

# Pneumatic Parallel Grippers

## FRC 2-Finger

FRC is an angular gripper for universal use in clean or slightly dirty environments. Suitable for space sensitive applications.

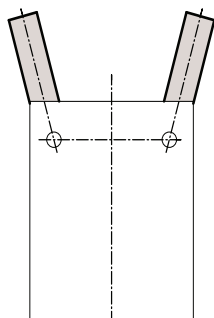
### Advantages

- Cost-efficient gripping system for lighter duty applications.
- Slim design allowing the grippers to be arranged in a row.
- Available in a comprehensive range of piston plate diameters from 12 to 32mm.
- Light, compact design for space-saving handling without interference.
- Integrated permanent magnets for direct monitoring of piston movement.
- Slots for mounting and positioning of magnetic-field sensors.

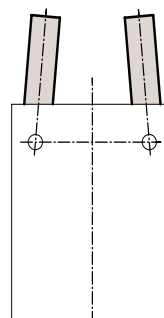


EFFECTO  
GROUP

## Open/Close Diagram

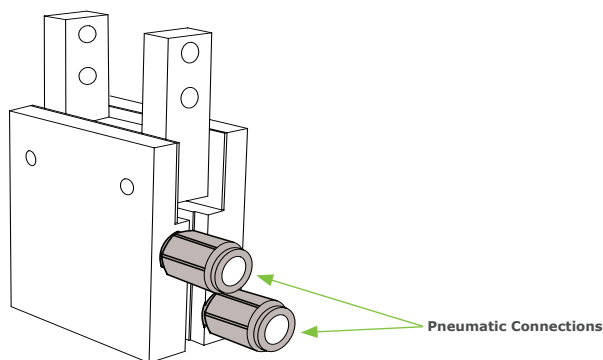


**OPEN**

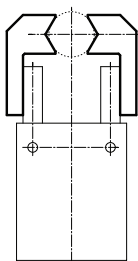


**CLOSED**

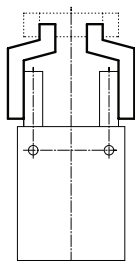
## Pneumatic Feed



## Gripping Diagram



**External Clamping**



**Internal Clamping**

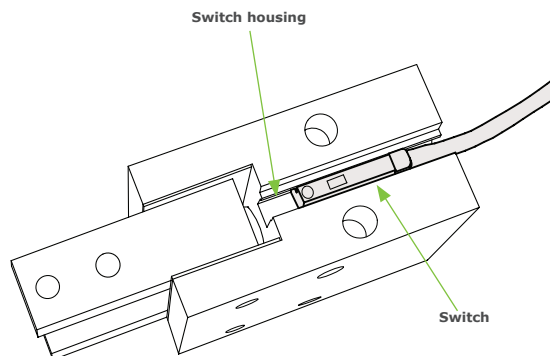
### **Guidelines for the selection of a gripper model**

Selection of the correct gripper model depends on the workpiece's weight, the friction coefficient between the fingers and the workpiece and the required motion of the application.

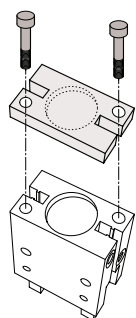
Due to inertial forces associated with motion, we recommend that the holding force of the gripper model should be from 10 to 20 times the workpiece's weight.

If the application presents high acceleration/deceleration or impacts during the motion, then a further safety margin should be considered.

