Card Motor
Series LAT3

CE
RoHS

The transportation, pushing and length measurement systems have been miniaturized through the use of a linear motor.

Weight
130 g
Stroke: 10 mm

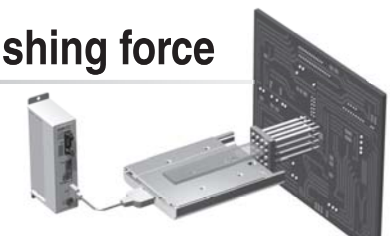
Thickness
9 mm

Linear guide **Linear motor** **Displacement sensor**

3 functions in 1 unit

Maximum pushing force
6 N

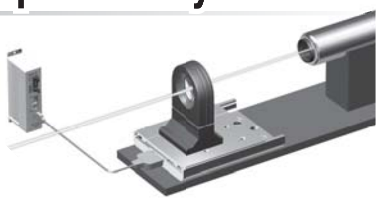
Pushing a miniature load



Example) Pushing a probe pin

Positioning repeatability
±5 μm

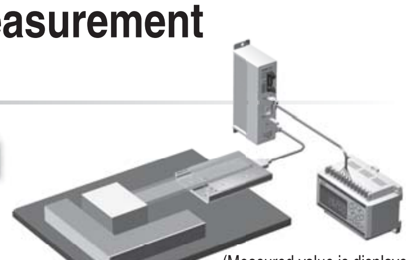
Positioning a workpiece



Example) Lens focusing

Pushing measurement accuracy
±10 μm

Parts measurement



(Measured value is displayed)

Load mass 100 g, Stroke 5 mm

Maximum operating frequency
500 cpm

Rejection of non-conforming products, etc.

- **Easy programming (Cycle time entry)**

Just input 3 parameters: Positioning time, Target position, Load mass.

New controllers added

Controller	Pulse input	Step data input
Series LATCA	●	●
Series LATC4		●

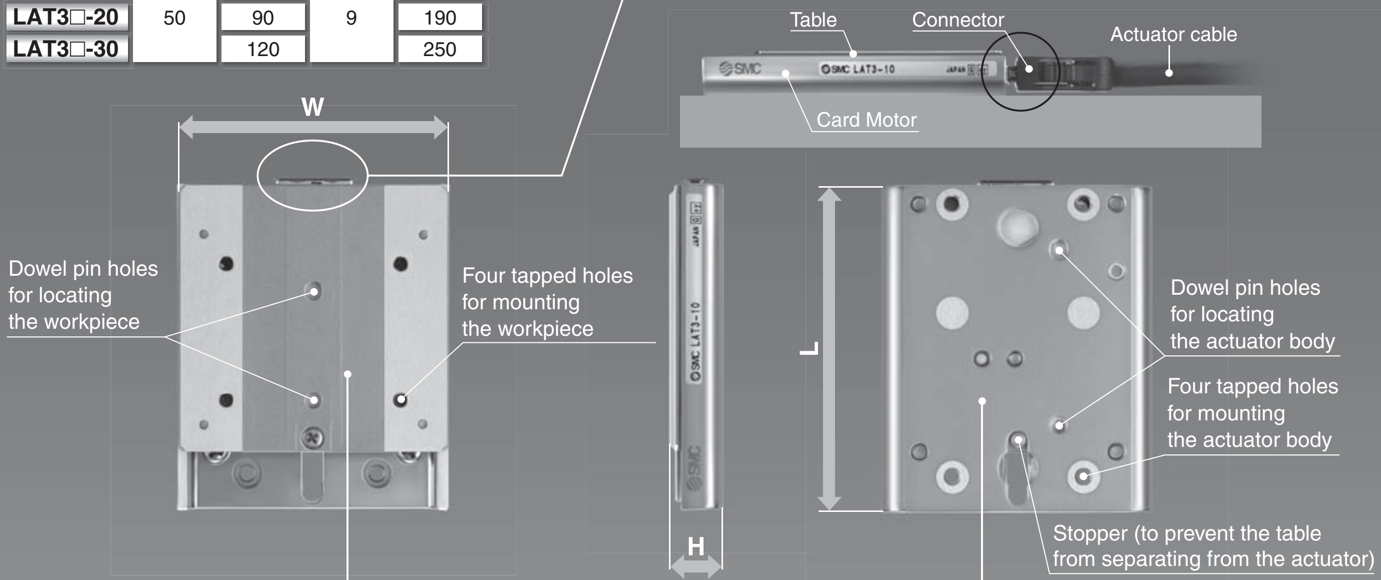
LEFS LEFB
LEJS LEJB
LEL
LEM
LEY LEYG
LES LESH
LEPY LEPS
LER
LEH
LEY-X5
11-LEFS
11-LEJS
25A-
LEC□
LECS□
LECSS-T
LECYM LECYU
Motorless
LAT3

Compact and lightweight

Model	W (mm)	L (mm)	H (mm)	Weight (g)
LAT3□-10	50	60	9	130
LAT3□-20		90		190
LAT3□-30		120		250

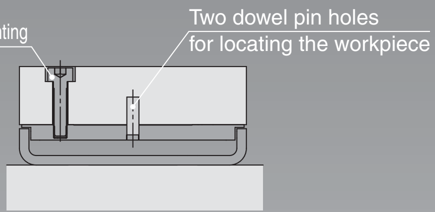
Cable Mounting

The cable connector does not protrude above the actuator.



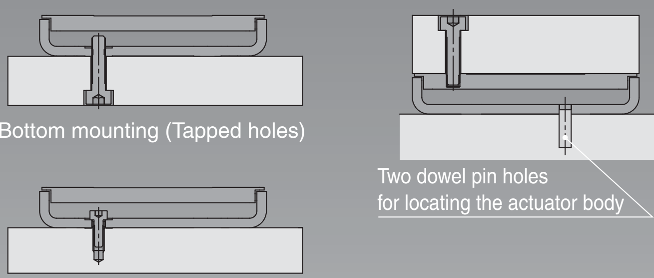
Workpiece Mounting

The table is provided with dowel pin holes for locating the workpiece as standard equipment.



Body Mounting

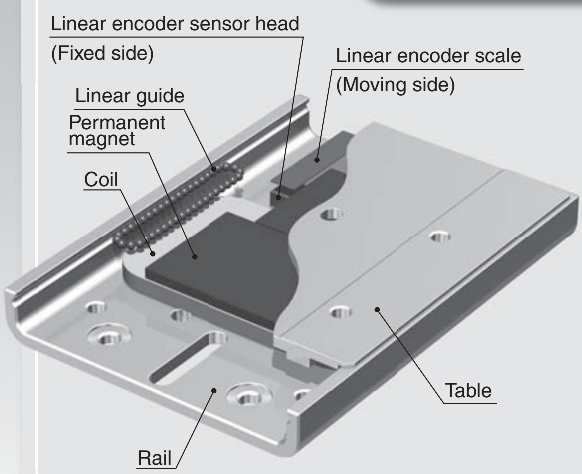
2 body mounting options



Series Variations

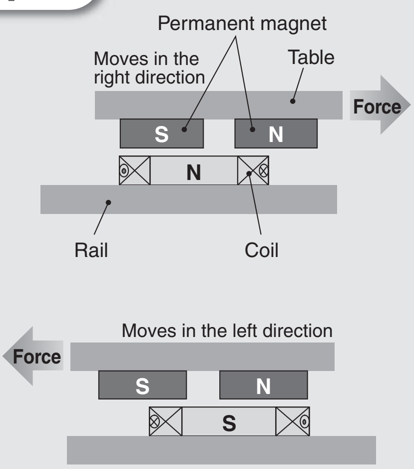
Model	Stroke	Sensor (Optical linear encoder)	Linear motor	Linear guide	Pushing	Positioning repeatability	Pushing measurement	Maximum load mass		Maximum speed
		Resolution	Type	Type	Maximum instantaneous thrust	Accuracy	Accuracy	Horizontal	Vertical	
LAT3F	10	1.25 µm	Moving magnetic type linear motor	Linear guide with circulating balls	5.2 N	±5 µm	±10 µm	500 g	100 g	400 mm/s
	20				6 N					
LAT3	30	30 µm			5.5 N	±90 µm	±100 µm		50 g	

Structure and Working Principle



The permanent magnet is mounted on the bottom side of the table, and the coil is mounted on the top surface of the rail. When current is supplied to the coil, a north pole (N) is generated in the middle of the top surface of the coil. This north pole attracts the south pole (S) of the permanent magnet on the left and repels the north pole on the right, and these attracting and repelling forces generate the thrust force. Therefore, thrust force is applied to the table in the right direction, and the table moves to the right.

When current is applied to the coil in the reverse direction, a south pole will be generated in the middle of the top surface of the coil. Similarly, a thrust force will be applied to the table in the left direction, and the table moves to the left.

