is any downstream fluid consumption. The knob will be damaged if it is turned by force.  
In case the set pressure becomes too high, reduce the pressure on the downstream side until the pressure falls below the desired value, then adjust it again.
- ④ **Confirm the primary pressure.**  
The downstream setting must be set at 85% or less of the supply pressure. Failure to observe this procedure could cause the downstream pressure to fluctuate.
- ⑤ **Do not use fluid containing solid matter.**  
It will cause malfunction or failure.

# Series SRP Precision Clean Regulator

## How to Order

SRP 1 1 0 1 — 01 — R



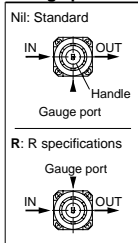
### Set pressure

0	0.005 to 0.2MPa
1	0.01 to 0.4MPa

### Port size

Symbol	Port size
M5	M5 X 0.8
01	Rc1/8

### Gauge port orientation



+ The gauge port position is indicated with the knob on top.

Note) The pressure gauge is optional. Refer to option specifications on page 646.

## Option

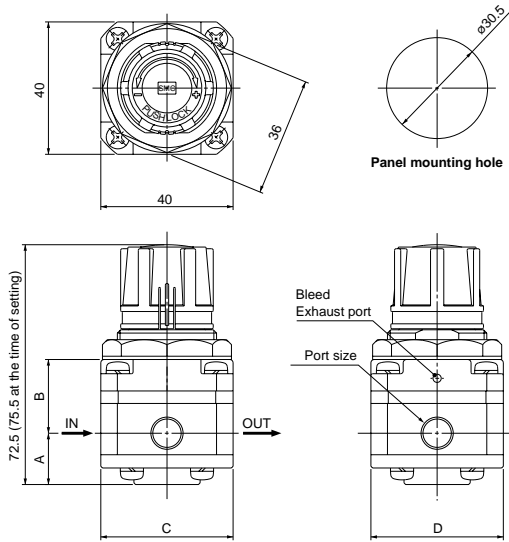
Description	Model	Material
Bracket	B21-1-T1	Rolled steel plate (Electroless nickel plated)

## Specifications

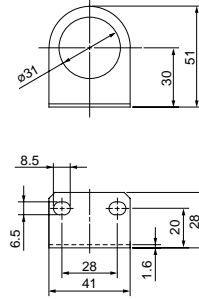
Port size	M5, Rc1/8	
Fluid	Air, N <sub>2</sub> , CO <sub>2</sub> , Ar	
Proof pressure MPa	1.5	
Max. operating pressure MPa	1.0	
Set pressure range MPa	Low pressure type	0.005 to 0.2
	High pressure type	0.01 to 0.4
Ambient and fluid temperature (°C)	0 to 60 (With no condensation)	
Fluid consumption /min (ANR) <sup>Note 1)</sup>	0.5 or less	
Sensitivity	full span±0.3%	
Repeatability	full span±1%	
	Wetted part material	
	Metal	SUS316
	Resin	Fluoro resin
	Rubber	Fluoro rubber
	Other	Ceramics
Assembly environment	Clean room class 10000	
Parts cleaning	HCFC141b ultrasonic cleaning of all fluid contact parts	

Note 1) At set pressure of 0.2 MPa

**Dimensions**



Bracket (B21-1-T1)

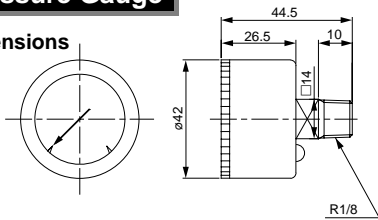


Model	Port size	A	B	C	D
<b>SRP11□1-M5</b>	M5 X 0.8	14	23.5	30	30
<b>SRP11□1-01</b>	Rc1/8	15	22.5	40	40

Option

**Pressure Gauge**

Dimensions



Specifications

Item	Model	G46-□-01-SRA	G46-□-01-SRB
Port size		R1/8	
Operating temperature range		0 to 60°C (With no condensation)	
Accuracy		±6%F.S.	
Calibration angle		270°	
Parts washing (Fluid contact parts)		Precision wash	General degrease
Assembly and adjustment environment		Clean room	General manufacturing line
Oil free/Water free		Oil free/Water free	
Material	Fluid contact parts	SUS316	
	Case	SUS304 (Black melamine coating)	
	Clear cover	Polycarbonate	
	Internal parts	brass	
Weight		80g	