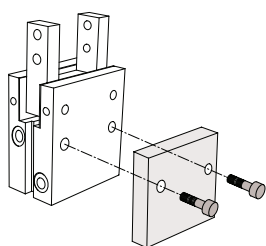
## Control Diagram



## Mounting

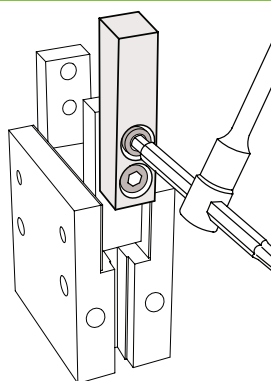


Axial Mounting  
Bottom fixing

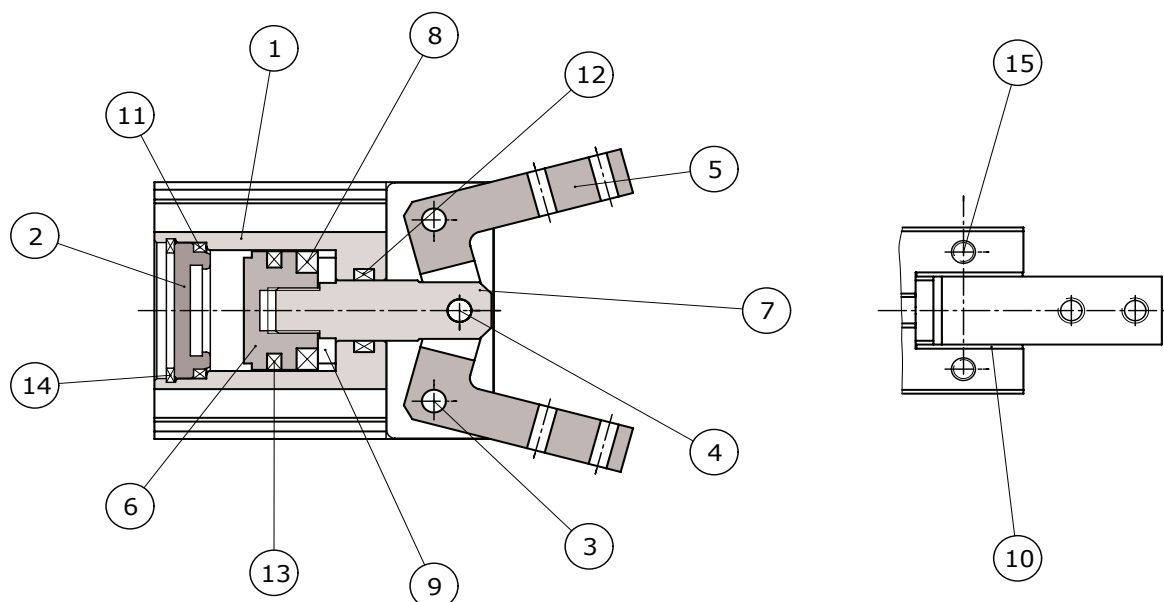


Side Mounting

## Fingers Mounting



## Construction Diagram

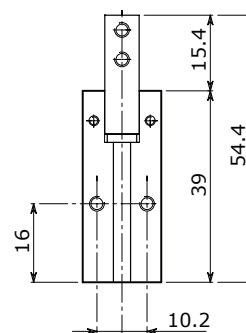
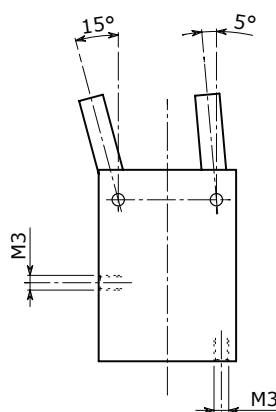
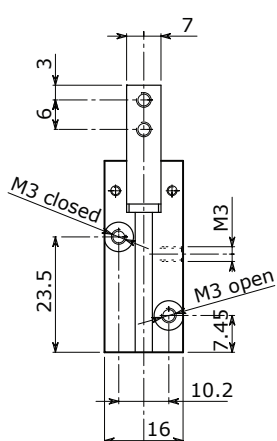
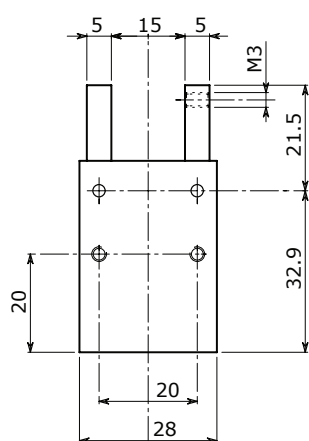
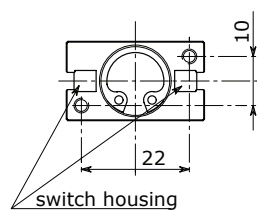


| Nr. | Description | Material                |
|-----|-------------|-------------------------|
| 01  | BODY        | Aluminum Alloy          |
| 02  | COVER       | Aluminum Alloy          |
| 03  | PIN         | Steel                   |
| 04  | KNUCKLE PIN | Steel                   |
| 05  | JAW         | Steel                   |
| 06  | PISTON      | Aluminum Alloy          |
| 07  | PISTON ROD  | Steel                   |
| 08  | MAGNET      | Rubber Magnet           |
| 09  | WASHER      | Steel                   |
| 10  | PLATE       | Steel                   |
| 11  | COVER SEAL  | NBR                     |
| 12  | ROD SEAL    | NBR                     |
| 13  | PISTON SEAL | NBR                     |
| 14  | SNAP RING   | Steel                   |
| 15  | SCREW       | Chrome Molybdenum Steel |