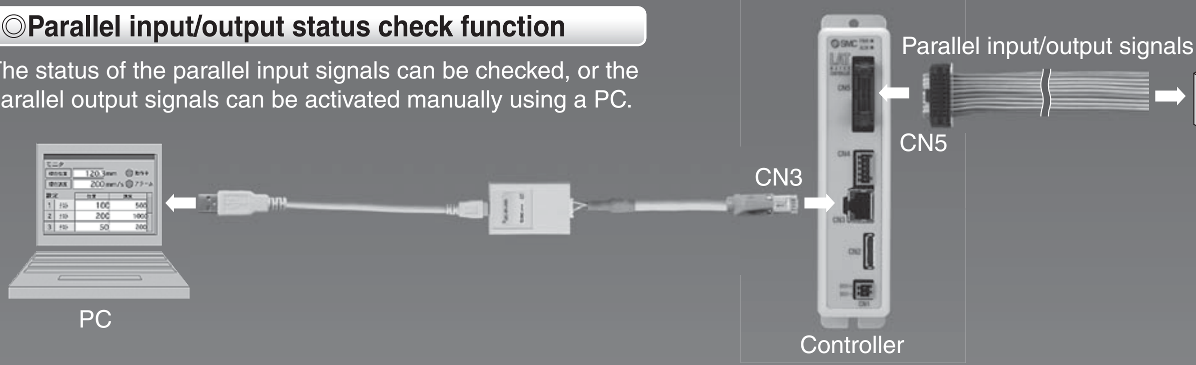


Start-up time is reduced greatly with a system that is ready-to-use and easy to set up.

The functions described below makes the start-up quick and easy.

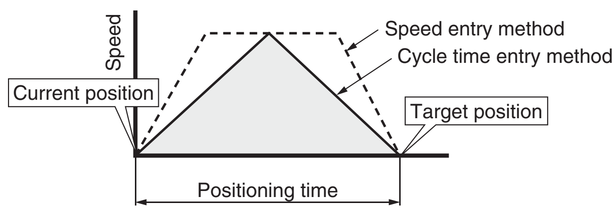
◎Parallel input/output status check function

The status of the parallel input signals can be checked, or the parallel output signals can be activated manually using a PC.



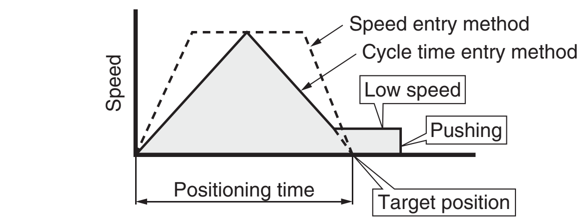
◎Built-in operation patterns

Positioning operation (Absolute • Relative)



Absolute: The table moves to the target position with reference to the origin position and stops there.
Relative : The table moves to the target position with reference to the current position and stops there.

Pushing operation (Absolute • Relative)



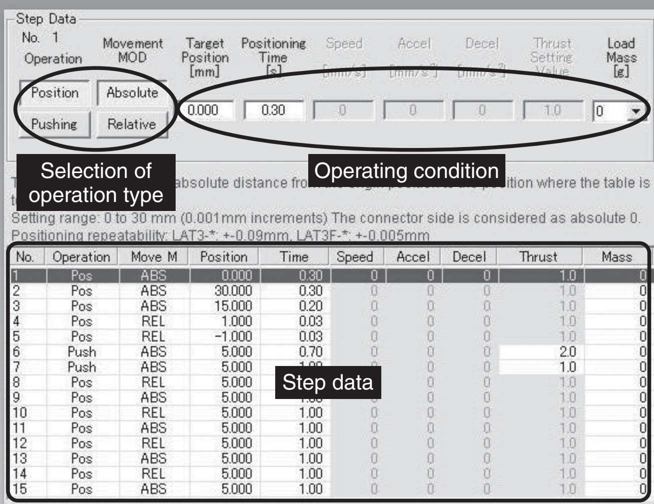
The table moves to a position close to the target position, decelerates to low speed and starts pushing after the table has come in contact with the workpiece.

◎Cycle time entry method

Only target position and positioning time need to be entered, so there is no need to enter the speed, acceleration and deceleration.
(Using the speed entry method allows you to enter the speed, acceleration and deceleration.)

◎Step data input

The Card Motor operation type and condition are preset in the step data. The Card Motor is operated according to the contents of the selected preset step data number.



No.	Operation	Move M	Position	Time	Speed	Accel	Decel	Thrust	Mass
1	Pos	ABS	0.000	0.30	0	0	0	1.0	0
2	Pos	ABS	30.000	0.30	0	0	0	1.0	0
3	Pos	ABS	15.000	0.20	0	0	0	1.0	0
4	Pos	REL	1.000	0.03	0	0	0	1.0	0
5	Pos	REL	−1.000	0.03	0	0	0	1.0	0
6	Push	ABS	5.000	0.70	0	0	0	2.0	0
7	Push	ABS	5.000	[illegible]	[illegible]	0	0	1.0	0
8	Pos	REL	5.000	[illegible]	[illegible]	0	0	1.0	0
9	Pos	ABS	5.000	[illegible]	[illegible]	0	0	1.0	0
10	Pos	REL	5.000	1.00	0	0	0	1.0	0
11	Pos	ABS	5.000	1.00	0	0	0	1.0	0
12	Pos	REL	5.000	1.00	0	0	0	1.0	0
13	Pos	ABS	5.000	1.00	0	0	0	1.0	0
14	Pos	REL	5.000	1.00	0	0	0	1.0	0
15	Pos	ABS	5.000	1.00	0	0	0	1.0	0

Function for measuring and differentiation of workpieces

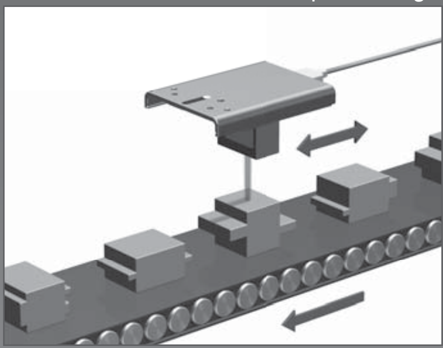
The size of the workpiece can be measured based on the table stopping position by driving the table until it comes into contact with the workpiece. The workpieces can be differentiated or checked for quality using parallel output signals that correspond to preset table position ranges. Furthermore, using the multi-counter (optional accessory: refer to page 895) makes it possible to display the table position and output up to 31 preset points.

Application Examples of Card Motor

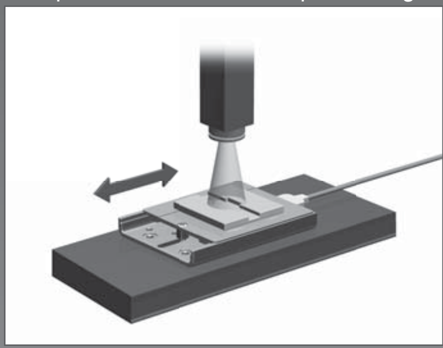
The applications described below are just a few examples.
When using the Card Motor, select an appropriate model by carefully checking the specifications.

Examples of positioning applications

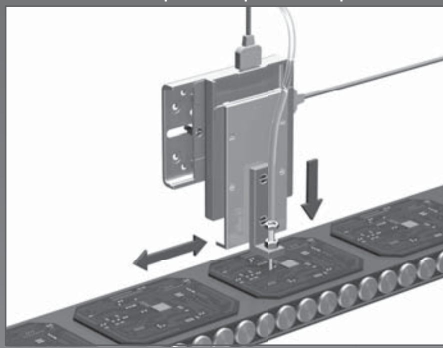
Sensor head movement and positioning



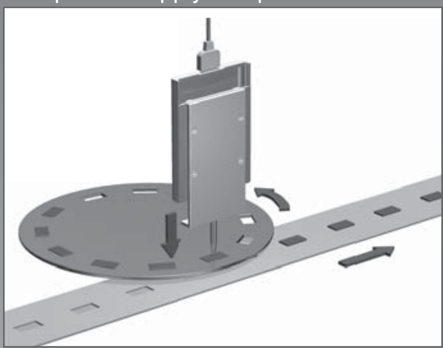
Component movement and positioning



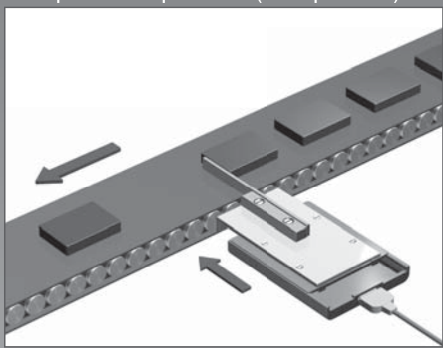
Electronic component pick and place



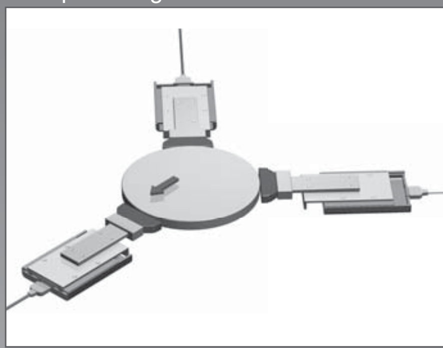
Component supply to tape



Component separation (escapement)