Model

Model	Pressure range		Indicator unit
	MPa	kgf/cm <sup>2</sup>	
G46-2-01-SRA	0 to 0.2	0 to 2	MPa
G46-2-01-SRB			
G46-4-01-SRA	0 to 0.4	0 to 4	
G46-4-01-SRB			

Handling Instructions for Pressure Gauge with Limit Gauge Indicators

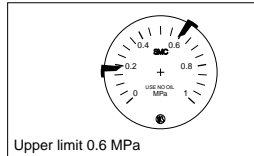
●Removing the cover

Hold the outer edge of the front cover with the fingers. Push and turn it counter clockwise (about 6 to 7mm) until it stops, and then pull it out.



●Setting the indicator needles

Movement of the indicator needles should be done with the finger tips. If a small screw driver or similar item is used, take care not to bend the indicator needles or scratch the gauge dial. There are two green indicator needles which are to be adjusted to the upper (Up to 0.6MPa) and lower limits of the pressure gauge.



●Installing the cover

After setting the indicator needles, the cover is replaced to its original position. This is accomplished by aligning the notch at the top of the black case with the cutout in the cover, and then pushing the cover back into position.

Rotate the cover clockwise until it stops (approx. by 6 to 7mm). Confirm that it is secured.





## ⚠ Specific Product Precautions

Be sure to read before handling.

Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series.

### Design and Selection

#### ⚠ Warning

- ① **Types of fluid**  
Use with air, N<sub>2</sub>, CO<sub>2</sub> or Ar as fluids. Consult SMC if the product is to be used with other fluids.  
Do not use toxic or corrosive gases because the bleed mechanism is adopted on the product to discharge fluids from the bleed port.
- ② **Do not use fluid containing solid matter.**  
To prevent malfunction caused by such substances, install a mist separator on the upstream side of the regulator.
- ③ **When using air containing a large amount of drainage, install an air dryer or after cooler upstream of the regulator.**  
It will cause malfunction or failure.
- ④ **Do not use in a place subject to heavy vibrations and/or shocks.**
- ⑤ **Install a protection cover if the product is exposed to direct sunlight.**
- ⑥ **Block off heat radiation with a cover if a heat source is at a close distance.**

#### ⚠ Caution

- ① **SMC recommends the secondary pressure be set within a 25 to 85% range of the supply pressure.**

#### Pressure gauge

- ① Avoid use in an environment where pulsation in pressure or a lot of vibration is generated.
- ② Consult SMC regarding high frequency operation of the product.

### Mounting

#### ⚠ Caution

- ① **The sealed package should be opened in a clean room.**  
The product is sealed in a double bag in a clean room. It is recommended that the inner bag should be opened in a clean room or other clean environments.
- ② **Flush out the piping.**  
Flush and clean the products before connecting them. If debris or scale remains in the piping, it can cause malfunction or failure.
- ③ **Do not allow the sealing material to enter the piping.**  
When screwing in the pipes and joints, make sure that cutting dust from the pipe, threads, sealing material, etc. do not enter the piping. If debris or scale, etc. remains inside the piping, failure or malfunction may result. Also, when thread tape is used, leave 1.5 to 2 threads exposed at the end of the pipe.
- ④ **Confirm the mounting orientation.**  
The mark IN indicates the inlet of fluid and the mark OUT the outlet. The equipment will not operate normally if mounted in the reverse direction.
- ⑤ **Do not block the bleed port.**  
If the bleed port is blocked, the product will not operate properly.

### Mounting

#### Pressure gauge

#### ⚠ Caution

- ① Do not apply impacts to the regulator by dropping or hitting it during transfer or installation.  
It can cause inaccuracy in indication.
- ② Do not install the regulator in an environment of high pressure or high humidity.  
It will cause malfunction or failure.
- ③ When screwing in the pressure gauge, be sure to apply the wrench to the 2 flat chamfered sides of the square. Holding other parts to screw in the pressure gauge may cause air leakage or damage.