# Dimensional Drawing



## FRC 12



# TECHNICAL DATA

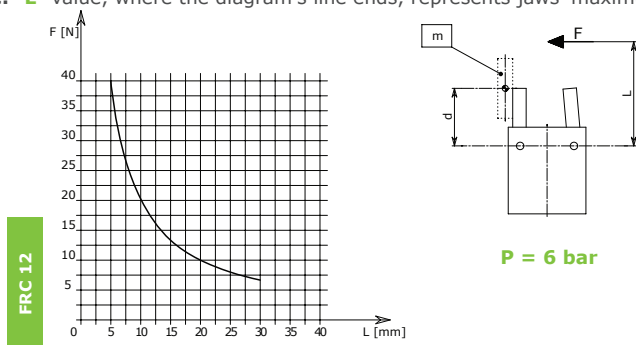
## FRC 12

|                                    |                                    |                    |
|------------------------------------|------------------------------------|--------------------|
| Stroke per jaw                     | °                                  | -5 / +15           |
| Fluid consumption<br>double stroke | cm <sup>3</sup><br>in <sup>3</sup> | 0.7<br>0.04        |
| Closing force per jaw<br>@ 6 bar   | N<br>lb                            | 20<br>5            |
| Opening force per jaw<br>@ 6 bar   | N<br>lb                            | 25<br>6            |
| Total closing force<br>@ 6 bar     | N<br>lb                            | 40<br>9            |
| Total opening force<br>@ 6 bar     | N<br>lb                            | 50<br>11           |
| Recommended<br>workpiece weight    | kg<br>lb                           | 0.20<br>0.40       |
| Weight                             | kg<br>lb                           | 0.10<br>0.22       |
| Repeat accuracy                    | mm<br>in                           | ± 0.05<br>± 0.0020 |

\* Recommended workpiece weight is calculated for force-fit gripping with a coefficient of static friction of 0.15 and a safety factor of 3 against workpiece slippage.  
 Opening Pressure **2 - 8 bar (29 - 116 psi)**  
 Working Temperature **5 - 60 °C (41 - 140 °F)**  
 Noise Emission (Sound Pressure) **≤ 70 db(A) in any direction**

## Clamping Force Diagram

**Note:** "L" value, where the diagram's line ends, represents jaws' maximum length.

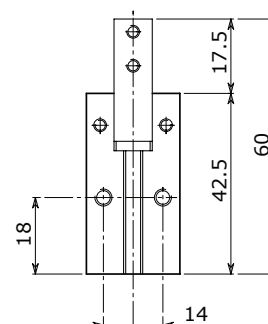
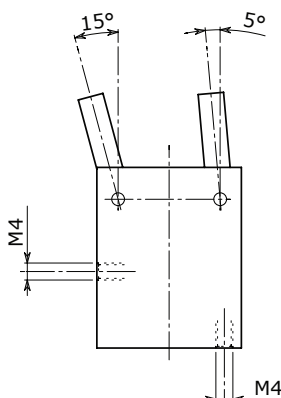
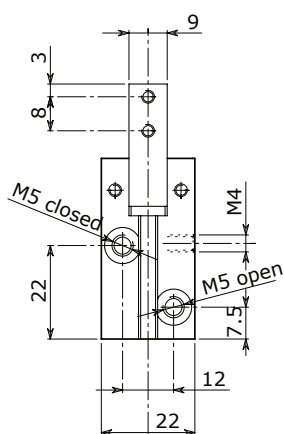
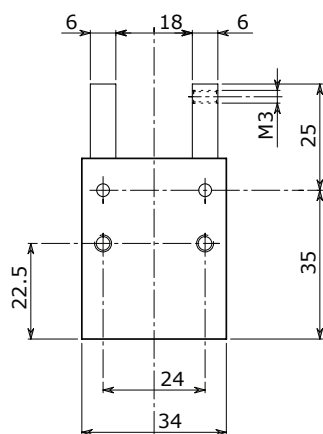
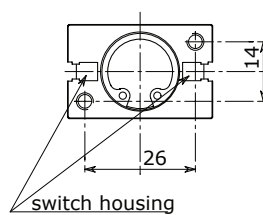