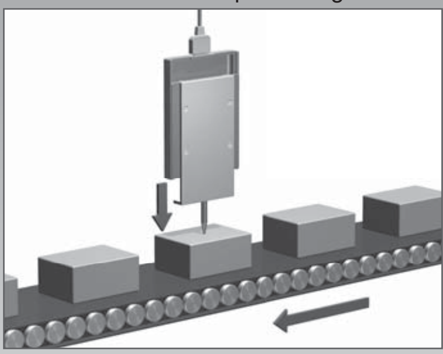


Workpiece alignment

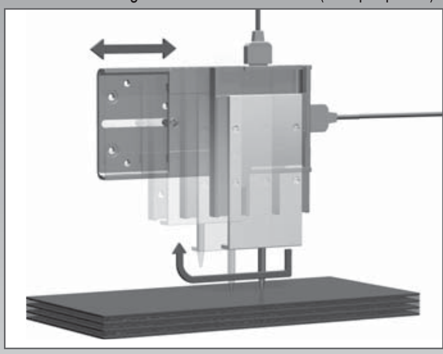


Examples of measurement applications

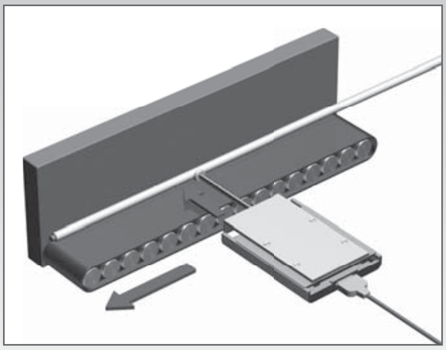
Measurement of workpiece height



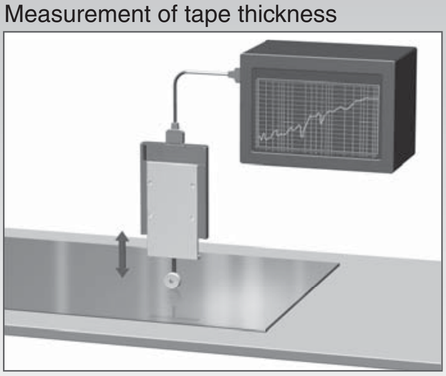
Measurement of glass substrate thickness (multiple points)



Measurement of cable outside diameter

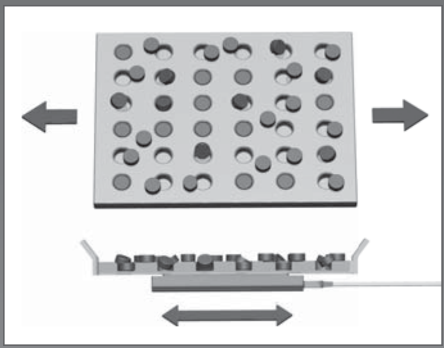


Measurement of tape thickness

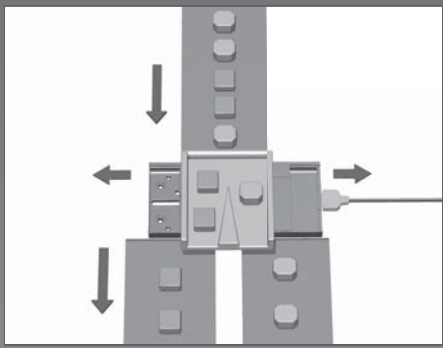


Examples of high frequency actuation

Alignment of components on pallet by vibration

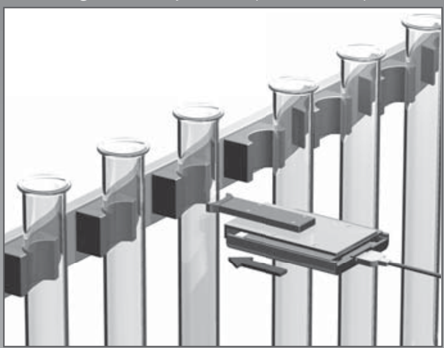


Distribution of workpieces

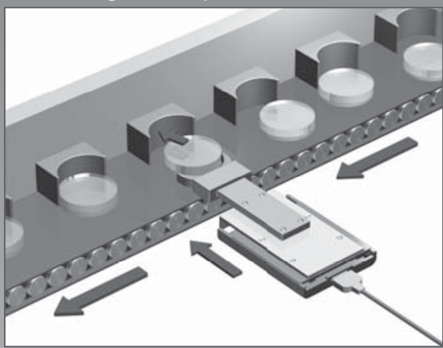


Examples of pushing applications

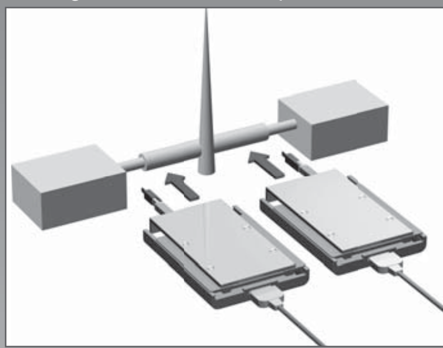
Pushing of workpieces (soft touch)



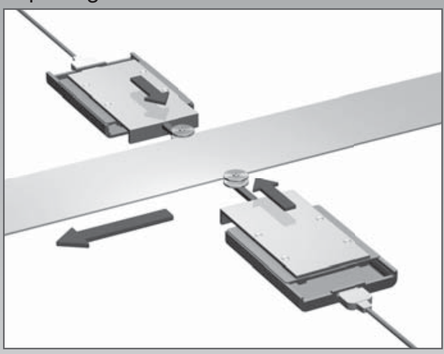
Positioning of workpieces



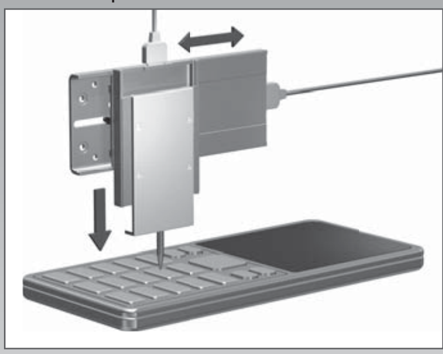
Cutting of resin mold component runners



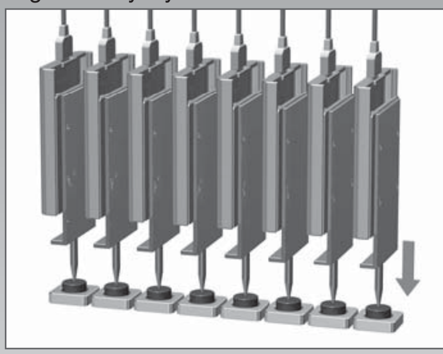
Tape alignment



Switch inspection



High-density layout



Model Selection 1

Selection Procedure for Positioning Operation (Refer to pages 867 and 868 for Fig.1, 2, 3, 4, 5 and Table 1, 2, 3.)

Selection Procedure	Formula/Data	Selection Example

1 Operating conditions

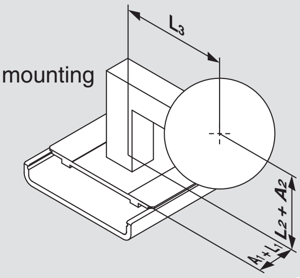
Selection Procedure: List the operating conditions with consideration to the mounting orientation and shape of the workpiece.

Formula/Data:

- Stroke St [mm]
- Load mass W [g]
- Mounting orientation
- Mounting angle θ [°] Fig.2
- Amount of overhang Ln [mm] Fig.1
- Correction values for the distances to the moment center An [mm] Fig.1 Table 1
- Positioning time Tp [ms]
- Positioning repeatability [µm]

Selection Example:

15 mm
200 g
Horizontal table mounting
$\theta = 0°$
$L_1 = -10$ mm
$L_2 = 30$ mm
$L_3 = 35$ mm
$Tp = 200$ ms
100 µm



2 Select an actuator temporarily.

Selection Procedure: Select a model temporarily based on the required positioning repeatability and stroke.

Formula/Data: Table 2

Selection Example: From Table 2, temporarily select the **LAT3-20**, which satisfies the positioning repeatability 100 µm and the minimum stroke that satisfies the stroke St = 15

Model	LAT3-10	LAT3F-10	LAT3-20	LAT3F-20	LAT3-30	LAT3F-30
Stroke [mm]	10		20		30	
Positioning repeatability [µm]	±90	±5	±90	±5	±90	±5

3 Check the load mass and load factor.

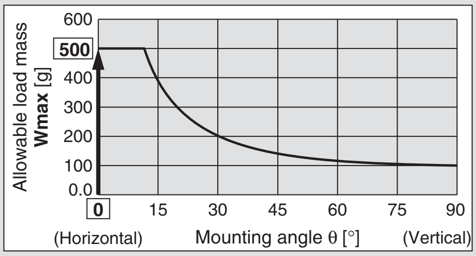
Selection Procedure: Find the allowable load mass Wmax [g] from the graph.

