

12

16

20

25

32

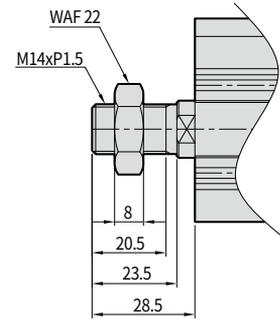
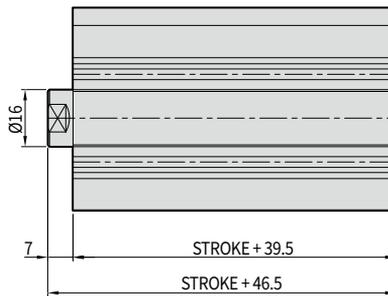
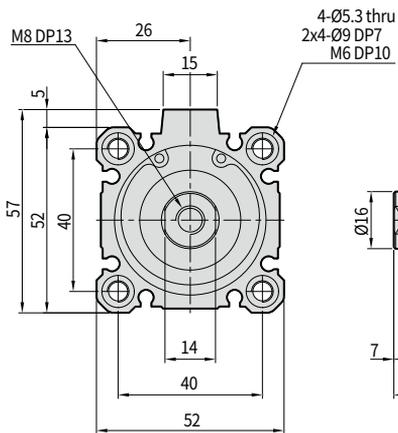
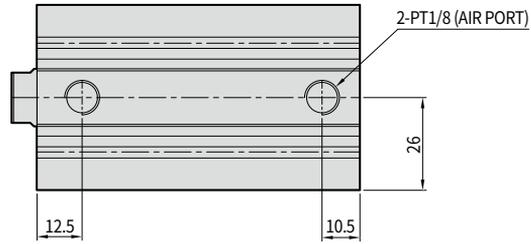
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CYLINDER

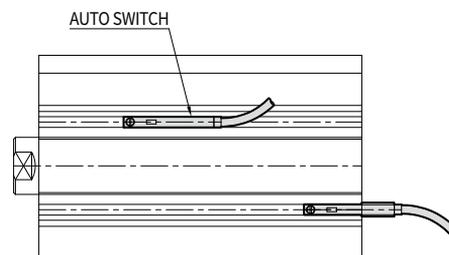
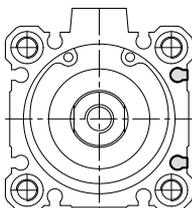
PFT  
PFTG  
PSK

PFT40



MALE SCREW TYPE

PFT40 Example of Auto Switch installation



# PFT Series

12

16

20

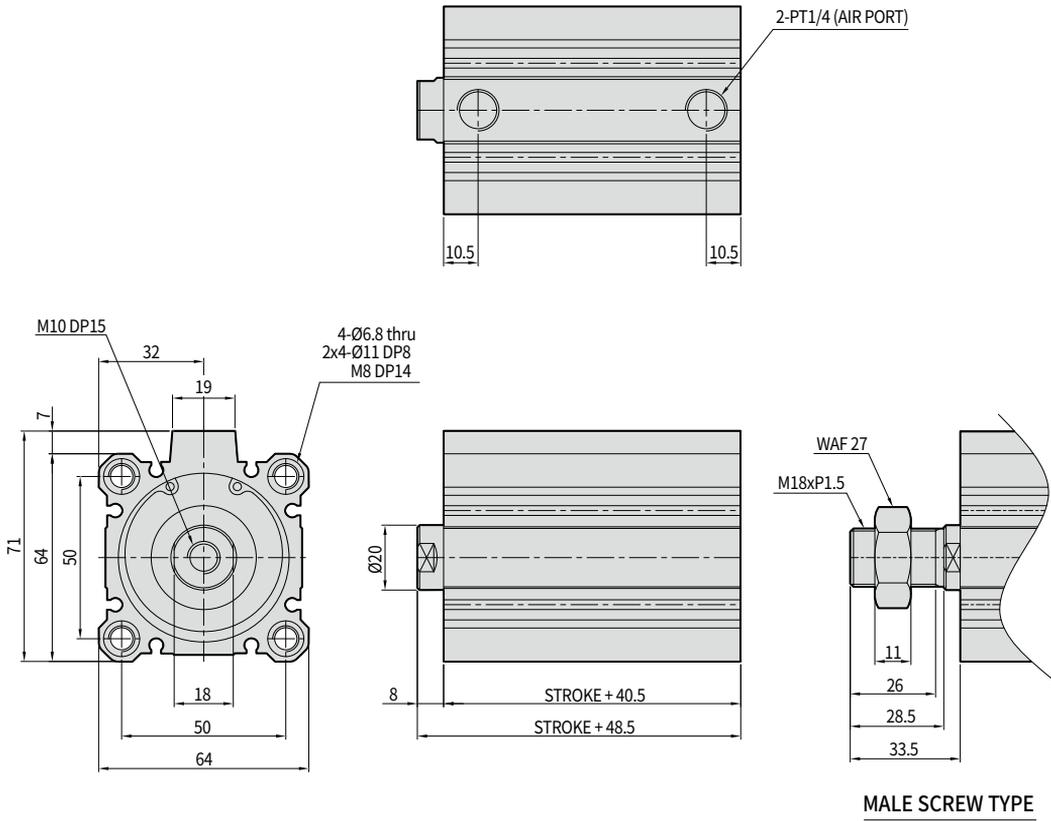
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32

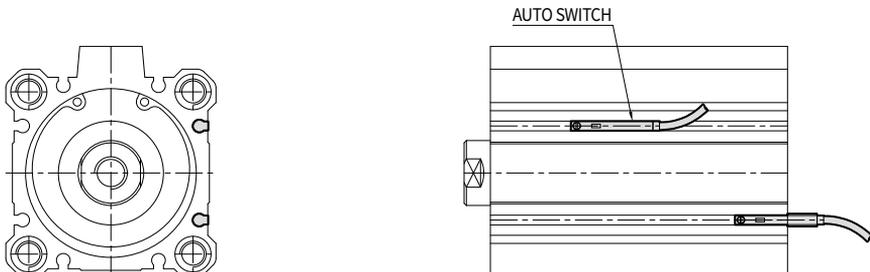
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50

## PFT50

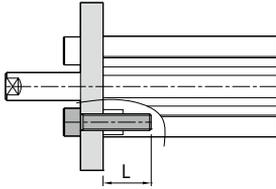


## PFT50 Example of Auto Switch installation



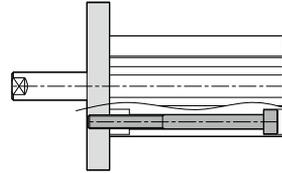
Installation Information

1. Installation by body tap holes



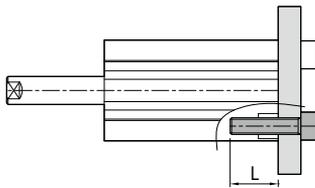
| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PFT12 | M4×P0.7        | 25                  | 10.5                   |
| PFT16 | M4×P0.7        | 25                  | 10.5                   |
| PFT20 | M6×P1          | 81                  | 17                     |
| PFT25 | M6×P1          | 81                  | 17                     |
| PFT32 | M6×P1          | 81                  | 17                     |
| PFT40 | M6×P1          | 81                  | 17                     |
| PFT50 | M8×P1.25       | 157                 | 22                     |

2. Installation by body through holes



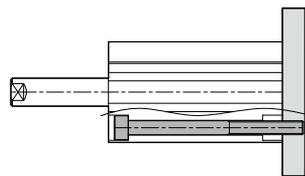
| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PFT12 | M3×P0.5        | 11                  |
| PFT16 | M3×P0.5        | 11                  |
| PFT20 | M5×P0.8        | 51                  |
| PFT25 | M5×P0.8        | 51                  |
| PFT32 | M5×P0.8        | 51                  |
| PFT40 | M5×P0.8        | 51                  |
| PFT50 | M6×P1          | 81                  |

3. Installation by body tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PFT12 | M4×P0.7        | 25                  | 10.5                   |
| PFT16 | M4×P0.7        | 25                  | 10.5                   |
| PFT20 | M6×P1          | 81                  | 17                     |
| PFT25 | M6×P1          | 81                  | 17                     |
| PFT32 | M6×P1          | 81                  | 17                     |
| PFT40 | M6×P1          | 81                  | 17                     |
| PFT50 | M8×P1.25       | 157                 | 22                     |

4. Installation by body through holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PFT12 | M3×P0.5        | 11                  |
| PFT16 | M3×P0.5        | 11                  |
| PFT20 | M5×P0.8        | 51                  |
| PFT25 | M5×P0.8        | 51                  |
| PFT32 | M5×P0.8        | 51                  |
| PFT40 | M5×P0.8        | 51                  |
| PFT50 | M6×P1          | 81                  |

## GENERAL CYLINDER / Compact Cylinder

# PFTG Series

### Features

NEW

- Space utility cylinder for compact design.
- Urethane damper to forward & backward as standard.
- Various mounting ways by supplying both of counter and tap without selective options.
- Anti-rotate and load direct mount by plate and guide rod structure.
- Freely selective mounting direction by 4 sides Auto Switch slots. (Ø12, Ø16 : 3 sides only)



### Order Form

## PFTG 20 B - 50 - E - A2 L S

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) |
|-------|--------------|-------------------------------|
| 12    | 12           | 05,10,15,20,25,30             |
| 16    | 16           | 05,10,15,20,25,30             |
| 20    | 20           | 05,10,20,30,40,50             |
| 25    | 25           | 05,10,20,30,40,50             |
| 32    | 32           | 05,10,20,30,40,50,75,100      |
| 40    | 40           | 05,10,20,30,40,50,75,100      |
| 50    | 50           | 10,20,30,40,50,75,100         |

#### ④ Standard Strokes

#### ③ Magnetic Option

| Order | Magnetic Option             |
|-------|-----------------------------|
| Blank | Standard (Without magnetic) |
| B     | Magnetic inside             |

#### ⑤ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

#### ⑥ Auto Switch Specification

| Order | Sensing Type            | Cable Spec |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|-------------------------|------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                         | Wires      | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank | No Auto Switch provided |            |           |         |              |         |                |               |                |
| A2    | Magnetic reed switch    | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch    | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2V   | Magnetic reed switch    | 2-Wire     | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B2    | Magnetic solid state    | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state    | 2-Wire     | Horiz     | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3B   | Magnetic solid state    | 2-Wire     | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3C   | Magnetic solid state    | 3-Wire     | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

#### ⑦ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑧ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

Specification

CYLINDER

PFT  
PFTG  
PSK

| Item Name                                 |          | PFTG12   | PFTG16     | PFTG20     | PFTG25     | PFTG32     | PFTG40     | PFTG50     |
|---|----------|--|------------|------------|------------|------------|------------|------------|
| CYL Bore Size(mm)                         |          | 12   | 16         | 20         | 25         | 32         | 40         | 50         |
| Rod Size(mm)                              |          | 6  | 8          | 10         | 12         | 16         | 16         | 20         |
| Standard Strokes(mm)                      |          | 5 ~ 30   |            | 5 ~ 50     |            | 5 ~ 100    |            | 10 ~ 100   |
| Theoretical Thrust(kgf)                   | Forward  | 1.13×P   | 2.01×P     | 3.14×P     | 4.90×P     | 8.04×P     | 12.56×P    | 19.63×P    |
|   | Backward | 0.84×P   | 1.50×P     | 2.35×P     | 3.77×P     | 6.03×P     | 10.55×P    | 16.49×P    |
| P : Air Pressure(kgf/cm <sup>2</sup> )    |          |  |            |            |            |            |            |            |
| Fitting Size                              |          | M5   |            |            |            | PT1/8      |            | PT1/4      |
| Weight(kgf)                               |          | 0.056 +  | 0.076 +    | 0.122 +    | 0.163 +    | 0.225 +    | 0.323 +    | 0.541 +    |
| S.T : Stroke(mm)                          |          | 0.0015×S.T   | 0.0020×S.T | 0.0028×S.T | 0.0034×S.T | 0.0044×S.T | 0.0049×S.T | 0.0075×S.T |
| Fluid                                     |          | Clean Air <small>Note 1)</small>                                   |            |            |            |            |            |            |
| Pressure Range(kgf/cm <sup>2</sup> )      |          | 1.5 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |            |            |            |            |            |            |
| Lubrication                               |          | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)    |            |            |            |            |            |            |
| Temperature Range(°C)                     |          | 5 ~ 60   |            |            |            |            |            |            |
| Moving Speed(mm/sec)                      |          | 50 ~ 300   |            |            |            |            |            |            |
| Operation Type                            |          | Double Acting  |            |            |            |            |            |            |
| Stroke Tolerance for Forward Position(mm) |          | 0 ~ +1   |            |            |            |            |            |            |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

# PFTG Series

12

16

20

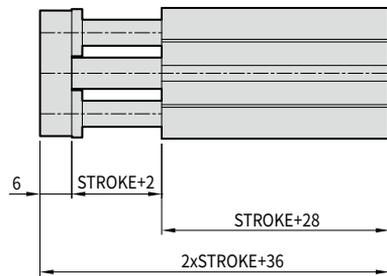
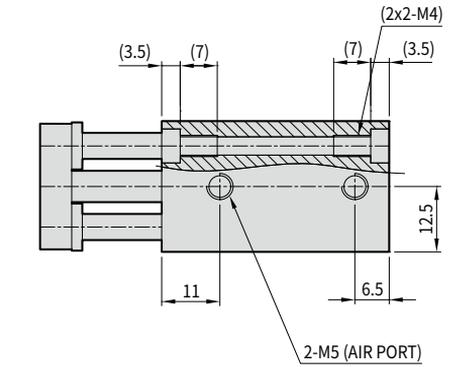
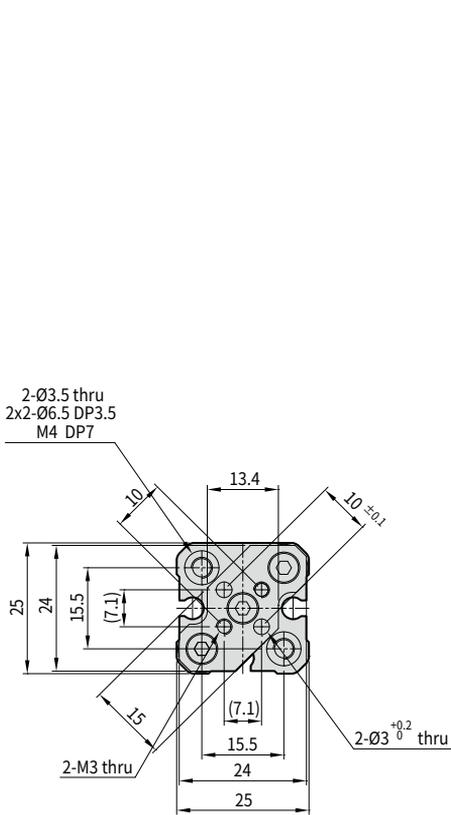
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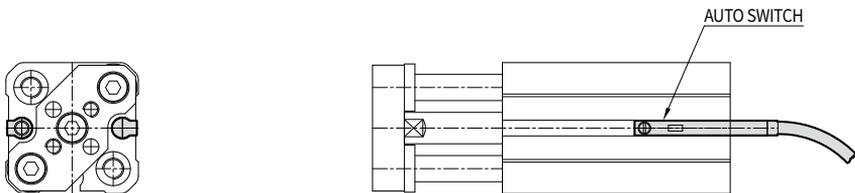
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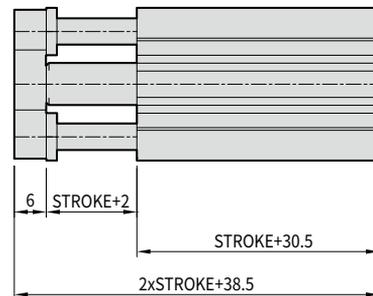
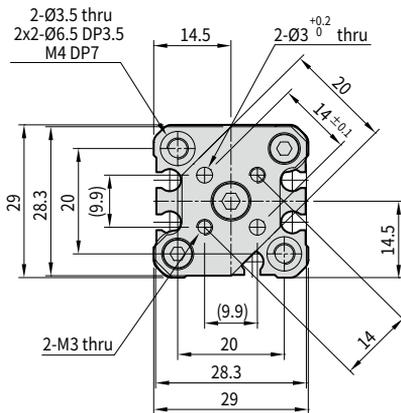
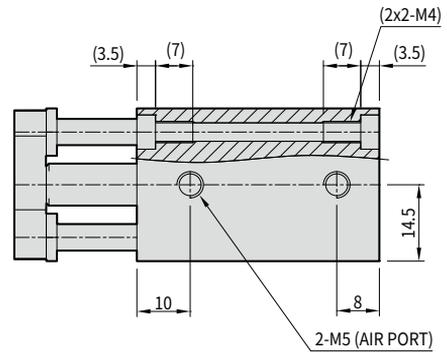
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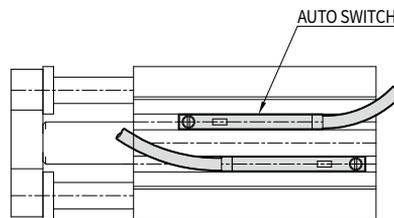
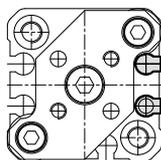
## PFTG12 Example of Auto Switch installation



PFTG16



PFTG16 Example of Auto Switch installation



# PFTG Series

12

16

20

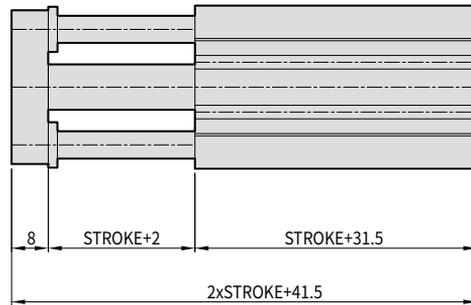
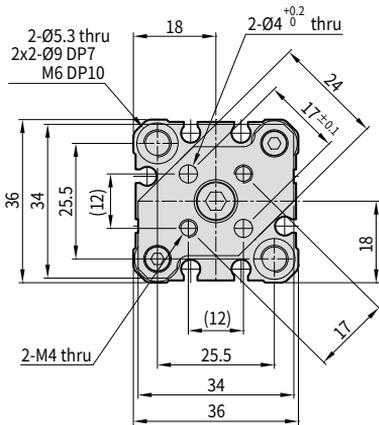
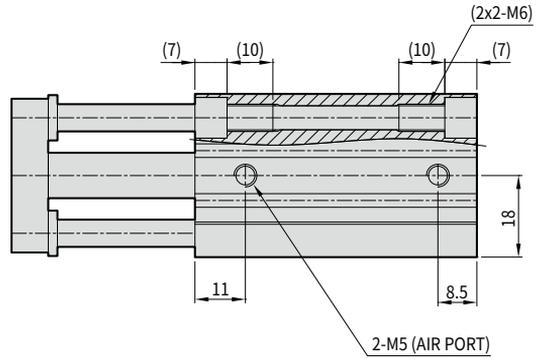
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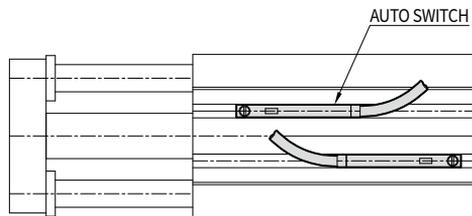
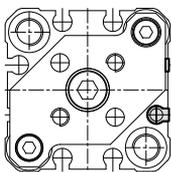
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## PFTG20



## PFTG20 Example of Auto Switch installation



12

16

20

25

32

40

50

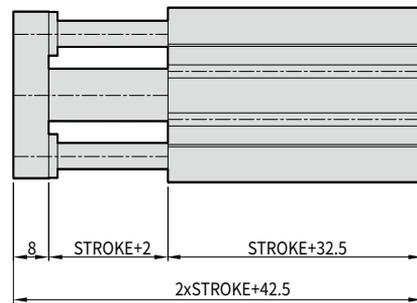
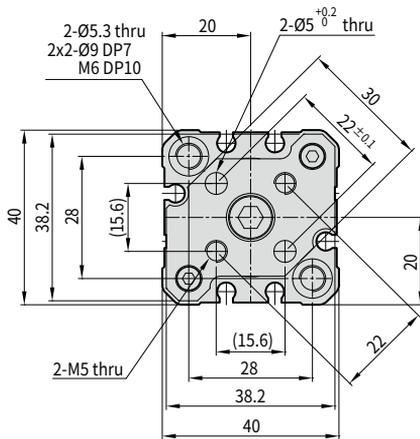
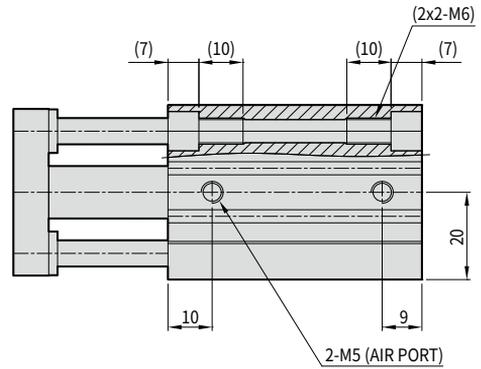
CYLINDER

PFT

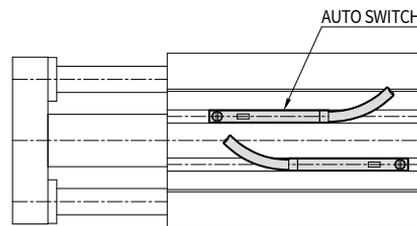
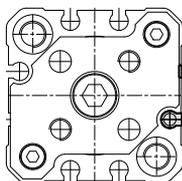
PFTG

PSK

PFTG25



PFTG25 Example of Auto Switch installation



# PFTG Series

12

16

20

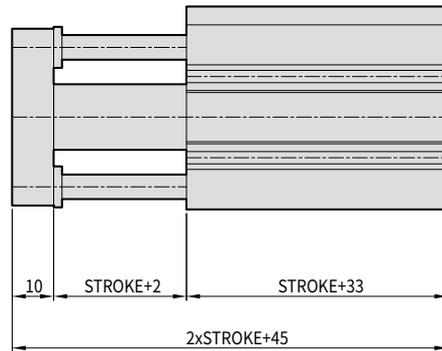
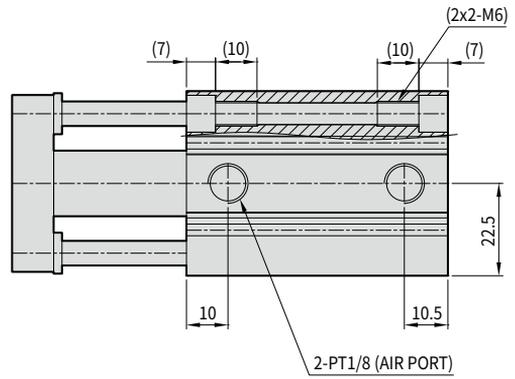
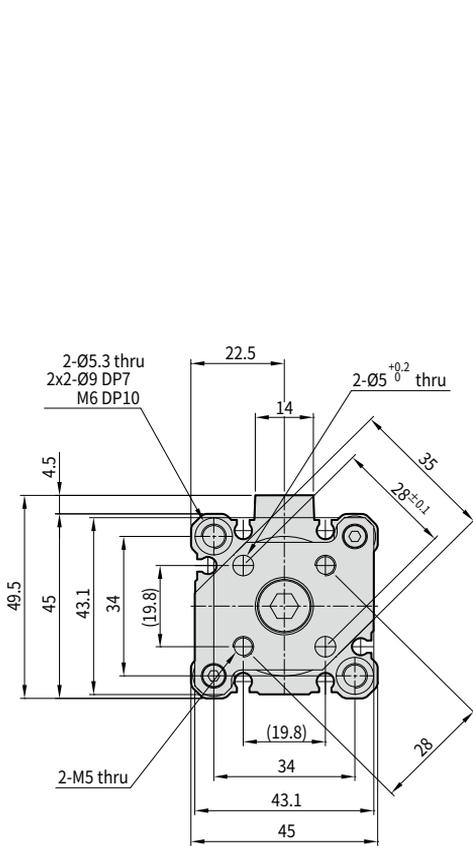
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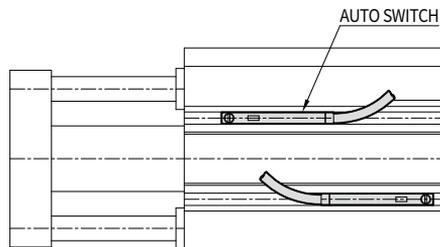
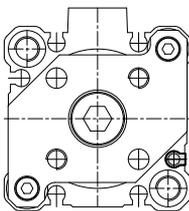
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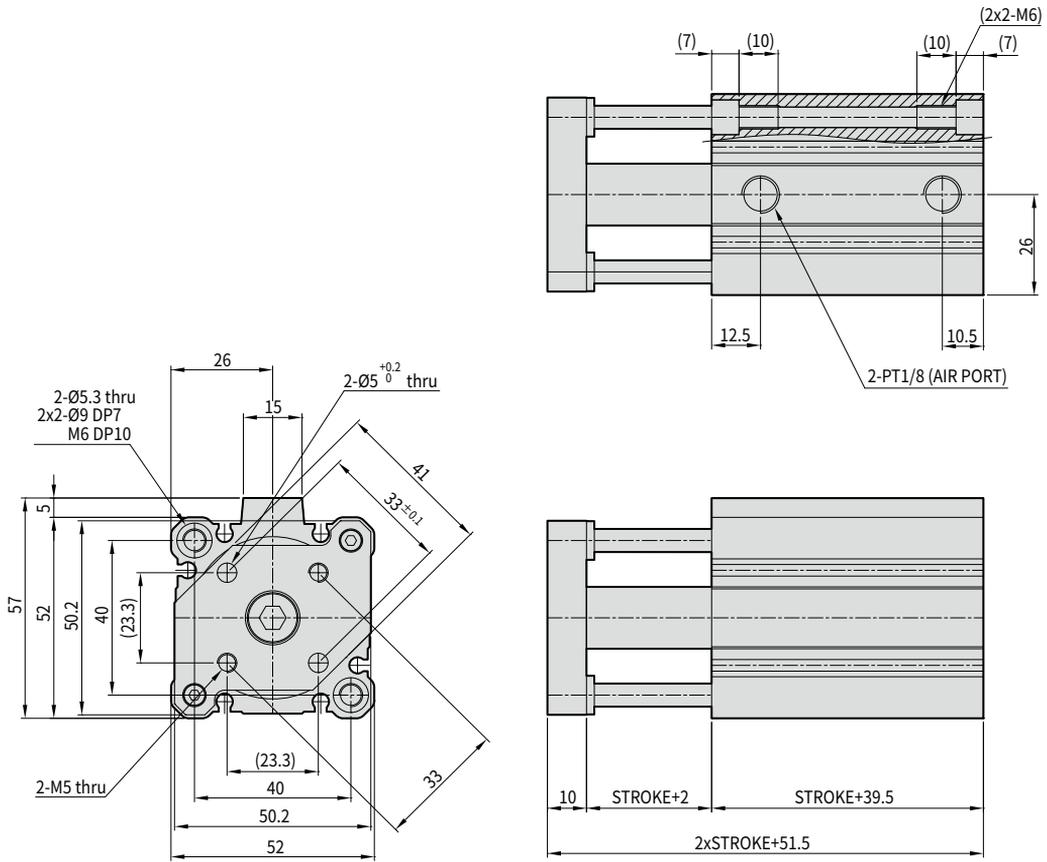
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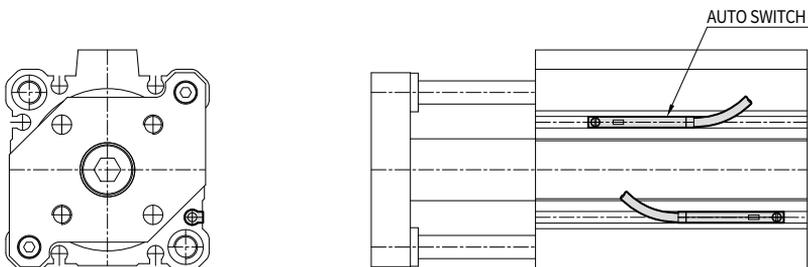
## PFTG32 Example of Auto Switch installation



PFTG40



PFTG40 Example of Auto Switch installation



# PFTG Series

12

16

20

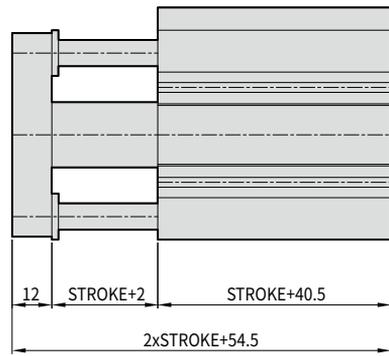
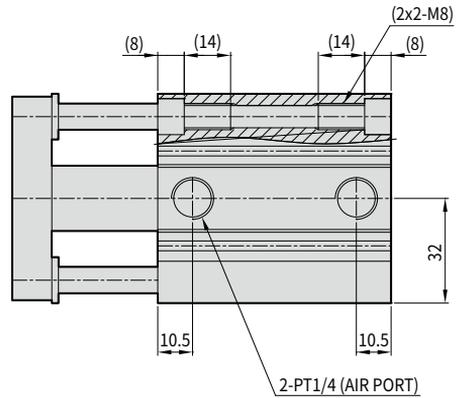
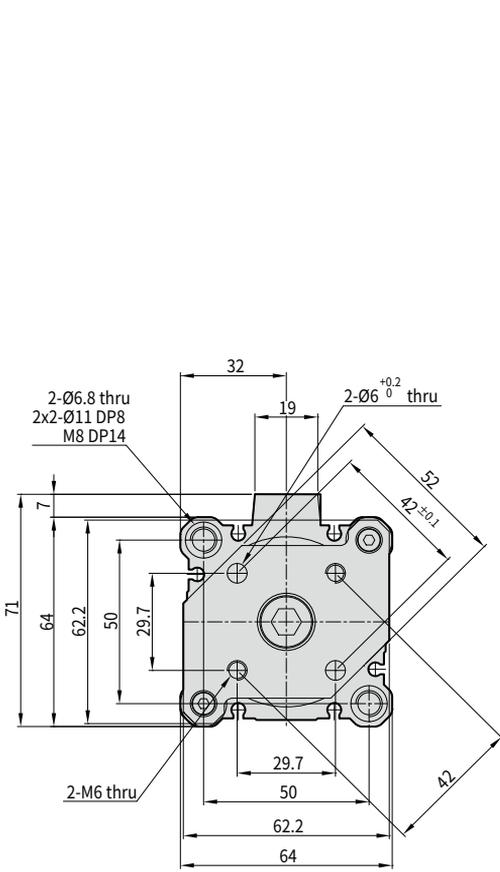
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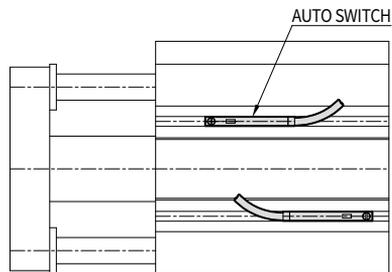
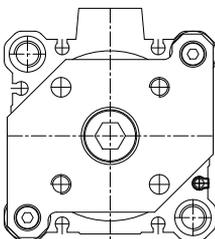
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## PFTG50

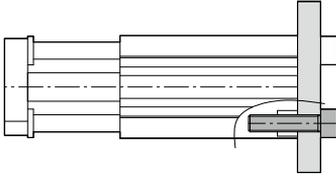


## PFTG50 Example of Auto Switch installation

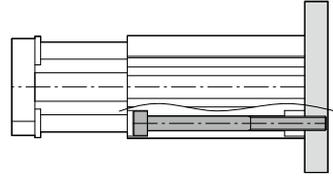


Installation Information

1. Installation by body tap holes



2. Installation by body through holes



| Item   | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|--------|----------------|---------------------|------------------------|
| PFTG12 | M4×P0.7        | 25                  | 10                     |
| PFTG16 | M4×P0.7        | 51                  | 10                     |
| PFTG20 | M6×P1          | 81                  | 17                     |
| PFTG25 | M6×P1          | 81                  | 17                     |
| PFTG32 | M6×P1          | 81                  | 17                     |
| PFTG40 | M6×P1          | 81                  | 17                     |
| PFTG50 | M8×P1.25       | 157                 | 22                     |

| Item   | Fastening Bolt | Max Torque (kgf·cm) |
|--------|----------------|---------------------|
| PFTG12 | M3×P0.5        | 11                  |
| PFTG16 | M3×P0.5        | 11                  |
| PFTG20 | M5×P0.8        | 51                  |
| PFTG25 | M5×P0.8        | 51                  |
| PFTG32 | M5×P0.8        | 51                  |
| PFTG40 | M5×P0.8        | 51                  |
| PFTG50 | M6×P1          | 81                  |

## GENERAL CYLINDER / Multi Mount

# PSK Series

### Features

- Various installation options by through and tap holes for 4 direction.
- Secured parallelism and squareness to center of rod for installation.
- Suitable to make small and precise design by various mounting ways and compact design.
- Auto Switch installation. (Optional)



### Order Form

## PSK 10 - 05 - E - A2 L S

①

②

③

④

⑤

⑥

⑦

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) |
|-------|--------------|-------------------------------|
| 10    | 10           | 05,10,15,20,25,30             |
| 16    | 16           | 05,10,15,20,25,30             |
| 20    | 20           | 05,10,15,20,25,30,40,50       |
| 25    | 25           | 05,10,15,20,25,30,40,50       |
| 32    | 32           | 05,10,15,20,25,30,40,50       |

#### ③ Standard Strokes

#### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ④ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

#### ⑤ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |                |               |                |
| A2    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2V   | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B2    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire                  | Horiz     | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3C   | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful for vertical wiring type sensor could not be mounted for certain models.