**F** = True clamping force per jaw - **L** = Reading distance - **d** = Distance from finger center of gravity to lever rotation fulcrum - **m** = Finger mass  
 Values read at a distance **L=10 mm**

# Dimensional Drawing



## FRC 16



## TECHNICAL DATA

### FRC 16

|                                    |                                    |                    |
|------------------------------------|------------------------------------|--------------------|
| Stroke per jaw                     | °                                  | -5 / +15           |
| Fluid consumption<br>double stroke | cm <sup>3</sup><br>in <sup>3</sup> | 1.5<br>0.1         |
| Closing force per jaw<br>@ 6 bar   | N<br>lb                            | 45<br>10           |
| Opening force per jaw<br>@ 6 bar   | N<br>lb                            | 60<br>13           |
| Total closing force<br>@ 6 bar     | N<br>lb                            | 90<br>20           |
| Total opening force<br>@ 6 bar     | N<br>lb                            | 119<br>27          |
| Recommended<br>workpiece weight    | kg<br>lb                           | 0.45<br>1.00       |
| Weight                             | kg<br>lb                           | 0.12<br>0.26       |
| Repeat accuracy                    | mm<br>in                           | ± 0.05<br>± 0.0020 |

\* Recommended workpiece weight is calculated for force-fit gripping with a coefficient of static friction of 0.15 and a safety factor of 3 against workpiece slippage.

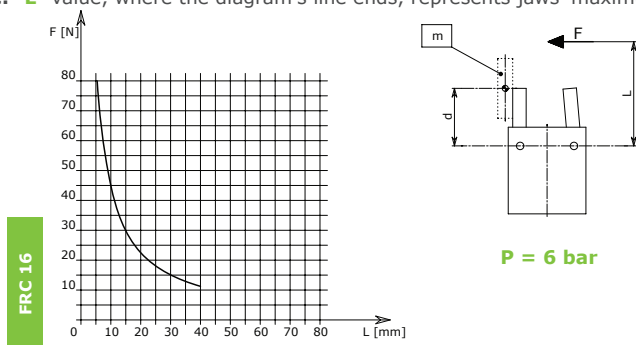
Opening Pressure **2 - 8 bar (29 - 116 psi)**

Working Temperature **5 - 60 °C (41 - 140 °F)**

Noise Emission (Sound Pressure) **≤ 70 db(A) in any direction**

## Clamping Force Diagram

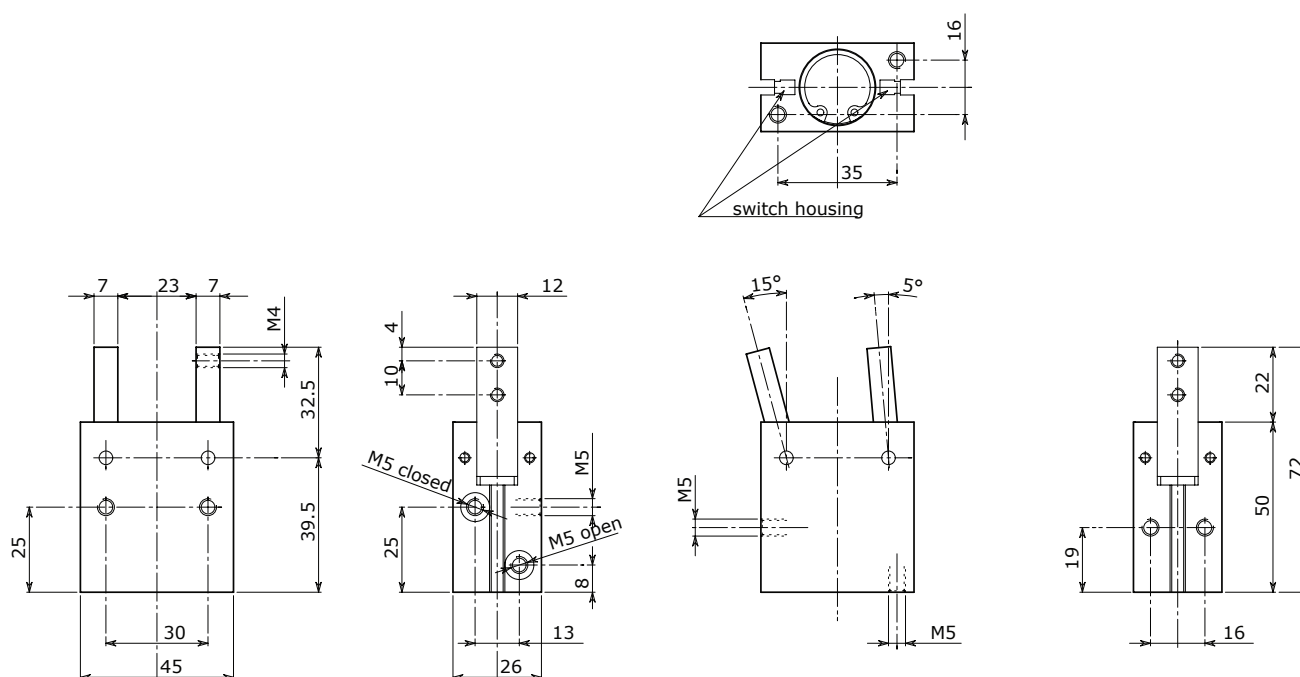
**Note:** "L" value, where the diagram's line ends, represents jaws' maximum length.