∗Confirm that the applied load mass W [g] does not exceed the allowable load mass.

Formula/Data: Wmax Fig.2

$W \leq Wmax$

Selection Example: From Fig. 2: $\theta = 0$, find Wmax = 500
As W = 200 < Wmax = 500, the selected model can be used.



Selection Procedure: From Table 1, find the correction values for the distances to the moment center. Calculate the static moment M [N·m]. From Table 3, find the allowable moment Mmax [N·m]. Calculate the load factor αn for the static moments.

∗Confirm that the total sum of the guide load factors for the static moments does not exceed 1.

Formula/Data:

An Table 1

$M = W/1000 \cdot 9.8\ (Ln + An)/1000$

Mmax Table 3

$\alpha = M/Mmax$

$\Sigma\alpha p + \alpha y + \alpha r \leq 1$

Selection Example: From Table 1, $A_1 = 32.5$

Pitch moment

$Mp = 200/1000 \times 9.8\ (-10 + 32.5)/1000 = 0.044$

From Table 3, Mpmax = 0.3

$\alpha p = 0.044/0.3 = 0.15$

Roll moment

$Mr = 200/1000 \times 9.8 \times 35/1000 = 0.069$

From Table 3, Mrmax = 0.2

$\alpha r = 0.069/0.2 = 0.35$

$\Sigma\alpha n = 0.15 + 0.35 = 0.5 \leq 1$, thus, the selected model can be used.

4 Check the positioning time.

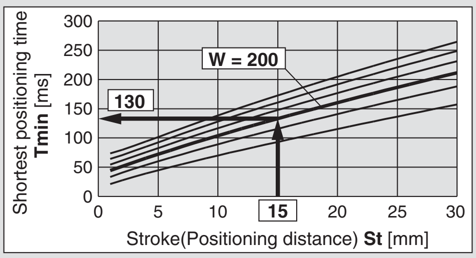
Selection Procedure: Find the shortest positioning time Tmin [ms] from the graph.

∗Confirm that the positioning time Tp [ms] is longer than the shortest positioning time.

Formula/Data: Tmin Fig.3

$Tp \geq Tmin$

Selection Example: From Fig. 3: St = 15 and W = 200, find Tmin = 130
As Tp = 200 ≥ Tmin = 130, the selected model can be used.



Selection Procedure for Pushing Operation

Selection Procedure	Formula/Data	Selection Example

❶ Operating conditions

Selection Procedure: List the operating conditions with consideration to the mounting orientation and shape of the workpiece.

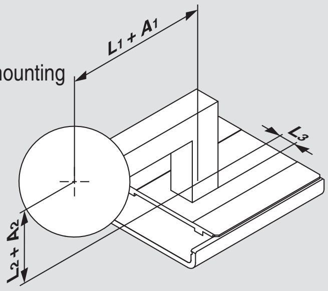
∗When operating the product in a vertical direction, consider the effect of the table weight on the Card Motor (See Table 2) and the weight of the workpiece to find out the pushing force of the Card Motor.

Formula/Data:

- Stroke St [mm]
- Load mass W [g]
- Mounting orientation
- Mounting angle θ [°]
- Amount of overhang (L1, L2, L3) [mm] **Fig.1**
- Correction values for the distances to the moment center An [mm] **Fig.1** **Table 1**
- Measuring accuracy [μm]
- Positioning time Tp [ms]
- Pushing force F [N]
- Pushing position [mm]
- Pushing direction
- Positioning time + Pushing time Ta [s]
- Cycle time Tb [s]

Selection Example:

8 mm
50 g
Horizontal table mounting
θ = 0°
L1 = 30 mm
L2 = 10 mm
L3 = 0 mm
10 μm
Tp = 150 ms
4 N
4 mm
Pushing direction away from the connector
4 s
10 s



❷ Select an actuator temporarily.

Selection Procedure: Select a model temporarily based on the required measuring accuracy and stroke.

Formula/Data: **Table 2**

Model	LAT3-10	LAT3F-10	LAT3-20	LAT3F-20	LAT3-30	LAT3F-30
Stroke [mm]	10		20		30	
Measuring accuracy [μm]	30	1.25	30	1.25	30	1.25

Selection Example: From Table 2, temporarily select the **LAT3F-10**, which satisfies the measuring accuracy 10 μm and the minimum stroke that satisfies the stroke St = 8

❸ Check the load mass and moment.

Selection Procedure: Find the allowable load mass Wmax [g] from the graph.

∗Confirm that the applied load mass W [g] does not exceed the allowable load mass.

From Table 1, find the correction values for the distances to the moment center. Calculate the static moment M [N·m].

From Table 3, find the allowable moment Mmax [N·m]. Calculate the load factor αn for the static moments.

∗Confirm that the total sum of the guide load factors for the static moments does not exceed 1.

Formula/Data:

Wmax **Fig.2**

$W \leq Wmax$

An **Table 1**

$M = W/1000 \cdot 9.8\ (Ln + An)/1000$

Mmax **Table 3**

$\alpha = M/Mmax$

$\Sigma\alpha p + \alpha y + \alpha r \leq 1$

Selection Example:

From Fig. 2: θ = 0, find Wmax = 500
As W = 50 < Wmax = 500, the selected model can be used.

From Table 1, $A_1 = 22.5$

Pitch moment

$Mp = 50/1000 \times 9.8\ (30 + 22.5)/1000 = 0.026$

From Table 3, Mpmax = 0.2

$\alpha p = 0.026/0.2 = 0.13$

$\Sigma\alpha n = 0.13 \leq 1$, thus, the selected model can be used.

❹ Check the positioning time.

Selection Procedure: Find the shortest positioning time Tmin [ms] from the graph.

∗Confirm that the positioning time Tp [ms] is longer than the minimum positioning time.

Formula/Data:

Tmin **Fig.3**

$Tp \geq Tmin$

Selection Example: From Fig. 3: St = 8 and W = 50, find Tmin = 100
As Tp = 150 ≥ Tmin = 100, the selected model can be used.

❺ Check the pushing force.

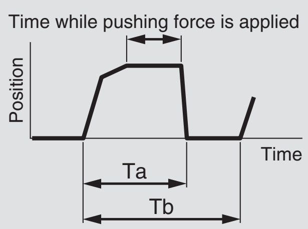
Selection Procedure: Calculate the duty ratio [%].

Find the allowable thrust setting value from the graph.
From Fig. 5, find the allowable pushing force Fmax [N] generated at the required pushing position and for the allowable thrust setting value.
Confirm that the pushing force F [N] does not exceed the allowable pushing force.

Formula/Data:

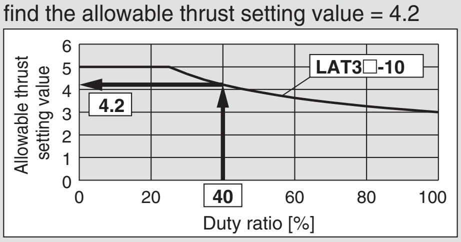
Duty ratio = Ta/Tb x 100 **Fig.4**

$F \leq Fmax$



Selection Example:

Duty ratio = 4/10 x 100 = 40%
From Fig. 4: **LAT3□-10** and 40% duty ratio, find the allowable thrust setting value = 4.2



From Fig. 5: **LAT3□-10**, pushing direction away from the connector at pushing position 4 mm, find Fmax = 4.5
As F = 4 ≤ Fmax = 4.5, the selected model can be used.

LEFS LEFB | LEJS LEJB | LEL | LEM | LEY LEYG | LES LESH | LEPY LEPS | LER | LEH | LEY-X5 | 11-LEFS | 11-LEJS | 25A- | LEC□ | LECS□ | LECSS-T | LECYM LECYU | Motorless | LAT3

Model Selection 2

Selection

⚠Caution

1. The temperature increase of the Card Motor varies depending on the duty ratio and the heat dissipation properties of the base it is mounted onto. If the temperature of the Card Motor becomes high, reduce the duty ratio by increasing the cycle time, or improve the heat transfer properties of the mounting base and the surroundings.
2. The pushing force generated by the Card Motor varies in relation to the thrust setting value depending on the pushing position and the pushing direction. Refer to Fig. 5 for details.