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

Specification

CYLINDER

PFT  
PFTG  
PSK

| Item Name                                 |          | PSK10  | PSK16     | PSK20     | PSK25     | PSK32      |
|---|----------|--|-----------|-----------|-----------|------------|
| CYL Bore Size(mm)                         |          | 10   | 16        | 20        | 25        | 32         |
| Rod Size(mm)                              |          | 4  | 6         | 8         | 10        | 12         |
| Standard Strokes(mm)                      |          | 5 ~ 30   |           | 5 ~ 50    |           |            |
| Theoretical Thrust(kgf)                   | Forward  | 0.78×P   | 2.01×P    | 3.14×P    | 4.90×P    | 8.04×P     |
|   | Backward | 0.65×P   | 1.72×P    | 2.63×P    | 4.12×P    | 6.91×P     |
| P : Air Pressure(kgf/cm <sup>2</sup> )    |          |  |           |           |           |            |
| Fitting Size                              |          | M5   |           |           |           | PT1/8      |
| Weight(kgf)                               |          | 0.030 +  | 0.070 +   | 0.115 +   | 0.215 +   | 0.306 +    |
| S.T : Stroke(mm)                          |          | 0.001×S.T  | 0.001×S.T | 0.002×S.T | 0.002×S.T | 0.0048×S.T |
| Fluid                                     |          | Clean Air <small>Note 1)</small>                                   |           |           |           |            |
| Pressure Range(kgf/cm <sup>2</sup> )      |          | 1.5 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |           |           |           |            |
| Lubrication                               |          | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)    |           |           |           |            |
| Temperature Range(°C)                     |          | 5 ~ 60   |           |           |           |            |
| Moving Speed(mm/sec)                      |          | 30 ~ 300   |           |           |           |            |
| Operation Type                            |          | Double Acting  |           |           |           |            |
| Stroke Tolerance for Forward Position(mm) |          | 0 ~ +1   |           |           |           |            |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

# PSK Series

10

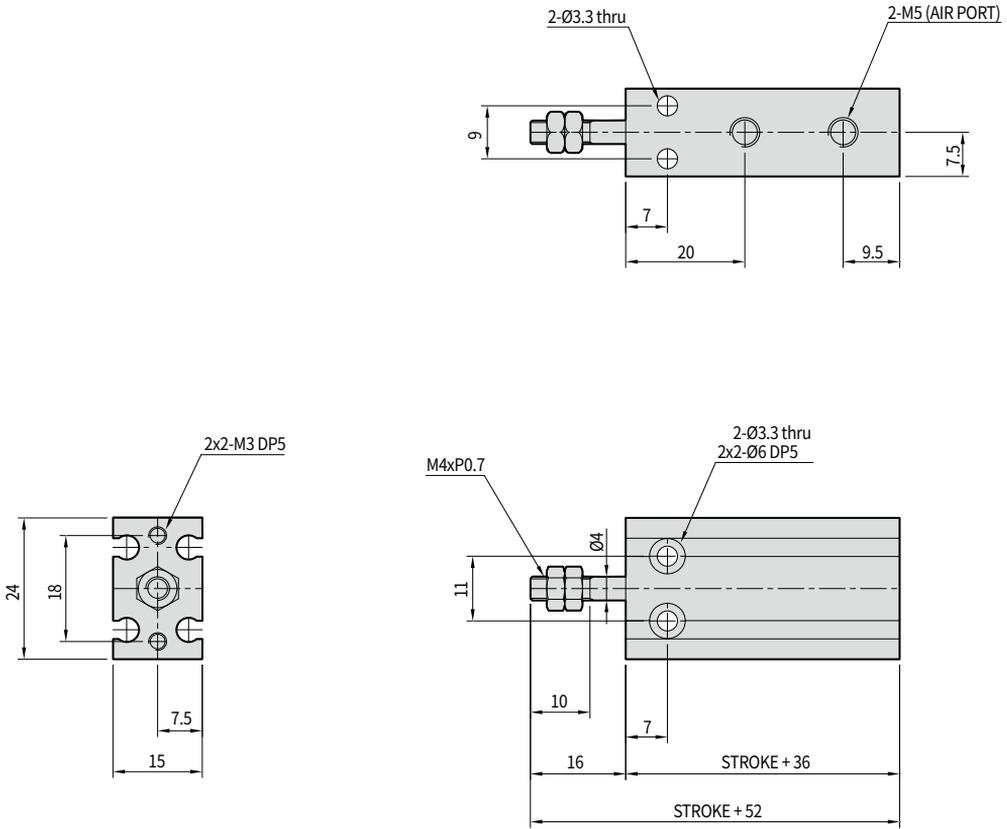
16

20

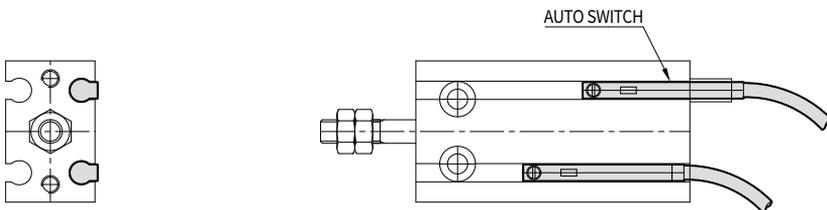
25

32

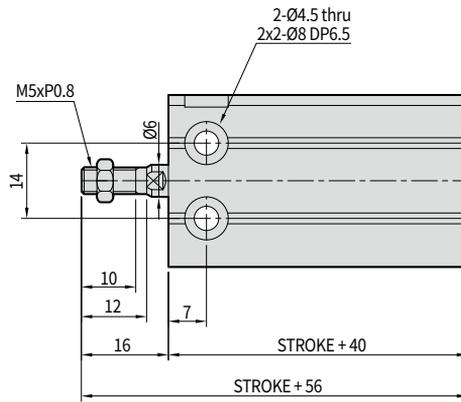
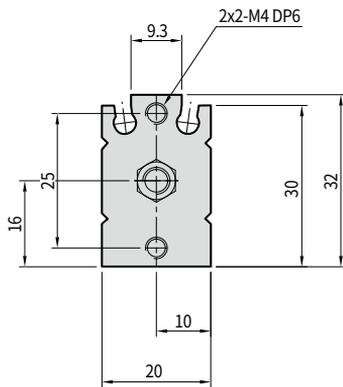
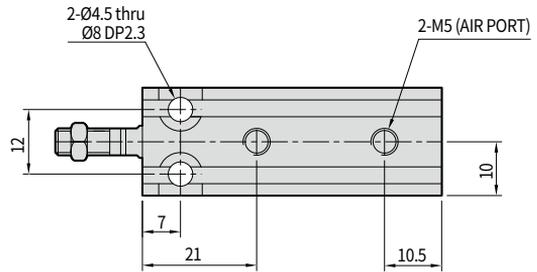
## PSK10



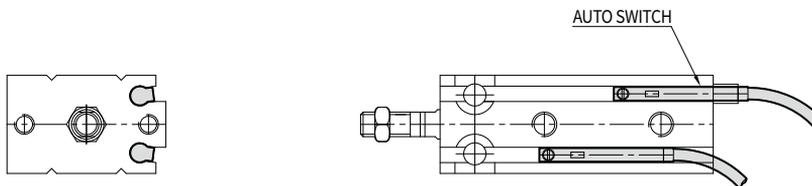
## PSK10 Example of Auto Switch installation



PSK16



PSK16 Example of Auto Switch installation



※ Vertical wiring type Auto Switch could not be mounted for PSK16 model.

# PSK Series

10

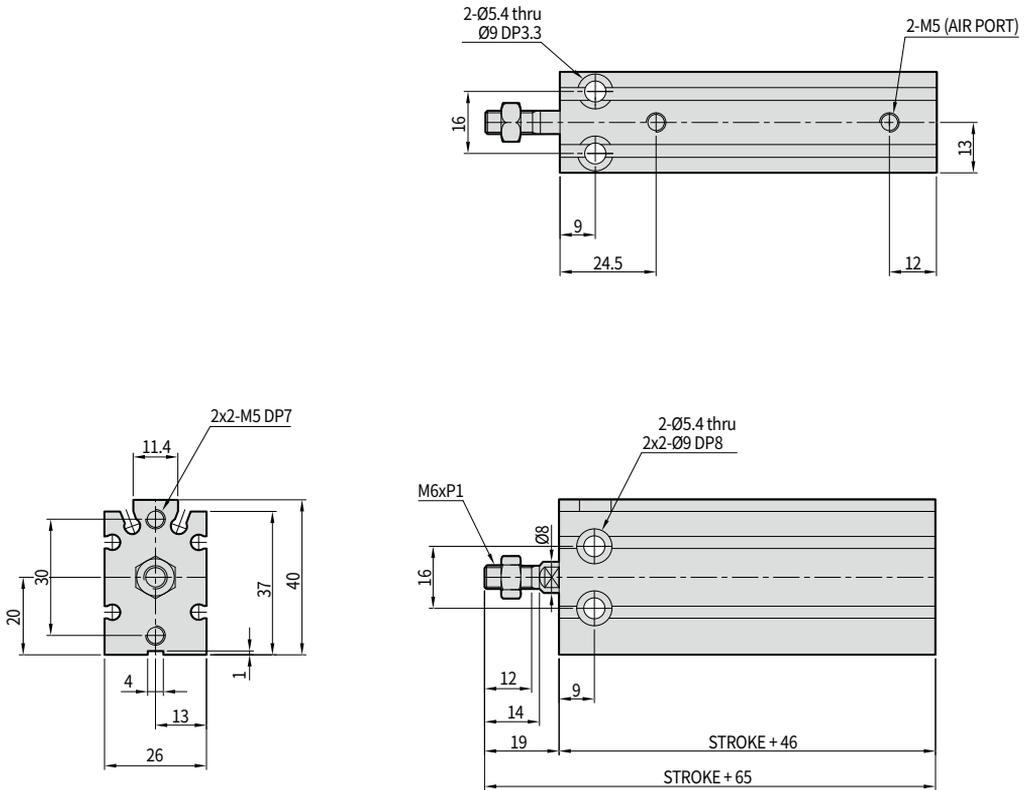
16

20

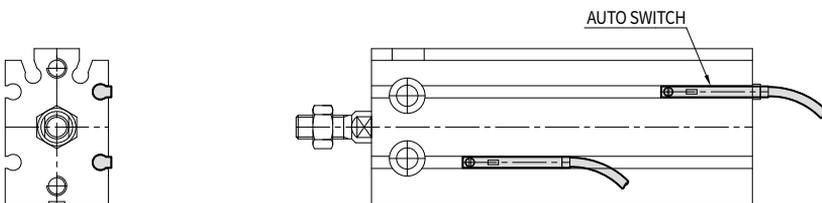
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32

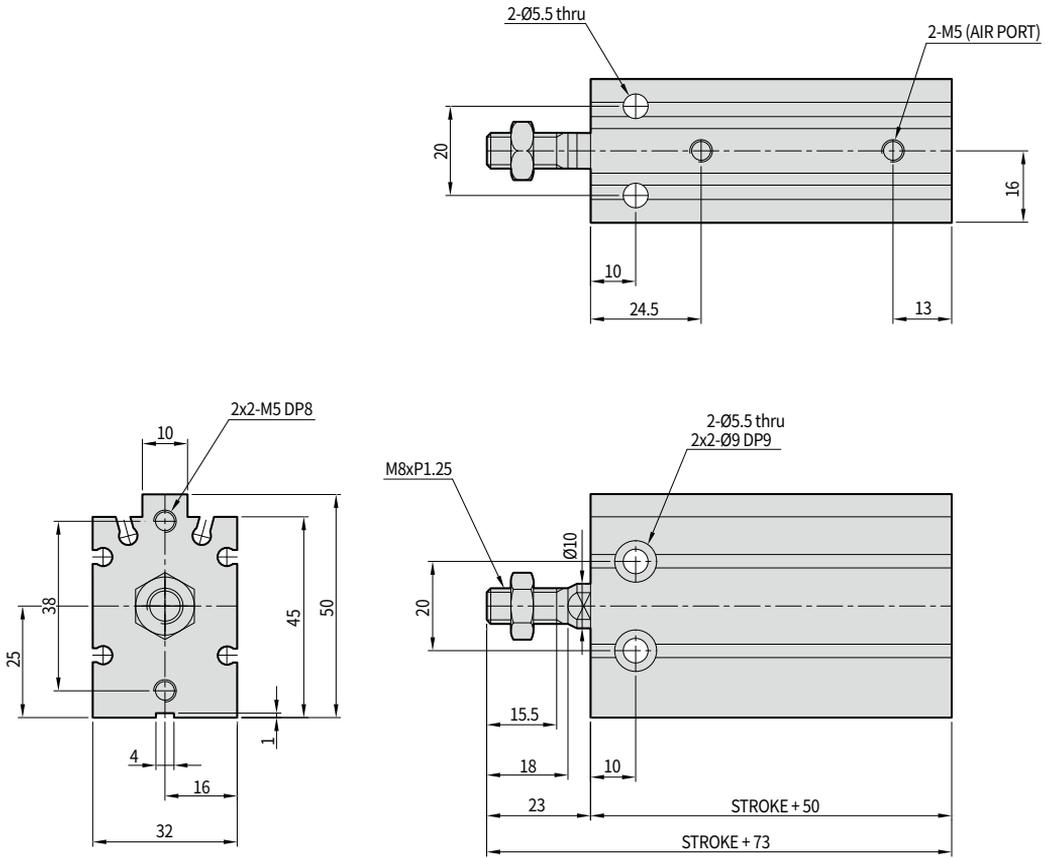
## PSK20



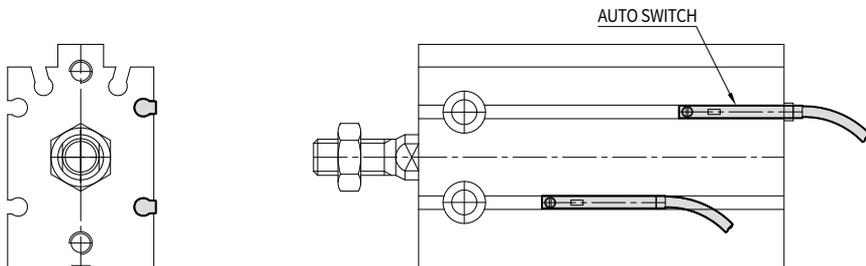
## PSK20 Example of Auto Switch installation



PSK25



PSK25 Example of Auto Switch installation



# PSK Series

10

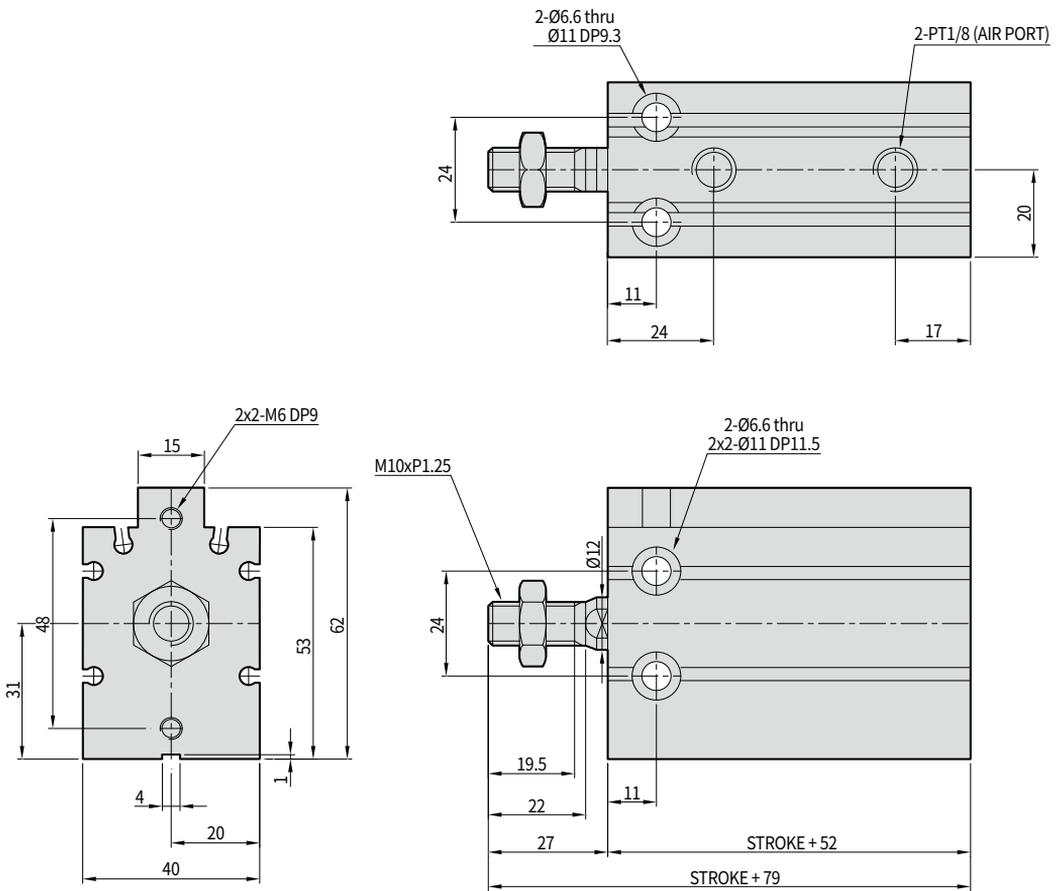
16

20

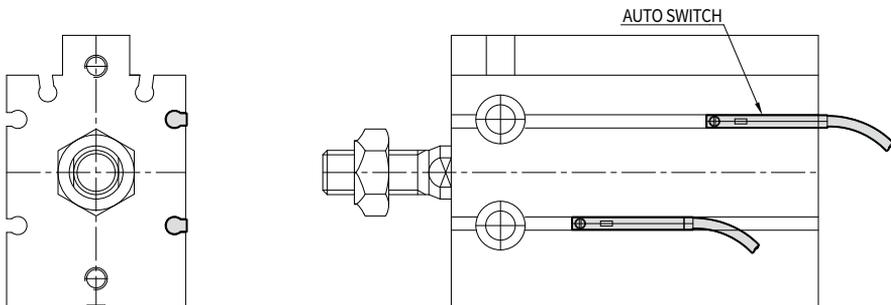
25

32

## PSK32

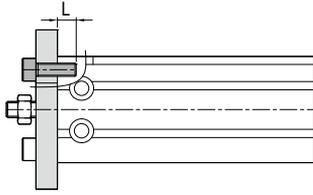


## PSK32 Example of Auto Switch installation



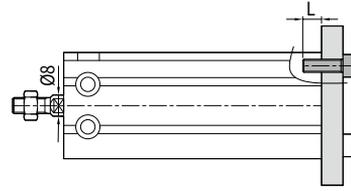
Installation Information

1. Installation by body tap holes



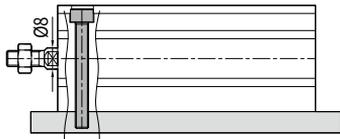
| Item  | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PSK10 | M3×P0.5        | 11                  | 5                      |
| PSK16 | M4×P0.7        | 25                  | 6                      |
| PSK20 | M5×P0.8        | 51                  | 7                      |
| PSK25 | M5×P0.8        | 51                  | 8                      |
| PSK32 | M6×P1          | 81                  | 9                      |

2. Installation by body tap holes



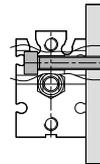
| Item  | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PSK10 | M3×P0.5        | 11                  | 5                      |
| PSK16 | M4×P0.7        | 25                  | 6                      |
| PSK20 | M5×P0.8        | 51                  | 7                      |
| PSK25 | M5×P0.8        | 51                  | 8                      |
| PSK32 | M6×P1          | 81                  | 9                      |

3. Installation by body through holes



| Item  | Fastening Bolt | Max Torque (kgf·cm) |
|-------|----------------|---------------------|
| PSK10 | M3×P0.5        | 11                  |
| PSK16 | M4×P0.7        | 25                  |
| PSK20 | M5×P0.8        | 51                  |
| PSK25 | M5×P0.8        | 51                  |
| PSK32 | M6×P1          | 81                  |

4. Installation by body through holes



| Item  | Fastening Bolt | Max Torque (kgf·cm) |
|-------|----------------|---------------------|
| PSK10 | M3×P0.5        | 11                  |
| PSK16 | M4×P0.7        | 25                  |
| PSK20 | M5×P0.8        | 51                  |
| PSK25 | M5×P0.8        | 51                  |
| PSK32 | M6×P1          | 81                  |



**P&M Catalogue**

**BLOCK CYLINDER**

Please read it before use, with individual notes for each series as well, for your safe use.

## **⚠ Basic Safety Notes for BLOCK CYLINDER ①**

### **⚠ Caution**

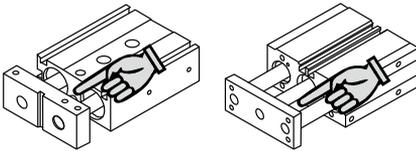
- **When mounting the cylinder at the working site, be careful to prevent drill chip or dust from entering the air port of cylinder**
- **Avoid any damage or scratches at the frictional surfaces of piston rod and guide rod.**  
It may cause damage to packing and faulty operation due to air leakage.
- **Be careful not to cause scratch or shock on the mounting surfaces of cylinder body, slide table, and end plate.**  
Damage in mounting surfaces makes worse the flatness, and cause work failure due to the increased vibration of guide unit and friction resistance.

### **Notes in Installation**

- **Install the screw to the cylinder and tighten it to the specified torque and depth.**  
Fasten it over than specified torque might cause of malfunction. Also, insufficient screw tightening might cause dislocation or work piece to drop.
- **When mounting the cylinder and load in vertical and horizontal directions, make sure to align the axial parallelism with the horizontal and vertical planes.**
- **Mount the cylinder so that it might be installed or disassembled easily for convenient maintenance.**

### **⚠ Warning**

- **Do not put your hand or finger in between cylinder body and the plates in both side.**  
Be careful of hand or finger jam between plate and body during air supplied to the cylinder as it may injure human body.



### **Notes in Handling**

- **In the installation of cylinder, make sure that the cylinder is not damaged or impacted by dropping or crash.**  
Any small distortion may be the cause of deterioration or malfunction.
- **Check for proper operation of the system before starting.**  
In advance system operation, check the performance of air cylinder and air leakage.
- **If any deflection occurs exceeding the specified capacity at the cylinder shaft, it may cause reduction of lifespan.**

### **⚠ Caution**

- **Do not exceed the specified load when selecting the product.**  
Select model based on the specified maximum load according to each model. Otherwise, it may result in distorted load of the guide unit, which may cause vibration to guide unit, deterioration, and adverse effects on cylinder life.

### **Notes in Selection**

- **Avoid excessive external force or shock. It may cause a failure.**
- **For the selection of each series, refer to the specification in this catalogue.**  
For the selection of each series, refer to the specification in this catalogue. Correct use for cylinder within the specified temperature and pressure range might reduce the reason of malfunction and failure.

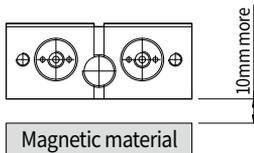
Please read it before use, with individual notes for each series as well, for your safe use.

## Basic Safety Notes for BLOCK CYLINDER ②

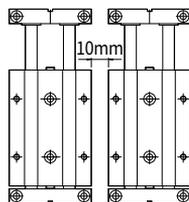
### Caution

### Notes in operating Environment and Handling

- Be careful of using in the place where vibration and shock occurs frequently, it may cause a failure.
- To maintain the quality of compressed air, exhaust drains in filter periodically.
- When there are magnetic materials like steel plate near the auto switch of cylinder, most likely they may cause malfunction in the auto switch, therefore they need to be designed and installed with sufficient space from the surface of cylinder.  
(Maintain 10mm or more space)



- When used around heat source of high temperature, product can be heated by radiant heat and cause failure. Therefore, install protective covers to block heat source.
- Do not use in the environment that can be affected by foreign substances such as dust and chip, and cutting oil.  
It may cause vibration, frictional resistance, and air leakage. In such environment, please install appropriate protective cover through the consultation with our company.
- Be careful with corrosion resistance for the stability in cross roller guide unit.  
Humid environment may cause water drop and rust in guide unit.
- To remove cylinder from installation, remove it after remove compressed air.
- If installing more than 2 cylinders with auto switch in close, keep clearance more than 10 mm.



If cylinders are installed as too close, there is a possibility of malfunction of auto switch by magnetic interruption. So, install them with sufficient extra space in between.

- To control the speed of cylinder, please use speed controller.
- Be careful not to damage on the cable line of auto switch.  
Over bending or scar, damage on the cable of auto switch will cause of current leakage or defect on connection may lead electric shock and/or fire, abnormal motion.
- Make sure to connect fixing or connection unit of cylinder firmly.

Make sure that the cylinder is connected firmly, in particular, if used in the place where vibration and shock occurs frequently.

- Be careful of handling heavy products.

In the transportation or installation of heavy product, install reinforced bar to avoid injury to human body and damage to the device.

- Can select various stroke adjustment unit. Check it before model selection.

When controlling the cylinder stroke, three different types of cushions can be used according to the intended use.

1. Urethane Stopper : generalized stroke adjusting unit  
(Allowable speed 50~500mm/sec)
2. Metal Stopper : It may improve the precise control of stroke, but doesn't have cushion function, so it is used only for light load and low-speed. As it is special ordering specification, please contact us.  
(Allowable speed 50~200mm/sec)
3. Shock Absorber : Soft stop by absorbing the shock at the end of stroke.

- Use the product within the specified speed control range.

Too low speed may cause stick slip or operation stop to the product.

Please read it before use, with individual notes for each series as well, for your safe use.

## **⚠ Basic Safety Notes for BLOCK CYLINDER ③**

### **⚠ Caution**

#### ■ **Add lubricant at the frictional surfaces of cylinder periodically.**

Adding lubricant periodically at the frictional surfaces of cylinder can extend lifespan.

#### ■ **Do NOT disassemble or remodel to Air Cylinder.**

Do NOT disassemble or remodel to Air Cylinder for other purpose. It could bring human injury or electrical shocks, fire due to abnormal operation.

#### ■ **Checklists before maintenance.**

Check if there is preventive measure for load from drop, deflection, and projection, and conduct inspection after block compressed air and power, and exhaust remained air in system. If air pressure is remained in cylinder, the

### **Notes in Maintenance**

actuator may cause injury to human body due to accidental operation.

#### ■ **Checklists after maintenance**

Check anti-protrusion action for re-starting, and inspect leakage and appropriate function by supplying compressed air or power to the pneumatic system. If the machine is not operated due to leakage, stop using it and check if the installation is correct.

#### ■ **Frequent inspection item.**

With daily frequent inspection, check the deterioration of durability and function in pneumatic devices to prevent accident in advance.

### **⚠ Caution**

### **Notes for the Adjustment of Cylinder Stroke**

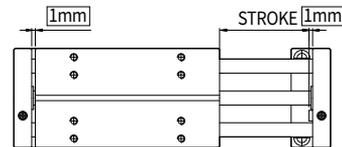
#### ■ **The stroke of cylinder is adjustable between 0 and 5mm.**

#### ■ **To adjust cylinder stroke, loosen the fixed stopper bolt, adjust it to desired working range, and then fix and tighten it again.**

#### ■ **The urethane damper used for shock absorption is a consumable part, so it shall be replaced if any damage occurs.**

#### ■ **Do not use cylinder stroke adjusting unit less than 1mm.**

Too short stroke may cause improper operation of urethane damper and shock absorber and have an adverse effect on the life.



### **⚠ Warning**

#### ■ **If there is a possibility to lead any danger in human body, please attach safety devices such as protective cover.**

If during cylinder on operating, the load or the working area of cylinder may lead danger in human body. In this case, change the structure not to contact that dangerous area directly by human body.

#### ■ **The possibility of failure in power source shall be considered.**

It is needed to set up the measures for equipment controlled with power source including air pressure, oil pressure, and electricity, to prevent injury to human body or damage to mechanical equipment, even when such power sources are in failure.

#### ■ **Operation in emergency stop shall be considered.**

Please be careful not to cause injury to human body or

### **Notes in Design**

damage to mechanical equipment from unexpected operation of cylinder, while the mechanical structure is stopped by the safety equipment due to system abnormality such as power failure or intentional stop by people.

#### ■ **Shock Absorber or decelerator may be required.**

When the working speed of load is fast or its mass is big, it may difficult to absorb shock by cushion in cylinder. Therefore, install deceleration circuit or shock absorber to decrease the shock sufficiently.

#### ■ **Do not use the product as a shock absorber.**

When there is abnormal pressure or air leakage, deceleration effect may be remarkably declined and result in injuries to human body and damage to equipment.

Please read it before use, with individual notes for each series as well, for your safe use.



## Basic Safety Notes for BLOCK CYLINDER 4

### Caution

#### ■ Air filter needs to be equipped.

Attach an air filter with 5 $\mu$ m or less of filtering degree at the upper stream side near the valve.

#### ■ Air dryer needs to be equipped.

Compressed air containing lots of drain may be the cause of failure in pneumatic devices. Therefore, install an air dryer or air catch so as to reduce occurring drain.

### Notes for Air Quality

#### ■ Temperature needs to be within the specified range.

Establish counter measure to make sure that the drain or moisture in compressed air is not frozen when you use the pneumatic devices at low temperature less than 5°C, so as not to damage to packing or cause faulty operation.

# BLOCK CYLINDER PT Series

## Features

- Twin cylinder inside type single direction acting type actuator.
- Double thrust of cylinder bore specification.
- Suitable for handling workpiece up & down in automation field.
- Improved durability and precision by profile body.
- Two options for guide components.
  - Sliding bearing : PT type
  - L.M bearing : PT-B, PT-DB (Double bearing) type
- Auto Switch installation. (Optional)



## Order Form

PT
20
B
-
50
-
E
-
A1
L
S

1
2
3
4
5
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7
8

### ① Series Name

### ② Cylinder Bore Size

### ④ Standard Strokes

### ⑥ Available Auto Switches

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) | Order |    |     |    |    |     |
|-------|--------------|-------------------------------|-------|----|-----|----|----|-----|
|       |              |                               | A1    | A2 | A2C | B1 | B2 | B2B |
| 12    | 12           | 15,25,50                      |       | ○  | ○   |    | ○  | ○   |
| 16    | 16           | 15,25,50,75                   |       | ○  | ○   |    | ○  | ○   |
| 20    | 20           | 25,50,75,100                  | ○     |    |     | ○  |    |     |
| 25    | 25           | 25,50,75,100,125              | ○     |    |     | ○  |    |     |
| 30    | 30           | 25,50,75,100,125              | ○     |    |     | ○  |    |     |
| 40    | 40           | 25,50,75,100,125              | ○     |    |     | ○  |    |     |

※ For "Blank", no Auto Switch is provided.

### ③ Bearing Types

| Order | Bearing Types      |
|-------|--------------------|
| Blank | Sliding bearing    |
| B     | L.M bearing        |
| DB    | Double L.M bearing |

### ⑤ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

※ Auto Switch Specification

| Order | Sensing Type         | Cable Spec |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires      | Direction | AC      | DC           | AC      | DC             |               |                |
| A1    | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2    | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2    | Magnetic solid state | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire     | Horiz     | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |

\* Please contact to office for auto switch mounting less than 25mm stroke model.

⑦ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

⑧ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |



Specification

| Item Name                                 | PT12   | PT16                | PT20                 | PT25                | PT30                | PT40                |                    |
|---|--|---------------------|----------------------|---------------------|---------------------|---------------------|--------------------|
| CYL Bore Size(mm)                         | 12   | 16                  | 20                   | 25                  | 30                  | 40                  |                    |
| Rod Size(mm)                              | 6  | 8                   | 10                   | 12                  | 16                  | 20                  |                    |
| Standard Strokes(mm)                      | 15 ~ 50  | 15 ~ 75             | 25 ~ 100             | 25 ~ 125            |                     |                     |                    |
| Theoretical Thrust(kgf)                   | Forward  | 2.26×P              | 4.01×P               | 6.28×P              | 9.81×P              | 14.13×P             | 25.12×P            |
|   | Backward   | 1.69×P              | 3.01×P               | 4.71×P              | 7.55×P              | 10.11×P             | 18.8×P             |
| P : Air Pressure(kgf/cm <sup>2</sup> )    | M5   |                     |                      | PT1/8               |                     |                     |                    |
| Fitting Size                              | Sliding Bearing  | 0.12 +<br>0.002×S.T | 0.27 +<br>0.0025×S.T | 0.51 +<br>0.005×S.T | 0.76 +<br>0.006×S.T | 1.30 +<br>0.009×S.T | 2.6 +<br>0.015×S.T |
|   | L.M Bearing  | 0.13 +<br>0.002×S.T | 0.29 +<br>0.0025×S.T | 0.55 +<br>0.005×S.T | 0.81 +<br>0.006×S.T | 1.36 +<br>0.009×S.T | 2.7 +<br>0.015×S.T |
|   | Double L.M Bearing   | 0.21 +<br>0.002×S.T | 0.48 +<br>0.0025×S.T | 0.77 +<br>0.005×S.T | 1.18 +<br>0.006×S.T | 1.92 +<br>0.009×S.T | 3.5 +<br>0.015×S.T |
| Fluid                                     | Clean Air <small>Note 1)</small>                                 |                     |                      |                     |                     |                     |                    |
| Pressure Range(kgf/cm <sup>2</sup> )      | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |                     |                      |                     |                     |                     |                    |
| Lubrication                               | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)  |                     |                      |                     |                     |                     |                    |
| Temperature Range(°C)                     | 5 ~ 60   |                     |                      |                     |                     |                     |                    |
| Moving Speed(mm/sec)                      | 30 ~ 300   |                     |                      |                     |                     |                     |                    |
| Operation Type                            | Double Acting  |                     |                      |                     |                     |                     |                    |
| Accuracy(mm)                              | Sliding Bearing : ±0.1   |                     |                      |                     |                     |                     |                    |
|   | L.M Bearing : ±0.05  |                     |                      |                     |                     |                     |                    |
| Stroke Tolerance for Forward Position(mm) | 0 ~ +1   |                     |                      |                     |                     |                     |                    |
| Stroke Adjustment Range(mm)               | 0 ~ -5 (For standard stroke model)                               |                     |                      |                     |                     |                     |                    |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

## Allowable Lateral Load

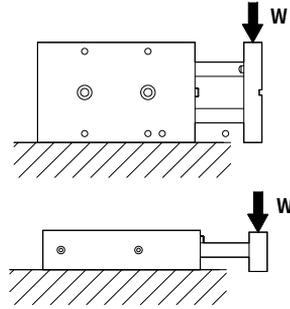
■ The graph means allowable lateral load on the end of plate at the block fixed shown as right fig.