### Pressure Adjustment

#### ⚠ Warning

- ① **Do not use tools to turn the pressure regulator knob.**  
The pressure regulator knob may be damaged if handled with tools. Be sure to handle the knob manually.
- ② **Set up the regulator while verifying the pressure that is indicated on the supply and the downstream pressure gauges. Turning the handle excessively could damage the internal parts.**  
Turning the knob excessively will damage the internal parts.

#### ⚠ Caution

- ① **Perform pressure adjustments only after releasing the lock.**  
The pressure regulator knob will not rotate when it is locked. To release the lock, pull out the pressure regulator knob. The knob will be damaged if turned with excessive force.  
Lock the knob again after adjusting the pressure by pressing it down.
- ② **Adjust pressure in an upward direction.**  
A correct pressure setting cannot be achieved by adjusting the pressure downward. Turning the pressure regulator knob clockwise will increase the downstream pressure and turning the knob counterclockwise will decrease it.
- ③ **Confirm the primary pressure.**  
The downstream pressure must be set at 85% or less of the supply pressure. Failure to observe this procedure could cause the downstream pressure to fluctuate.
- ④ **A small amount of fluid is consumed from the bleed port.**  
The bleed mechanism is adopted for high precision pressure adjustment. Therefore, a small amount of fluid is constantly consumed from the bleed port but this is not abnormality.



# Clean Series Clean Gas Filter

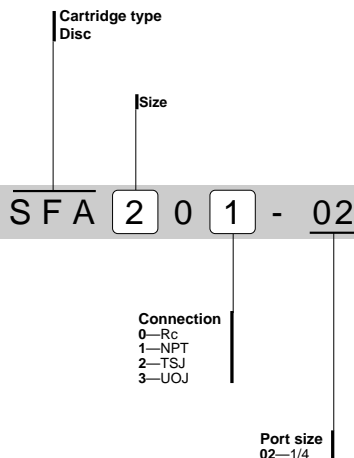
SF□ Clean Gas Filter  
Series SFA/SFB/SFC  
P.650

Clean Gas Filter

# Series SF Clean Gas Filter/Strainer Cartridge Type/Disposable Type

## Cartridge Type/Disc

### How to Order



### Model

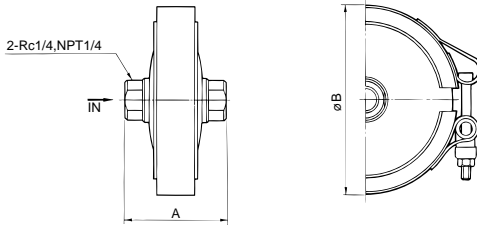
Model	Connection	Filtration area cm <sup>2</sup>	Element part no.	Weight kg
SFA100-02	Rc1/4	13.85	ED001S-X10V	0.34
SFA101-02	NPT1/4			
SFA200-02	Rc1/4	33.18	ED101S-X10V	0.44
SFA201-02	NPT1/4			
SFA300-02	Rc1/4	56.75	ED201S-X10V	0.66
SFA301-02	NPT1/4			
SFA102-02	TSJ1/4 (Tube Swage Joint)	13.85	ED001S-X10V	0.38
SFA202-02		33.18	ED101S-X10V	0.49
SFA302-02		56.75	ED201S-X10V	0.70
SFA103-02	UOJ1/4 (Union O-Ring Joint)	13.85	ED001S-X10V	0.42
SFA203-02		33.18	ED101S-X10V	0.53
SFA303-02		56.75	ED201S-X10V	0.75

### Specifications

<b>Operating pressure</b>		Max.1.0MPa, Vacuum 1.3 X 10 <sup>-6</sup> kPa
<b>Max. operating pressure</b>		80°C
<b>Element proof differential pressure</b>		Max.0.1MPa
<b>Element reverse differential pressure</b>		Max.0.05MPa
<b>Filtration</b>		0.01μm (100% removal of 0.01mm particles)
<b>Main material</b>	<b>Housing</b>	SUS316 (Electrolytic polishing)
	<b>Filter element</b>	PTFE+Polyethylene
	<b>Seal</b>	Fluoro rubber (FPM)