Fig. 1 Amount of Overhang: Ln [mm], Correction Value for the Distances to the Moment Center: An [mm]

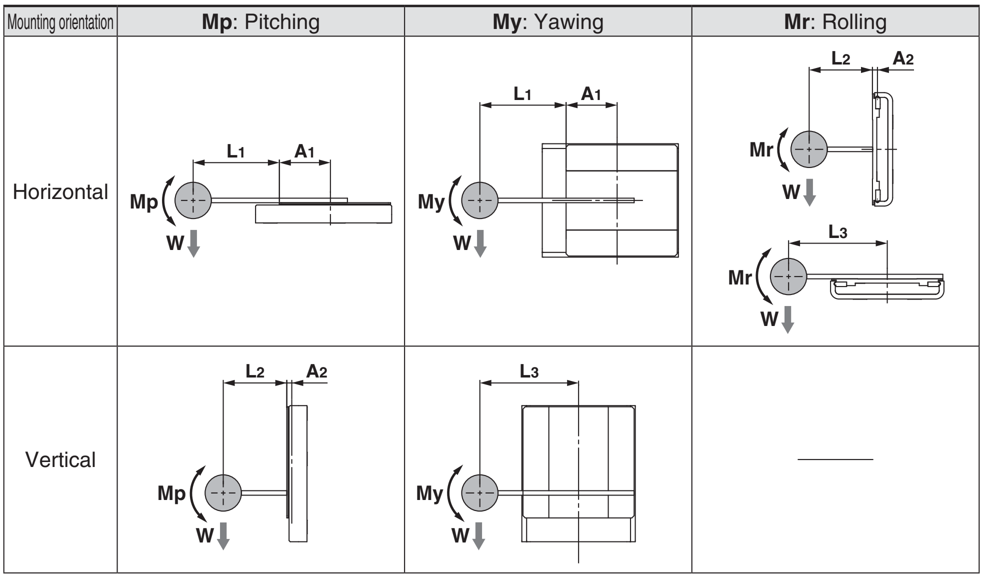


Table 1 Correction Value for the Distances to the Moment Center: An [mm]

Model	A_1	A_2
LAT3□-10	22.5	2.2
LAT3□-20	32.5	2.2
LAT3□-30	42.5	2.2

Fig. 2 Allowable Load Mass: Wmax [g]

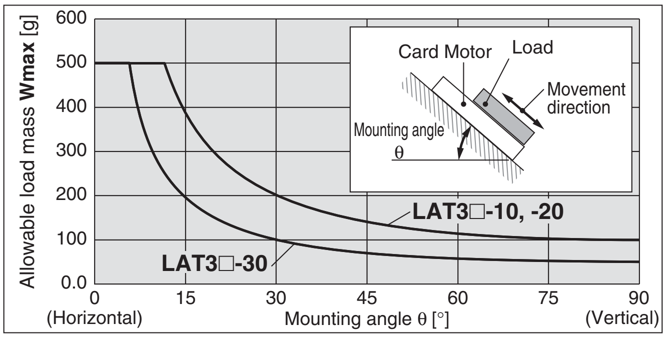
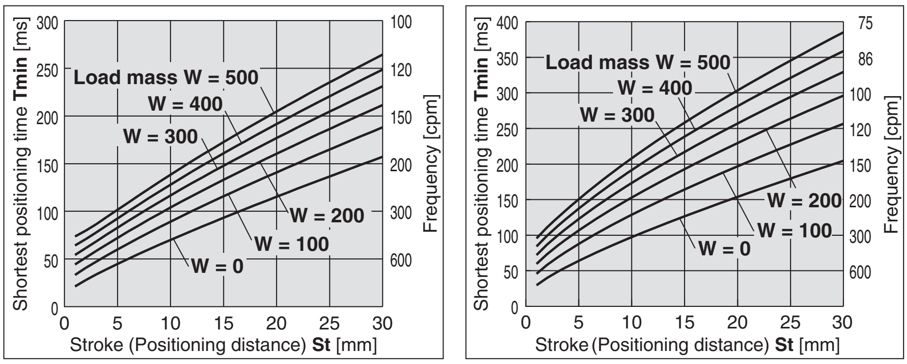


Fig. 3 Shortest Positioning Time: Tmin [ms] (These are only reference values.)

LAT3-□ LAT3F-□



Operating conditions
Model: LAT3-□
Mounting orientation: Horizontal/Vertical
Step data input version: Cycle time entry method (Triangular movement profile)

Operating conditions
Model: LAT3F-□
Mounting orientation: Horizontal/Vertical
Step data input version: Cycle time entry method (Triangular movement profile)

Fig. 4 Allowable Thrust Setting Value

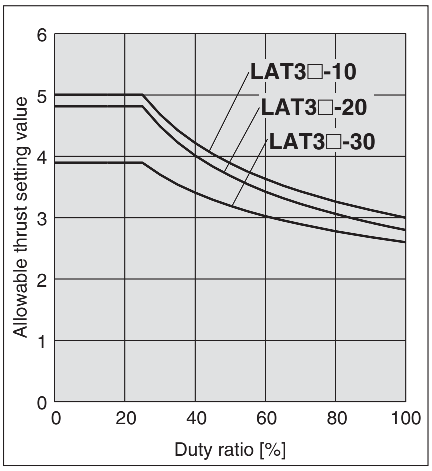
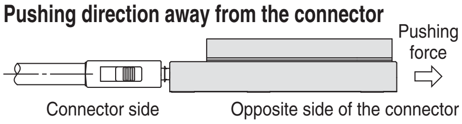


Fig. 5 Pushing force: F [N] characteristics (Reference)

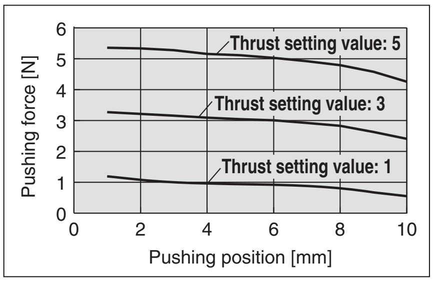
Pushing direction away from the connector



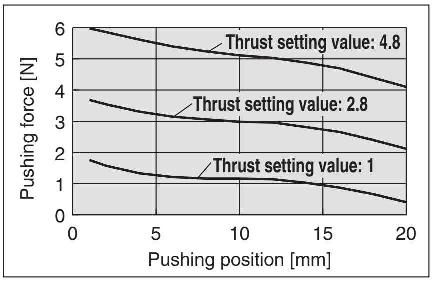
Operating conditions
Mounting orientation: Horizontal table mounting
Thrust setting value: Minimum, continuous, instantaneous maximum of each model.

Table start position: Retracted end (Connector side)
Pushing direction: Away from the connector
Pushing position: Positioning distance from the connector side, retracted end

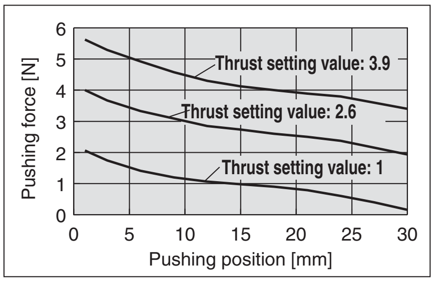
LAT3□-10



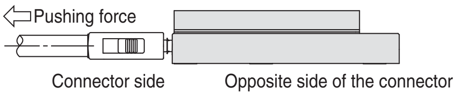
LAT3□-20



LAT3□-30



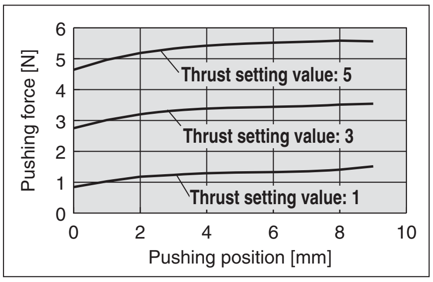
Pushing direction toward the connector



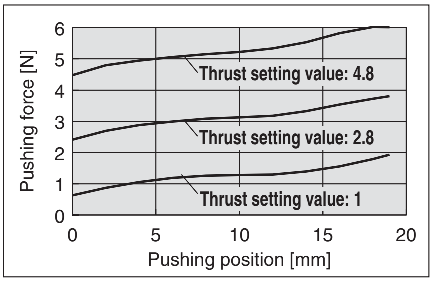
Operating conditions
Mounting orientation: Horizontal table mounting
Thrust setting value: Minimum, continuous, instantaneous maximum of each model.

Table start position: Extended end (Opposite side of the connector)
Pushing force direction: Toward the connector
Pushing position: Positioning distance from the connector side, retracted end

LAT3□-10



LAT3□-20



LAT3□-30

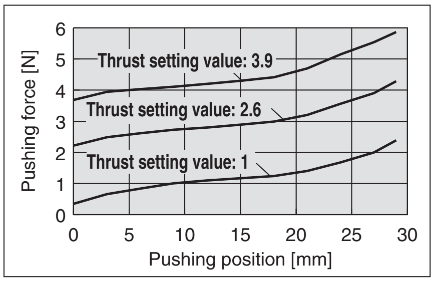
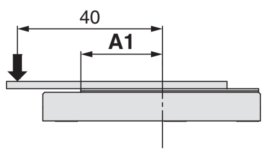


Table Displacement (Reference)

Displacement through the entire stroke when a load is applied to the point indicated by the arrow

Table displacement due to pitch moment load



LAT3□-10, -20, -30

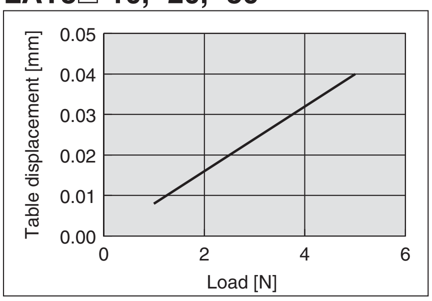
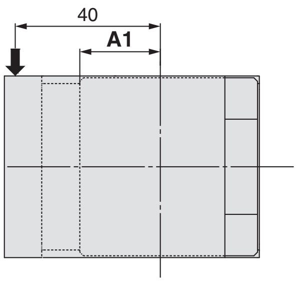