### ■ Guide Type

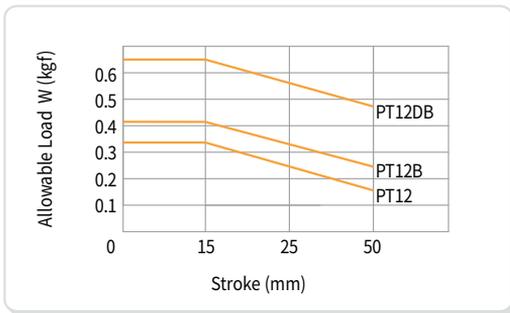
PT : Sliding Bearing

PT-B : L.M Bearing

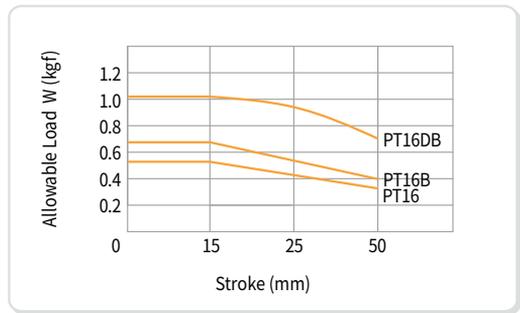
PT-DB : Double L.M Bearing



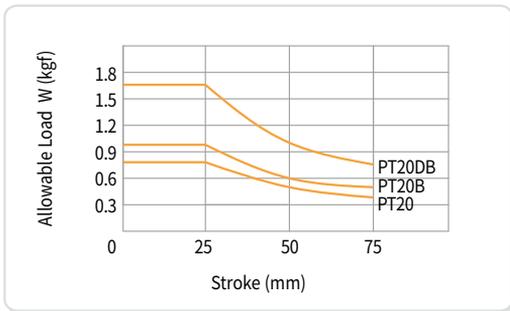
### ▶ PT12



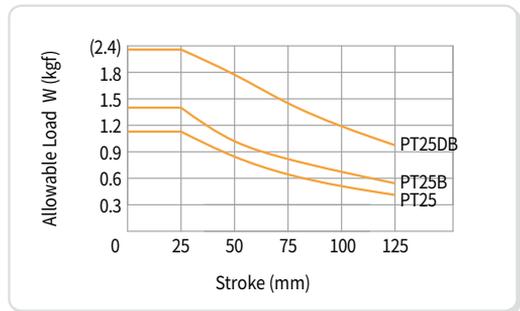
### ▶ PT16



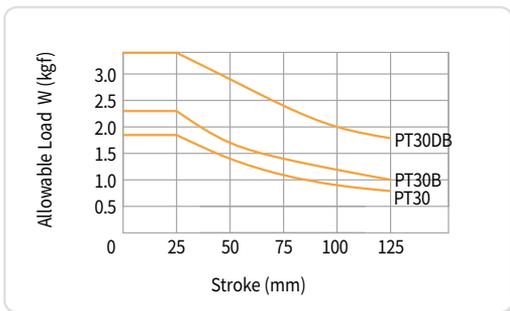
### ▶ PT20



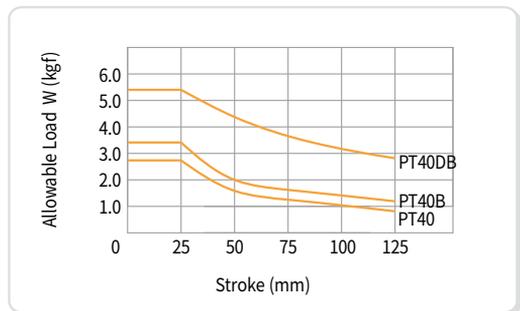
### ▶ PT25



### ▶ PT30

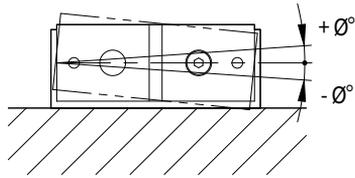


### ▶ PT40



Anti-Rotate Degree of Plate

■ Under table refers the anti-rotate degree of plate for load free status shown as below fig.



| MODEL                      | $\theta^\circ$ |
|----------------------------|----------------|
| PT (Sliding Bearing)       | $\pm 0.12$     |
| PT-B (L.M Bearing)         | $\pm 0.1$      |
| PT-DB (Double L.M Bearing) | $\pm 0.07$     |

# PT Series

12(B)

12DB

16(B)

16DB

20(B)

20DB

25(B)

25DB

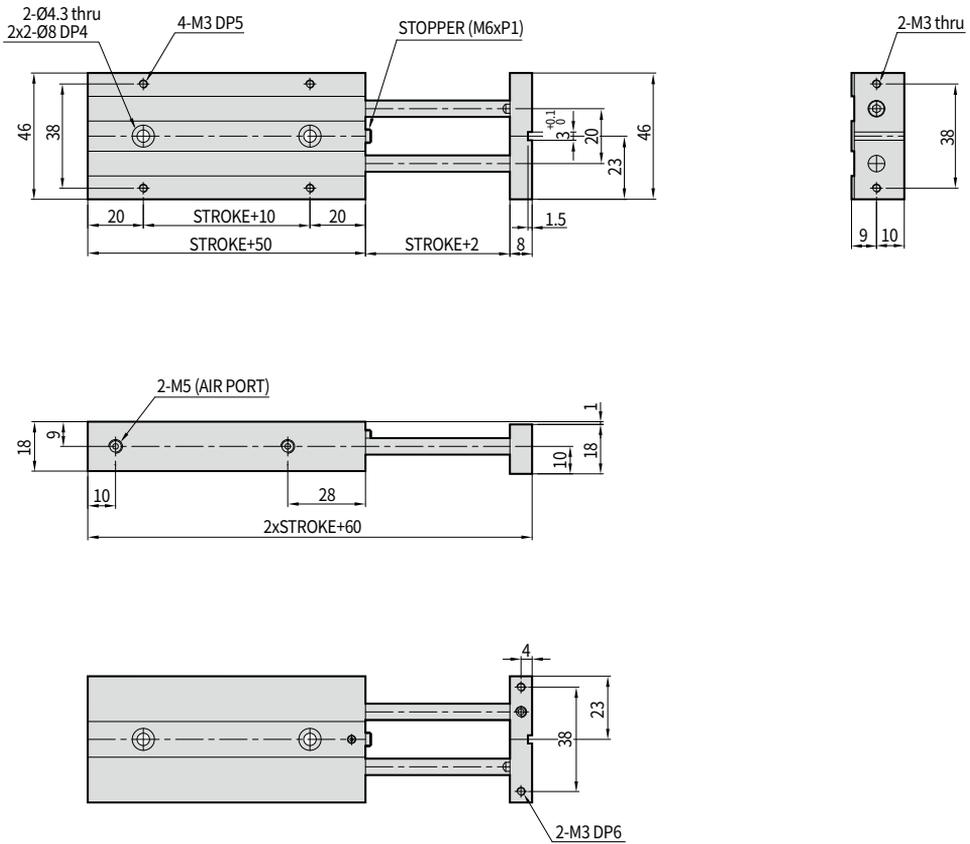
30(B)

30DB

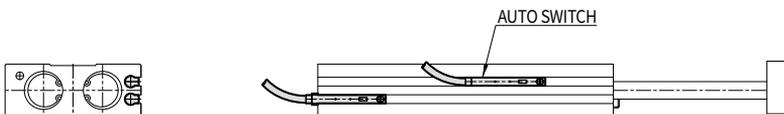
40(B)

40DB

## PT12(B)

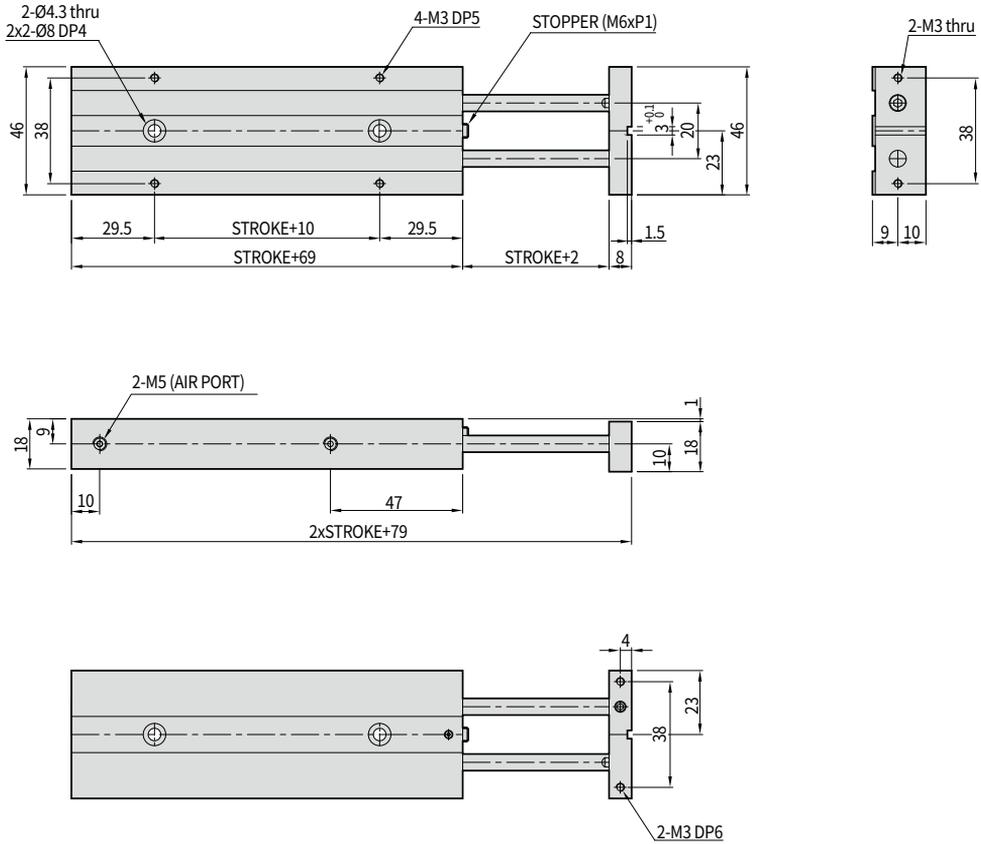


## PT12(B) Example of Auto Switch installation



- 12(B) 12DB 16(B) 16DB 20(B) 20DB 25(B) 25DB 30(B) 30DB 40(B) 40DB

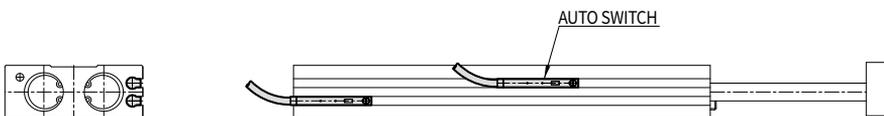
PT12DB



BLOCK

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC

PT12DB Example of Auto Switch installation



# PT Series

12(B)

12DB

16(B)

16DB

20(B)

20DB

25(B)

25DB

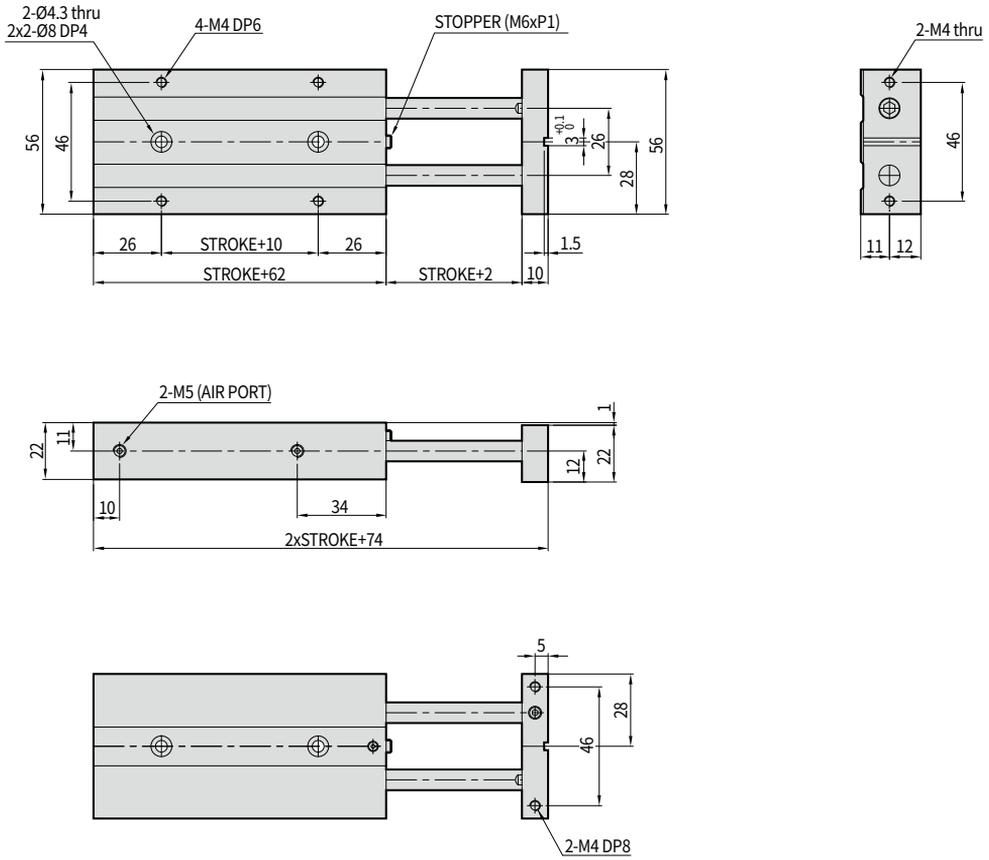
30(B)

30DB

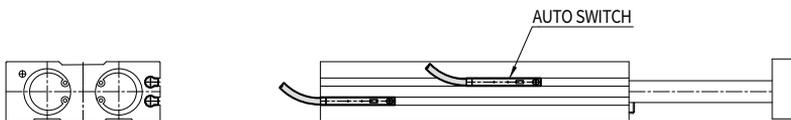
40(B)

40DB

## PT16(B)

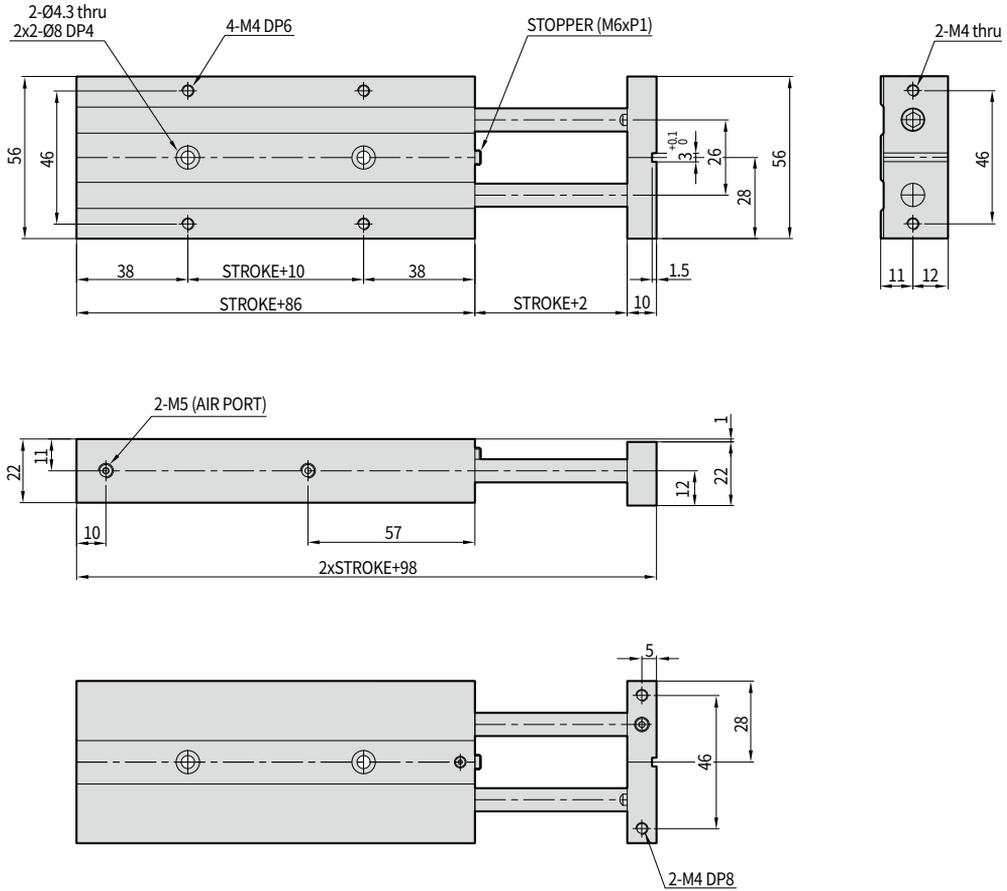


## PT16(B) Example of Auto Switch installation



- 12(B) 12DB 16(B) **16DB** 20(B) 20DB 25(B) 25DB 30(B) 30DB 40(B) 40DB

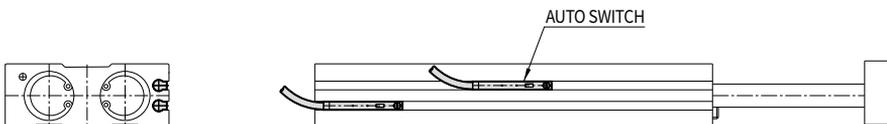
PT16DB



BLOCK

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC

PT16DB Example of Auto Switch installation



# PT Series

12(B)

12DB

16(B)

16DB

20(B)

20DB

25(B)

25DB

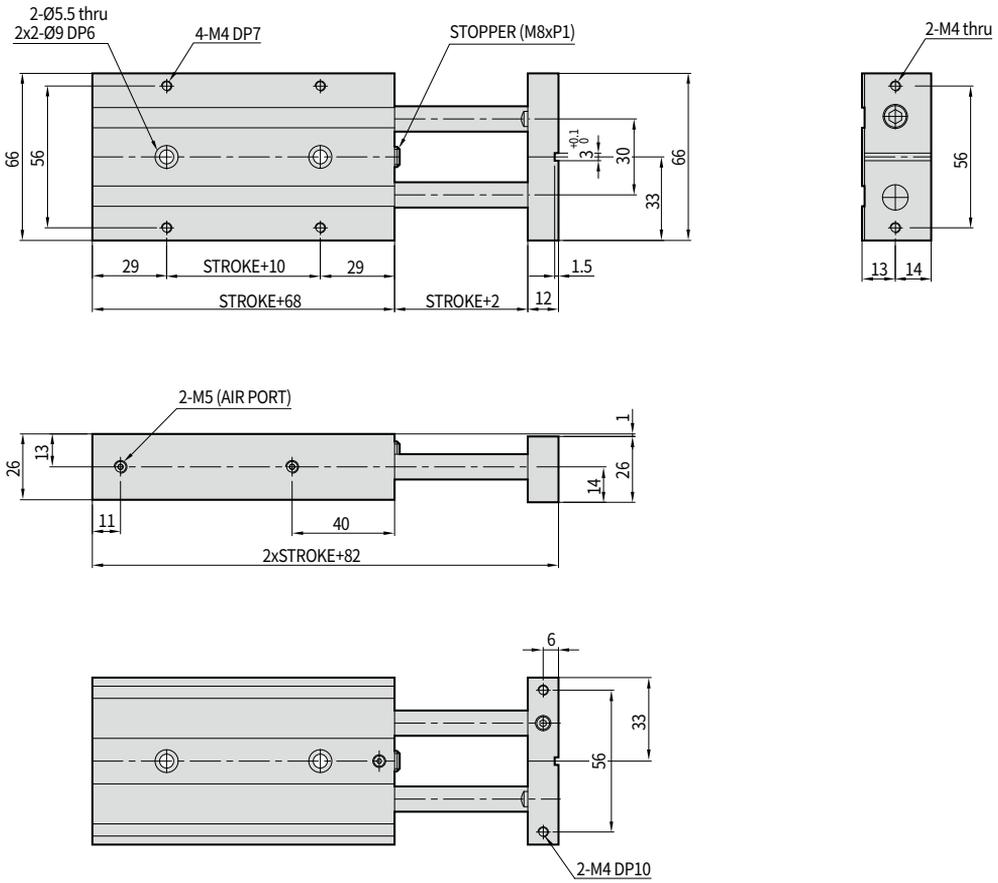
30(B)

30DB

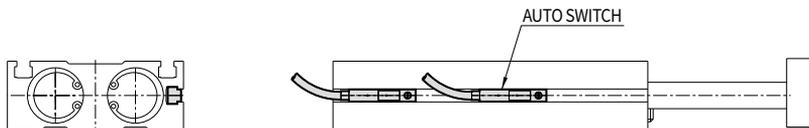
40(B)

40DB

## PT20(B)

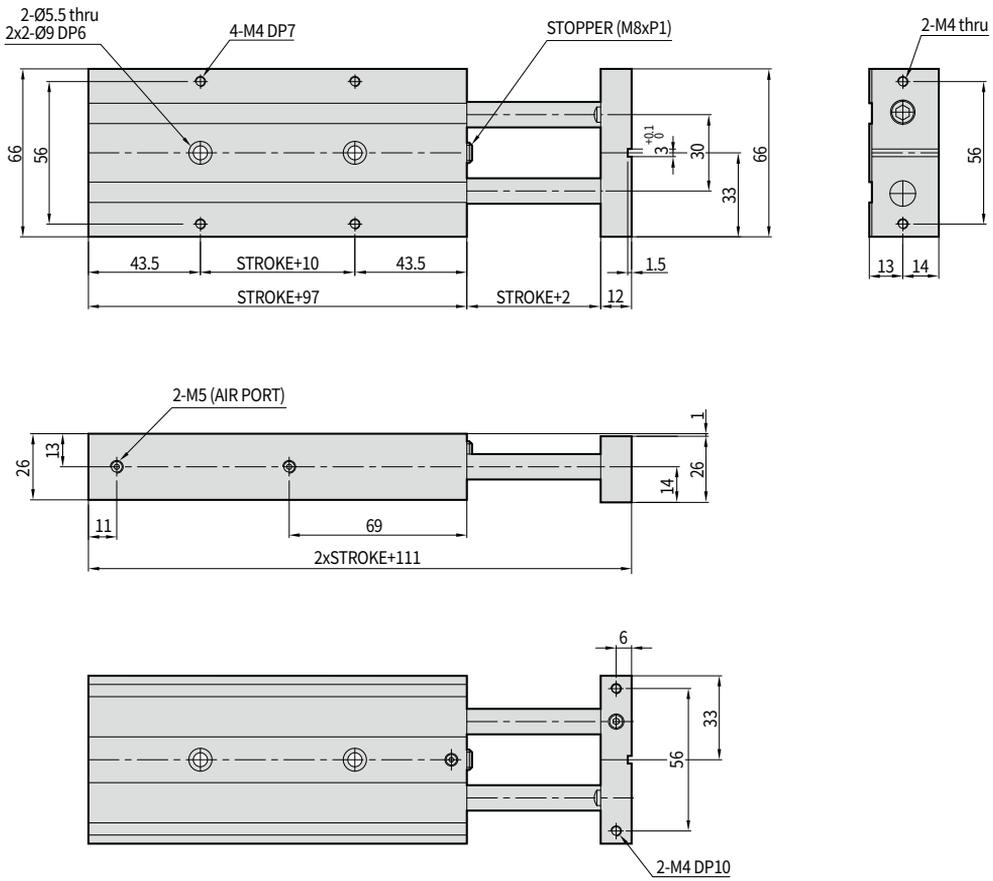


## PT20(B) Example of Auto Switch installation



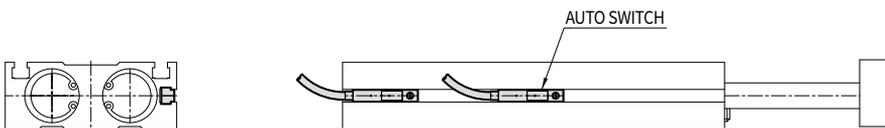
- 12(B) 12DB 16(B) 16DB 20(B) 20DB 25(B) 25DB 30(B) 30DB 40(B) 40DB

PT20DB



- BLOCK
- PT
  - PB
  - PBM-N
  - PQG
  - PBF
  - PGL
  - PGC

PT20DB Example of Auto Switch installation



# PT Series

12(B)

12DB

16(B)

16DB

20(B)

20DB

25(B)

25DB

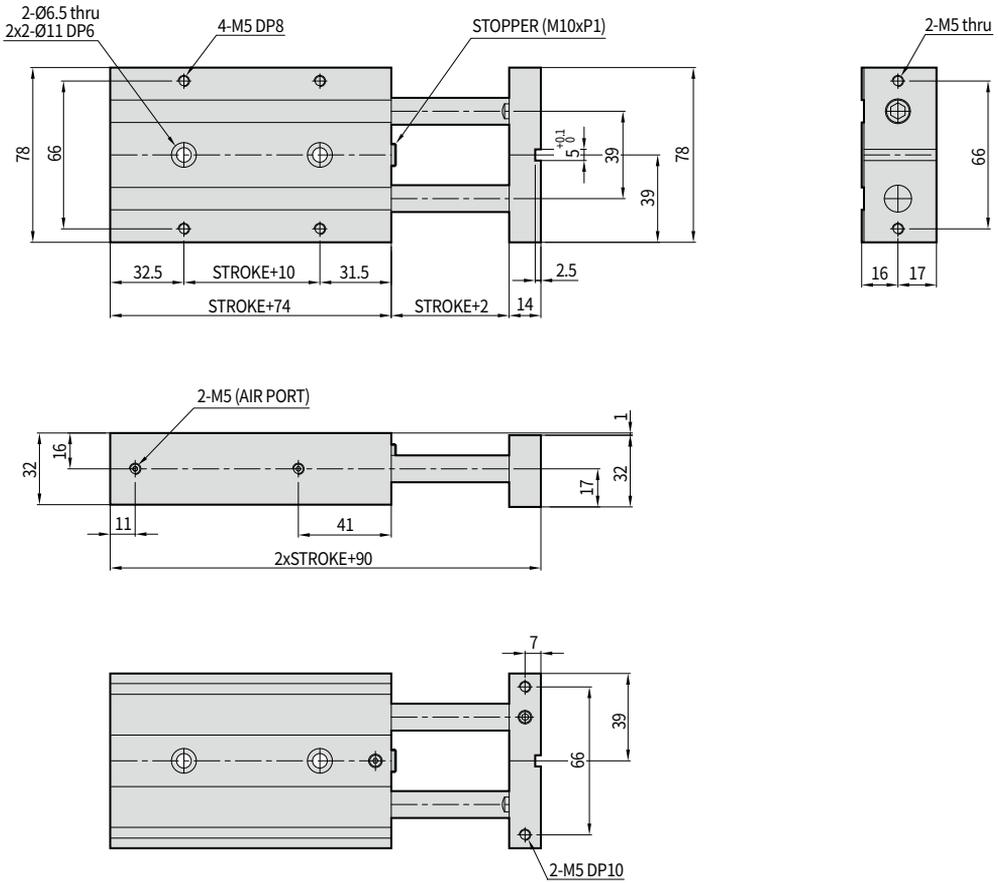
30(B)

30DB

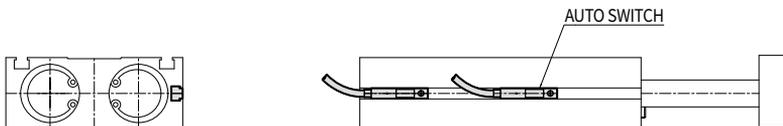
40(B)

40DB

## PT25(B)

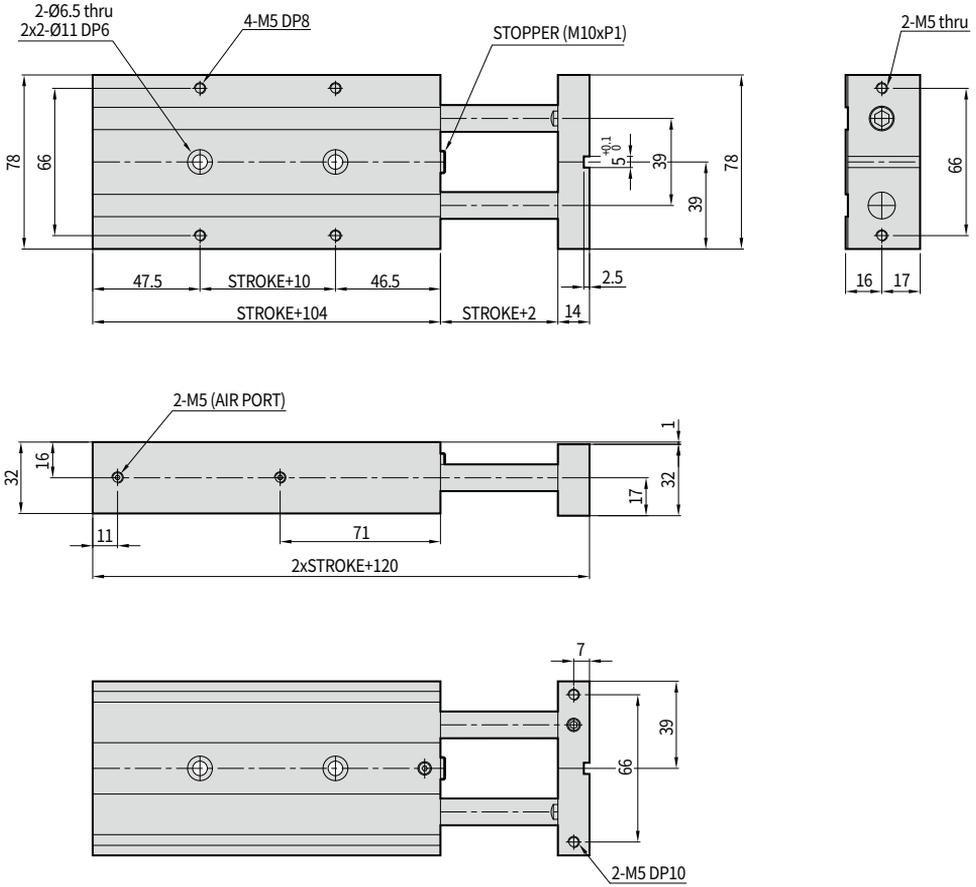


## PT25(B) Example of Auto Switch installation



- 12(B) 12DB 16(B) 16DB 20(B) 20DB 25(B) 25DB 30(B) 30DB 40(B) 40DB

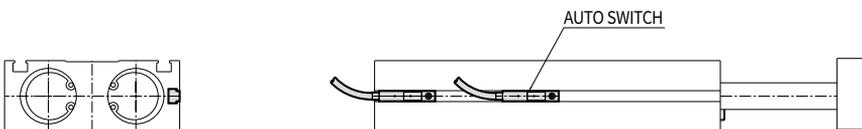
PT25DB



BLOCK

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC

PT25DB Example of Auto Switch installation



# PT Series

12(B)

12DB

16(B)

16DB

20(B)

20DB

25(B)

25DB

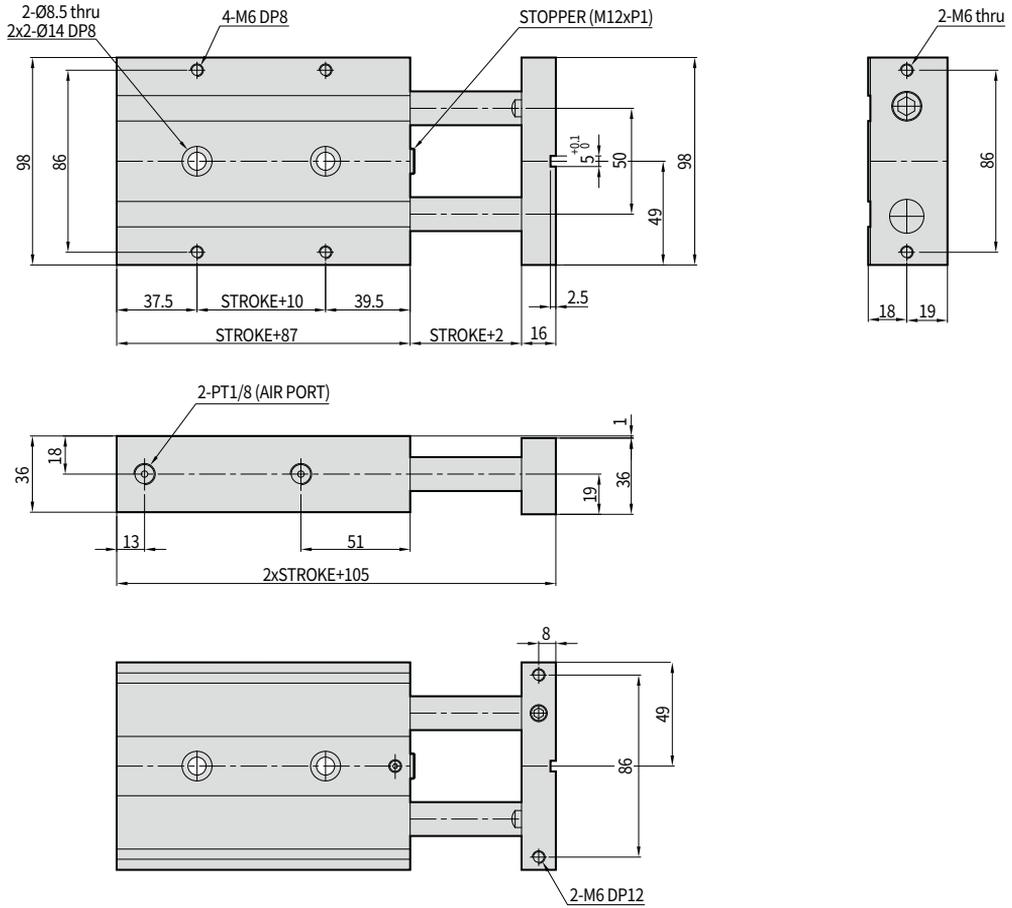
30(B)

30DB

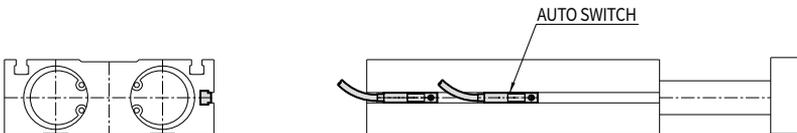
40(B)

40DB

## PT30(B)

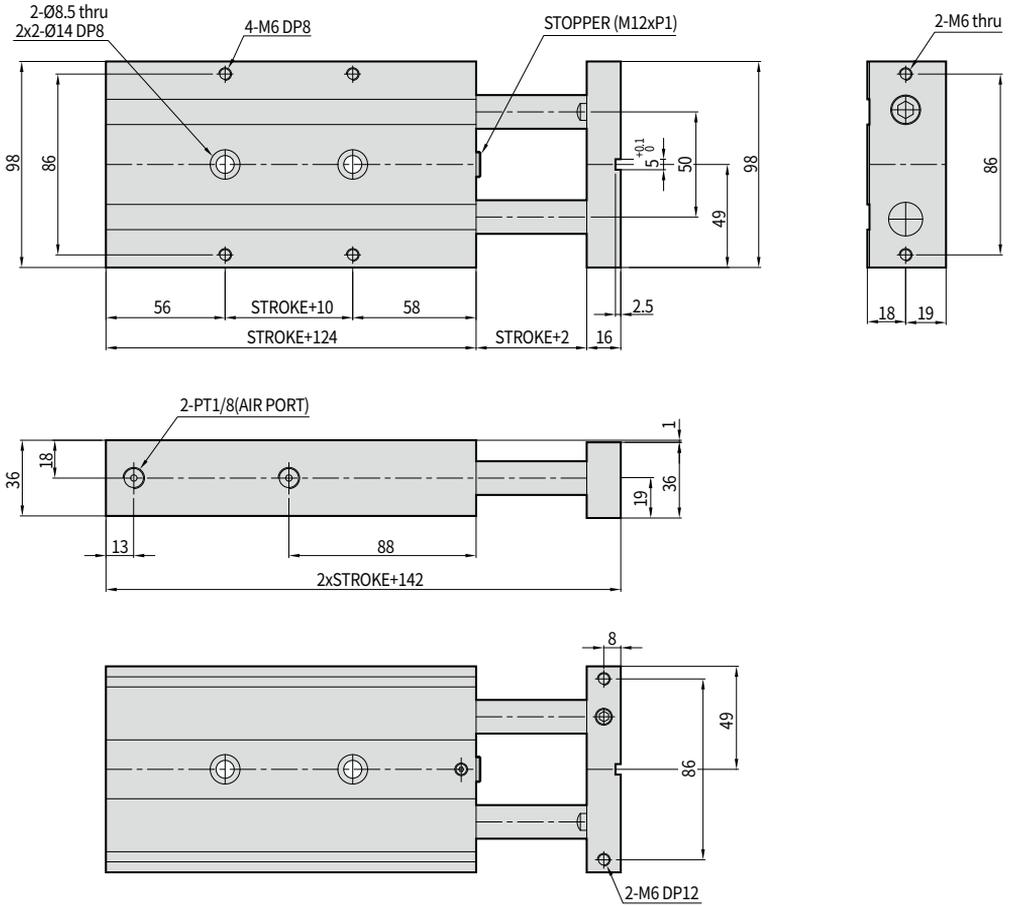


## PT30(B) Example of Auto Switch installation



- 12(B) 12DB 16(B) 16DB 20(B) 20DB 25(B) 25DB 30(B) **30DB** 40(B) 40DB

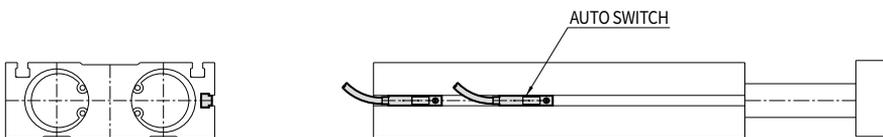
PT30DB



BLOCK

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC

PT30DB Example of Auto Switch installation



# PT Series

12(B)

12DB

16(B)

16DB

20(B)

20DB

25(B)

25DB

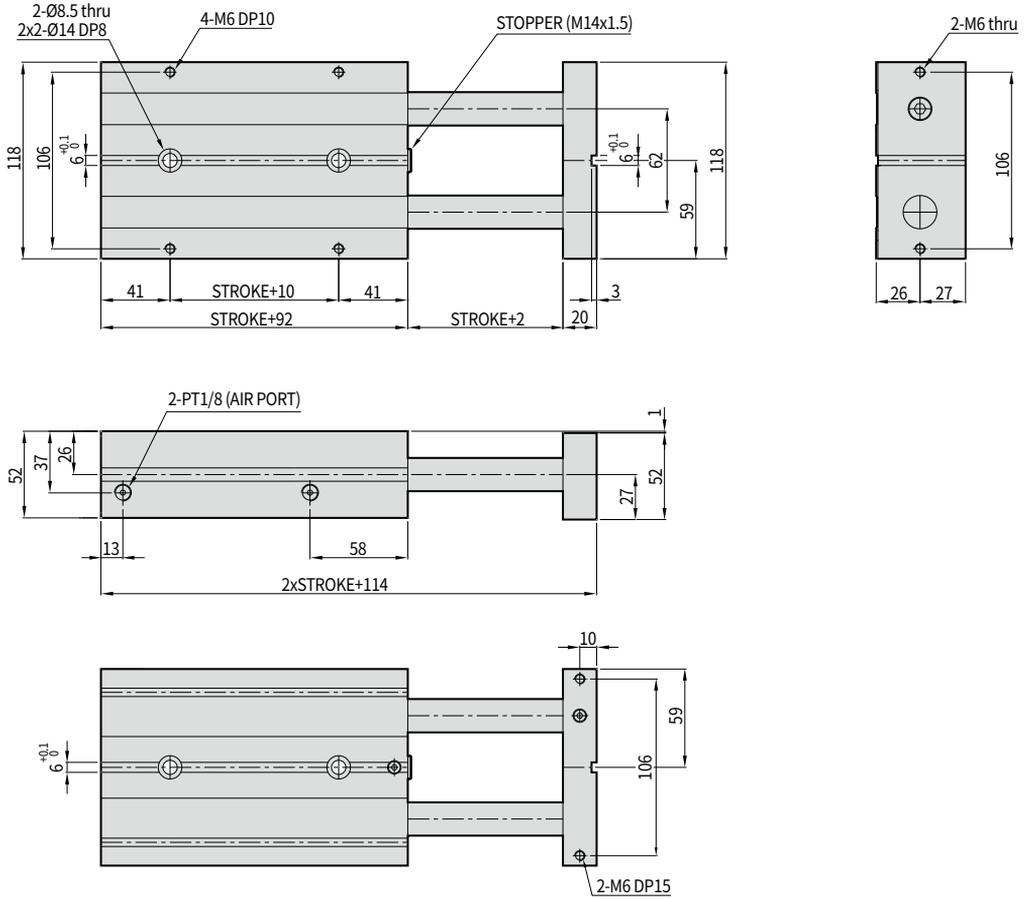
30(B)