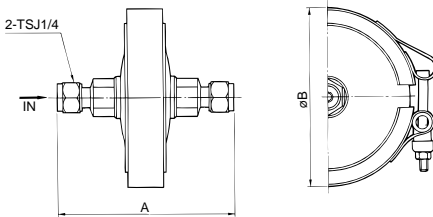
**Dimensions**

SFA100, 101, SFA200, 201, SFA300, 301



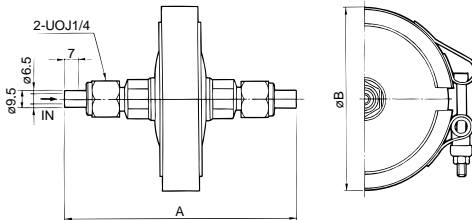
Model	Connection	A	B
SFA100-02	Rc1/4	46	76
SFA101-02	NPT1/4		
SFA200-02	Rc1/4	51	96
SFA201-02	NPT1/4		
SFA300-02	Rc1/4	59	120
SFA301-02	NPT1/4		

SFA102, SFA202, SFA302

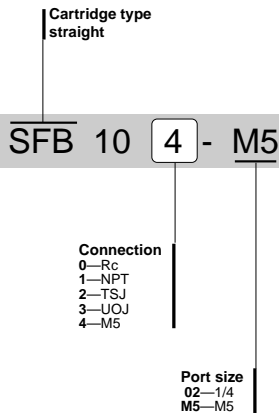


Model	Connection	A	B
SFA102-02	TSJ1/4 (Tube Swage Joint)	89	76
SFA202-02		93	96
SFA302-02		101	120

SFA103, SFA203, SFA303



Model	Connection	A	B
SFA103-02	UOJ1/4 (Union O-ring Joint)	117	76
SFA203-02		122	96
SFA303-02		130	120

**Cartridge Type/Straight****How to Order****Model**

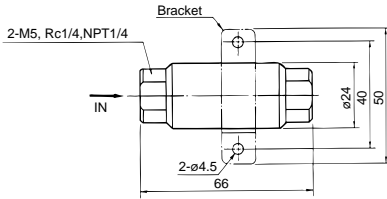
Model	Connection	Filtration area cm <sup>2</sup>	Element part no.	Weight kg
SFB100-02	Rc1/4	10	ED301S-X10V	0.15
SFB101-02	NPT1/4			
SFB102-02	TSJ1/4			0.16
SFB103-02	UQJ1/4			0.19
SFB104-M5	M5			0.16

**Specifications**

<b>Operating pressure</b>		Max.1.0MPa, Vacuum1.3 X 10 <sup>-6</sup> kPa
<b>Max. operating temperature</b>		80°C
<b>Element proof differential pressure</b>		Max.0.5MPa
<b>Element reverse differential pressure</b>		Max.0.07MPa
<b>Filtration</b>		100% removal of 0.01-μm particles
<b>Main material</b>	<b>Housing</b>	SUS316 (Electrolytic polishing)
	<b>Seal</b>	Fluoro rubber (FPM)
	<b>Filter element</b>	PTFE membrane

## Dimensions

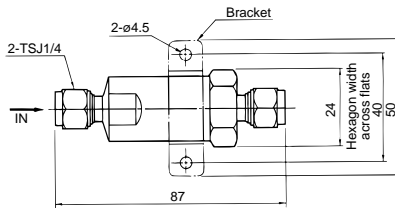
Rc1/4: SFB100  
 NPT1/4: SFB101  
 M5: SFB104



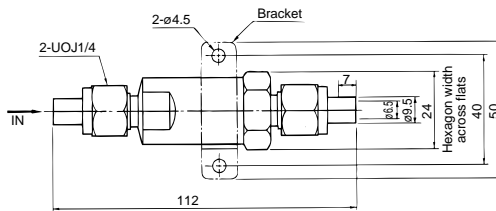
Model	Connection
SFB100-02	Rc1/4
SFB101-02	NPT1/4
SFB104-M5	M5

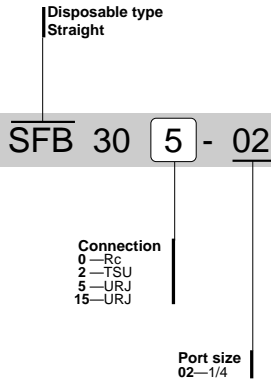
\* The bracket (BP-8S) is attached to standard products.