**F** = True clamping force per jaw - **L** = Reading distance - **d** = Distance from finger center of gravity to lever rotation fulcrum - **m** = Finger mass  
Values read at a distance **L=10 mm**



## FRC 20





# TECHNICAL DATA

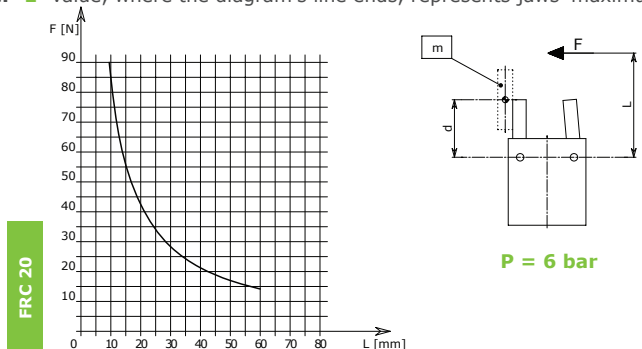
## FRC 20

|                                    |                                    |                    |
|------------------------------------|------------------------------------|--------------------|
| Stroke per jaw                     | °                                  | -5 / +15           |
| Fluid consumption<br>double stroke | cm <sup>3</sup><br>in <sup>3</sup> | 2.1<br>0.2         |
| Closing force per jaw<br>@ 6 bar   | N<br>lb                            | 43<br>10           |
| Opening force per jaw<br>@ 6 bar   | N<br>lb                            | 58<br>13           |
| Total closing force<br>@ 6 bar     | N<br>lb                            | 85<br>19           |
| Total opening force<br>@ 6 bar     | N<br>lb                            | 116<br>26          |
| Recommended<br>workpiece weight    | kg<br>lb                           | 0.43<br>0.90       |
| Weight                             | kg<br>lb                           | 0.20<br>0.44       |
| Repeat accuracy                    | mm<br>in                           | ± 0.05<br>± 0.0020 |

\* Recommended workpiece weight is calculated for force-fit gripping with a coefficient of static friction of 0.15 and a safety factor of 3 against workpiece slippage.  
Opening Pressure **2 - 8 bar (29 - 116 psi)**  
Working Temperature **5 - 60 °C (41 - 140 °F)**  
Noise Emission (Sound Pressure) **≤ 70 db(A) in any direction**