30DB

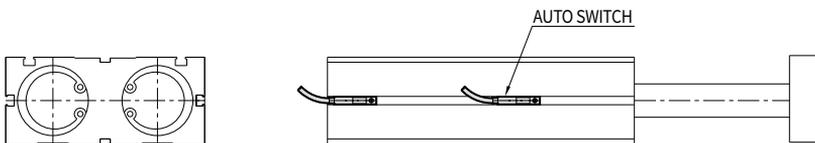
40(B)

40DB

## PT40(B)

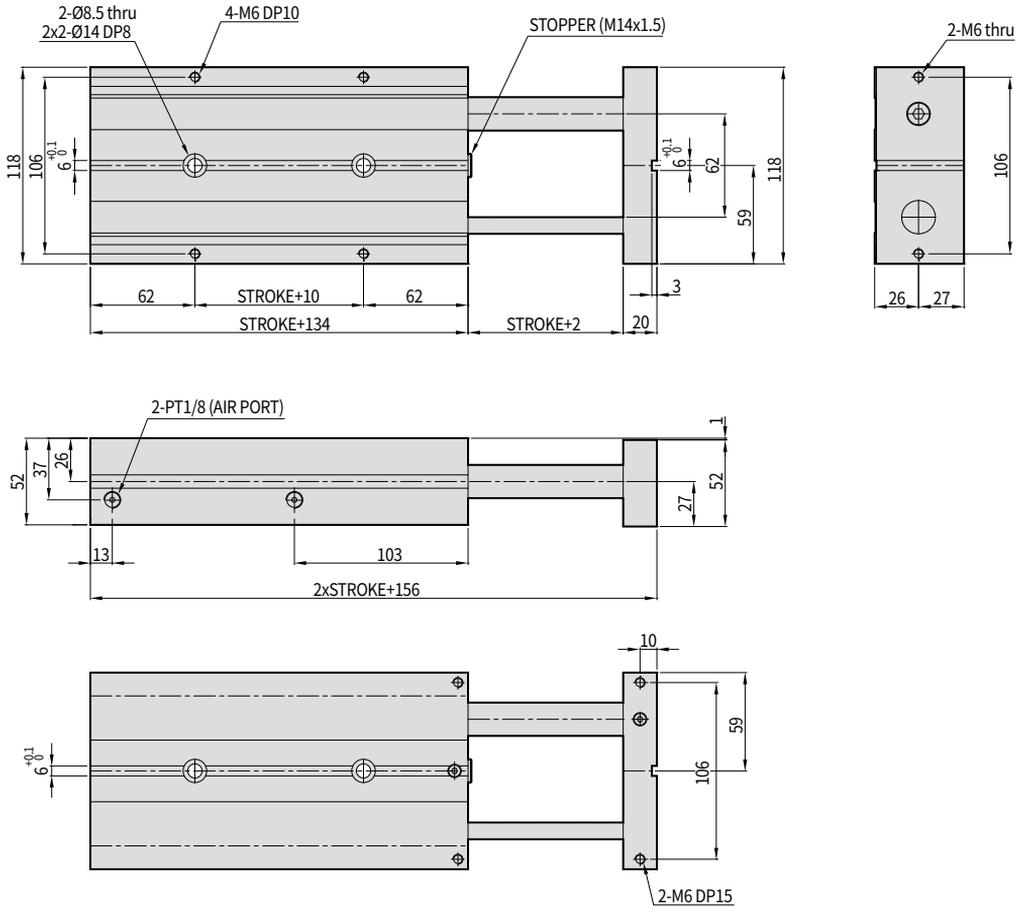


## PT40(B) Example of Auto Switch installation



- 12(B) 12DB 16(B) 16DB 20(B) 20DB 25(B) 25DB 30(B) 30DB 40(B) 40DB

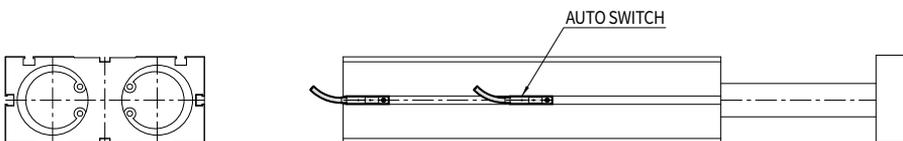
PT40DB



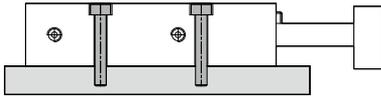
BLOCK

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC

PT40DB Example of Auto Switch installation

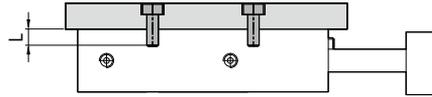


1. Installation by body through holes



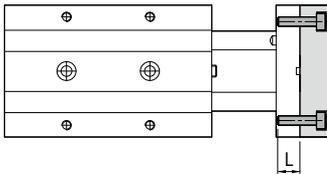
| Item | Fastening Bolt | Max Torque (kgf-cm) |
|------|----------------|---------------------|
| PT12 | M4×P0.7        | 25                  |
| PT16 | M4×P0.7        | 25                  |
| PT20 | M5×P0.8        | 51                  |
| PT25 | M6×P1          | 81                  |
| PT30 | M8×P1.25       | 157                 |
| PT40 | M8×P1.25       | 157                 |

2. Installation by body tap holes



| Item | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|------|----------------|---------------------|------------------------|
| PT12 | M3×P0.5        | 11                  | 5                      |
| PT16 | M4×P0.7        | 25                  | 6                      |
| PT20 | M4×P0.7        | 25                  | 7                      |
| PT25 | M5×P0.8        | 51                  | 8                      |
| PT30 | M6×P1          | 81                  | 8                      |
| PT40 | M6×P1          | 81                  | 10                     |

3. Installation by plate tap holes



| Item | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|------|----------------|---------------------|------------------------|
| PT12 | M3×P0.5        | 11                  | 8                      |
| PT16 | M4×P0.7        | 25                  | 10                     |
| PT20 | M4×P0.7        | 25                  | 12                     |
| PT25 | M5×P0.8        | 51                  | 14                     |
| PT30 | M6×P1          | 81                  | 16                     |
| PT40 | M6×P1          | 81                  | 20                     |

MEMO

Horizontal dotted lines for writing.

**BLOCK**

|       |
|-------|
| PT    |
| PB    |
| PBM-N |
| PQG   |
| PBF   |
| PGL   |
| PGC   |

# BLOCK CYLINDER

## PB Series

### Features

- Twin cylinder inside type both side acting type actuator.
- Double thrust of cylinder bore specification.
- Two of installation options as block and plate mounting ways.
- Easy piping by basically supplied two side air port options from application of hollow shaft rod.
- Minimized crash noise and absorbing shock by urethane damper at the end of stroke.
- Suitable for handling workpiece in automation field.
- Improved durability and precision by profile body.
- Two options for guide components.
  - Sliding bearing : PB Type
  - LM Bearing : PB-B Type
- Auto Switch installation. (Optional)



### Order Form

**PB 12 B - 50 - E - A1 L S P - SH2**

①    ②    ③    ④    ⑤    ⑥    ⑦    ⑧    ⑨    ⑩

#### ① Series Name

#### ② Cylinder Bore Size

#### ④ Standard Strokes

#### ⑥ Available Auto Switches (For block fixed installation only)

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) | Order |    |     |    |    |     |
|-------|--------------|-------------------------------|-------|----|-----|----|----|-----|
|       |              |                               | A1    | A2 | A2C | B1 | B2 | B2B |
| 12    | 12           | 25,50,75                      |       | ○  | ○   |    | ○  | ○   |
| 16    | 16           | 25,50,75,100                  |       | ○  | ○   |    | ○  | ○   |
| 20    | 20           | 25,50,75,100,125              | ○     |    |     | ○  |    |     |
| 25    | 25           | 25,50,75,100,125,150          | ○     |    |     | ○  |    |     |
| 30    | 30           | 25,50,75,100,125,150          | ○     |    |     | ○  |    |     |

※ For "Blank", no Auto Switch is provided.

※ For plate fixed installation, all of product can be used only PRO-A1 and PRO-B1 type auto switch.

#### ③ Bearing Types

| Order | Bearing Types   |
|-------|-----------------|
| Blank | Sliding bearing |
| B     | L.M bearing     |

#### ⑤ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

#### ※ Auto Switch Specification

| Order | Sensing Type         | Cable Spec |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires      | Direction | AC      | DC           | AC      | DC             |               |                |
| A1    | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2    | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2    | Magnetic solid state | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire     | Horiz     | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |

\* Please contact to office for auto switch mounting less than 25mm stroke model.

⑦ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

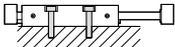
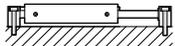
⑧ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

⑩ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

⑨ Installation Options

| Order | Installation Options  | Auto Switch Could be Attached for Detection of Position   |
|-------|---|---|
| Blank | Block Installation<br> | Various auto switches for each types of product<br>Refer <⑥ Available Auto Switches(For block fixed installation only)> |
| P     | Plate Installation<br> | Rail type sensor bracket is supplied<br>(Private brackets for PRO-A1 and PRO-B1)  |

Accessory Order Form

(1) Shock Absorber

**PB 20 - SH - ASSY**

①      ②      ③      ④

① Series Name

③ Shock Absorber

② Cylinder Bore Size

④ Order Name for Accessory

- Based for only one set for single side of product.

Specification

| Item Name   | PB12   | PB16                | PB20                 | PB25                 | PB30                |                    |
|---|--|---------------------|----------------------|----------------------|---------------------|--------------------|
| CYL Bore Size(mm)   | 12   | 16                  | 20                   | 25                   | 30                  |                    |
| Rod Size(mm)  | 6  | 8                   | 10                   | 12                   | 16                  |                    |
| Standard Strokes(mm)  | 25 ~ 75  | 25 ~ 100            | 25 ~ 125             | 25 ~ 150             |                     |                    |
| Theoretical Thrust(kgf)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 1.69×P   | 3.02×P              | 4.71×P               | 7.56×P               | 10.12×P             |                    |
| Fitting Size  | M5   |                     |                      |                      | PT1/8               |                    |
| Weight(kgf)<br>S.T : Stroke(mm)                                   | Sliding Bearing  | 0.14 +<br>0.002×S.T | 0.23 +<br>0.0035×S.T | 0.5 +<br>0.0045×S.T  | 0.7 +<br>0.007×S.T  | 1.24 +<br>0.01×S.T |
|   | L.M Bearing  | 0.25 +<br>0.002×S.T | 0.37 +<br>0.0035×S.T | 0.78 +<br>0.0045×S.T | 1.04 +<br>0.007×S.T | 1.98 +<br>0.01×S.T |
| Fluid   | Clean Air <small>Note 1)</small>                                 |                     |                      |                      |                     |                    |
| Pressure Range(kgf/cm <sup>2</sup> )                              | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |                     |                      |                      |                     |                    |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)  |                     |                      |                      |                     |                    |
| Temperature Range(°C)   | 5 ~ 60   |                     |                      |                      |                     |                    |
| Moving Speed(mm/sec)  | 30 ~ 300   |                     |                      |                      |                     |                    |
| Operation Type  | Double Acting  |                     |                      |                      |                     |                    |
| Accuracy(mm)  | Sliding Bearing : ±0.1<br>L.M Bearing : ±0.05                    |                     |                      |                      |                     |                    |
| Stroke Adjustment Range(mm)                                       | 0 ~ -10 (For standard stroke model, 5mm for single direction)    |                     |                      |                      |                     |                    |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

BLOCK

- PT
- PB**
- PBM-N
- PQG
- PBF
- PGL
- PGC

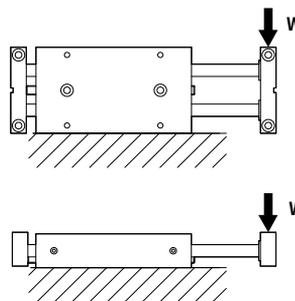
## Allowable Lateral Load - For Block installation

■ The graph means allowable lateral load on the end of plate at the block fixed shown as right fig.

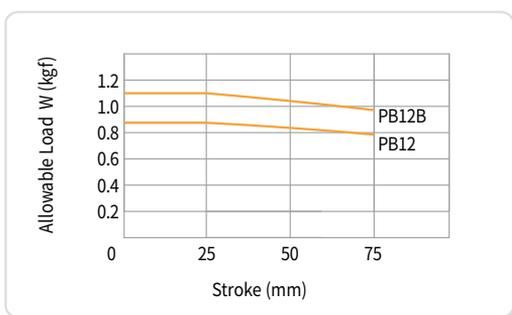
■ Guide Type

PB : Sliding Bearing

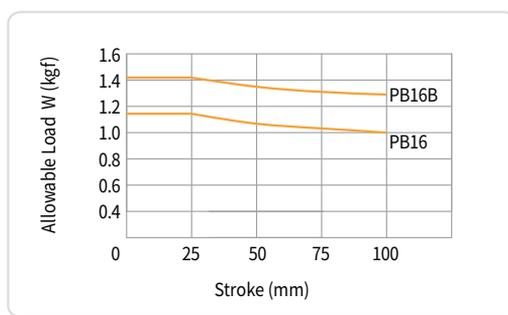
PB-B : L.M Bearing



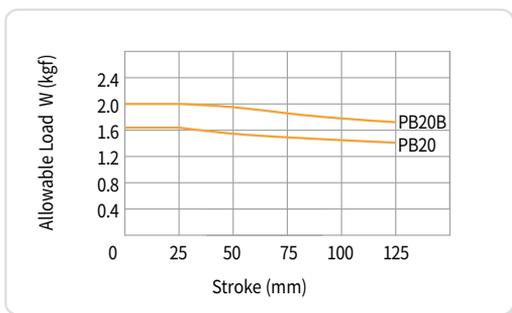
▶ PB12



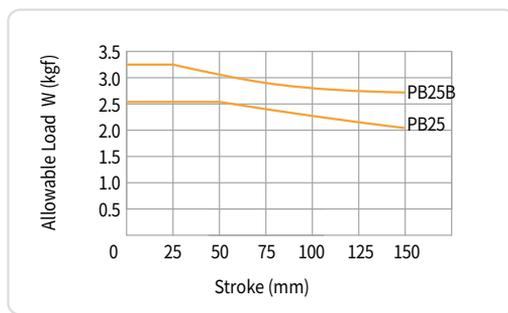
▶ PB16



▶ PB20



▶ PB25

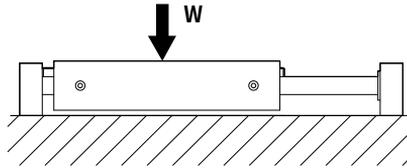


▶ PB30



Allowable Payload - For Plate installation

■ Under table refers the maximum payload of table at plate installation shown as below fig.



Unit: kgf

| Bearing Types        | Ø12 | Ø16 | Ø20 | Ø25 | Ø30 |
|----------------------|-----|-----|-----|-----|-----|
| PB (Sliding Bearing) | 1.1 | 2.1 | 3   | 4.4 | 6.3 |
| PB-B (L.M Bearing)   | 1.4 | 2.7 | 3.8 | 5.6 | 7.9 |

BLOCK

PT

PB

PBM-N

PQG

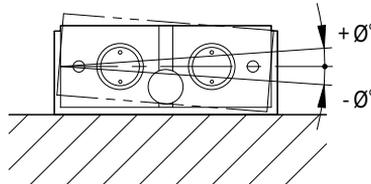
PBF

PGL

PGC

Anti-Rotate Degree of Plate

■ Under table refers the anti-rotate degree of plate for load free status shown as below fig.



| MODEL                | $\theta^\circ$ |
|----------------------|----------------|
| PB (Sliding Bearing) | $\pm 0.1$      |
| PB-B (L.M Bearing)   | $\pm 0.08$     |

# PB Series

12

12B

16

16B

20

20B

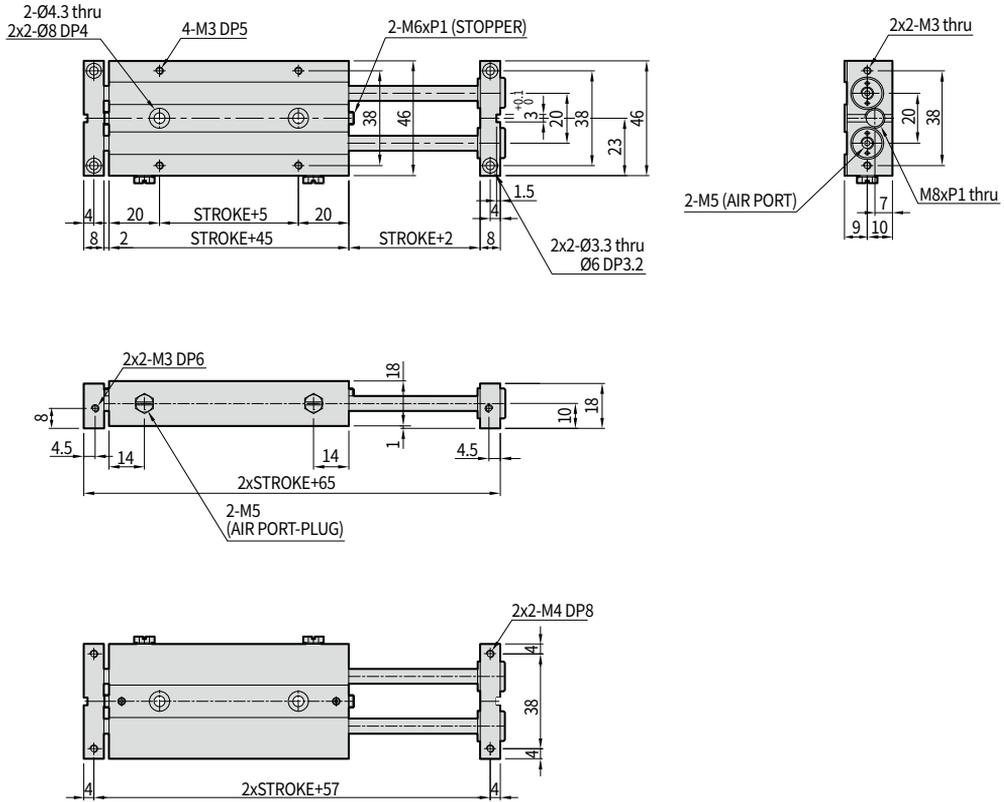
25

25B

30

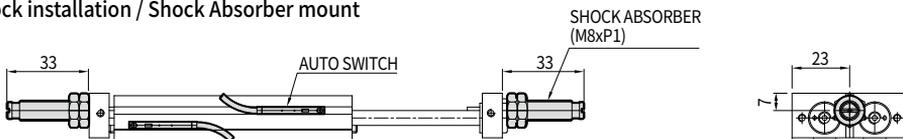
30B

## PB12

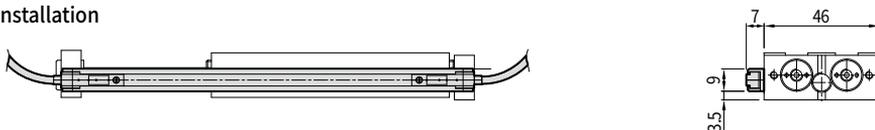


## PB12 Example of Auto Switch installation

### 1. Block installation / Shock Absorber mount



### 2. Plate installation



12

12B

16

16B

20

20B

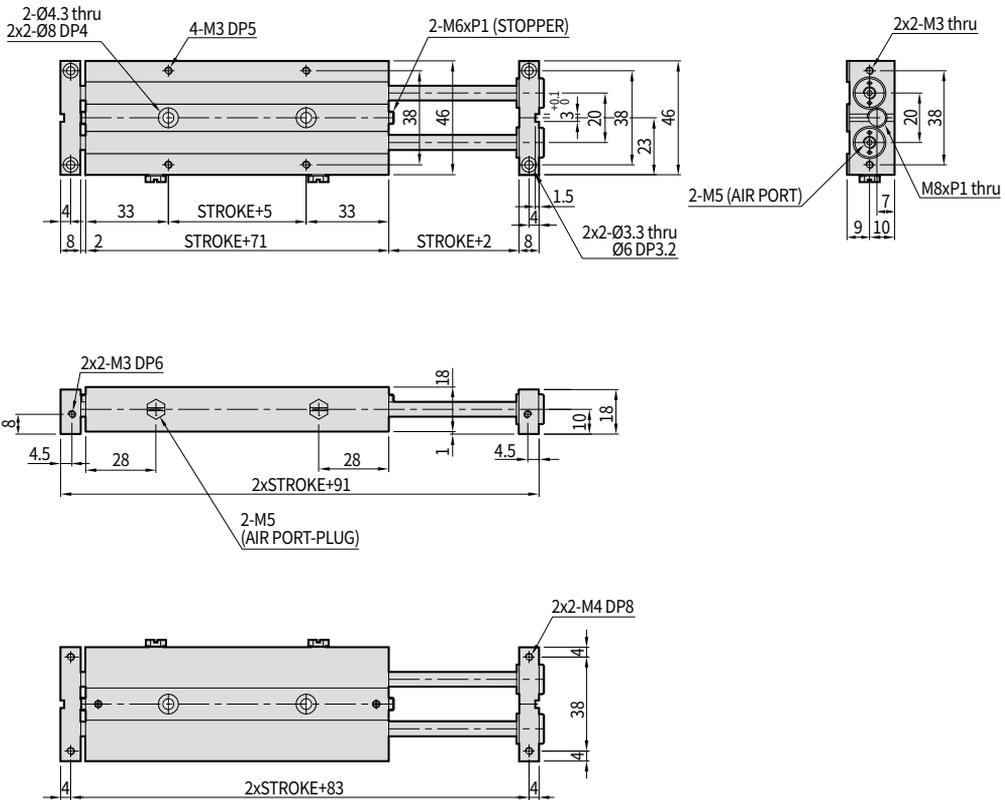
25

25B

30

30B

PB12B



BLOCK

PT

**PB**

PBM-N

PQG

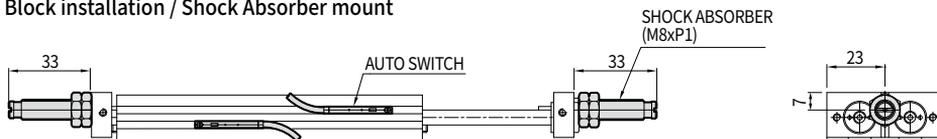
PBF

PGL

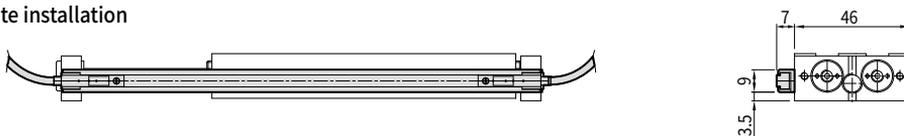
PGC

PB12B Example of Auto Switch installation

1. Block installation / Shock Absorber mount



2. Plate installation



# PB Series

12

12B

16

16B

20

20B

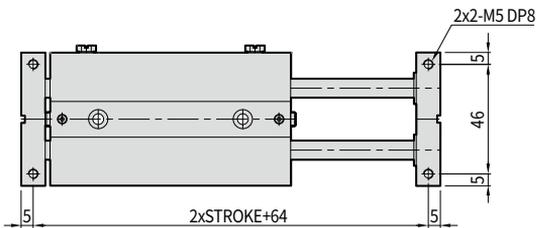
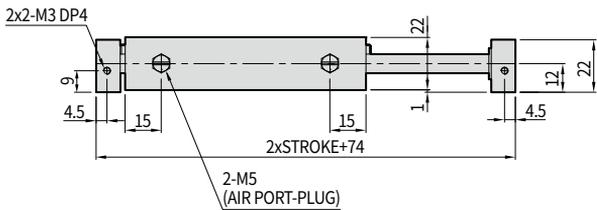
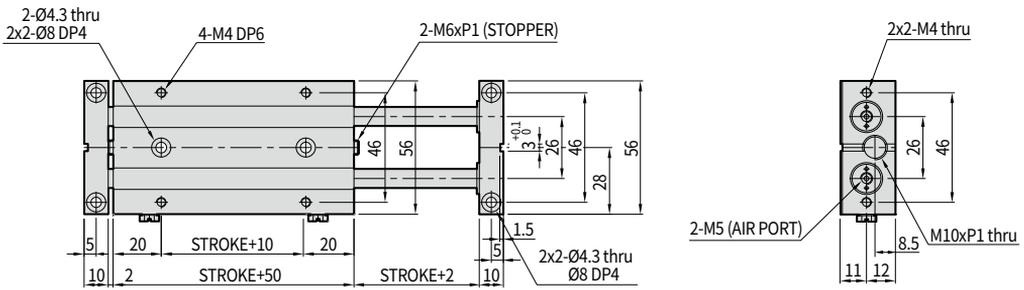
25