### TSJ1/4 (Tube Swage Joint) SFB102-02



### UOJ (Union O Ring Joint) SFB103-02



**Disposable Type/Straight****How to Order****Model**

Model	Connection	Filtration area cm <sup>2</sup>	Weight kg
SFB300-02	Rc1/4	10	0.14
SFB302-02	TSJ1/4		0.15
SFB305-02	URJ1/4		0.14
SFB315-02	URJ1/4		0.15

**Specifications**

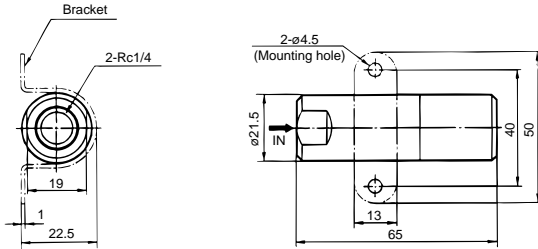
<b>Operating pressure</b>		Max.15MPa, Vacuum1.3 X 10 <sup>-6</sup> kPa
<b>Max. operating temperature</b>		120°C
<b>Element proof differential pressure</b>		Max.0.5MPa
<b>Element reverse differential pressure</b>		Max.0.07MPa
<b>Filtration</b>		100% removal of 0.01µm particles
<b>100% helium leak</b>		4.053 X 10 <sup>-9</sup> Pam <sup>3</sup> /sec or less
<b>Main material</b>	<b>Element</b>	PTFE membrane
	<b>Housing</b>	SUS316 (Electrolytic polishing)
	<b>Bracket</b>	SUS304

\* The SFB315-03 is identical with the Co. M product in dimensions.

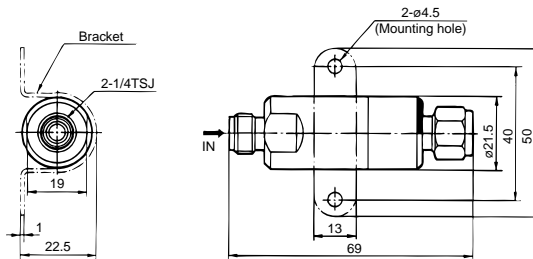


## Dimensions

### Rc1/4: SFB300-02

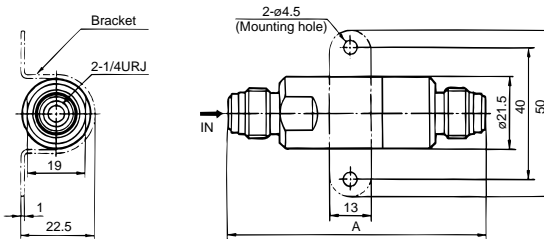


### TSJ1/4 (Tube Swage Joint): SFB302-02

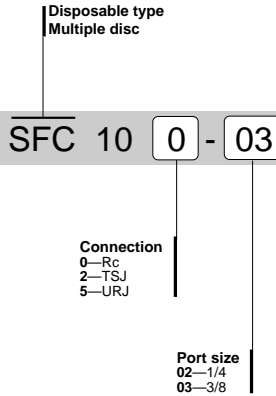


\* The bracket (BP-8S) is attached to standard products.

### URJ1/4 (Union Ring Joint): SFB305-02 SFB315-02



Model	A
SFB305-02	79
SFB315-02	84

**Disposable Type/Multiple Disc****How to Order****Model**

Model	Connection	Filtration area cm <sup>2</sup>	Weight kg
SFC100-02	Rc1/4	300	0.36
SFC100-03	Rc3/8		0.35
SFC102-02	TSJ1/4		0.40
SFC102-03	TSJ3/8		0.41
SFC105-02	URJ1/4		0.44
SFC105-03	URJ3/8		0.49