Table displacement due to yaw moment load



LAT3□-10, -20, -30

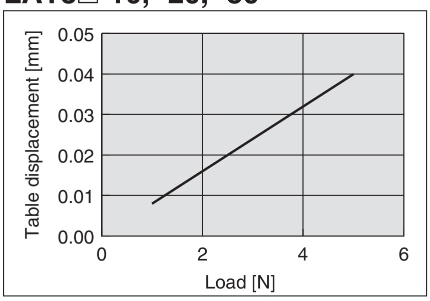
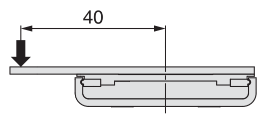


Table displacement due to roll moment load



LAT3□-10, -20, -30

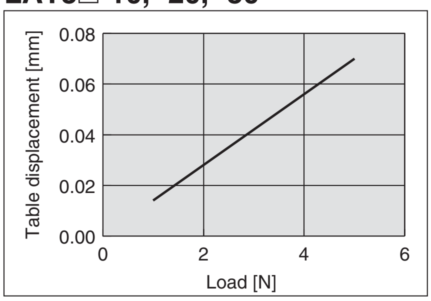


Table 2 Stroke: St [mm], Positioning Repeatability [µm], Measuring Accuracy [µm], Table Weight [g]

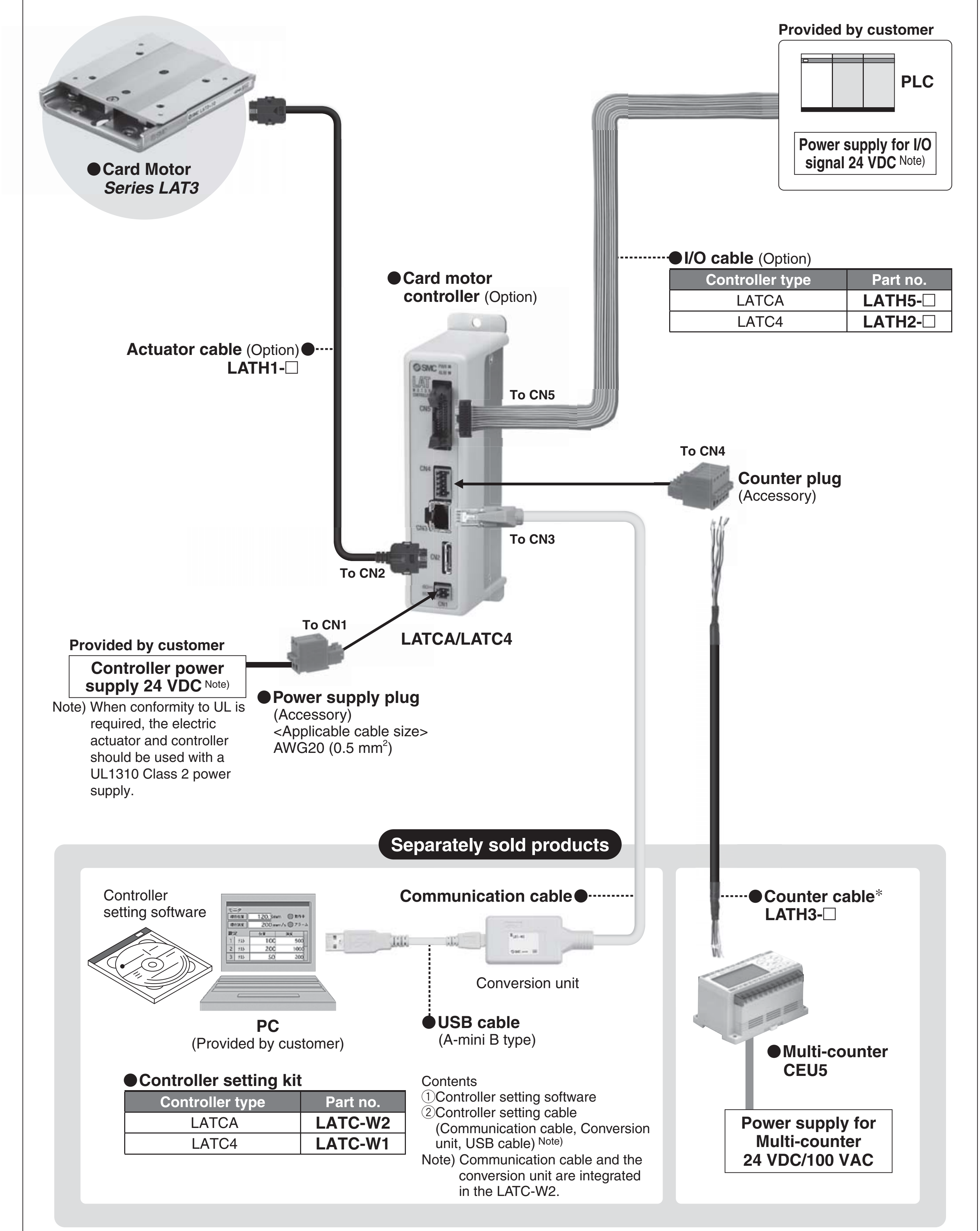
Model	LAT3-10	LAT3F-10	LAT3-20	LAT3F-20	LAT3-30	LAT3F-30
Stroke [mm]	10		20		30	
Positioning repeatability [µm]	±90	±5	±90	±5	±90	±5
Measuring accuracy [µm]	30	1.25	30	1.25	30	1.25
Table weight [g]	50		70		90	

Table 3 Allowable Moment: Mmax [N·m]

Model	Pitch moment/Yaw moment **Mpmax, Mymax**	Roll moment **Mrmax**
LAT3□-10	0.2	0.2
LAT3□-20	0.3	0.2
LAT3□-30	0.4	0.2

LEFS LEFB
LEJS LEJB
LEL
LEM
LEY LEYG
LES LESH
LEPY LEPS
LER
LEH
LEY-X5
11-LEFS
11-LEJS
25A-
LEC□
LECS□
LECSS-T
LECYM LECYU
Motorless
LAT3

System Construction/General Purpose I/O



●I/O cable (Option)

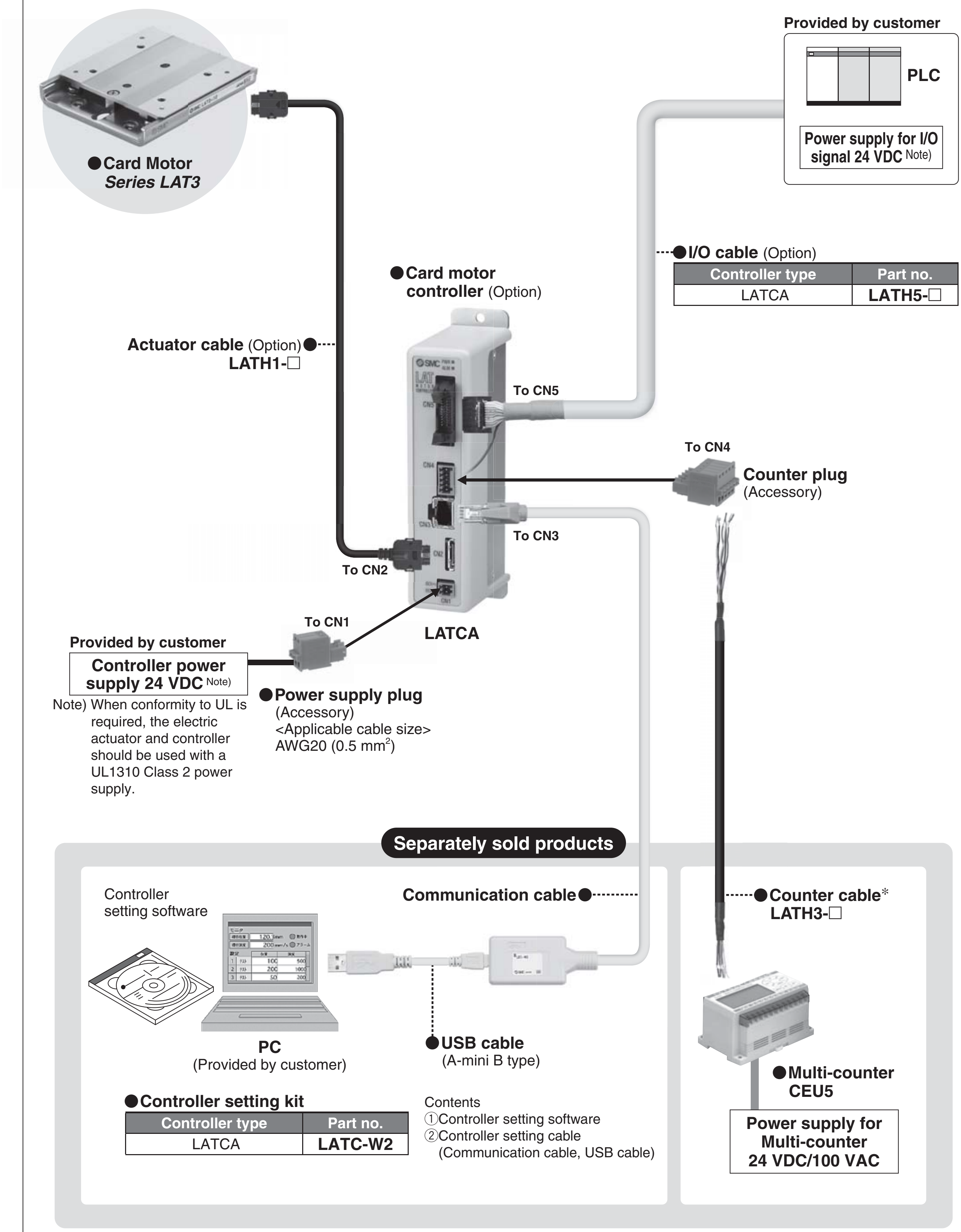
Controller type	Part no.
LATCA	**LATH5-□**
LATC4	**LATH2-□**