25B

30

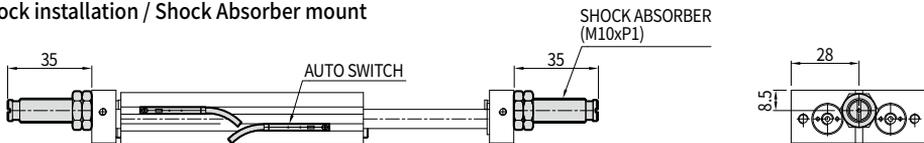
30B

## PB16

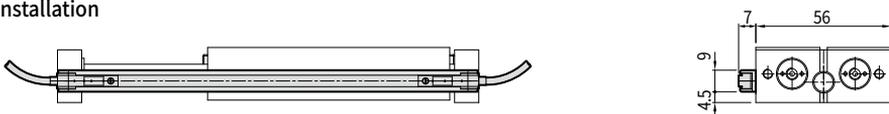


## PB16 Example of Auto Switch installation

### 1. Block installation / Shock Absorber mount



### 2. Plate installation



12

12B

16

16B

20

20B

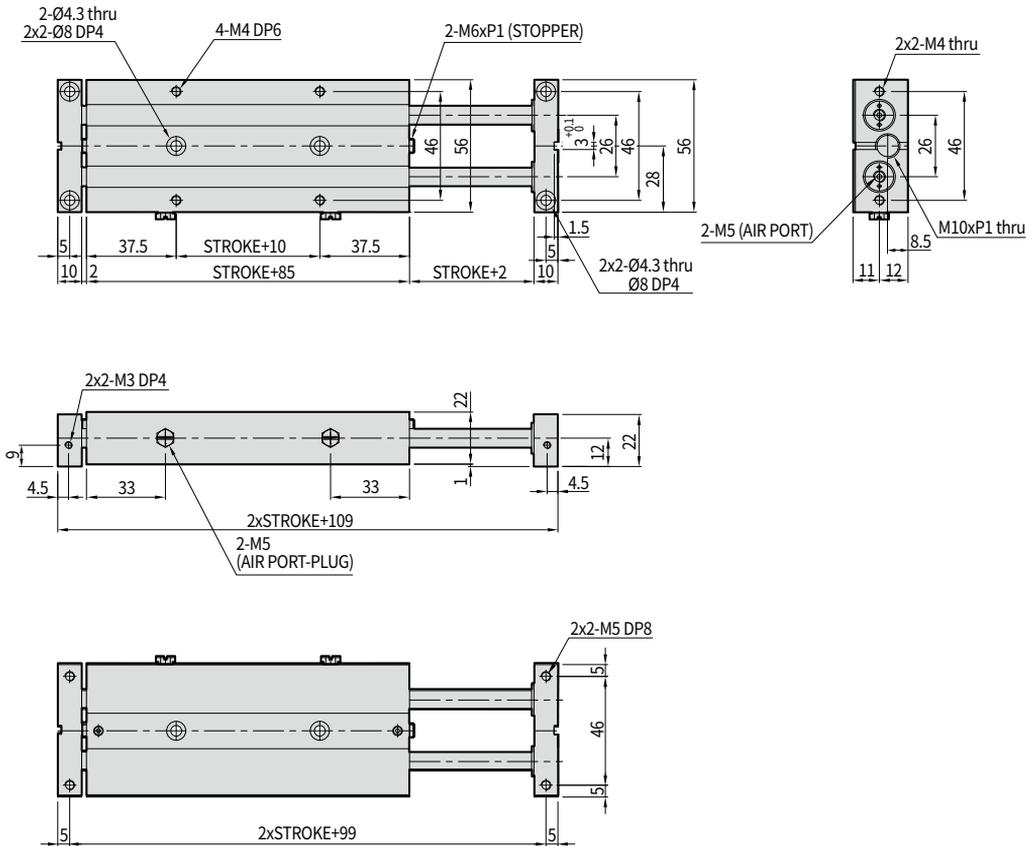
25

25B

30

30B

PB16B



BLOCK

PT

**PB**

PBM-N

PQG

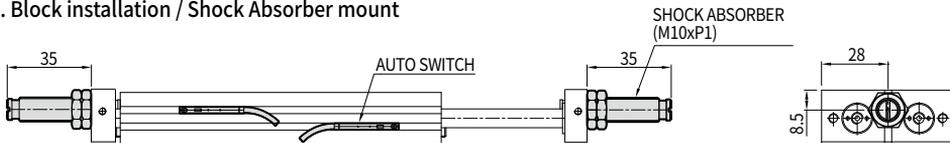
PBF

PGL

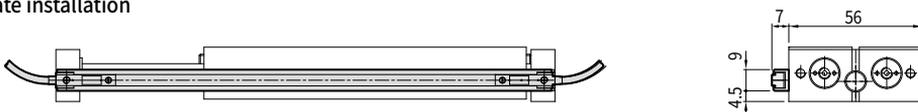
PGC

PB16B Example of Auto Switch installation

1. Block installation / Shock Absorber mount



2. Plate installation



# PB Series

12

12B

16

16B

20

20B

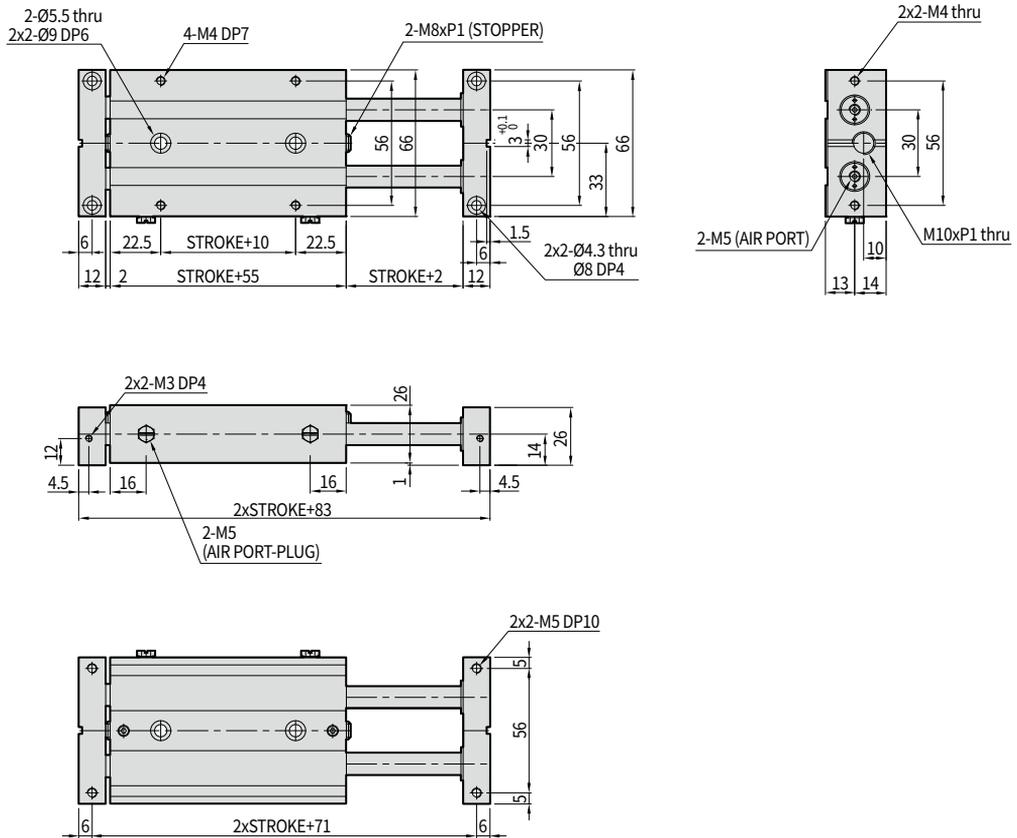
25

25B

30

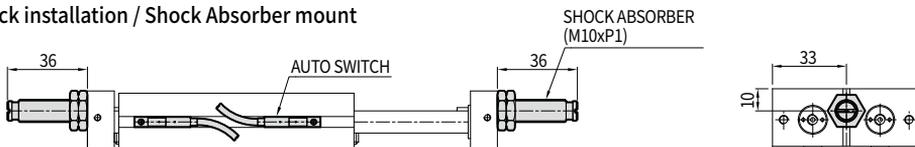
30B

## PB20

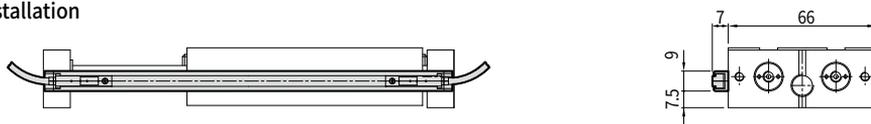


## PB20 Example of Auto Switch installation

### 1. Block installation / Shock Absorber mount



### 2. Plate installation



12

12B

16

16B

20

20B

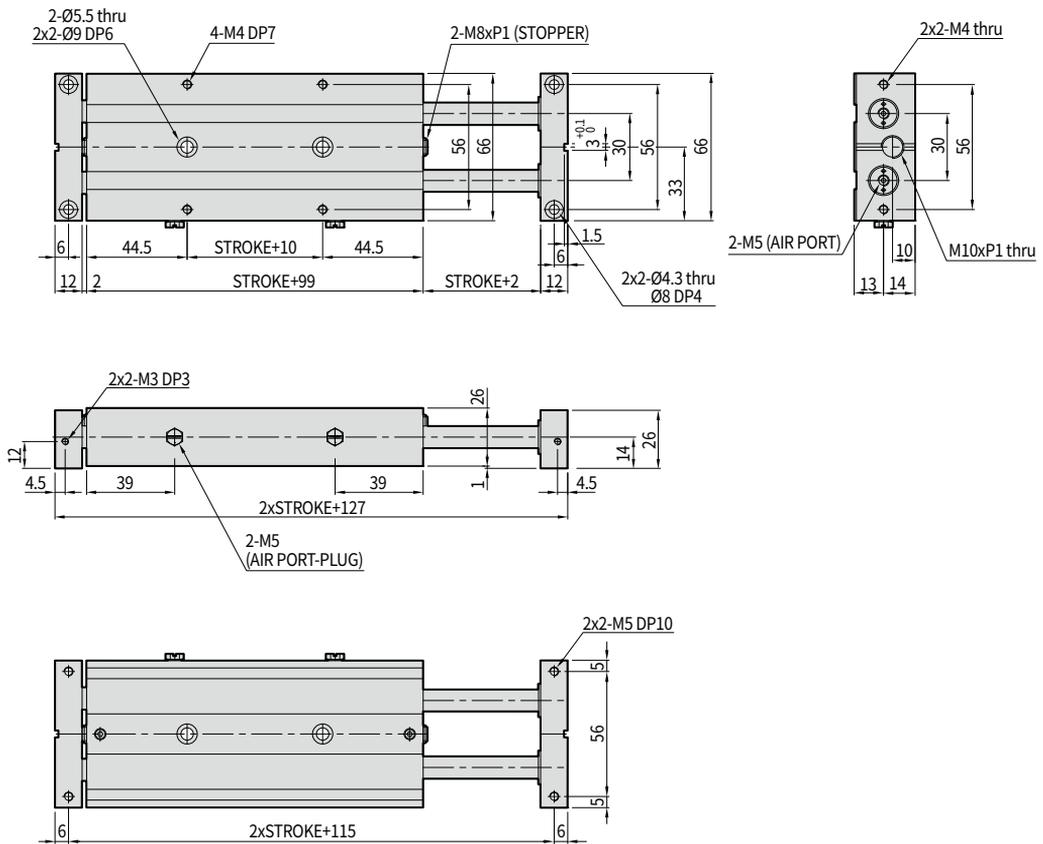
25

25B

30

30B

PB20B



BLOCK

PT

PB

PBM-N

PQG

PBF

PGL

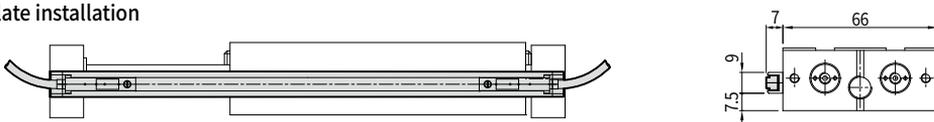
PGC

PB20B Example of Auto Switch installation

1. Block installation / Shock Absorber mount



2. Plate installation



# PB Series

12

12B

16

16B

20

20B

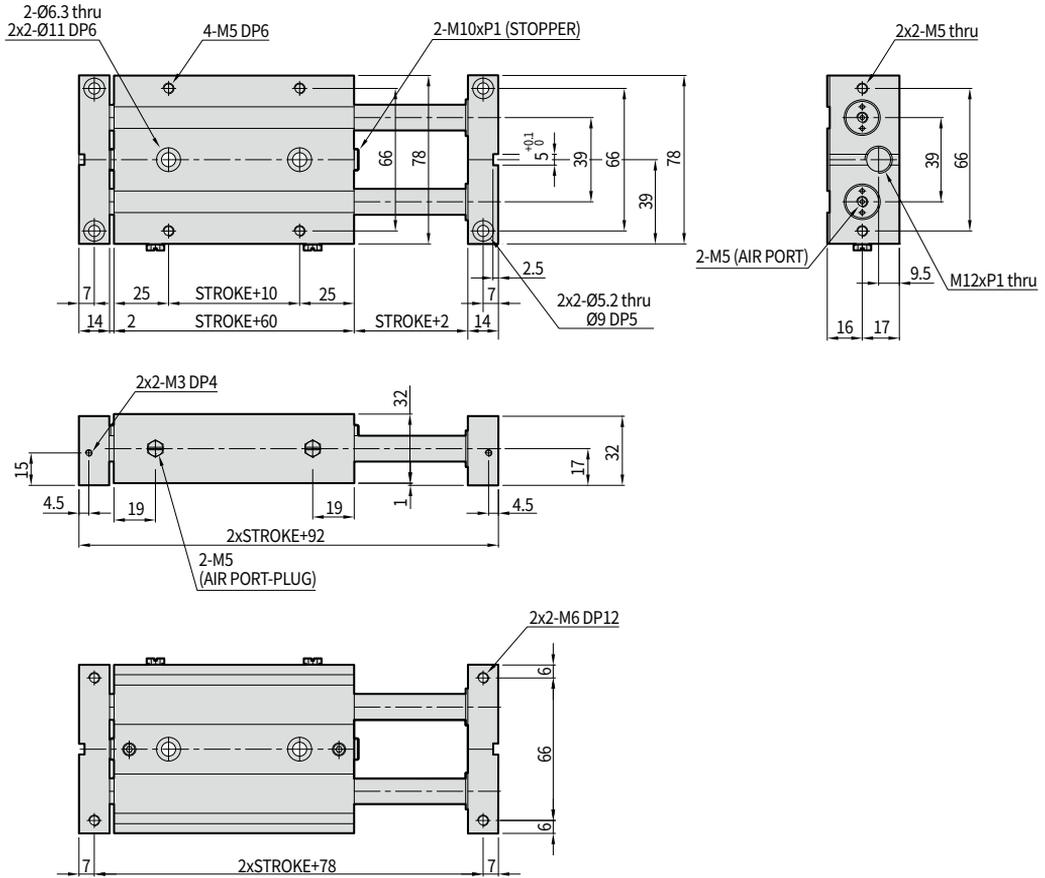
25

25B

30

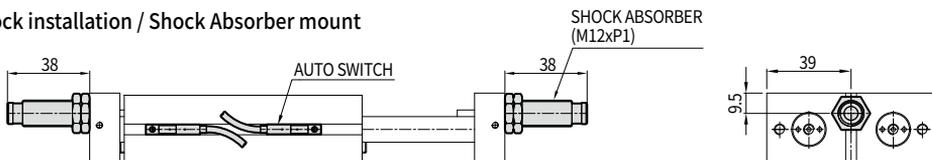
30B

## PB25

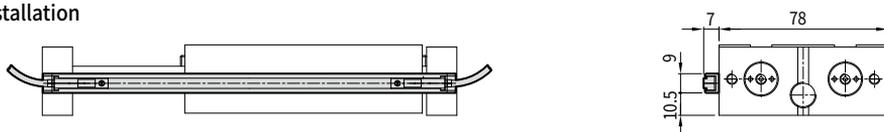


## PB25 Example of Auto Switch installation

### 1. Block installation / Shock Absorber mount



### 2. Plate installation



12

12B

16

16B

20

20B

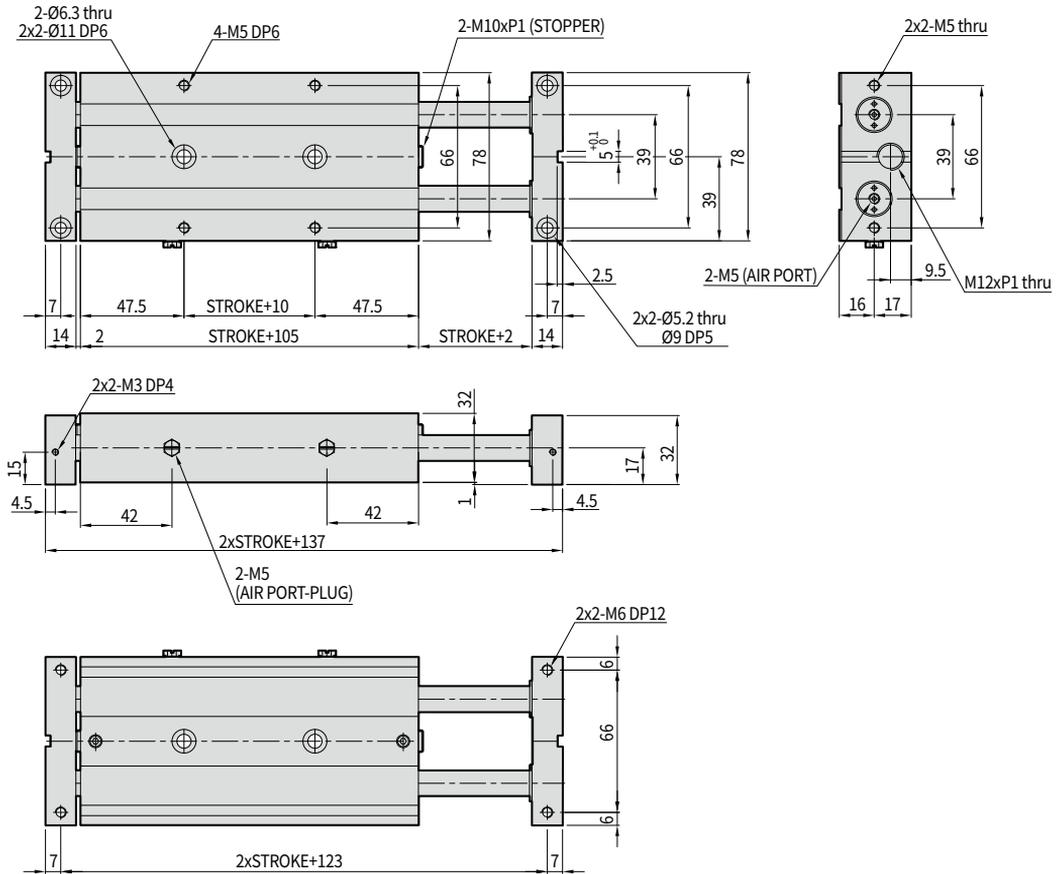
25

25B

30

30B

PB25B



BLOCK

PT

PB

PBM-N

PQG

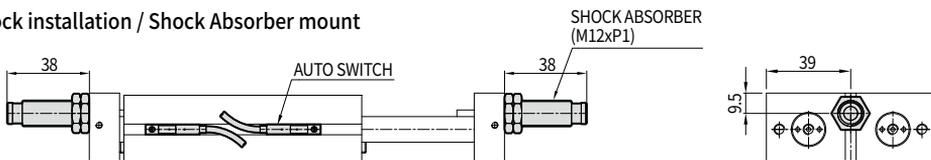
PBF

PGL

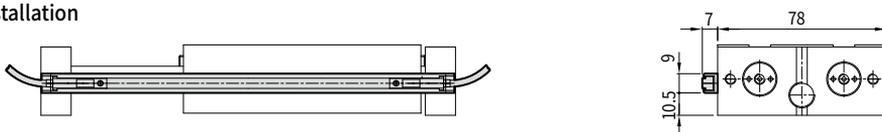
PGC

PB25B Example of Auto Switch installation

1. Block installation / Shock Absorber mount



2. Plate installation



# PB Series

12

12B

16

16B

20

20B

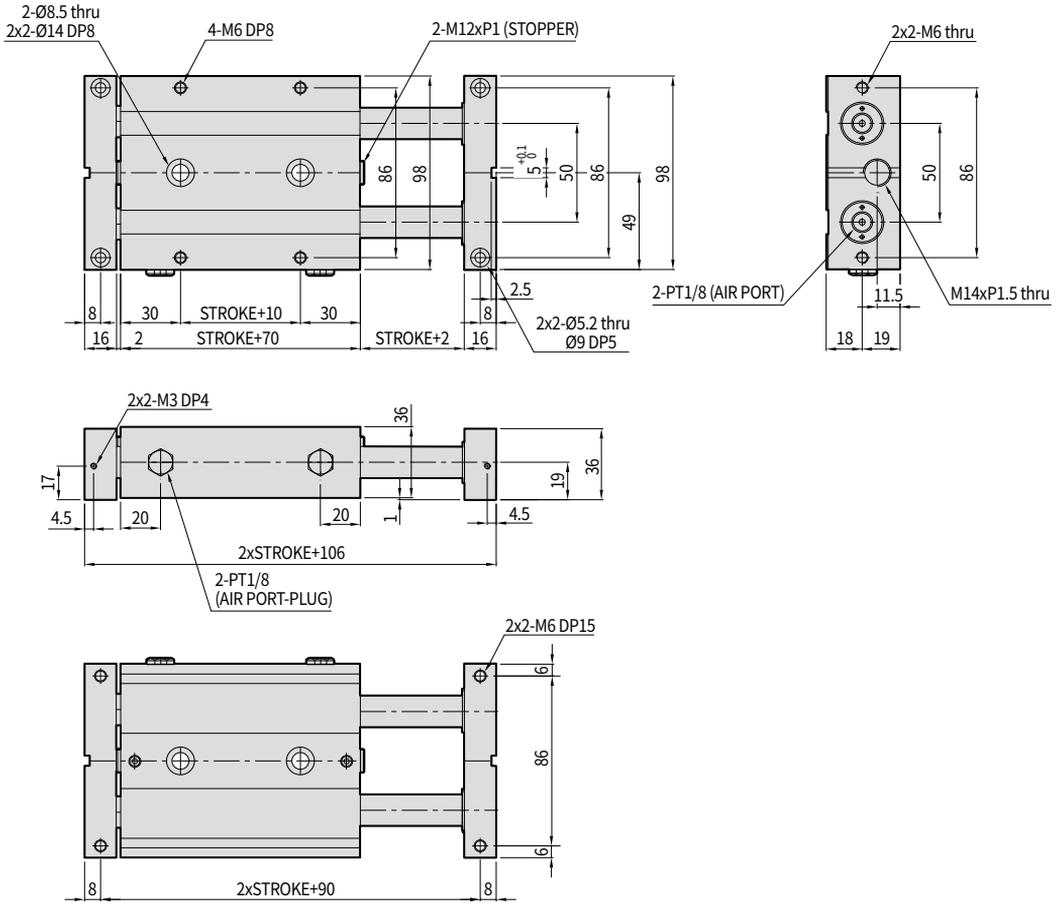
25

25B

30

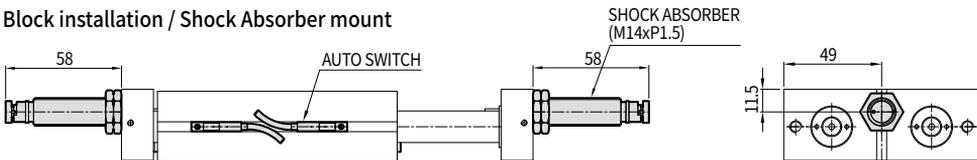
30B

## PB30

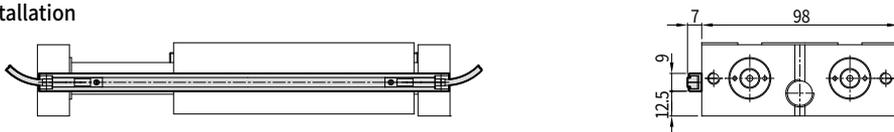


## PB30 Example of Auto Switch installation

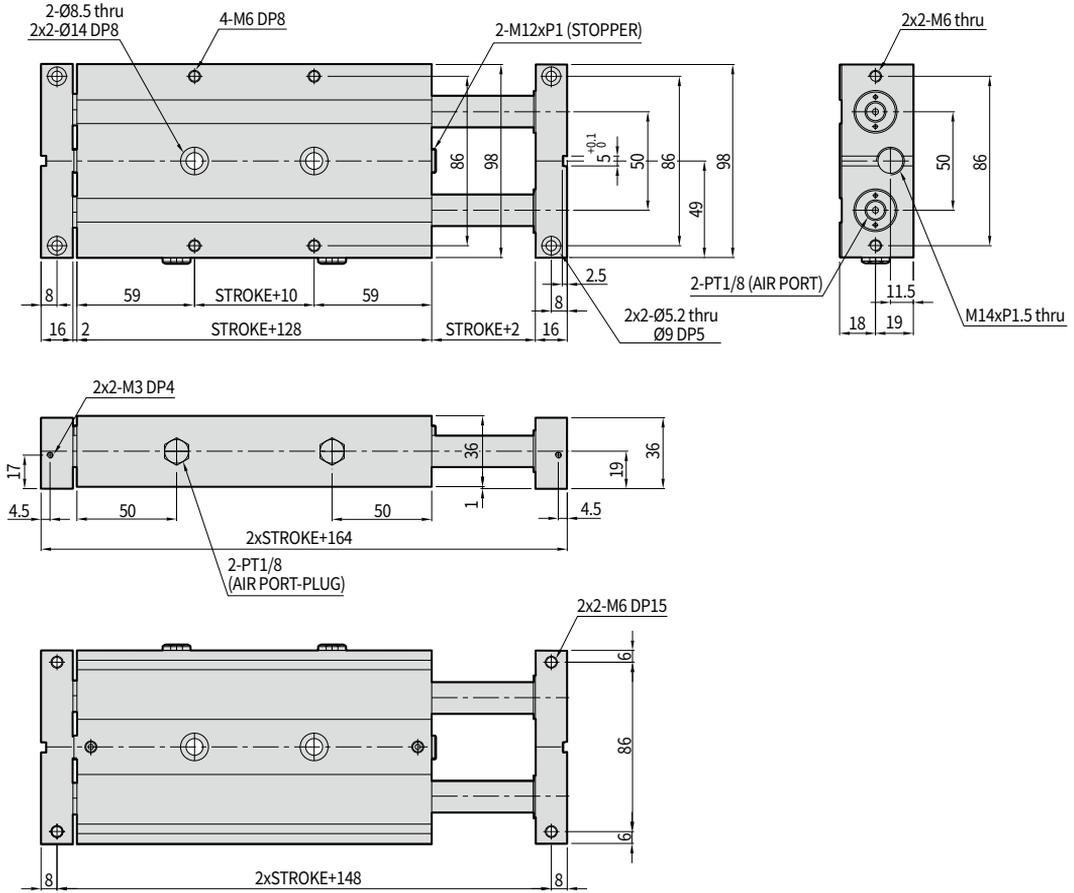
### 1. Block installation / Shock Absorber mount



### 2. Plate installation



PB30B



BLOCK

PT

PB

PBM-N

PQG

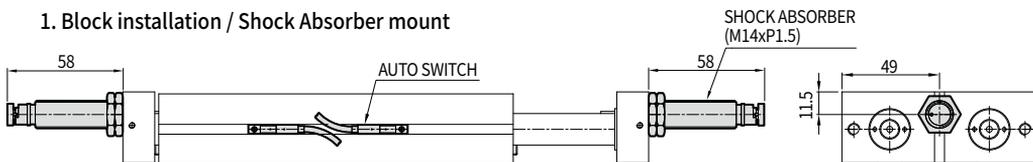
PBF

PGL

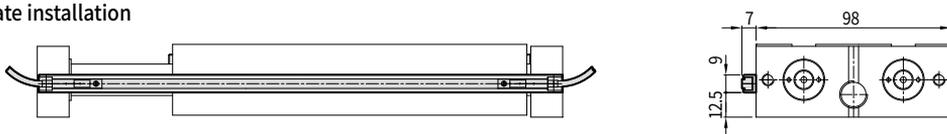
PGC

PB30B Example of Auto Switch installation

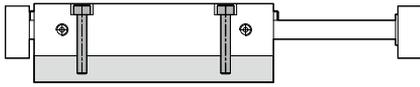
1. Block installation / Shock Absorber mount



2. Plate installation

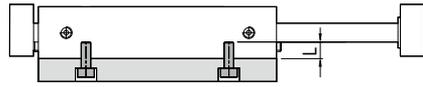


1. Installation by body through holes



| Item | Fastening Bolt | Max Torque (kgf·cm) |
|------|----------------|---------------------|
| PB12 | M4×P0.7        | 25                  |
| PB16 | M4×P0.7        | 25                  |
| PB20 | M5×P0.8        | 51                  |
| PB25 | M6×P1          | 81                  |
| PB30 | M8×P1.25       | 157                 |

2. Installation by body tap holes



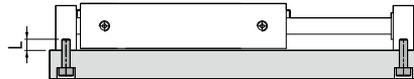
| Item | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|------|----------------|---------------------|------------------------|
| PB12 | M3×P0.5        | 11                  | 5                      |
| PB16 | M4×P0.7        | 25                  | 6                      |
| PB20 | M4×P0.7        | 25                  | 7                      |
| PB25 | M5×P0.8        | 51                  | 6                      |
| PB30 | M6×P1          | 81                  | 8                      |

3. Installation by plate through holes



| Item | Fastening Bolt | Max Torque (kgf·cm) |
|------|----------------|---------------------|
| PB12 | M3×P0.5        | 8                   |
| PB16 | M4×P0.7        | 25                  |
| PB20 | M4×P0.7        | 25                  |
| PB25 | M5×P0.8        | 51                  |
| PB30 | M5×P0.8        | 51                  |

4. Installation by plate tap holes



| Item | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|------|----------------|---------------------|------------------------|
| PB12 | M4×P0.7        | 25                  | 8                      |
| PB16 | M5×P0.8        | 51                  | 8                      |
| PB20 | M5×P0.8        | 51                  | 10                     |
| PB25 | M6×P1          | 81                  | 12                     |
| PB30 | M6×P1          | 81                  | 15                     |

MEMO

Horizontal dotted lines for writing.

**BLOCK**

|           |
|-----------|
| PT        |
| <b>PB</b> |
| PBM-N     |
| PQG       |
| PBF       |
| PGL       |
| PGC       |

Double guides in one body

# PBM-N Series

Anti-lateral load & High solidity with anti-rotate function

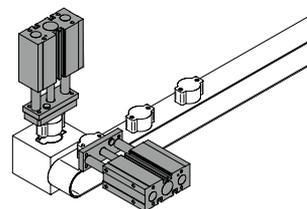


- Cylinder Bore Size :  $\varnothing 6$ ,  $\varnothing 10$ ,  $\varnothing 12$ ,  $\varnothing 16$ ,  $\varnothing 20$ ,  $\varnothing 25$ ,  $\varnothing 30$ ,  $\varnothing 40$ ,  $\varnothing 50$ ,  $\varnothing 60$ ,  $\varnothing 80$ ,  $\varnothing 100$
- Bearing Types : Slide bush and L.M Bearing

WIDEN ITEM  
LINE UP

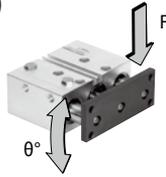
$\varnothing 6$ ,  $\varnothing 10$   
Released

## Application



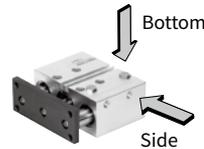
Improved lateral load and anti-rotate

- Improved lateral load. (Max 7 times)
- Improved anti-rotate amount( $\theta^\circ$ ) (Max 30% improved) (Comparison of PT Series of us)



Selectable air port options as standard

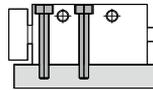
- For customer convenience, side or bottom air port supplied as standard. (Bottom side air port is plugged initially.)



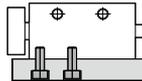
※ Only bottom air port available for PBM06N, PBM10N.

Various installations (5 ways)

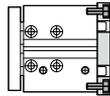
- ① Body through hole installation



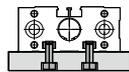
- ② Body bottom tap installation



- ③ Body backside tap installation

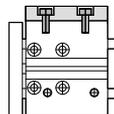


- ④ Body slot installation (T-Slot)



- More freely installation by position adjustment

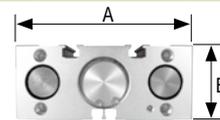
- ⑤ Body side tap installation



※ For PBM06N, PBM10N, ①Body through hole installation, ③Body back tap installation available only.

Widen item line up

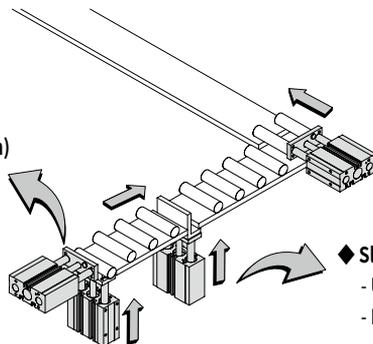
| CYL Bore | A   | B    |
|----------|-----|------|
| 06       | 29  | 14.5 |
| 10       | 33  | 17   |
| 12       | 58  | 26   |
| 16       | 64  | 30   |
| 20       | 83  | 36   |
| 25       | 91  | 42   |
| 30       | 114 | 49   |
| 40       | 124 | 53   |
| 50       | 146 | 61   |
| 60       | 162 | 73   |
| 80       | 200 | 92   |
| 100      | 240 | 112  |



Various guide types (Sliding / L.M bearing)

- ◆ L.M Bearing (Ball bush)

- Used for lifter or pusher of workpiece



- ◆ Sliding Bearing

- Used for stopper in assembly or transfer line  
- For stopper of high shock of lateral load



# BLOCK CYLINDER

## PBM-N Series

Ø6, Ø10 Newly Released !!

### Features

- Compact cylinder of one cylinder and two guides integrated in one body having anti-rotate function and improved anti-lateral load.
- Improved durability and various installation ways by standardizing the body profile.
- Suitable to be used for stopper or lifter of assembly and transfer line.
- New launch of Ø6, Ø10 products of minimized size.
- Auto Switch installation. (Optional)



### Order Form

**PBM 20N B - 50 - E - A1 L S**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

#### ① Series Name

#### ② Cylinder Bore Size

#### ④ Standard Strokes

#### ⑥ Available Auto Switches

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) | Order |    |     |     |
|-------|--------------|-------------------------------|-------|----|-----|-----|
|       |              |                               | A1    | B1 | B3B | B3C |
| 06N   | 6            | 05,10,15                      |       |    | ○   | ○   |
| 10N   | 10           | 05,10,15,20                   |       |    | ○   | ○   |
| 12N   | 12           | 10,20,30,40,50                | ○     | ○  |     |     |
| 16N   | 16           | 10,20,30,40,50                | ○     | ○  |     |     |
| 20N   | 20           | 20,30,40,50,75,100            | ○     | ○  |     |     |
| 25N   | 25           | 20,30,40,50,75,100            | ○     | ○  |     |     |
| 30N   | 30           | 25,50,75,100                  | ○     | ○  |     |     |
| 40N   | 40           | 25,50,75,100                  | ○     | ○  |     |     |
| 50N   | 50           | 25,50,75,100                  | ○     | ○  |     |     |
| 60N   | 63           | 25,50,75,100                  | ○     | ○  |     |     |
| 80N   | 80           | 25,50,75,100                  | ○     | ○  |     |     |
| 100N  | 100          | 25,50,75,100                  | ○     | ○  |     |     |

※ For "Blank", no Auto Switch is provided.

#### ③ Bearing Types

| Order | Bearing Types   |
|-------|-----------------|
| Blank | Sliding bearing |
| B     | L.M bearing     |

#### ⑤ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

• L.M Bearing is not available for PBM06N, PBM10N models.

⑦ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

⑧ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

※ Auto Switch Specification

| Order | Sensing Type         | Cable Spec |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires      | Direction | AC      | DC           | AC      | DC             |               |                |
| A1    | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B3B   | Magnetic solid state | 2-Wire     | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3C   | Magnetic solid state | 3-Wire     | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)



Specification

| Item Name [Ø06 ~ Ø25]                     | PBM06N   | PBM10N               | PBM12N              | PBM16N              | PBM20N              | PBM25N              |                     |
|---|--|----------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| CYL Bore Size(mm)                         | 6  | 10                   | 12                  | 16                  | 20                  | 25                  |                     |
| Rod Size(mm)                              | 3  | 5                    | 6                   | 8                   | 10                  | 12                  |                     |
| Standard Strokes(mm)                      | 5 ~ 15   | 5 ~ 20               | 10 ~ 50             |                     | 20 ~ 100            |                     |                     |
| Theoretical Thrust(kgf)                   | Forward  | 0.28×P               | 0.78×P              | 1.13×P              | 2.0×P               | 3.1×P               | 4.9×P               |
|   | Backward   | 0.21×P               | 0.59×P              | 0.84×P              | 1.5×P               | 2.36×P              | 3.8×P               |
| P : Air Pressure(kgf/cm <sup>2</sup> )    |  |                      |                     |                     |                     |                     |                     |
| Fitting Size                              | M3   |                      |                     | M5                  |                     | PT1/8               |                     |
| Weight(kgf)<br>S.T : Stroke(mm)           | Sliding Bearing  | 0.015 +<br>0.002×S.T | 0.02 +<br>0.003×S.T | 0.2 +<br>0.004×S.T  | 0.31 +<br>0.005×S.T | 0.42 +<br>0.007×S.T | 0.65 +<br>0.01×S.T  |
|   | L.M Bearing  | -                    | -                   | 0.18 +<br>0.003×S.T | 0.3 +<br>0.004×S.T  | 0.4 +<br>0.006×S.T  | 0.63 +<br>0.009×S.T |
| Fluid                                     | Clean Air <small>Note 1)</small>                                 |                      |                     |                     |                     |                     |                     |
| Pressure Range(kgf/cm <sup>2</sup> )      | 3 ~ 7 (Guaranteed Resist Pressure : 10.2) <small>Note 2)</small> |                      |                     |                     |                     |                     |                     |
| Lubrication                               | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)  |                      |                     |                     |                     |                     |                     |
| Temperature Range(°C)                     | 5 ~ 60   |                      |                     |                     |                     |                     |                     |
| Moving Speed(mm/sec)                      | 50 ~ 500   |                      |                     |                     |                     |                     |                     |
| Operation Type                            | Double Acting  |                      |                     |                     |                     |                     |                     |
| Position Accuracy(mm)                     | Sliding Bearing : ±0.1   |                      |                     |                     |                     |                     |                     |
|   | L.M Bearing : ±0.05  |                      |                     |                     |                     |                     |                     |
| Stroke Tolerance for Forward Position(mm) | 0 ~ +1   |                      |                     |                     |                     |                     |                     |

| Item Name [Ø30 ~ Ø100]                    | PBM30N   | PBM40N              | PBM50N              | PBM60N             | PBM80N              | PBM100N            |                    |
|---|--|---------------------|---------------------|--------------------|---------------------|--------------------|--------------------|
| CYL Bore Size(mm)                         | 30   | 40                  | 50                  | 63                 | 80                  | 100                |                    |
| Rod Size(mm)                              | 16   | 16                  | 20                  | 20                 | 25                  | 30                 |                    |
| Standard Strokes(mm)                      | 25 ~ 100   |                     |                     |                    |                     |                    |                    |
| Theoretical Thrust(kgf)                   | Forward  | 7.0×P               | 12.6×P              | 19.6×P             | 31.1×P              | 50.2×P             | 78.5×P             |
|   | Backward   | 5.0×P               | 10.5×P              | 16.5×P             | 28.0×P              | 45.3×P             | 71.4×P             |
| P : Air Pressure(kgf/cm <sup>2</sup> )    |  |                     |                     |                    |                     |                    |                    |
| Fitting Size                              | PT1/8  |                     |                     | PT1/4              |                     | PT3/8              |                    |
| Weight(kgf)<br>S.T : Stroke(mm)           | Sliding Bearing  | 1.2 +<br>0.016×S.T  | 1.25 +<br>0.018×S.T | 2.1 +<br>0.022×S.T | 2.5 +<br>0.025×S.T  | 4.2 +<br>0.032×S.T | 7.3 +<br>0.052×S.T |
|   | L.M Bearing  | 0.98 +<br>0.014×S.T | 1.1 +<br>0.018×S.T  | 1.8 +<br>0.024×S.T | 2.12 +<br>0.026×S.T | 3.9 +<br>0.034×S.T | 7.1 +<br>0.053×S.T |
| Fluid                                     | Clean Air <small>Note 1)</small>                                 |                     |                     |                    |                     |                    |                    |
| Pressure Range(kgf/cm <sup>2</sup> )      | 3 ~ 7 (Guaranteed Resist Pressure : 10.2) <small>Note 2)</small> |                     |                     |                    |                     |                    |                    |
| Lubrication                               | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)  |                     |                     |                    |                     |                    |                    |
| Temperature Range(°C)                     | 5 ~ 60   |                     |                     |                    |                     |                    |                    |
| Moving Speed(mm/sec)                      | 50 ~ 500   |                     |                     | 50 ~ 300           |                     |                    |                    |
| Operation Type                            | Double Acting  |                     |                     |                    |                     |                    |                    |
| Position Accuracy(mm)                     | Sliding Bearing : ±0.1   |                     |                     |                    |                     |                    |                    |
|   | L.M Bearing : ±0.05  |                     |                     |                    |                     |                    |                    |
| Stroke Tolerance for Forward Position(mm) | 0 ~ +1   |                     |                     |                    |                     |                    |                    |

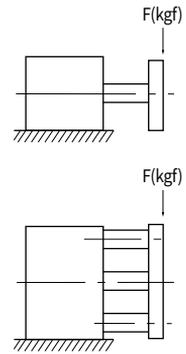
Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

## Conditions

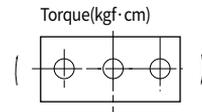
### ■ Lateral load capacity (Normal load) (kgf)

| Item Name | Standard Strokes(mm) |      |      |      |      |      |     |      |       |       |
|-----------|----------------------|------|------|------|------|------|-----|------|-------|-------|
|           | 5                    | 10   | 15   | 20   | 25   | 30   | 40  | 50   | 75    | 100   |
| PBM06N    | 0.09                 | 0.07 | 0.06 | -    | -    | -    | -   | -    | -     | -     |
| PBM10N    | 0.29                 | 0.24 | 0.22 | 0.18 | -    | 0.18 | -   | -    | -     | -     |
| PBM12N    | -                    | 2.1  | -    | 1.8  | -    | 1.5  | 1.3 | 1.2  | -     | -     |
| PBM12NB   | -                    | 2.7  | -    | 2.2  | -    | 1.7  | 2.1 | 1.9  | -     | -     |
| PBM16N    | -                    | 3.4  | -    | 2.8  | -    | 2.5  | 2.2 | 1.9  | -     | -     |
| PBM16NB   | -                    | 3.8  | -    | 3.0  | -    | 2.6  | 3.7 | 3.3  | -     | -     |
| PBM20N    | -                    | -    | -    | 5.1  | -    | 4.4  | 3.8 | 3.4  | 5.7   | 4.9   |
| PBM20NB   | -                    | -    | -    | 5.5  | -    | 4.7  | 7.8 | 6.9  | 5.3   | 4.4   |
| PBM25N    | -                    | -    | -    | 7.0  | -    | 6.0  | 5.3 | 4.7  | 7.7   | 6.5   |
| PBM25NB   | -                    | -    | -    | 7.1  | -    | 6.1  | 7.7 | 7.2  | 5.9   | 5.1   |
| PBM30N    | -                    | -    | -    | -    | 19.6 | -    | -   | 16.2 | 13.7  | 10.8  |
| PBM30NB   | -                    | -    | -    | -    | 8.8  | -    | -   | 5.9  | 27.5  | 21.6  |
| PBM40N    | -                    | -    | -    | -    | 19.6 | -    | -   | 16.7 | 13.7  | 10.8  |
| PBM40NB   | -                    | -    | -    | -    | 8.8  | -    | -   | 5.9  | 27.5  | 21.6  |
| PBM50N    | -                    | -    | -    | -    | 29.4 | -    | -   | 25.5 | 21.5  | 17.8  |
| PBM50NB   | -                    | -    | -    | -    | 13.7 | -    | -   | 8.8  | 39.2  | 31.3  |
| PBM60N    | -                    | -    | -    | -    | 29.4 | -    | -   | 25.5 | 21.5  | 17.6  |
| PBM60NB   | -                    | -    | -    | -    | 13.7 | -    | -   | 8.8  | 39.2  | 31.3  |
| PBM80N    | -                    | -    | -    | -    | 35.3 | -    | -   | 30.4 | 25.5  | 21.5  |
| PBM80NB   | -                    | -    | -    | -    | 23.5 | -    | -   | 15.7 | 86.3  | 68.6  |
| PBM100N   | -                    | -    | -    | -    | 53.9 | -    | -   | 47.0 | 41.2  | 34.3  |
| PBM100NB  | -                    | -    | -    | -    | 47.0 | -    | -   | 31.3 | 137.0 | 107.0 |



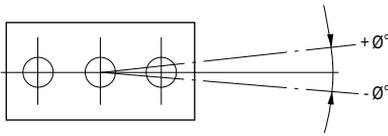
### ■ Plate allowable torsion torque (kgf·cm)

| Item Name | Standard Strokes(mm) |      |      |      |       |      |      |       |       |       |
|-----------|----------------------|------|------|------|-------|------|------|-------|-------|-------|
|           | 5                    | 10   | 15   | 20   | 25    | 30   | 40   | 50    | 75    | 100   |
| PBM06N    | 0.09                 | 0.07 | 0.06 | -    | -     | -    | -    | -     | -     | -     |
| PBM10N    | 0.47                 | 0.39 | 0.33 | 0.28 | -     | -    | -    | -     | -     | -     |
| PBM12N    | -                    | 2.9  | -    | 2.4  | -     | 2.1  | 1.8  | 1.6   | -     | -     |
| PBM12NB   | -                    | 4.8  | -    | 3.9  | -     | 3.1  | 3.7  | 3.3   | -     | -     |
| PBM16N    | -                    | 5.1  | -    | 4.3  | -     | 3.5  | 3.1  | 2.7   | -     | -     |
| PBM16NB   | -                    | 7.3  | -    | 5.8  | -     | 4.8  | 7.1  | 6.4   | -     | -     |
| PBM20N    | -                    | -    | -    | 9.1  | -     | 7.8  | 7.1  | 6.3   | 10.4  | 8.8   |
| PBM20NB   | -                    | -    | -    | 12.6 | -     | 10.6 | 7.7  | 15.8  | 12.2  | 10.1  |
| PBM25N    | -                    | -    | -    | 15.3 | -     | 13.1 | 11.6 | 10.3  | 16.8  | 14.2  |
| PBM25NB   | -                    | -    | -    | 19.6 | -     | 16.9 | 21.6 | 20.0  | 16.5  | 14.1  |
| PBM30N    | -                    | -    | -    | -    | 39.2  | -    | -    | 29.4  | 24.5  | 19.6  |
| PBM30NB   | -                    | -    | -    | -    | 19.6  | -    | -    | 9.8   | 58.8  | 44.1  |
| PBM40N    | -                    | -    | -    | -    | 44.1  | -    | -    | 34.3  | 29.4  | 24.5  |
| PBM40NB   | -                    | -    | -    | -    | 24.5  | -    | -    | 14.7  | 63.7  | 53.9  |
| PBM50N    | -                    | -    | -    | -    | 73.5  | -    | -    | 58.8  | 49.0  | 44.1  |
| PBM50NB   | -                    | -    | -    | -    | 34.3  | -    | -    | 24.5  | 107.8 | 83.3  |
| PBM60N    | -                    | -    | -    | -    | 78.4  | -    | -    | 63.7  | 53.9  | 49.0  |
| PBM60NB   | -                    | -    | -    | -    | 39.2  | -    | -    | 24.5  | 117.6 | 93.1  |
| PBM80N    | -                    | -    | -    | -    | 110.7 | -    | -    | 98.0  | 78.4  | 68.6  |
| PBM80NB   | -                    | -    | -    | -    | 93.1  | -    | -    | 58.8  | 313.6 | 245.0 |
| PBM100N   | -                    | -    | -    | -    | 225.4 | -    | -    | 196.0 | 166.0 | 147.0 |
| PBM100NB  | -                    | -    | -    | -    | 215.6 | -    | -    | 137.2 | 637.0 | 490.0 |



Conditions

■ Plate anti-rotation degree



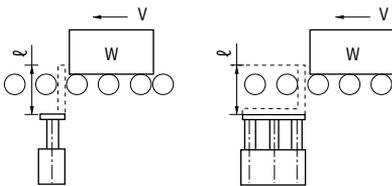
| CYL Bore (mm) | Anti-Rotation Degree(±θ°) |        |
|---------------|---------------------------|--------|
|               | PBM-N                     | PBM-NB |
| 06            |                           |        |
| 10            | ±0.10°                    | -      |
| 12            | ±0.10°                    | ±0.08° |
| 16            |                           |        |
| 20            | ±0.09°                    | ±0.07° |
| 25            |                           |        |
| 30            | ±0.08°                    | ±0.06° |
| 40            |                           |        |
| 50            | ±0.06°                    | ±0.05° |
| 60            |                           |        |
| 80            | ±0.05°                    | ±0.04° |
| 100           |                           |        |

\* L.M Bearing is not available for PBM06N, PBM10N models.