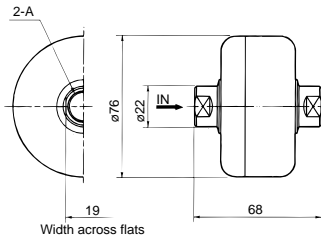
**Specifications**

<b>Operating pressure</b>		Max.1.8MPa, Vacuum1.3 X 10 <sup>-6</sup> kPa
<b>Max. operating temperature</b>		120°C
<b>Element proof differential pressure</b>		Max.0.42MPa
<b>Element reverse differential pressure</b>		Max.0.07MPa
<b>Filtration</b>		100% removal of 0.01-μm particles
<b>100% helium leak</b>		4.053 X 10 <sup>-9</sup> Pam <sup>3</sup> /sec
<b>Main material</b>	<b>Element</b>	PTFE membrane, PVDF holder
	<b>Housing</b>	SUS316 (Electrolytic polishing)
	<b>O-ring</b>	PTFE

## Dimensions

Rc1/4: SFC100-02

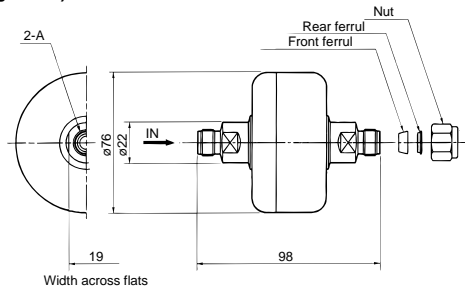
Rc3/8: SFC100-03



Model	A
SFC100-02	Rc1/4
SFC100-03	Rc3/8

TSJ1/4 (Tube Swage Joint): SFC102-02

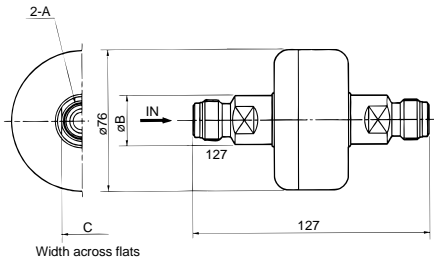
TSJ3/8 (Tube Swage Joint): SFC102-03



Model	A
SFC102-02	TSJ1/4
SFC102-03	TSJ3/8

URJ1/4 (Union Ring Joint): SFC105-02

URJ3/8 (Union Ring Joint): SFC105-03



Model	A	B	C
SFC105-02	URJ1/4	22	19
SFC105-03	URJ3/8	26.5	22

## ⚠ Specific Product Precautions

**Be sure to read before handling.**  
**Refer to pages 7 to 16 of Front matter for safety instructions and common precautions for clean series.**

### Design

#### ⚠ Caution

- ① The clean gas filter is intended to remove solid particles in gas and cannot remove mist of drain, oil, etc. Remove mist in gas sufficiently using SMC's air cleaning system.
- ② Design a layout which will prevent occurrence of reverse pressure and reverse flow. Reverse pressure and reverse flow could cause damage to the filter element.

### Selection

#### ⚠ Warning

- ① Confirm thoroughly and carefully the purpose of use, required specifications and operating conditions (fluid, pressure, flow rate, temperature and environment) to select a model within the specifications.
- ② Do not use for caisson shields, breathing, medical treatment or for blowing of medicine or food products which will enter the human body.  
 The clean gas filter is for microfiltration of various gases in light electric appliance or semiconductor manufacturing device manufacturers. Please confirm with SMC when it is to be used for other purposes.

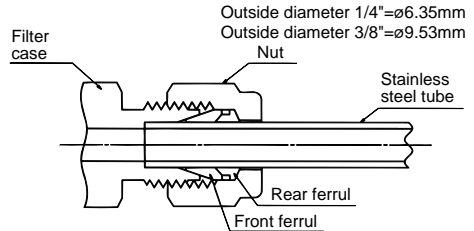
#### ⚠ Caution

- ① Set a flow capacity for a 0.02MPa or less initial pressure drop. If initial pressure drop is set high, the life time of the product may be shortened due to clogging.