## Clamping Force Diagram

**Note:** "L" value, where the diagram's line ends, represents jaws' maximum length.

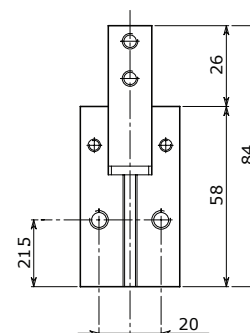
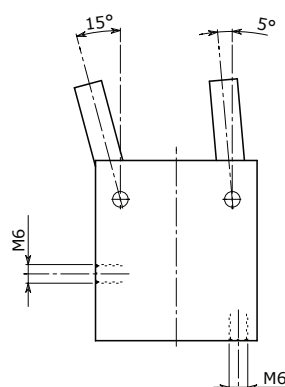
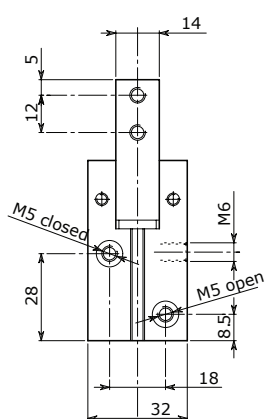
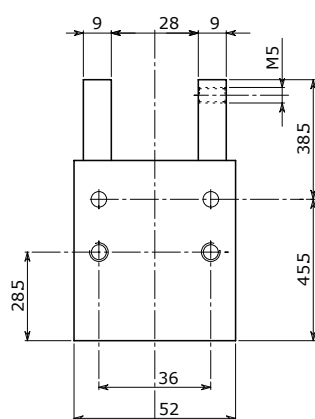
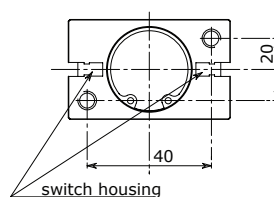


**F** = True clamping force per jaw - **L** = Reading distance - **d** = Distance from finger center of gravity to lever rotation fulcrum - **m** = Finger mass  
Values read at a distance **L=20 mm**

# Dimensional Drawing



## FRC 25



## TECHNICAL DATA

### FRC 25

|                                    |                                    |                    |
|------------------------------------|------------------------------------|--------------------|
| Stroke per jaw                     | °                                  | -5 / +15           |
| Fluid consumption<br>double stroke | cm <sup>3</sup><br>in <sup>3</sup> | 5.5<br>0.3         |
| Closing force per jaw<br>@ 6 bar   | N<br>lb                            | 85<br>19           |
| Opening force per jaw<br>@ 6 bar   | N<br>lb                            | 110<br>25          |
| Total closing force<br>@ 6 bar     | N<br>lb                            | 170<br>38          |
| Total opening force<br>@ 6 bar     | N<br>lb                            | 220<br>49          |
| Recommended<br>workpiece weight    | kg<br>lb                           | 0.85<br>1.90       |
| Weight                             | kg<br>lb                           | 0.33<br>0.73       |
| Repeat accuracy                    | mm<br>in                           | ± 0.05<br>± 0.0020 |

\* Recommended workpiece weight is calculated for force-fit gripping with a coefficient of static friction of 0.15 and a safety factor of 3 against workpiece slippage.

Opening Pressure **2 - 8 bar (29 - 116 psi)**

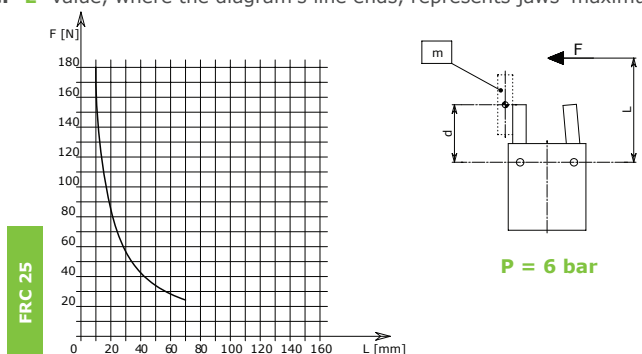
Working Temperature **5 - 60 °C (41 - 140 °F)**