■ Working range for stopper usage

- Do not use PBM06N and PBM10N as stopper.

1. Ø12 ~ Ø25 (Sliding Bearing)

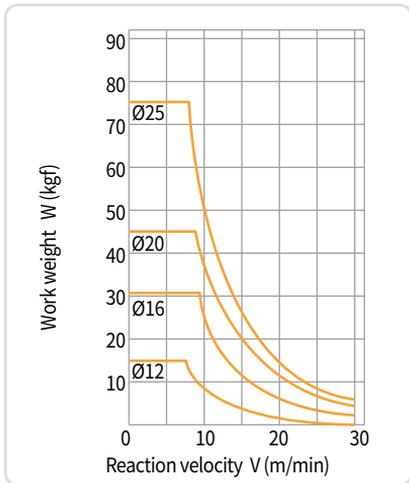


• In the case of ℓ is long for, select enough big size model.

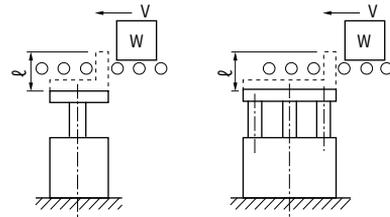
• Cautions

- For stopper usage, select shorter than 30mm stroke model.
- PBM-NB Type(L.M bearing) cannot be used for stopper.

• Ø12 ~ Ø25 (Sliding bearing)



2. Ø30 ~ Ø100 (Sliding Bearing)

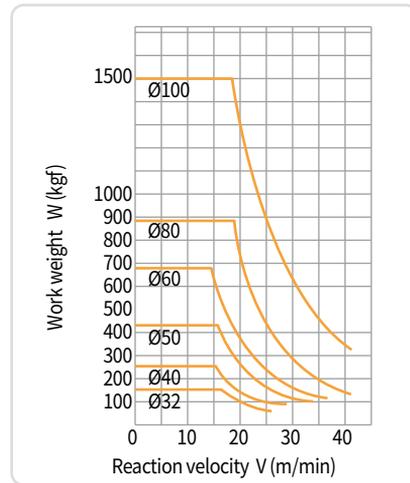


• In the case of ℓ is long for, select enough big size model.

• Cautions

- For stopper usage, select shorter than 30mm stroke model.
- PBM-NB Type(L.M bearing) cannot be used for stopper.

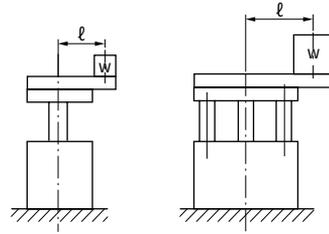
• Ø30 ~ Ø100 (Sliding bearing)



■ Working range for lifter usage

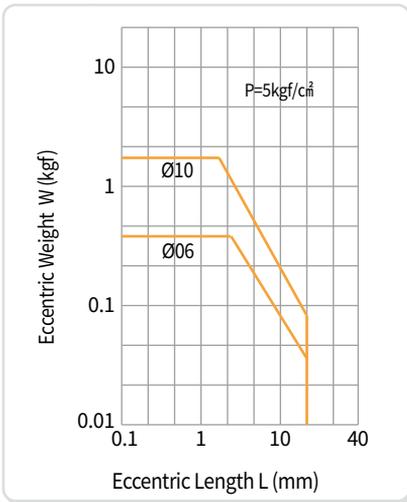
\* Product should be selected as total weight of work lower than theoretical thrust. (Ref. below table)

| CYL Bore   | Theoretical Thrust |
|------------|--------------------|
| Ø6, Ø10    | Not more than 35%  |
| Ø12, Ø16   | Not more than 40%  |
| Ø20, Ø25   | Not more than 50%  |
| Ø30 ~ Ø100 | Not more than 60%  |

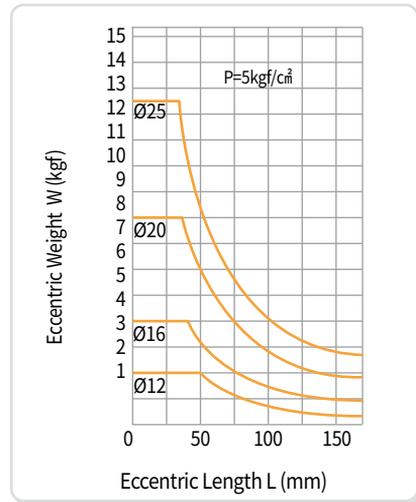


◆ PBM-N (Sliding Bearing)

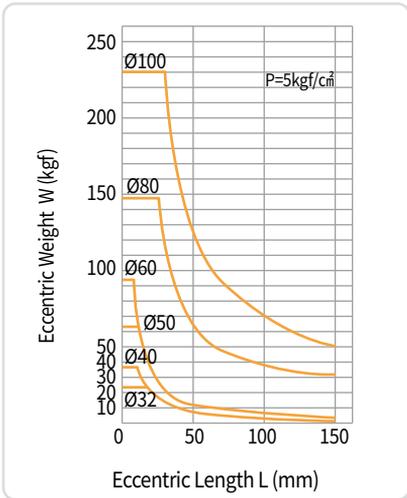
• PBM 06N, 10N



• PBM 12~25N



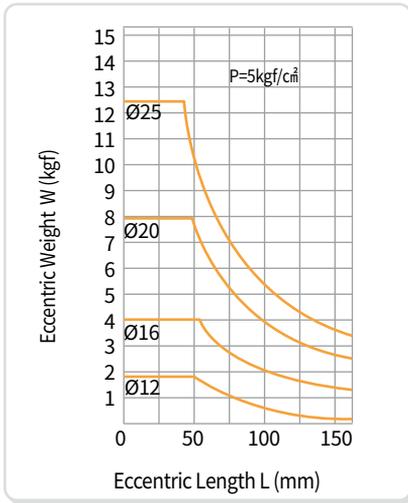
• PBM 30~100N



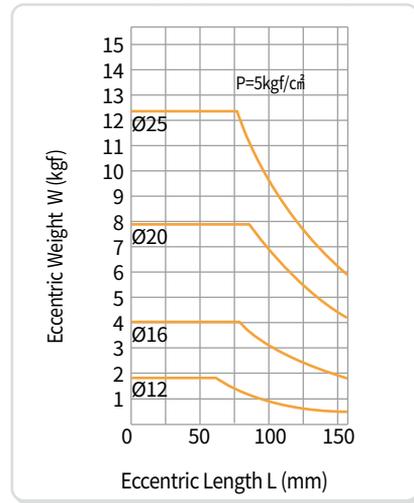
Conditions

◆ PBM-NB (L.M Bearing)

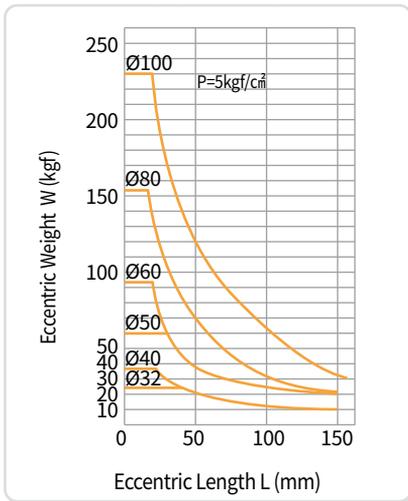
• PBM 12~25NB (10, 20, 30 stroke)



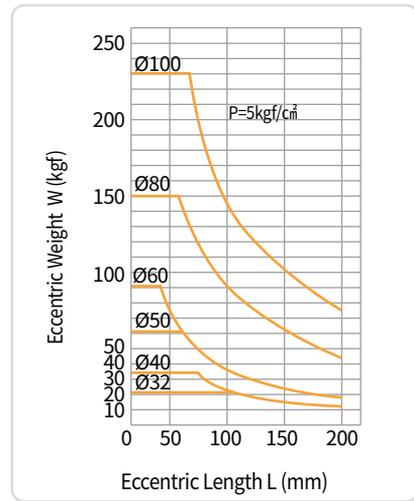
• PBM 12~25NB (Longer than 30 stroke)



• PBM 30~100NB (25, 50 stroke)



• PBM 30~100NB (75, 100 stroke)



BLOCK

|              |
|--------------|
| PT           |
| PB           |
| <b>PBM-N</b> |
| PQG          |
| PBF          |
| PGL          |
| PGC          |

# PBM-N Series

06

10

12

16

20

25

30

40

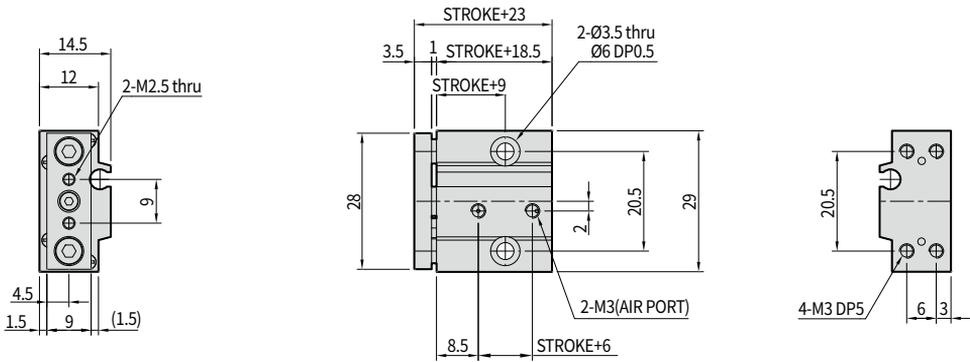
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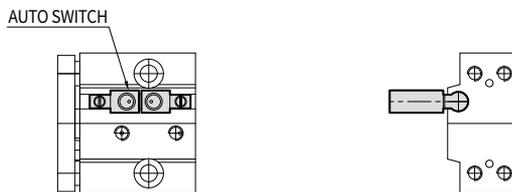
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100

## PBM06N



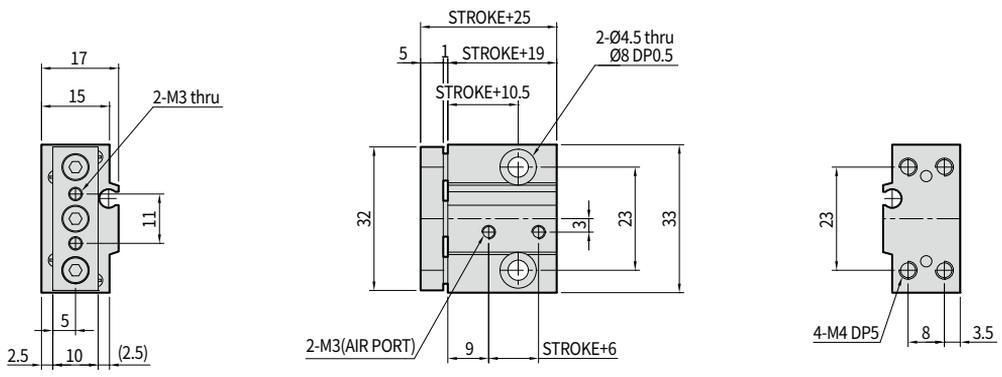
## PBM06N Example of Auto Switch installation



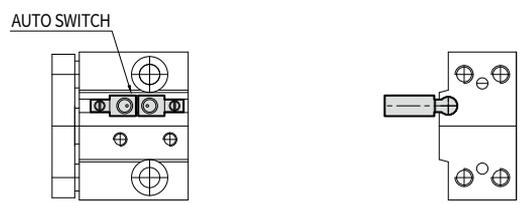
- 06
- 10
- 12
- 16
- 20
- 25
- 30
- 40
- 50
- 60
- 80
- 100

PBM10N

|              |
|--------------|
| <b>BLOCK</b> |
| PT           |
| PB           |
| <b>PBM-N</b> |
| PQG          |
| PBF          |
| PGL          |
| PGC          |



PBM10N Example of Auto Switch installation



# PBM-N Series

06

10

12

16

20

25

30

40

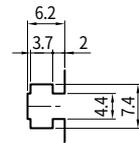
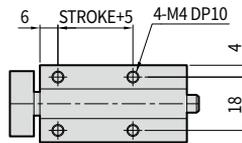
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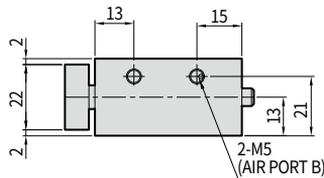
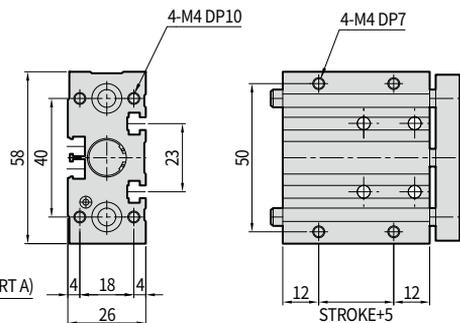
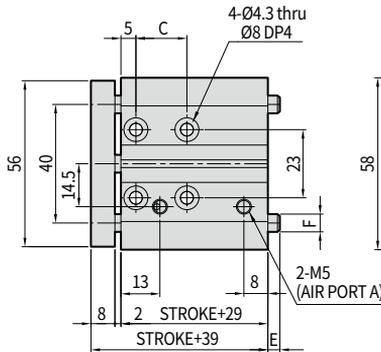
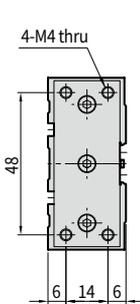
80

100

## PBM12N(B)

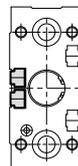
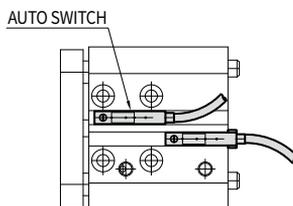


Details of T-SLOT

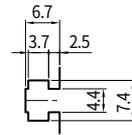
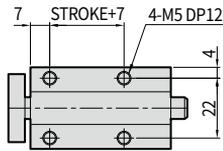


| Types   | C              |                  | E                |               | F  |
|---------|----------------|------------------|------------------|---------------|----|
|         | Under S.T.: 30 | S.T.: 30 or over | S.T.: 30 or less | Over S.T.: 30 |    |
| PBM12N  | 17             | 30               | 0                | 0             | Ø8 |
| PBM12NB | 17             | 30               | 4                | 16            | Ø6 |

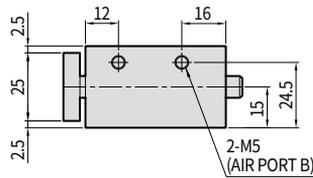
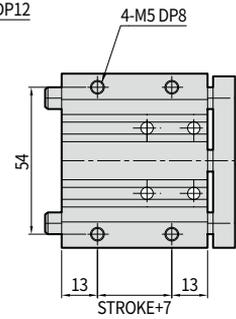
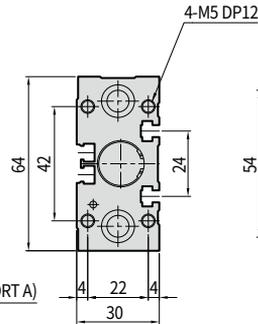
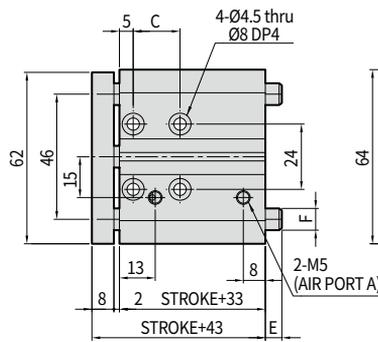
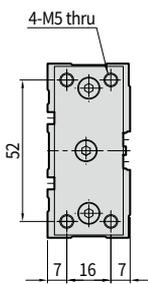
## PBM12N(B) Example of Auto Switch installation



PBM16N(B)



Details of T-SLOT

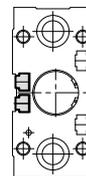
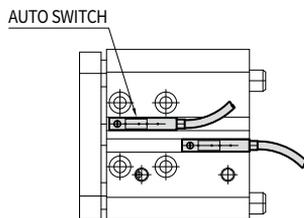


| Types   | C               |              | E               |              | F   |
|---------|-----------------|--------------|-----------------|--------------|-----|
|         | S.T.:30 or less | Over S.T.:30 | S.T.:30 or less | Over S.T.:30 |     |
| PBM16N  | 17              | 35           | 0               | 0            | Ø10 |
| PBM16NB | 17              | 35           | 6               | 22           | Ø8  |

BLOCK

- PT
- PB
- PBM-N**
- PQG
- PBF
- PGL
- PGC

PBM16N(B) Example of Auto Switch installation



# PBM-N Series

06

10

12

16

20

25

30

40

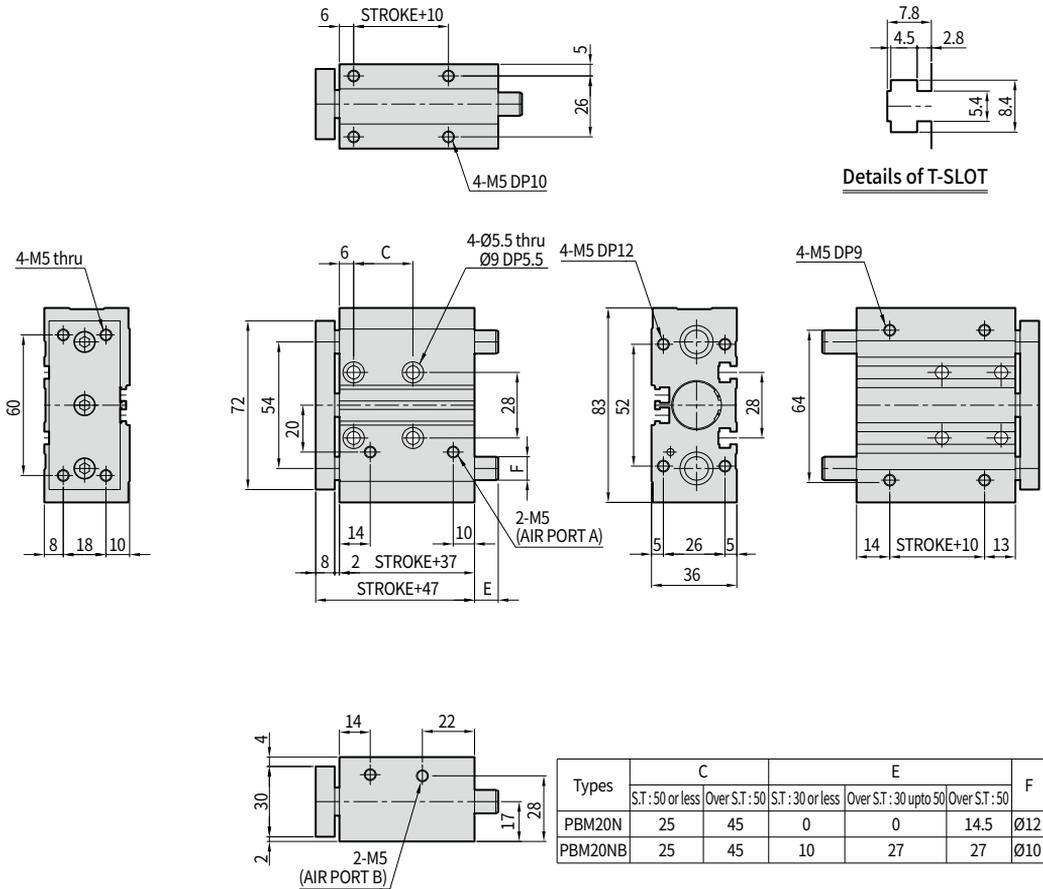
50

60

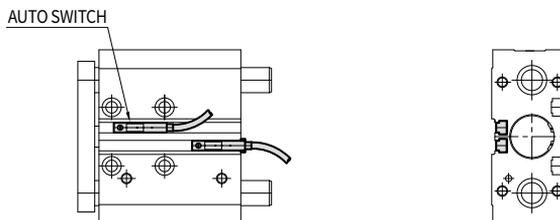
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100

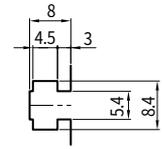
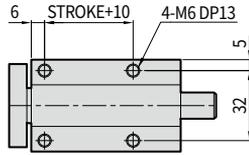
## PBM20N(B)



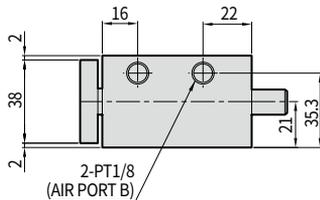
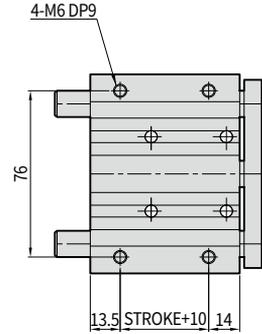
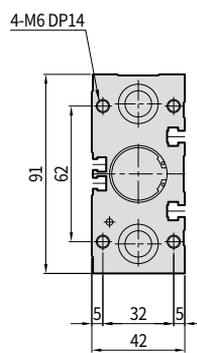
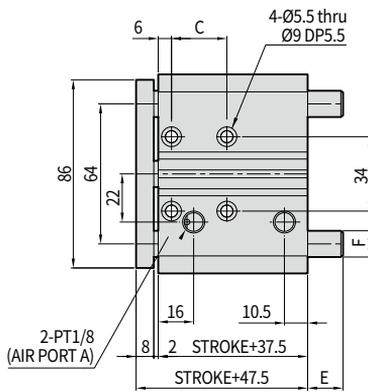
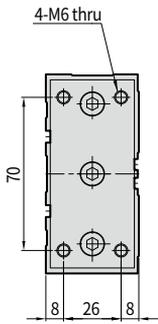
## PBM20N(B) Example of Auto Switch installation



PBM25N(B)



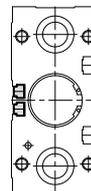
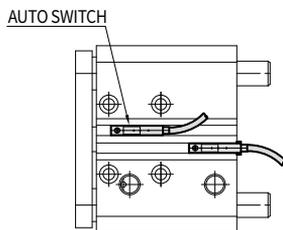
Details of T-SLOT



| Types   | C                |               | E                |                       |               | F   |
|---------|------------------|---------------|------------------|-----------------------|---------------|-----|
|         | S.T.: 50 or less | Over S.T.: 50 | S.T.: 30 or less | Over S.T.: 30 upto 50 | Over S.T.: 50 |     |
| PBM25N  | 25               | 45            | 0                | 0                     | 14.5          | Ø16 |
| PBM25NB | 25               | 45            | 16               | 32                    | 32            | Ø12 |

- BLOCK**
- PT
  - PB
  - PBM-N**
  - PQG
  - PBF
  - PGL
  - PGC

PBM25N(B) Example of Auto Switch installation



# PBM-N Series

06

10

12

16

20

25

30

40

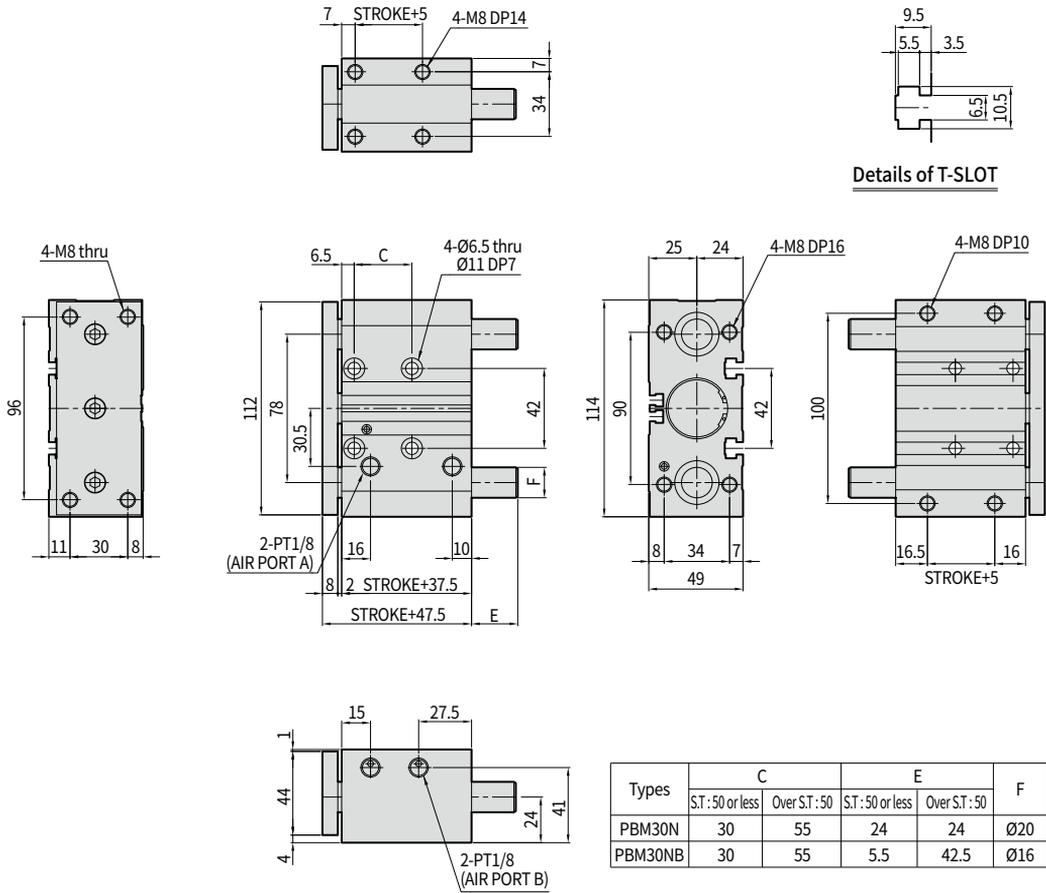
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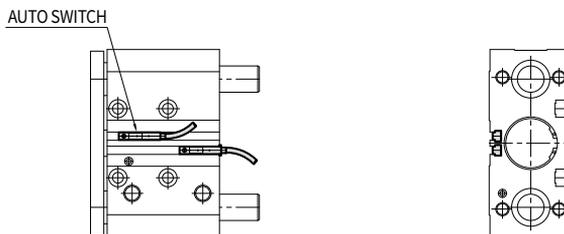
80

100

## PBM30N(B)

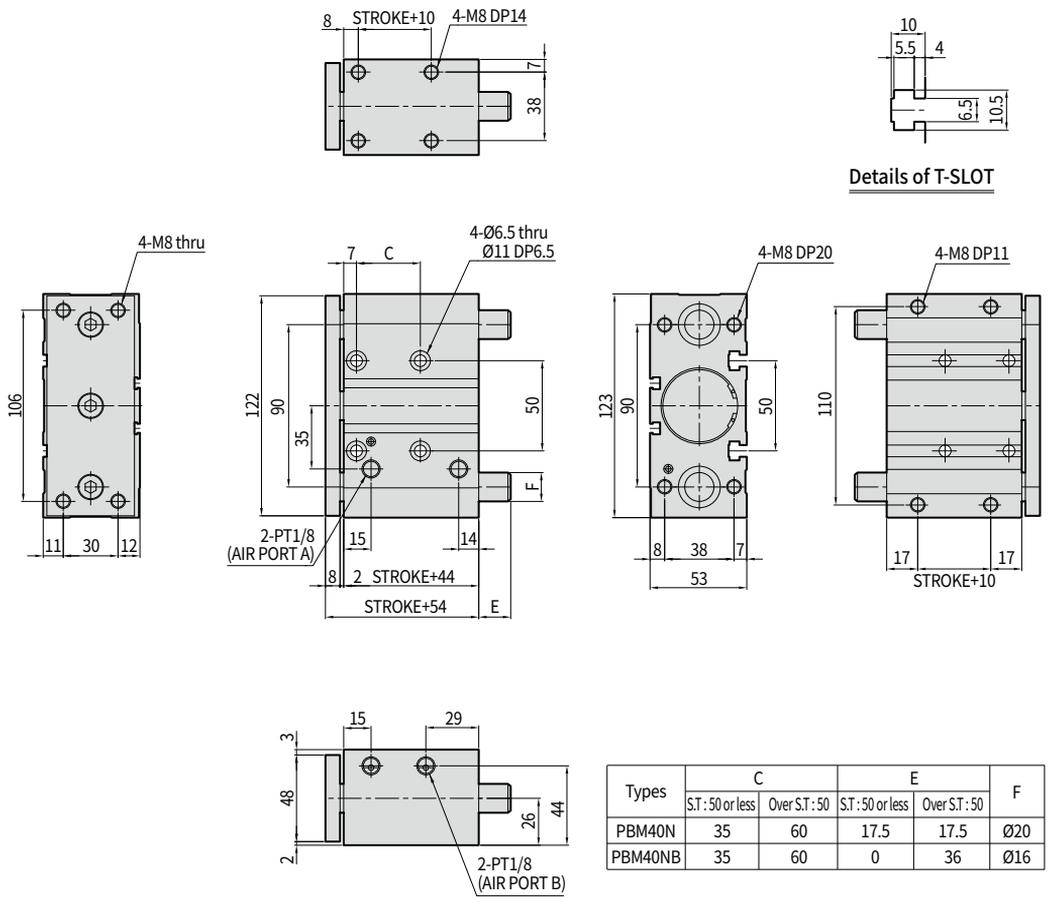


## PBM30N(B) Example of Auto Switch installation



- 06
- 10
- 12
- 16
- 20
- 25
- 30
- 40
- 50
- 60
- 80
- 100

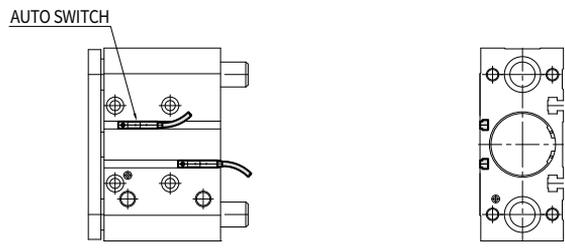
PBM40N(B)



- BLOCK
- PT
  - PB
  - PBM-N
  - PQG
  - PBF
  - PGL
  - PGC

| Types   | C                |               | E                |               | F   |
|---------|------------------|---------------|------------------|---------------|-----|
|         | S.T.: 50 or less | Over S.T.: 50 | S.T.: 50 or less | Over S.T.: 50 |     |
| PBM40N  | 35               | 60            | 17.5             | 17.5          | Ø20 |
| PBM40NB | 35               | 60            | 0                | 36            | Ø16 |

PBM40N(B) Example of Auto Switch installation



# PBM-N Series

06

10

12

16

20

25

30

40

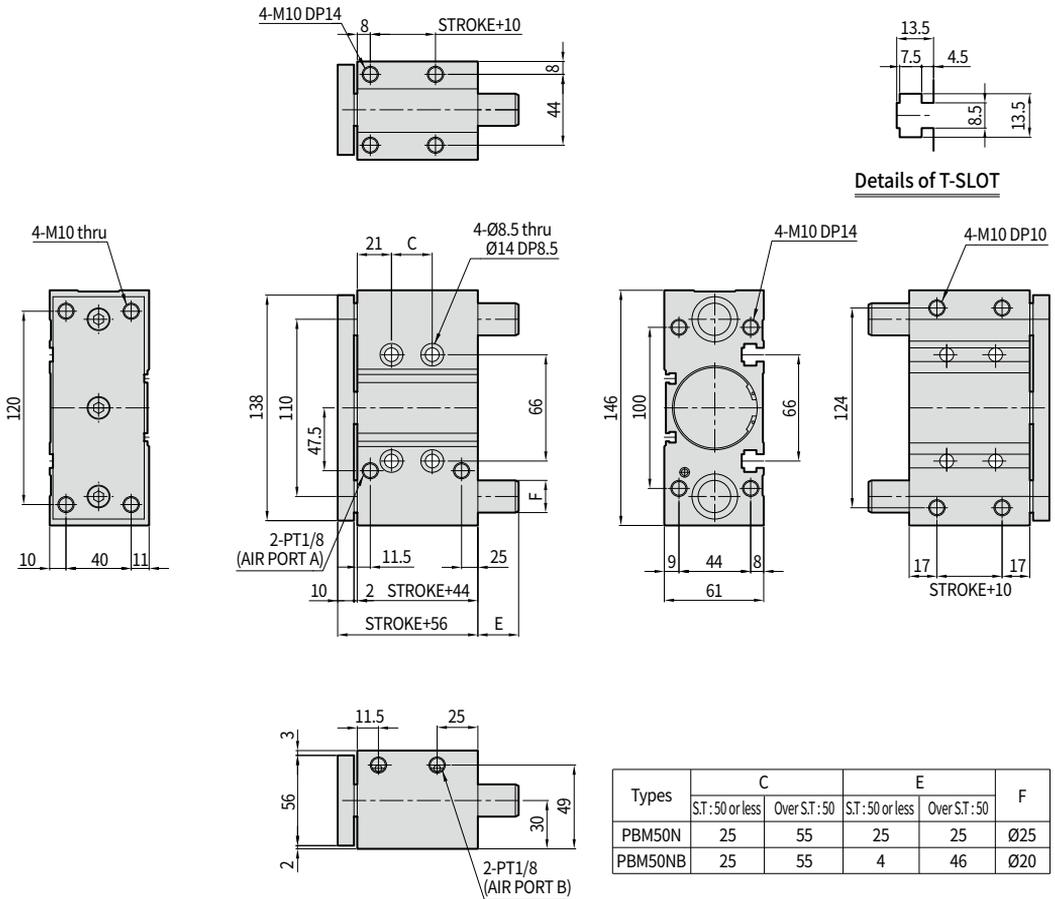
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60