●Controller setting kit

Controller type	Part no.
LATCA	**LATC-W2**
LATC4	**LATC-W1**

∗ Option: Can be ordered in the "How to Order" for the Card Motor.
∗ Accessory: Attached to the controller
∗ Separately sold products: Order separately. Refer to pages 894 to 896 for details.

System Construction/Pulse Signal



I/O cable (Option)

Controller type	Part no.
LATCA	LATH5-□

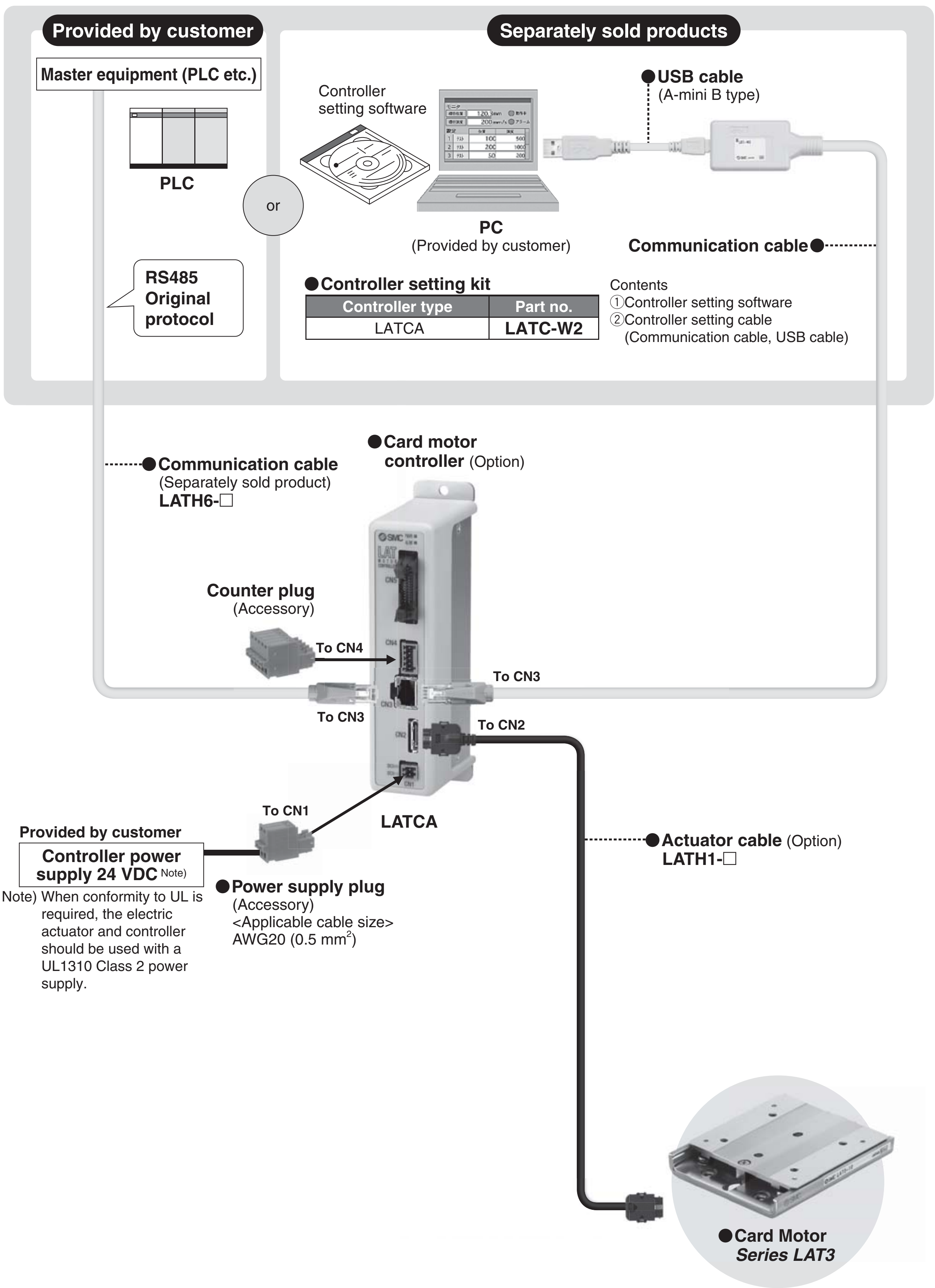
Controller setting kit

Controller type	Part no.
LATCA	LATC-W2

Note) When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

* Option: Can be ordered in the "How to Order" for the Card Motor.
* Accessory: Attached to the controller
* Separately sold products: Order separately. Refer to pages 894 to 896 for details.

System Construction/Serial Communication (One controller)

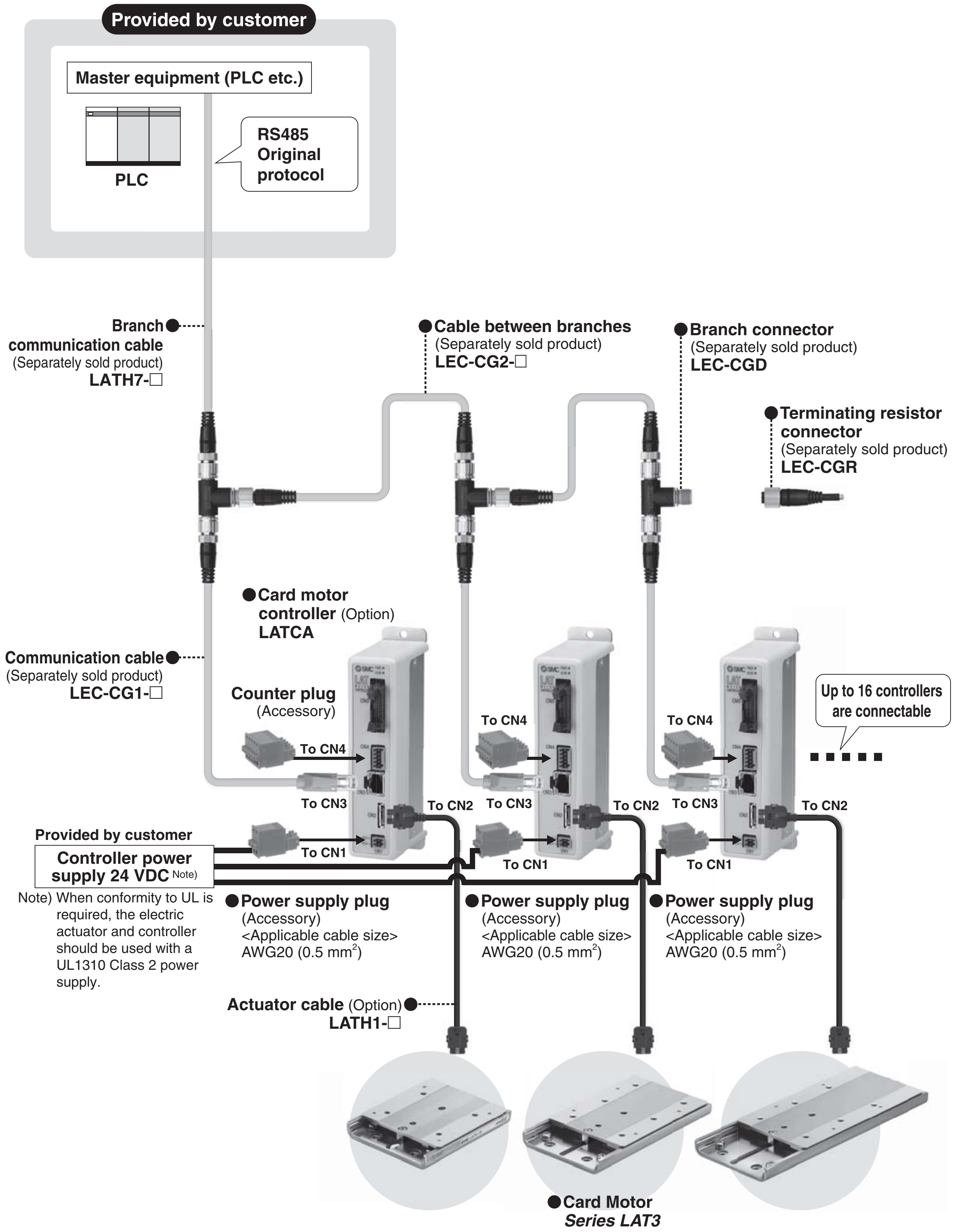


●Controller setting kit

Controller type	Part no.
LATCA	**LATC-W2**

∗ Option: Can be ordered in the “How to Order” for the Card Motor.
∗ Accessory: Attached to the controller
∗ Separately sold products: Order separately. Refer to pages 894 to 896 for details.