### Piping

#### ⚠ Caution

- ① Since the filter and replacement element are sealed in a double bag in a clean room, the package should be opened in a clean room or a clean environment.
- ② Install and mount the filter while providing sufficient space for maintenance and inspection.
- ③ Use an air blower to thoroughly flush the piping or wash the piping to remove any cutting chips, cutting oil, or debris from inside the piping before connecting them.
- ④ Confirm IN and OUT before piping.
- ⑤ Apply a wrench to 2 chamfered flats on the IN side or the OUT side to prevent rotation of the housing.
- ⑥ Connection
  - 1) Rc and NPT connection  
 Make sure that cutting chips or sealing material on the threaded portion will not enter the piping. When a seal tape is used, leave 1.5 to 2 thread ridges exposed at the end of the male thread.
  - 2) TSJ connection  
 The TSJ fitting is a kind of self-align fittings. Set it as shown in the figure.



After tightening the nut by hand, add another 1/4 to 1 1/2 turns with a wrench to seal the fitting. In case the fitting is re-installed after filter replacement, first tighten the nut by hand and add another 1/4 to 1/2 turn for sealing. Use the following parts as piping and fittings.

- Piping Outside diameter 1/4"=ø6.35mm SUS316 tube  
 or  
 Outside diameter 3/8"=ø9.53mm SUS316 tube

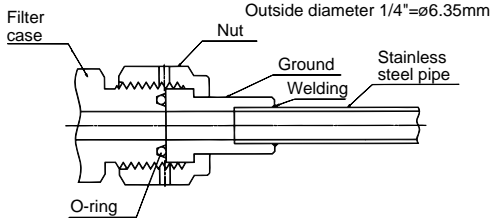
- Nut
  - Front ferrul
  - Rear ferrul
- } Attached to product (2 pcs each)

When using similar fittings of other brands, be sure to conduct a helium leak test before use.

## Piping

### 3) UOJ fittings

The UOJ fitting is a union type fitting using an O-ring seal. Install it as illustrated below.



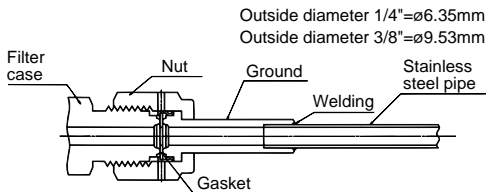
Weld the gland and piping when the fitting is used. At the time of welding, supply inert gas such as  $N_2$  to the piping to prevent formation of oxide film. Also Remove the oxide film on the external surface by applying electrolytic polishing or acid cleaning.

After tightening the nut by hand, add another 1/8 turn with a wrench to seal the fitting. Use the following parts as piping and fittings.

- A) Piping Outside diameter 1/4"=ø6.35mm SUS316 tubing
- B) Nut
- C) Grand } Attached to product (2 pcs each)
- D) O-ring }

### 4) URJ connection

The URJ fitting is a union type fitting using a metal gasket. Install it as illustrated below.



Weld the ground and piping when the fitting is used. At the time of welding, supply inert gas such as  $N_2$  to the piping to prevent formation of oxide film. Also Remove the oxide film on the external surface by applying electrolytic polishing or acid cleaning.

After tightening the nut by hand, add another 1/8 turn with a wrench to seal the fitting.

Use the following parts as piping and fittings.

<1/4">

- Piping O.D. 1/4"=ø6.35mm SUS316 tubing
- Nut VCR® fittings by CAJON  
VCR female nut (SS-4-VCR-1)
- Grand VCR® fittings by CAJON  
VCR grand (SS-4-VCR-3)
- Gasket VCR® fittings by CAJON  
VCR gasket retainer assembly (SS-4-VCR-2-GR)

<3/8">

- Piping O.D. 3/8"=ø9.35mm SUS316 tubing
- Nut VCR® fittings by CAJON  
VCR female nut (SS-8-VCR-1)
- Grand VCR® fittings by CAJON  
VCR grand (SS-8-VCR-3)
- Gasket VCR® fittings by CAJON  
VCR gasket retainer assembly (SS-8-VCR-2-GR)

When using similar fittings of other brands, be sure to conduct a helium leak test before use.