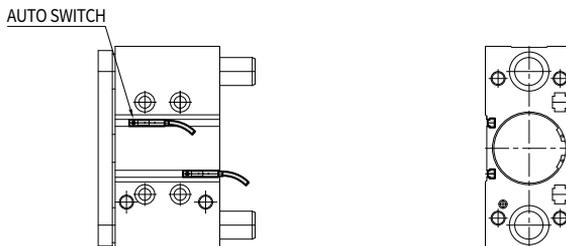
80

100

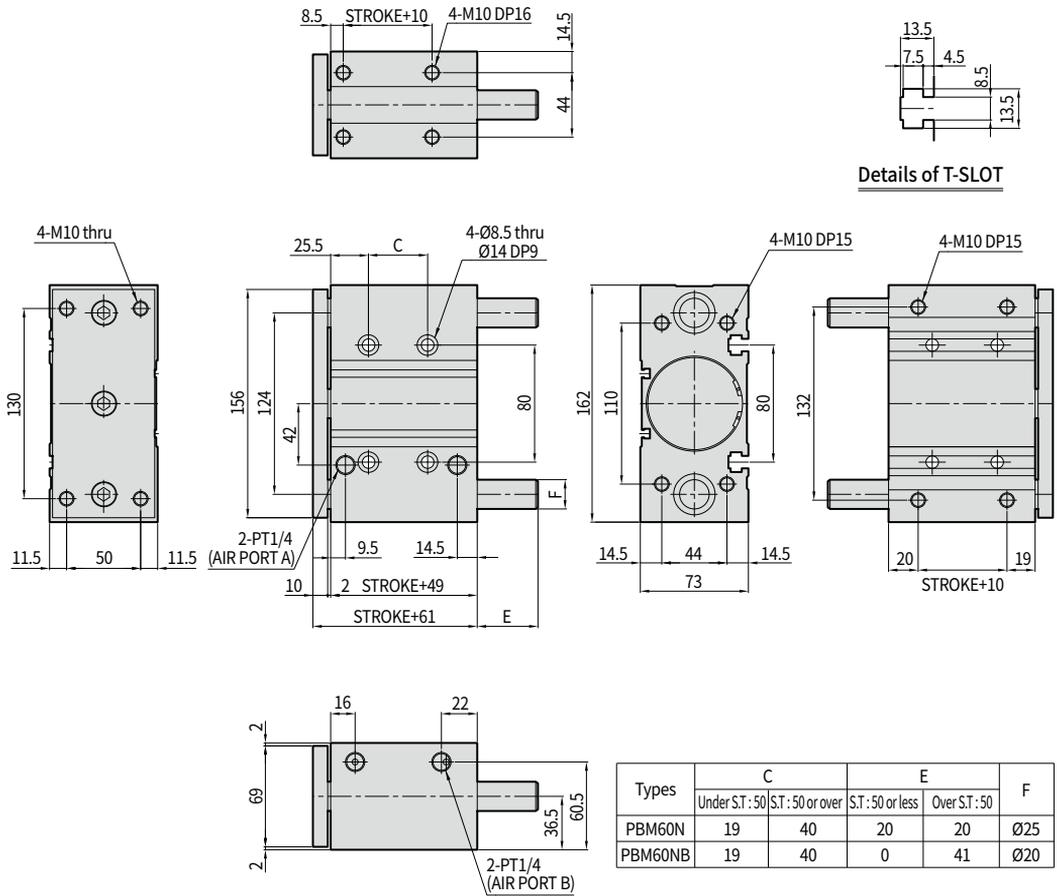
## PBM50N(B)



## PBM50N(B) Example of Auto Switch installation



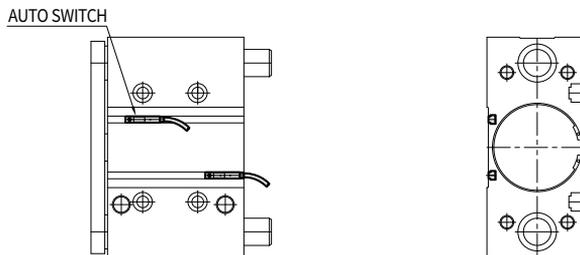
PBM60N(B)



BLOCK

- PT
- PB
- PBM-N**
- PQG
- PBF
- PGL
- PGC

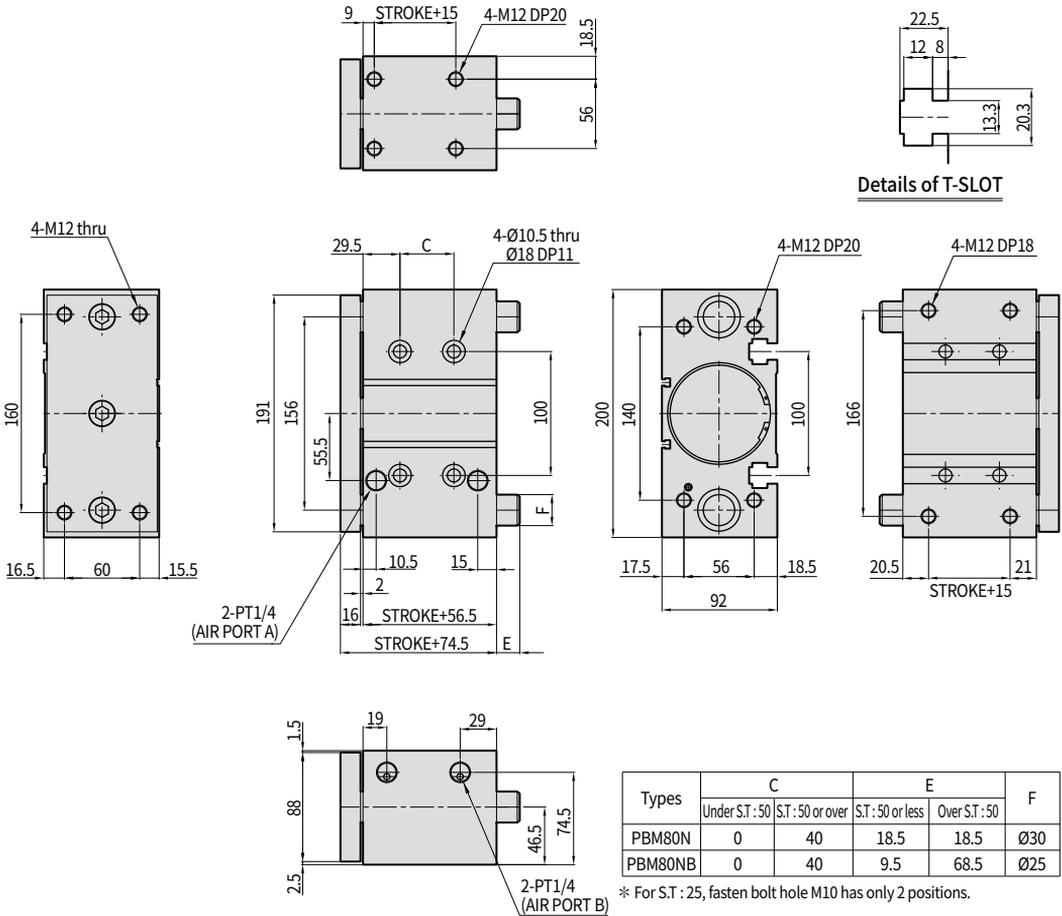
PBM60N(B) Example of Auto Switch installation



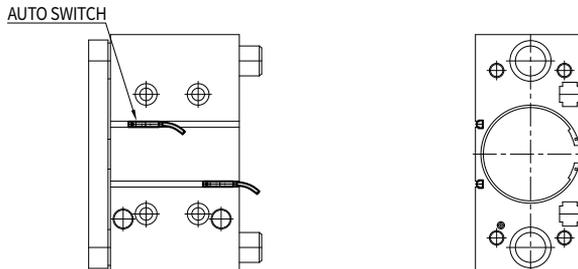
# PBM-N Series

06 10 12 16 20 25 30 40 50 60 **80** 100

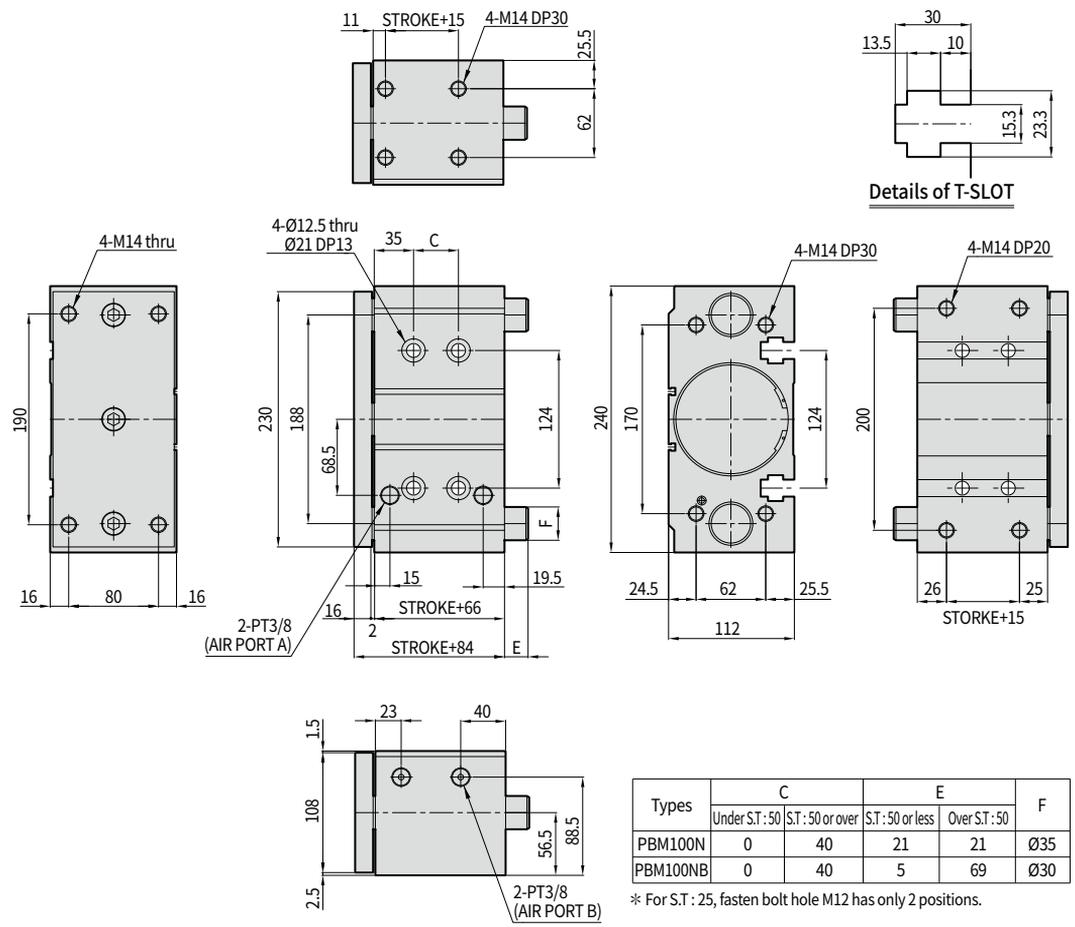
## PBM80N(B)



## PBM80N(B) Example of Auto Switch installation



PBM100N(B)

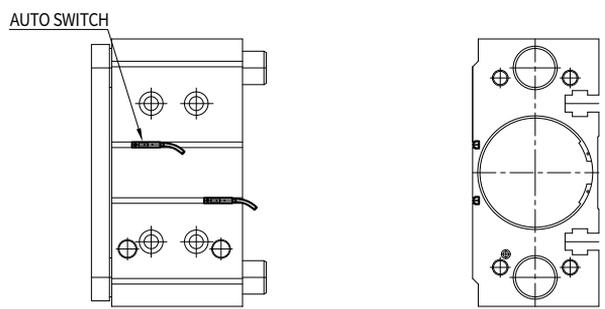


- BLOCK**
- PT
  - PB
  - PBM-N**
  - PQG
  - PBF
  - PGL
  - PGC

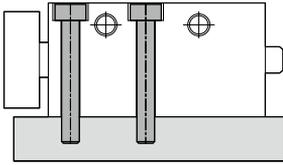
| Types    | C              |                  | E                |               | F   |
|----------|----------------|------------------|------------------|---------------|-----|
|          | Under S.T.: 50 | S.T.: 50 or over | S.T.: 50 or less | Over S.T.: 50 |     |
| PBM100N  | 0              | 40               | 21               | 21            | Ø35 |
| PBM100NB | 0              | 40               | 5                | 69            | Ø30 |

\* For S.T.: 25, fasten bolt hole M12 has only 2 positions.

PBM100N(B) Example of Auto Switch installation

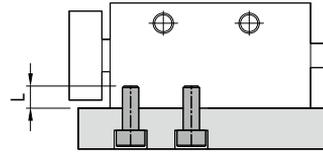


1. Installation by body through holes



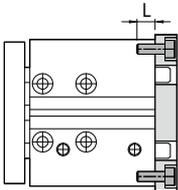
| Item    | Fastening Bolt | Max Torque (kgf·cm) |
|---------|----------------|---------------------|
| PBM06N  | M3×P0.5        | 11                  |
| PBM10N  | M4×P0.7        | 25                  |
| PBM12N  | M4×P0.7        | 25                  |
| PBM16N  | M4×P0.7        | 25                  |
| PBM20N  | M5×P0.8        | 51                  |
| PBM25N  | M5×P0.8        | 51                  |
| PBM30N  | M6×P1          | 81                  |
| PBM40N  | M6×P1          | 81                  |
| PBM50N  | M8×P1.25       | 157                 |
| PBM60N  | M8×P1.25       | 157                 |
| PBM80N  | M10×P1.5       | 360                 |
| PBM100N | M12×P1.75      | 670                 |

2. Installation by body tap holes



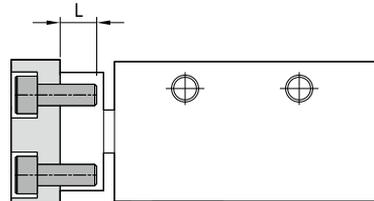
| Item    | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PBM06N  |                | Not usable          |                        |
| PBM10N  |                | Not usable          |                        |
| PBM12N  | M4×P0.7        | 25                  | 7                      |
| PBM16N  | M5×P0.8        | 51                  | 8                      |
| PBM20N  | M5×P0.8        | 51                  | 10                     |
| PBM25N  | M6×P1          | 81                  | 10                     |
| PBM30N  | M8×P1.25       | 157                 | 11                     |
| PBM40N  | M8×P1.25       | 157                 | 11                     |
| PBM50N  | M10×P1.5       | 360                 | 12                     |
| PBM60N  | M10×P1.5       | 360                 | 15                     |
| PBM80N  | M12×P1.75      | 670                 | 18                     |
| PBM100N | M14×P2         | 1067                | 20                     |

3. Installation by body tap holes



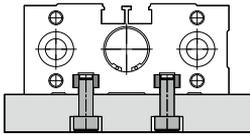
| Item    | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PBM06N  | M3×P0.5        | 11                  | 5                      |
| PBM10N  | M4×P0.7        | 25                  | 5                      |
| PBM12N  | M4×P0.7        | 25                  | 10                     |
| PBM16N  | M5×P0.8        | 51                  | 12                     |
| PBM20N  | M5×P0.8        | 51                  | 13                     |
| PBM25N  | M6×P1          | 81                  | 14                     |
| PBM30N  | M8×P1.25       | 157                 | 18                     |
| PBM40N  | M8×P1.25       | 157                 | 20                     |
| PBM50N  | M10×P1.5       | 360                 | 12                     |
| PBM60N  | M10×P1.5       | 360                 | 15                     |
| PBM80N  | M12×P1.75      | 670                 | 20                     |
| PBM100N | M14×P2         | 1067                | 30                     |

4. Installation by plate tap holes



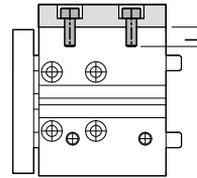
| Item    | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PBM06N  | M2.5×P0.45     | 4.9                 | 3                      |
| PBM10N  | M3×P0.5        | 11                  | 4                      |
| PBM12N  | M4×P0.7        | 25                  | 8                      |
| PBM16N  | M5×P0.8        | 51                  | 8                      |
| PBM20N  | M5×P0.8        | 51                  | 8                      |
| PBM25N  | M6×P1          | 81                  | 8                      |
| PBM30N  | M8×P1.25       | 157                 | 8                      |
| PBM40N  | M8×P1.25       | 157                 | 8                      |
| PBM50N  | M10×P1.5       | 360                 | 10                     |
| PBM60N  | M10×P1.5       | 360                 | 10                     |
| PBM80N  | M12×P1.75      | 670                 | 16                     |
| PBM100N | M14×P2         | 1067                | 16                     |

5. Installation by T-Slot in the body



- For the details of T-Slot specification, please refer each size models. (It is useful to adjust installation between actuator and work)

6. Installation by body tap holes



| Item    | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PBM06N  |                | Not usable          |                        |
| PBM10N  |                | Not usable          |                        |
| PBM12N  | M4×P0.7        | 25                  | 10                     |
| PBM16N  | M5×P0.8        | 51                  | 12                     |
| PBM20N  | M5×P0.8        | 51                  | 10                     |
| PBM25N  | M6×P1          | 81                  | 14                     |
| PBM30N  | M8×P1.25       | 157                 | 18                     |
| PBM40N  | M8×P1.25       | 157                 | 20                     |
| PBM50N  | M10×P1.5       | 360                 | 20                     |
| PBM60N  | M10×P1.5       | 360                 | 20                     |
| PBM80N  | M12×P1.75      | 670                 | 20                     |
| PBM100N | M14×P2         | 1067                | 30                     |

**BLOCK**

- PT
- PB
- PBM-N**
- PQG
- PBF
- PGL
- PGC

# BLOCK CYLINDER

## PQG Series

### Features

- Lifter actuator consisted with 5 cylinders in one body. (an up&down cylinder and 4 lifter cylinders)
- Five times thrust of cylinder bore size to lifting direction.
- Suitable for lifter on assembling or transfer automation.
- Auto Switch installation. (Optional)



### Order Form

**PQG 30 - 30 - A1 L S**

①      ②      ③      ④      ⑤      ⑥

#### ① Series Name

#### ② Cylinder Bore Size

#### ③ Standard Strokes

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) |
|-------|--------------|-------------------------------|
| 20    | 20           | 10,20,30,40,50                |
| 30    | 30           | 10,20,30,40,50,75,100         |
| 40    | 40           | 10,20,30,40,50,75,100         |

#### ④ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |             | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|-------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC          | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |             |         |                |               |                |
| A1    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V         | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V) | -       | Less than 50mA | IP 67         | 1ms            |

#### ⑤ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑥ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

Specification

| Item Name                                   |          | PQG20  | PQG30           | PQG40          |
|---|----------|--|-----------------|----------------|
| CYL Bore Size(mm)                           |          | 20   | 30              | 40             |
| Rod Size(mm)                                |          | 10   | 12              | 16             |
| Standard Strokes(mm)                        |          | 10 ~ 50  | 10 ~ 100        |                |
| Theoretical Thrust(kgf)                     | Forward  | 15.7×P   | 35.3×P          | 62.8×P         |
|   | Backward | 2.36×P   | 5.93×P          | 10.55×P        |
| P : Air Pressure(kgf/cm <sup>2</sup> )      |          | PT1/8  |                 | PT1/4          |
| Fitting Size                                |          | PT1/8  |                 | PT1/4          |
| Weight(kgf)                                 |          | 0.892 + 0.018×S.T  | 2.5 + 0.042×S.T | 4.5 + 0.06×S.T |
| S.T : Stroke(mm)                            |          |  |                 |                |
| Fluid                                       |          | Clean Air <small>Note 1)</small>                                   |                 |                |
| Pressure Range(kgf/cm <sup>2</sup> )        |          | 1.5 ~ 7 (Guaranteed Resist Pressure : 10.2) <small>Note 2)</small> |                 |                |
| Lubrication                                 |          | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)    |                 |                |
| Temperature Range(°C)                       |          | 5 ~ 60   |                 |                |
| Moving Speed(mm/sec) <small>Note 3)</small> |          | 50 ~ 300   |                 |                |
| Operation Type                              |          | Double Acting  |                 |                |
| Position Accuracy(mm)                       |          | ±0.1   |                 |                |
| Stroke Tolerance for Forward Position(mm)   |          | 0 ~ +1   |                 |                |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

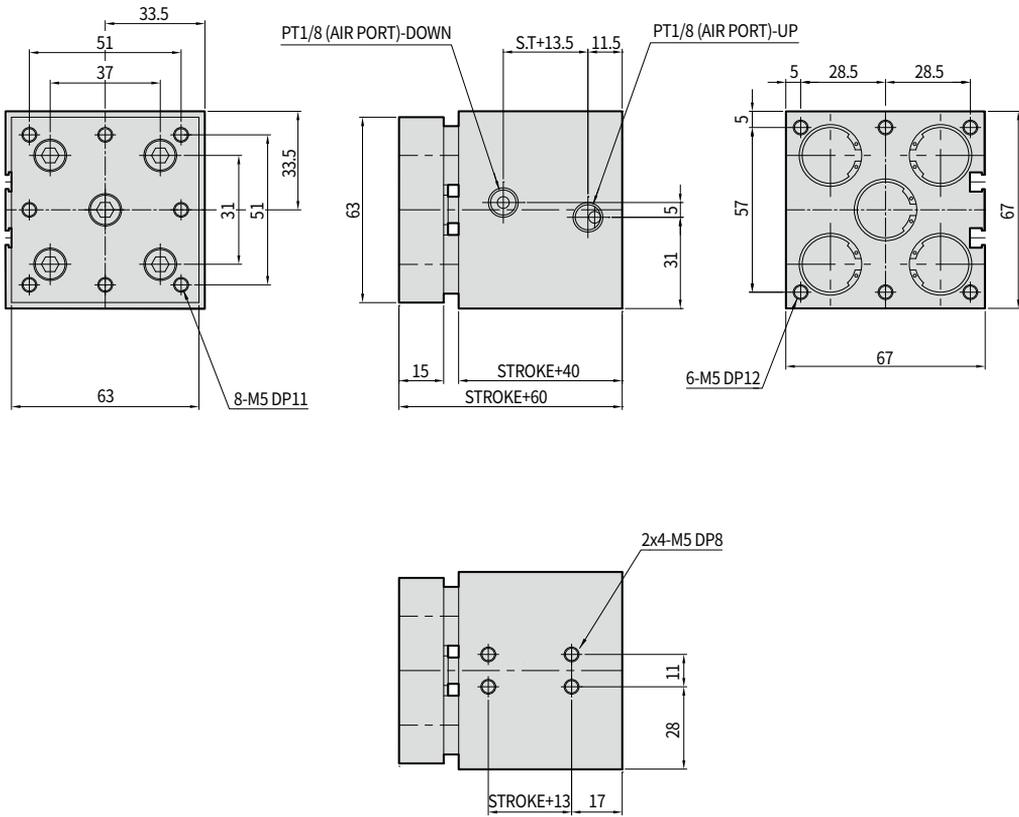
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) If needs to control moving speed, using a meter-in speed controller is recommended.

**BLOCK**

- PT
- PB
- PBM-N
- PQG**
- PBF
- PGL
- PGC

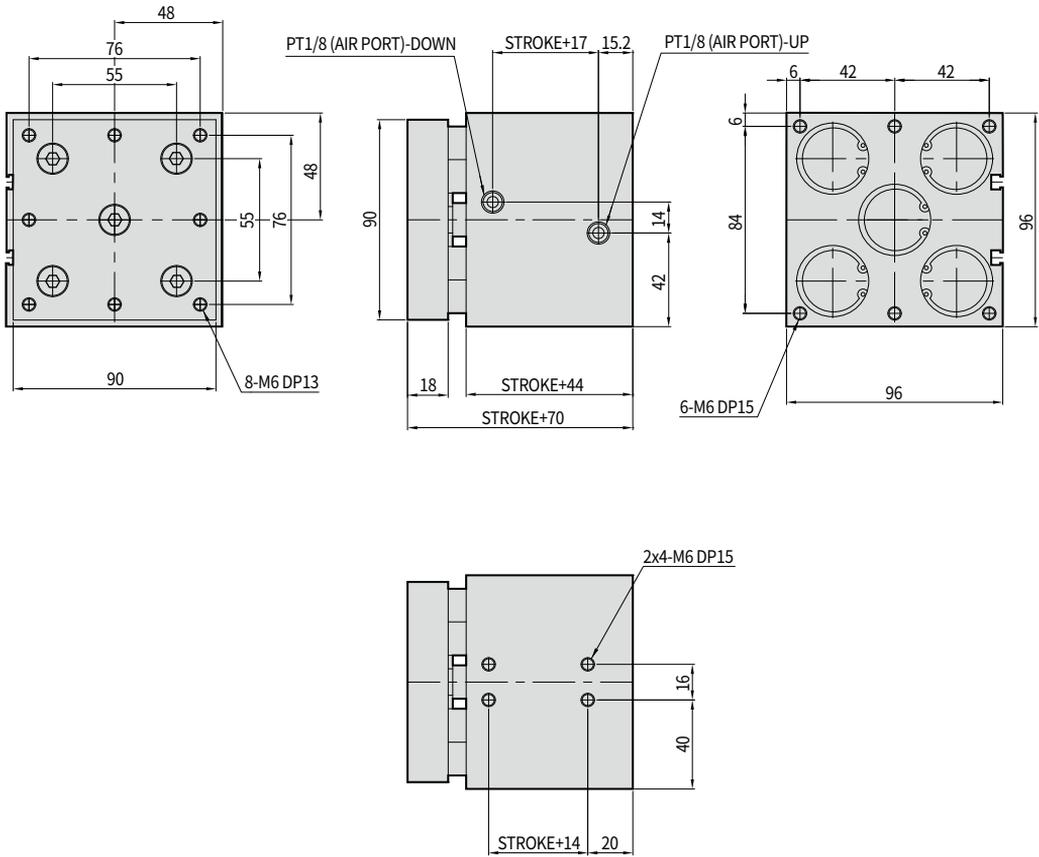
## PQG20



## PQG20 Example of Auto Switch installation



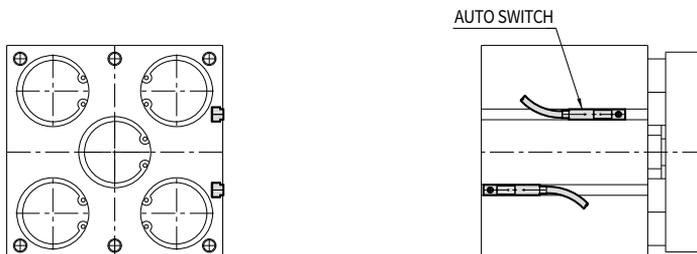
PQG30



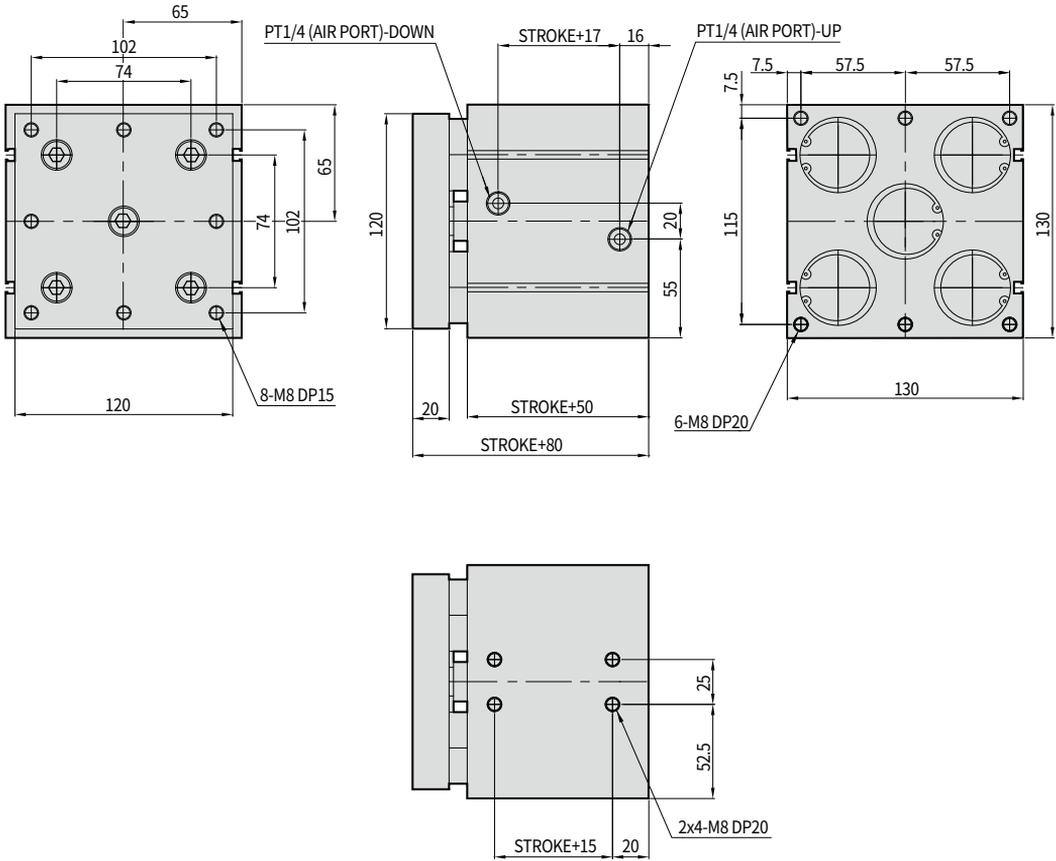
BLOCK

- PT
- PB
- PBM-N
- PQG**
- PBF
- PGL
- PGC

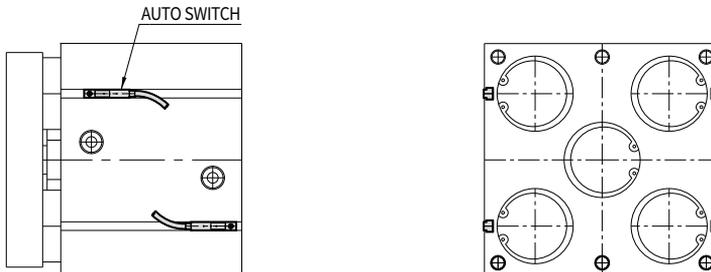
PQG30 Example of Auto Switch installation



## PQG40

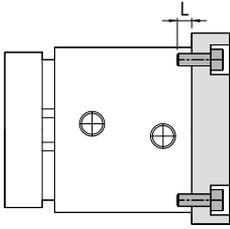


## PQG40 Example of Auto Switch installation



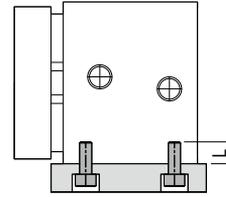
Installation Information

1. Installation by body tap holes



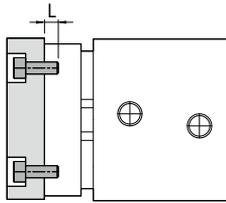
| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PQG20 | M5×P0.8        | 51                  | 12                     |
| PQG30 | M6×P1          | 81                  | 15                     |
| PQG40 | M8×P1.25       | 157                 | 20                     |

2. Installation by body tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PQG20 | M5×P0.8        | 51                  | 12                     |
| PQG30 | M6×P1          | 81                  | 15                     |
| PQG40 | M8×P1.25       | 157                 | 20                     |

3. Installation by plate tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PQG20 | M5×P0.8        | 51                  | 12                     |
| PQG30 | M6×P1          | 81                  | 15                     |
| PQG40 | M8×P1.25       | 157                 | 15                     |

BLOCK

- PT
- PB
- PBM-N
- PQG**
- PBF
- PGL
- PGC

# BLOCK CYLINDER

## PBF Series

### Features

- Tripple rod cylinder which is consist of one cylinder and double guides in one body.
- Plates for mounting and one block for moving.
- Stable and solid durability by plate supporting design.
- Smooth moving and suitable for heavy load with L.M bearing application for Sliding part.
- Auto Switch installation. (Optional)



### Order Form

**PBF 16 - 50 - A1 L S - SH2**

①

②

③

④

⑤

⑥

⑦

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) |
|-------|--------------|-------------------------------|
| 16    | 16           | 25,50,75,100                  |
| 20    | 20           | 25,50,75,100,125              |
| 25    | 25           | 25,50,75,100,125,150          |
| 30    | 30           | 25,50,75,100,125,150,175,200  |
| 40    | 40           | 25,50,75,100,125,150,175,200  |

#### ③ Standard Strokes

#### ⑥ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ⑦ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

#### ④ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |             | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|-------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC          | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |             |         |                |               |                |
| A1    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V         | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V) | -       | Less than 50mA | IP 67         | 1ms            |

#### ⑤ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

Accessory Order Form

(1) Shock Absorber

**PBF 20 - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

**BLOCK**

|            |
|------------|
| PT         |
| PB         |
| PBM-N      |
| PQG        |
| <b>PBF</b> |
| PGL        |
| PGC        |

Specification

| Item Name                              | PBF16  | PBF20     | PBF25    | PBF30     | PBF40    |
|--|--|-----------|----------|-----------|----------|
| CYL Bore Size(mm)                      | 16   | 20        | 25       | 30        | 40       |
| Rod Size(mm)                           | 8  | 10        | 12       | 16        | 20       |
| Standard Strokes(mm)                   | 25 ~ 100   | 25 ~ 125  | 25 ~ 150 | 25 ~ 200  |          |
| Theoretical Thrust(kgf)                | 1.5×P  | 2.36×P    | 3.78×P   | 5.06×P    | 9.4×P    |
| P : Air Pressure(kgf/cm <sup>2</sup> ) |  |           |          |           |          |
| Fitting Size                           | M5   |           |          | PT1/8     |          |
| Weight(kgf)                            | 0.46 +   | 0.8 +     | 1.2 +    | 1.68 +    | 2.7 +    |
| S.T : Stroke(mm)                       | 0.005×S.T  | 0.007×S.T | 0.01×S.T | 0.016×S.T | 0.02×S.T |
| Max Load Weight(kgf)                   | 3.2  | 4.5       | 6.7      | 9.5       | 14       |
| Fluid                                  | Clean Air <small>Note 1)</small>                                   |           |          |           |          |
| Pressure Range(kgf/cm <sup>2</sup> )   | 1.5 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |           |          |           |          |
| Lubrication                            | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)    |           |          |           |          |
| Temperature Range(°C)                  | 5 ~ 60   |           |          |           |          |
| Moving Speed(mm/sec)                   | 30 ~ 300   |           |          |           |          |
| Operation Type                         | Double Acting  |           |          |           |          |
| Position Accuracy(mm)                  | ±0.04  |           |          |           |          |
| Stroke Adjustment Range(mm)            | 0 ~ -10 (For standard stroke model, 5mm for single direction)      |           |          |           |          |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