System Construction/Serial Communication (2 to 16 controllers)



Note) When conformity to UL is required, the electric actuator and controller should be used with a UL1310 Class 2 power supply.

* Option: Can be ordered in the "How to Order" for the Card Motor.
* Accessory: Attached to the controller
* Separately sold products: Order separately. Refer to pages 894 to 896 for details.

Card Motor

Series LAT3

RoHS

How to Order

LAT3 [ ] – 10 – 1 N 1 D

Sensor resolution

Nil	30 µm
F	1.25 µm

Stroke

10	10 mm
20	20 mm
30	30 mm

Actuator cable length

Nil	Without cable
1	1 m
3	3 m
5	5 m

Controller Note 1)

Nil	Without controller
N	With controller LATC4 (NPN)
P	With controller LATC4 (PNP)
AN	With controller LATCA (NPN)
AP	With controller LATCA (PNP)

I/O cable length Note 2)

Nil	Without cable
1	1 m
3	3 m
5	5 m

Controller mounting

Nil	Screw mounting
D Note 3)	DIN rail mounting

Note 1) Refer to pages 875 (LATCA) and 883 (LATC4) for detailed specifications of the controller.
Note 2) If "Without controller" has been selected, the I/O cable is also not included.
Therefore it is not possible to select the I/O cable for this option. If the I/O cable is required, please order separately. (Refer to page 893, "[I/O cable]" for details.)
When controller LATC4 is selected, I/O cable LATH2 is supplied.
When controller LATCA is selected, I/O cable LATH5 is supplied.
Note 3) The DIN rail is not included. If the DIN rail is required, please order separately. (Refer to page 876, "DIN rail" and "DIN rail mounting adapter" for details.)

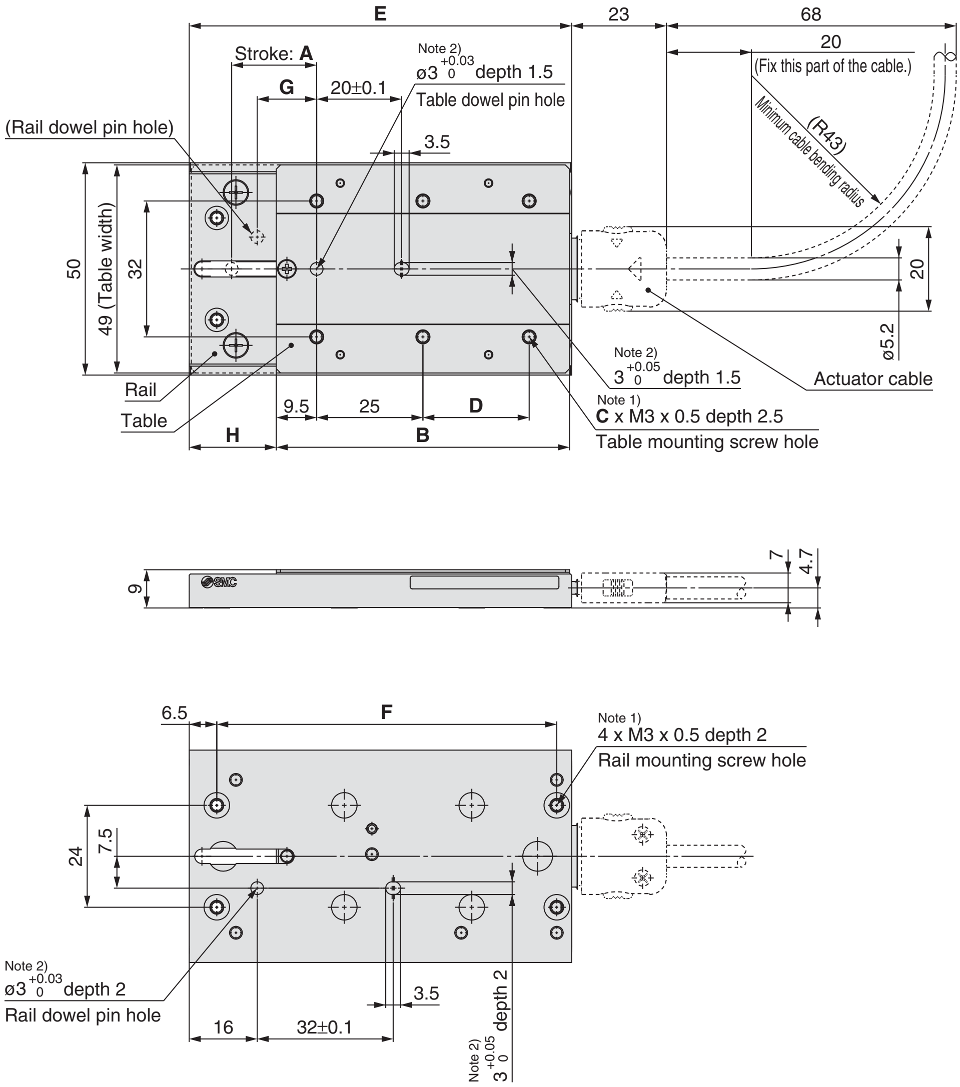
Specifications

Model		LAT3-10	LAT3F-10	LAT3-20	LAT3F-20	LAT3-30	LAT3F-30
Stroke (mm)		10		20		30	
Motor	Type	Moving magnet type linear motor					
	Maximum instantaneous thrust (N) Note 1) 2) 3)	5.2		6		5.5	
	Continuous thrust (N) Note 1) 2) 3)	3		2.8		2.6	
Guide	Type	Linear guide with circulating balls					
	Maximum load mass (g)	Horizontal: 500, Vertical: 100				Horizontal: 500, Vertical: 50	
Sensor	Type	Optical linear encoder (incremental)					
	Resolution (µm)	30	1.25	30	1.25	30	1.25
	Origin position signal	None	Provided	None	Provided	None	Provided
Pushing operation	Pushing speed (mm/s)	6					
	Thrust setting value Note 1) 2) 3)	1 to 5		1 to 4.8		1 to 3.9	
Positioning operation	Positioning repeatability (µm) Note 4) 5)	±90	±5	±90	±5	±90	±5
Measurement	Accuracy (µm) Note 4) 5)	±100	±10	±100	±10	±100	±10
Maximum speed (mm/s) Note 6)		400					
Operating temperature range (°C)		5 to 40 (No condensation)					
Operating humidity range (%)		35 to 85 (No condensation)					
Weight (g) Note 7)		130		190		250	
Table weight (g)		50		70		90	

Note 1) Continuous thrust can be generated and maintained continuously. Maximum instantaneous thrust is the maximum peak thrust that can be generated. Refer to **Fig. 4** Allowable thrust setting value (Page 867) and to **Fig. 5** Pushing force characteristics (Page 868).
Note 2) When mounted on a base with good heat dissipating capacity at 20°C ambient temperature.
Note 3) The pushing force varies depending on the operating environment, pushing direction and table position. Refer to **Fig. 5** Pushing force characteristics (Page 868).
Note 4) When the temperature of the Card Motor is 20°C.
Note 5) The accuracy after mounting the Card Motor may vary depending on the mounting conditions, operating conditions and environment, so please calibrate it with the equipment used in your application.
Note 6) The maximum speed varies depending on the operating conditions (load mass, positioning distance).
Note 7) The weight of the Card Motor itself. Controllers and cables are not included.

Dimensions

LAT3□-□



Note 1) Refer to page 898 regarding Specific Product Precautions for the mounting screws.
Note 2) The length of the part of the dowel pin inserted into the positioning hole should be shorter than the specified depth.
Note 3) This drawing shows the origin position.
Note 4) The origin positions G and H are reference dimensions (guide). Refer to page 892 for details on the origin position.

[mm]

Model	Stroke	Table dimensions			Rail dimensions		Origin position Note 4)	
	A	B	C	D	E	F	G	H
LAT3□-10	10	49	4	—	60	50	4	10.5
LAT3□-20	20	69	6	25	90	80	14	20.5
LAT3□-30	30	89	6	25	120	110	24	30.5

LEFS LEFB
LEJS LEJB
LEL
LEM
LEY LEYG
LES LESH
LEPY LEPS
LER
LEH
LEY-X5
11-LEFS
11-LEJS
25A-
LEC□
LECS□
LECSS-T
LECYM LECYU
Motorless
LAT3