Noise Emission (Sound Pressure) **≤ 70 db(A) in any direction**

FRC 25

## Clamping Force Diagram

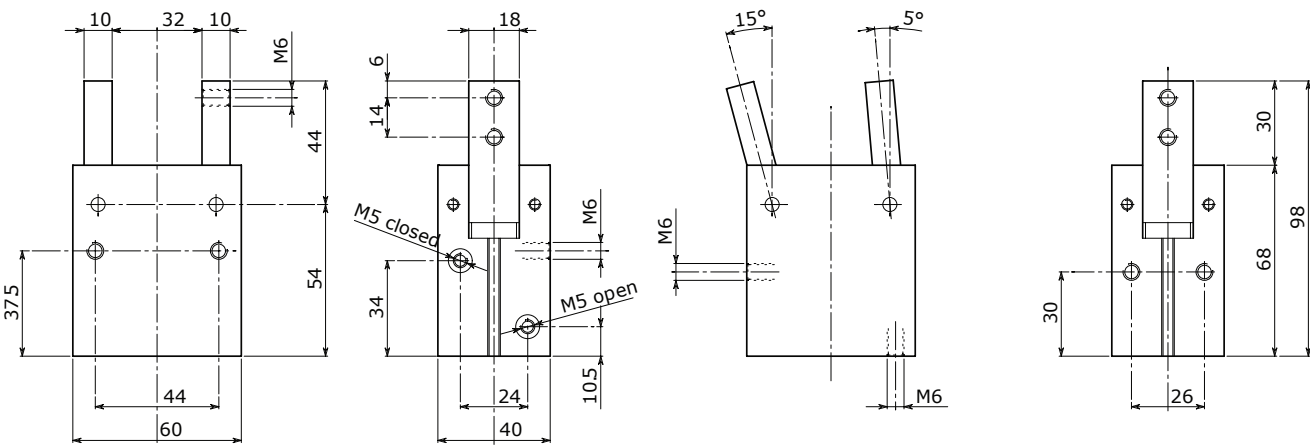
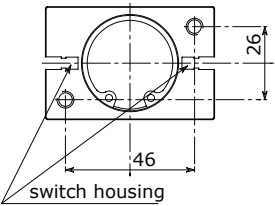
**Note:** "L" value, where the diagram's line ends, represents jaws' maximum length.



**F** = True clamping force per jaw - **L** = Reading distance - **d** = Distance from finger center of gravity to lever rotation fulcrum - **m** = Finger mass  
Values read at a distance **L=20 mm**



FRC 32



## TECHNICAL DATA

### FRC 32

|                                    |                                    |                    |
|------------------------------------|------------------------------------|--------------------|
| Stroke per jaw                     | °                                  | -5 / +15           |
| Fluid consumption<br>double stroke | cm <sup>3</sup><br>in <sup>3</sup> | 10.3<br>0.6        |
| Closing force per jaw<br>@ 6 bar   | N<br>lb                            | 152<br>34          |
| Opening force per jaw<br>@ 6 bar   | N<br>lb                            | 200<br>45          |
| Total closing force<br>@ 6 bar     | N<br>lb                            | 403<br>68          |
| Total opening force<br>@ 6 bar     | N<br>lb                            | 400<br>90          |
| Recommended<br>workpiece weight    | kg<br>lb                           | 1.52<br>3.30       |
| Weight                             | kg<br>lb                           | 0.56<br>1.23       |
| Repeat accuracy                    | mm<br>in                           | ± 0.05<br>± 0.0020 |

\* Recommended workpiece weight is calculated for force-fit gripping with a coefficient of static friction of 0.15 and a safety factor of 3 against workpiece slippage.

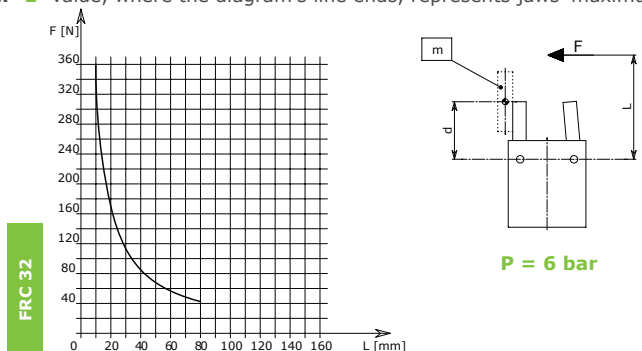
Opening Pressure **2 - 8 bar (29 - 116 psi)**

Working Temperature **5 - 60 °C (41 - 140 °F)**

Noise Emission (Sound Pressure) **≤ 70 db(A) in any direction**

## Clamping Force Diagram

**Note:** "L" value, where the diagram's line ends, represents jaws' maximum length.



**F** = True clamping force per jaw - **L** = Reading distance - **d** = Distance from finger center of gravity to lever rotation fulcrum - **m** = Finger mass  
Values read at a distance **L=20 mm**



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