### ⑦ Line flushing

Flush the piping line when the filter is used for the first time or has been replaced. Although all products have passed the 0.1  $\mu$ m cleanliness test, leakage of 0.1  $\mu$ m or larger particles can be expected at the initial use due to influences of vibration during transportation. Line flushing is also required to eliminate contamination during piping line installation. Therefore, be sure to conduct line flushing before actually running the system. When toxic, corrosive or flammable gas is used, after mounting the filter, conduct sufficient line flushing with dry inert gas such as  $N_2$  gas, followed by helium leak tests on the fittings before actually running the product.

### ⑧ Filter replacement (or element replacement)

Release gas from the piping to make the internal pressure 0. If toxic, corrosive or flammable gas is used, replace it with dry  $N_2$  gas by a purge in advance. The guideline for filter (element) replacement is 0.1 MPa of differential pressure between IN and OUT.

## Operating fluid

### ⚠ Warning

#### ① Use general gas with no toxicity or corrosiveness with the cartridge type.

Depending on the fluid, deterioration of the packing and O-ring and consequent leakage may result.

Model Series SFA

Series SFB10, 20

#### ② The disposable type can be used with various process gases for semiconductor manufacturing. However, when a corrosive gas is used, the advisability of its use and appropriate period of operation should be determined after thorough review of the compatibility of the corrosive gas with the housing material (SUS316). Following is a list of major corrosive gases for reference.

Major corrosive gases	
Hydrogen chloride (HCl)	Phosphorus trifluoride (PF <sub>3</sub> )
Chlorine gas (Cl <sub>2</sub> )	Phosphorus pentafluoride (PF <sub>5</sub> )
Phosphorus trichloride (PCl <sub>3</sub> )	Arsenic trichloride (AsCl <sub>3</sub> )
Dichlorosilane (SiH <sub>2</sub> Cl <sub>2</sub> )	Tetrachloride (SnCl <sub>4</sub> )
Trichlorosilane (SiHCl <sub>3</sub> )	Oxy-salt phosphorus (POCl <sub>3</sub> )
Boron trifluoride (BF <sub>3</sub> )	

Depending on the fluid, deterioration of the housing and consequent leakage may result.

Model Series SFB30

Series SFC



**Alphabet Index**  
**Product Series Index**  
**(Alphabetical Order)**

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## Revisions

### 2nd Edition

- **Series Added**
  - **Actuator**  
Series 10-CBM2, 10-REC, 10-CXSL, 10-MGPL, 10-MGF, 12-CY1B, 12-CY1R, 12-REA, 11-MSQ, 11-MHR2•3, 11-MHL2
  - **Directional Control Valve**  
Series 10-SYJ, 10-SY100, 10-VQ100, 10-VQD1000
  - **Air Line Equipment**  
Series 10-AFM, 10-AFD, 10-ARP, 10-AWM, 10-AWD
  - **Air Purification Equipment**  
Series 10-AMD, 10-IDG
  - **Pressure Switch**  
Series 10-PSE, 10-ZSE/ISE
  - **Clean Regulator**  
Series SR
  - **Clean Gas Filter**  
Series SF
- **Addition of Safety Instructions**
- **Series Removed**
  - **Directional Control Valve**  
Series 10-VZ

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### 3rd Edition

- **Series Added**
  - **Actuator**  
Series 10-CUJ, 10-CXSJ, 11-MXP, 11-MXPJ6, 13-MXQ, 13-MXS, CYP, 10-CQSX, 10-CQ2X, 10-CM2X, 11-MHZZ
  - **Directional Control Valve**  
Series 10-SZ3000, 10-SQ1000/2000
  - **Air Line Equipment**
    - <Speed controller>  
Series AS-FPG/FPQ, 10-AS-FG (Universal, In-line ), 10-ASD, 10-AS-FM, 10-ASD-FM
    - <Regulator>  
Series 10-IR1000/2000/3000
    - <Fittings & Tubing>  
Series KP/KPQ/KPG, TPH, TPS
  - **Air Purification Equipment**  
Series AMP220/320/420
  - **Pressure Switch**  
Series 10- ZSE40/ISE40
  - **Clean Regulator**  
Series SRH3000/4000, SRP1000
- **Series Removed**
  - **Pressure Switch**  
Series 10- ZSE4E/ISE4E
  - **Clean Regulator**  
Series SR1000/3000/4000

EZ

## Pneumatic Clean Series

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50YG

Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.



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