# PBF Series

16

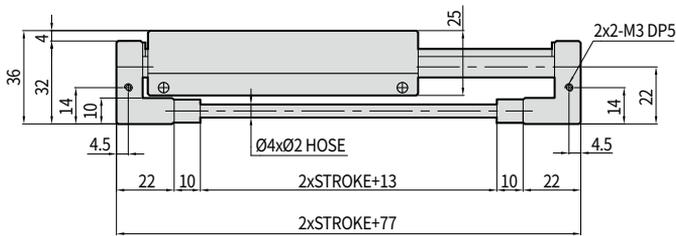
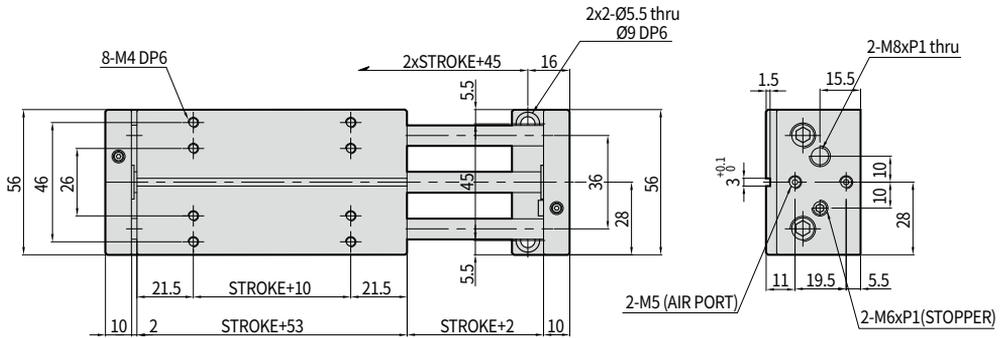
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25

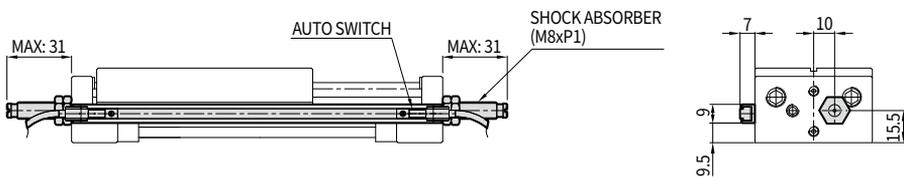
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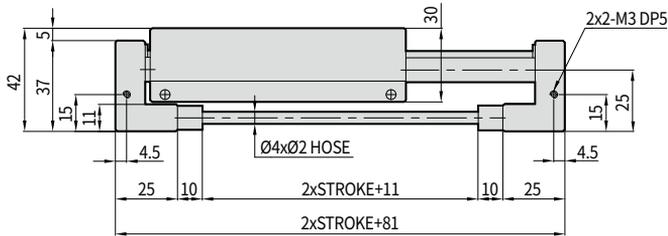
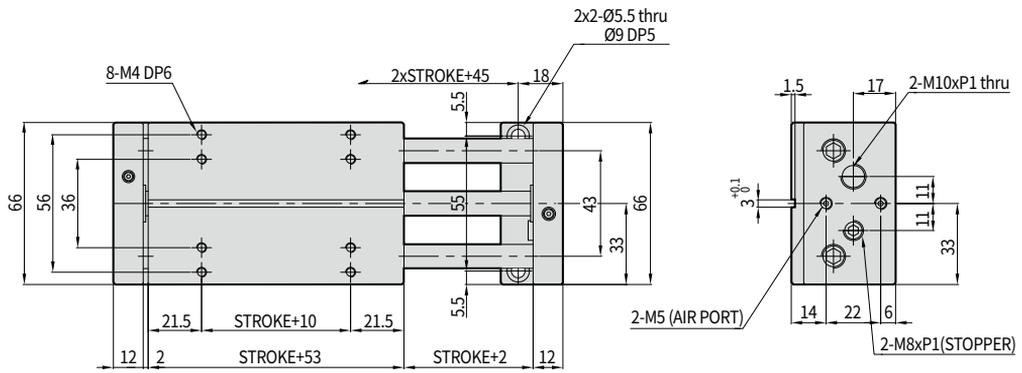
## PBF16



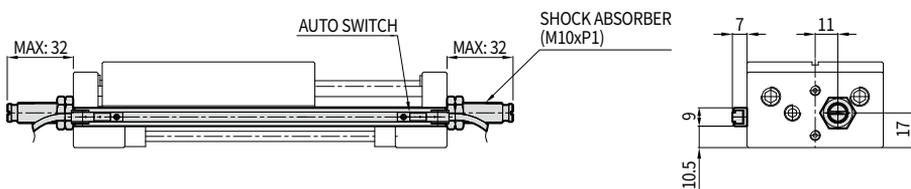
## PBF16 Example of Auto Switch installation



PBF20



PBF20 Example of Auto Switch installation

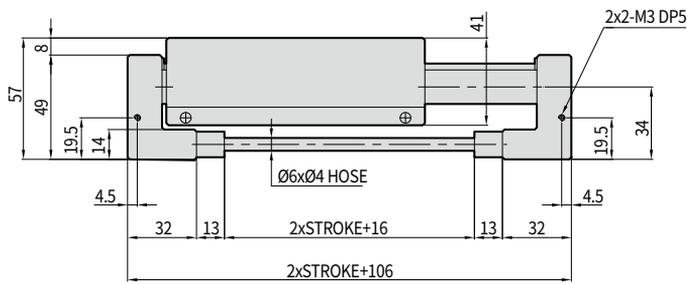
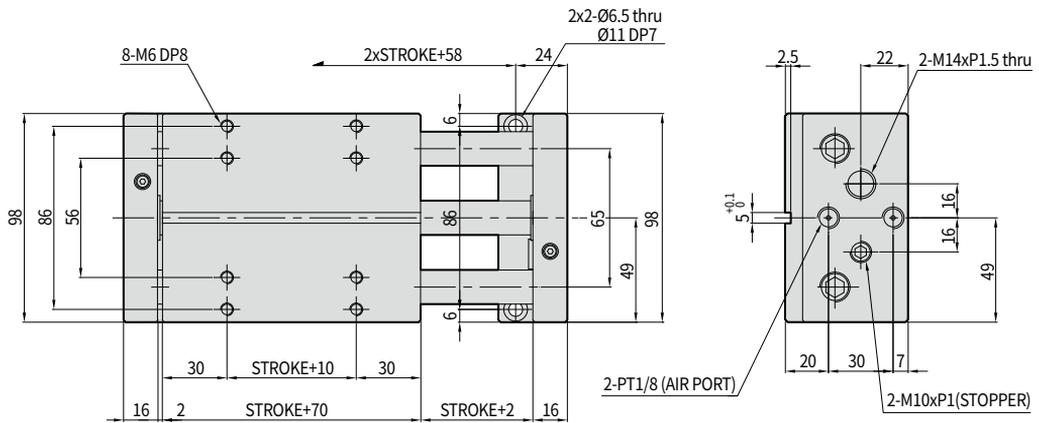


BLOCK

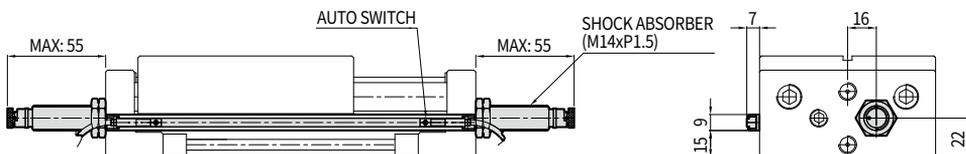
- PT
- PB
- PBM-N
- PQG
- PBF**
- PGL
- PGC



PBF30



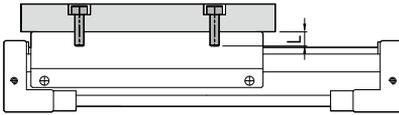
PBF30 Example of Auto Switch installation





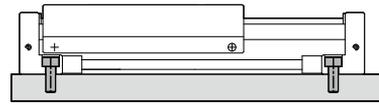
**Installation Information**

**1. Installation by body tap holes**



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PBF16 | M4×P0.7        | 25                  | 6                      |
| PBF20 | M4×P0.7        | 25                  | 6                      |
| PBF25 | M5×P0.8        | 51                  | 7                      |
| PBF30 | M6×P1          | 81                  | 8                      |
| PBF40 | M8×P1.25       | 157                 | 12                     |

**2. Installation by plate through holes**



| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PBF16 | M5×P0.8        | 51                  |
| PBF20 | M5×P0.8        | 51                  |
| PBF25 | M6×P1          | 81                  |
| PBF30 | M6×P1          | 81                  |
| PBF40 | M8×P1.25       | 157                 |

**BLOCK**

- PT
- PB
- PBM-N
- PQG
- PBF**
- PGL
- PGC

BLOCK CYLINDER

# PGL Series

---

Wide and slim body Guided cylinder

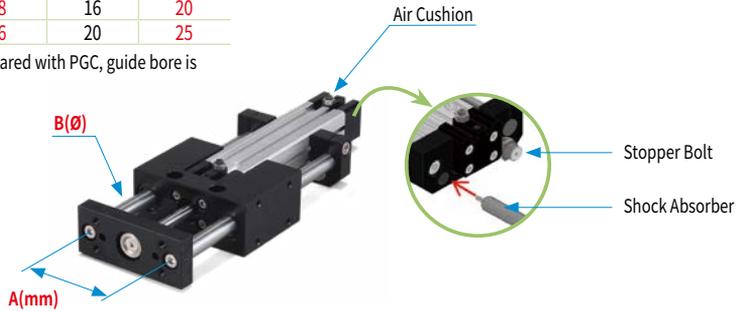


### Increased allowable moment

- Widest guide distance among equivalent models.
- Enlarged guide bore size of ball bush guide as standard.

| Bore Size | Guide Distance A(mm) |     | Guide Bore B(Ø) |     |
|-----------|----------------------|-----|-----------------|-----|
|           | PGC                  | PGL | PBM-NB          | PGL |
| Ø16       | -                    | 52  | 8               | 10  |
| Ø20       | 60                   | 64  | 10              | 12  |
| Ø25       | 70                   | 76  | 12              | 13  |
| Ø30       | 80                   | 84  | 16              | 16  |
| Ø40       | 95                   | 108 | 16              | 20  |
| Ø50       | 115                  | 136 | 20              | 25  |

※ Listed Guide distance is compared with PGC, guide bore is compared with PBM-NB.



### Enhanced shock absorbing function

- Air cushion for forward and backward as standard.
- Shock absorber as option.
- Easy control stroke by stopper bolt as standard.

### Dramatically reduced size and weight by innovative design

- Compact body and plate.

Reduced volume average -48%

| Bore Size | Dimension L×W×H (mm) |            |
|-----------|----------------------|------------|
|           | PGC                  | PGL        |
| Ø16       | -                    | 193×74×32  |
| Ø20       | 257×108×55           | 203×90×38  |
| Ø25       | 275×130×65           | 212×106×46 |
| Ø30       | 301×135×73           | 232×118×59 |
| Ø40       | 338×170×93           | 283×148×69 |
| Ø50       | 385×194×103          | 301×184×82 |

- Light weight of using aluminum.

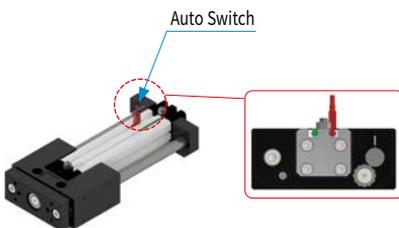
Reduced weight average -49%

| Bore Size | Weight (kgf) |      |
|-----------|--------------|------|
|           | PGC          | PGL  |
| Ø16       | -            | 0.88 |
| Ø20       | 3.7          | 1.34 |
| Ø25       | 4.2          | 1.89 |
| Ø30       | 5.7          | 2.93 |
| Ø40       | 8.4          | 4.95 |
| Ø50       | 12.7         | 8.14 |

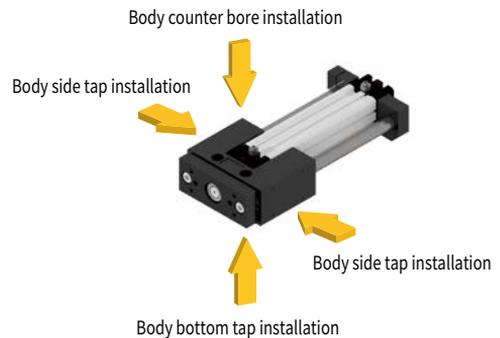
※ Listed specification compare with PGC model as 100mm stroke.

### Auto Switch installation (Optional)

- Various auto switches types as optional.



### Various installation ways



# BLOCK CYLINDER

## PGL Series

### Features

NEW

- Dramatically reduced size and weight by innovative design.
- Compact body and plate.
- Lightest weight model for all of domestic equivalent products as innovative design.
- Beautiful and lightweight design by front plate made by aluminum.
- Superior allowable moment by widest guide distance among equivalent models.
- Enlarged guide bore size of ball bush guide as standard.
- Extremely increased shock absorbing ability by standard air cushion and stopper for control stroke.
- Auto Switch installation. (Optional)



### Order Form

**PGL 20 - 100 - SH1 - A2 L S**

① ② ③ ④ ⑤ ⑥ ⑦

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) |
|-------|--------------|-------------------------------|
| 16    | 16           | 50, 75, 100, 125, 150, 200    |
| 20    | 20           | 50, 75, 100, 125, 150, 200    |
| 25    | 25           | 50, 75, 100, 125, 150, 200    |
| 30    | 32           | 75, 100, 150, 200, 250, 300   |
| 40    | 40           | 75, 100, 150, 200, 250, 300   |
| 50    | 50           | 75, 100, 150, 200, 250, 300   |

#### ③ Standard Strokes

#### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ④ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |

※ Standard stopper is combination of urethane stopper for forward stroke adjustment and air cushion.

※ For "SH1" option, shock absorber will be mounted with standard stopper together.

#### ⑤ Auto Switch Specification

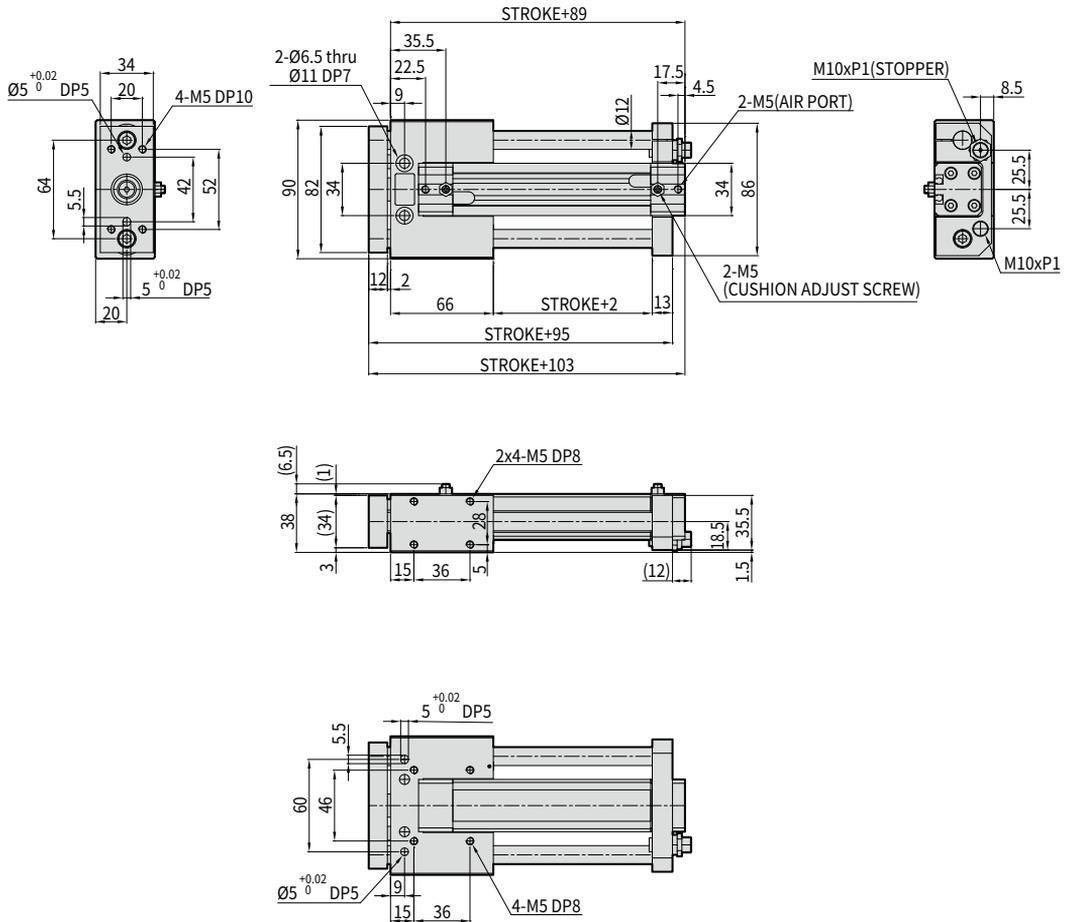
| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |                |               |                |
| A2    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2V   | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B2    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3C   | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~30V)  | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)





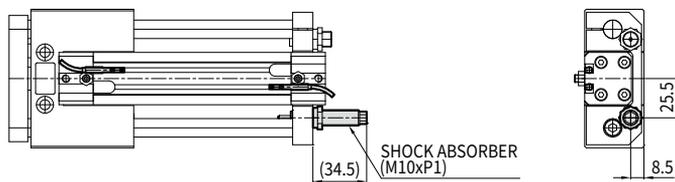
PGL20



**BLOCK**

|            |
|------------|
| PT         |
| PB         |
| PBM-N      |
| PQG        |
| PBF        |
| <b>PGL</b> |
| PGC        |

PGL20 Example of Auto Switch & Shock Absorber installation



# PGL Series

16

20

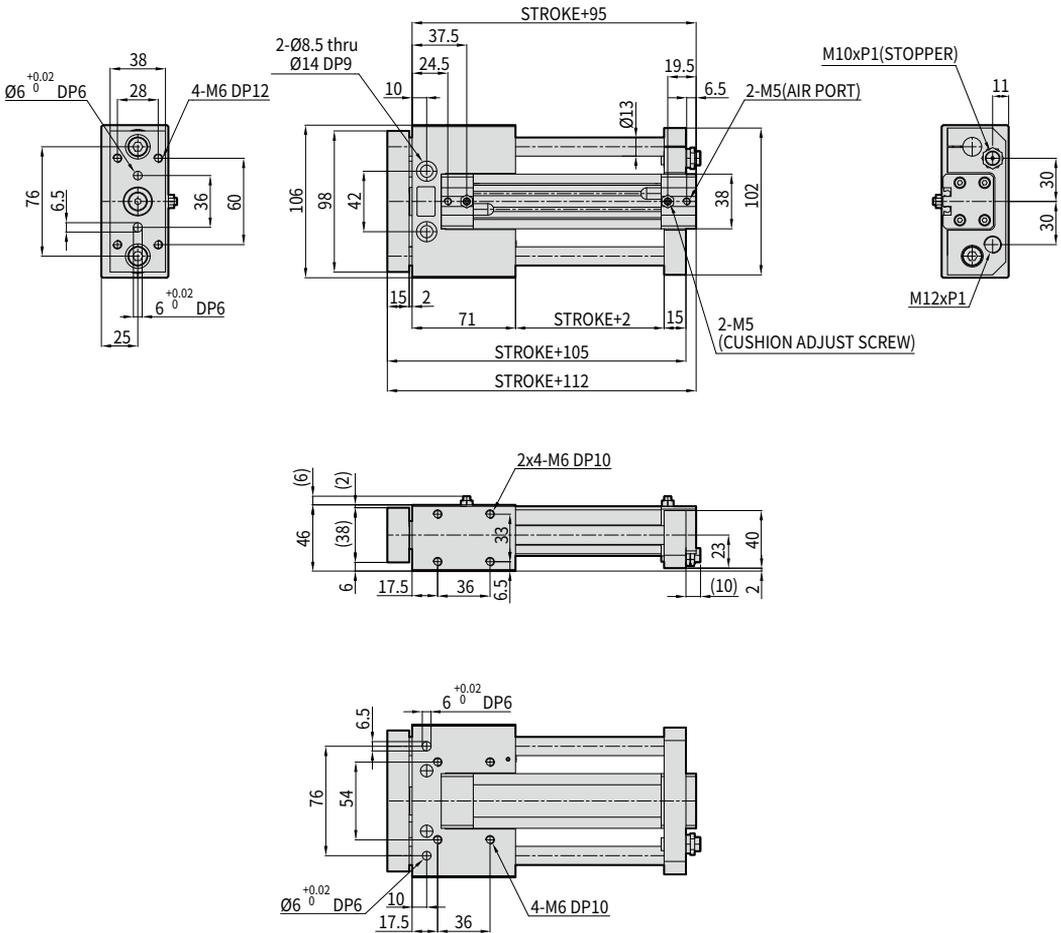
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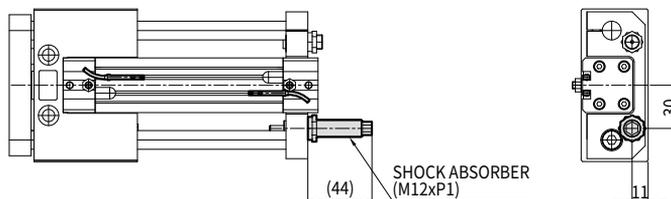
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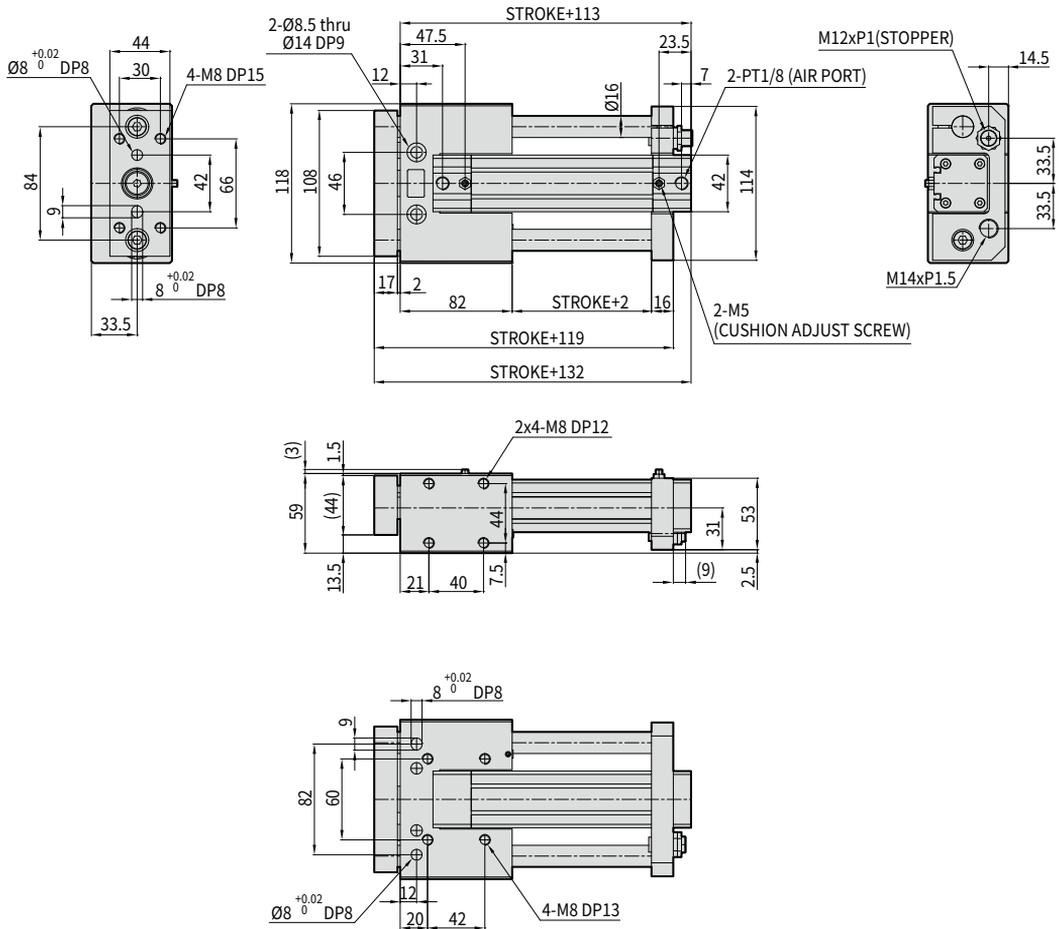
## PGL25



## PGL25 Example of Auto Switch & Shock Absorber installation



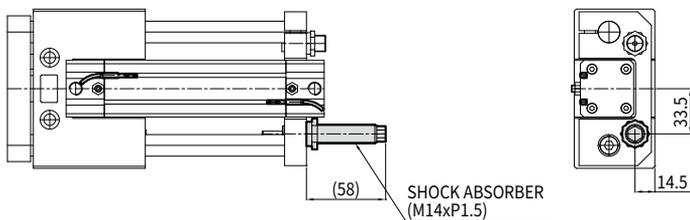
PGL30



**BLOCK**

|            |
|------------|
| PT         |
| PB         |
| PBM-N      |
| PQG        |
| PBF        |
| <b>PGL</b> |
| PGC        |

PGL30 Example of Auto Switch & Shock Absorber installation



# PGL Series

16

20

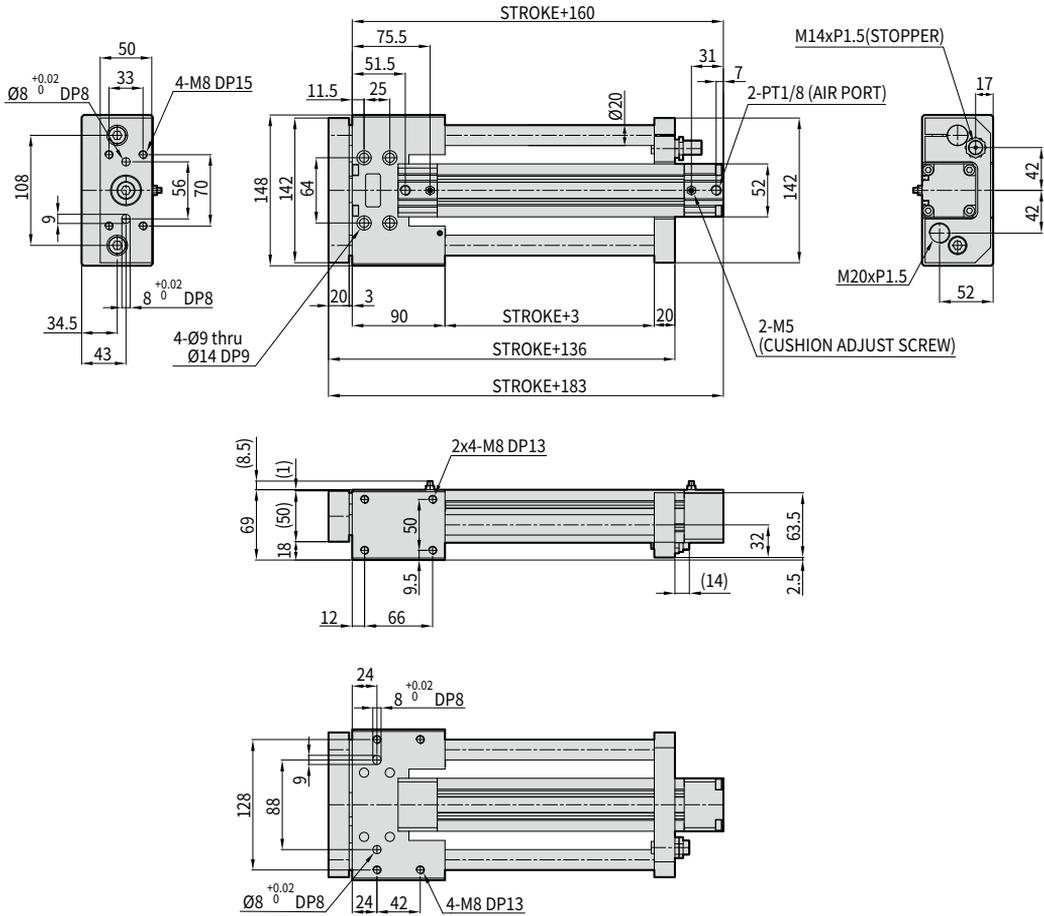
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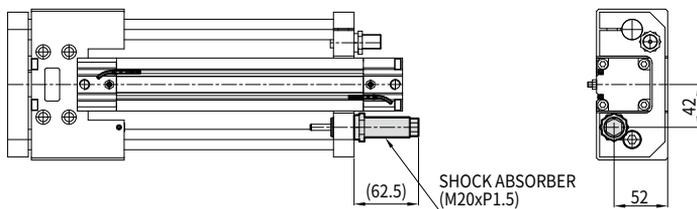
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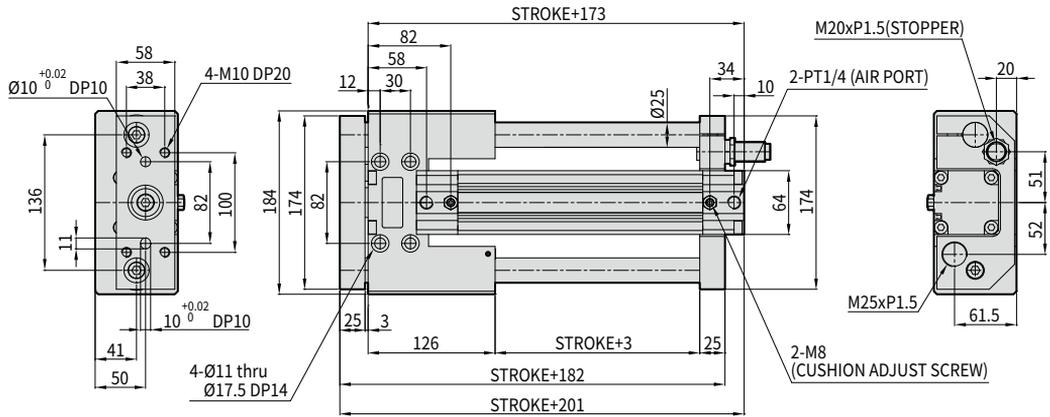
## PGL40



## PGL40 Example of Auto Switch & Shock Absorber installation



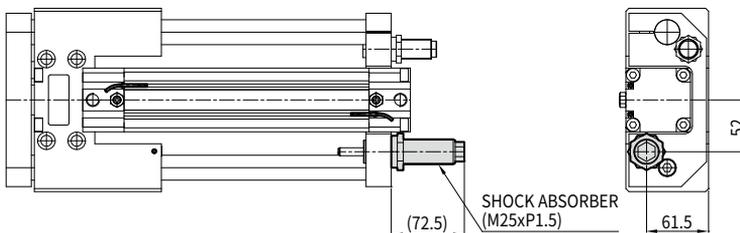
PGL50



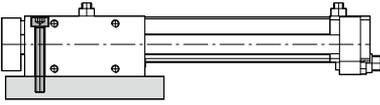
BLOCK

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL**
- PGC

PGL50 Example of Auto Switch & Shock Absorber installation

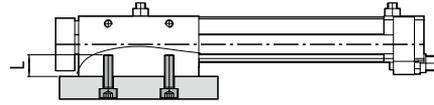


1. Installation by body through holes



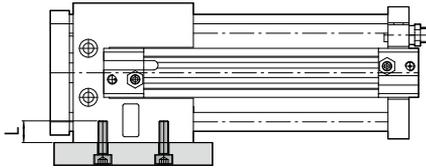
| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PGL16 | M5×0.8         | 51                  |
| PGL20 | M6×1           | 81                  |
| PGL25 | M8×1.25        | 157                 |
| PGL30 | M8×1.25        | 157                 |
| PGL40 | M8×1.25        | 157                 |
| PGL50 | M10×1.5        | 360                 |

2. Installation by body tap holes



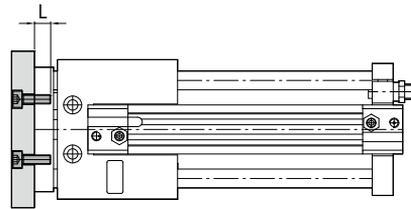
| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PGL16 | M4×0.7         | 25                  | 6                      |
| PGL20 | M5×0.8         | 51                  | 8                      |
| PGL25 | M6×1           | 81                  | 10                     |
| PGL30 | M8×1.25        | 157                 | 13                     |
| PGL40 | M8×1.25        | 157                 | 13                     |
| PGL50 | M10×1.5        | 360                 | 17                     |

3. Installation by body tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PGL16 | M4×0.7         | 25                  | 6                      |
| PGL20 | M5×0.8         | 51                  | 8                      |
| PGL25 | M6×1           | 81                  | 10                     |
| PGL30 | M8×1.25        | 157                 | 12                     |
| PGL40 | M8×1.25        | 157                 | 13                     |
| PGL50 | M10×1.5        | 360                 | 17                     |

4. Installation by plate tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PGL16 | M4×0.7         | 25                  | 8                      |
| PGL20 | M5×0.8         | 51                  | 10                     |
| PGL25 | M6×1           | 81                  | 12                     |
| PGL30 | M8×1.25        | 157                 | 15                     |
| PGL40 | M8×1.25        | 157                 | 15                     |
| PGL50 | M10×1.5        | 360                 | 20                     |

MEMO

Horizontal dotted lines for writing.

**BLOCK**

|            |
|------------|
| PT         |
| PB         |
| PBM-N      |
| PQG        |
| PBF        |
| <b>PGL</b> |
| PGC        |

# BLOCK CYLINDER

## PGC Series

### Features

- Up and down linear motion cylinder that compactly integrates general cylinder and guide block.
- Two types of selectable options for guide part.
  - Sliding bearing : PGC type
  - L.M bearing : PGC-B type
- As solid structure, improved durability and precision and suitable to handle high load.
- Stroke adjustable stopper mounted for both side.
- Shock Absorber installation. (Optional)
- Auto Switch installation. (Optional)



### Order Form

**PGC 30 B - 150 - C73K L S - SH2**

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) |
|-------|--------------|-------------------------------|
| 20    | 20           | 75 ~ 200                      |
| 25    | 25           | 75 ~ 200                      |
| 30    | 32           | 75 ~ 300                      |
| 40    | 40           | 75 ~ 500                      |
| 50    | 50           | 75 ~ 500                      |

#### ④ Standard Strokes

#### ③ Bearing Types

| Order | Bearing Types   |
|-------|-----------------|
| Blank | Sliding bearing |
| B     | L.M bearing     |

#### ⑤ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |     | Current |        | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|-----|---------|--------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC  | AC      | DC     |               |                |
| Blank |                      | No Auto Switch provided |           |         |     |         |        |               |                |
| C73K  | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V | 5~20mA  | 5~40mA | IP 67         | 1ms            |

#### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 0.5M         |
| L     | 3M           |

#### ⑧ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

#### ⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ※ Shock Absorber Specification

| Item Name | Shock Absorber Specification |
|-----------|------------------------------|
| PGC20     | M12×P1                       |
| PGC25     | M12×P1                       |
| PGC30     | M14×P1.5                     |
| PGC40     | M20×P1.5                     |
| PGC50     | M20×P1.5                     |

Accessory Order Form

(1) Shock Absorber

**PGC 30 - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

**BLOCK**

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC**

Specification

| Item Name                              | PGC20  | PGC25     | PGC30     | PGC40     | PGC50     |        |
|--|--|-----------|-----------|-----------|-----------|--------|
| CYL Bore Size(mm)                      | 20   | 25        | 32        | 40        | 50        |        |
| Rod Size(mm)                           | 8  | 10        | 12        | 14        | 20        |        |
| Standard Strokes(mm)                   | 75 ~ 200   | 75 ~ 200  | 75 ~ 300  | 75 ~ 500  | 75 ~ 500  |        |
| Theoretical Thrust(kgf)                | Forward  | 3.14×P    | 4.9×P     | 8.04×P    | 12.56×P   | 19.6×P |
|  | Backward   | 2.64×P    | 4.12×P    | 6.92×P    | 11.04×P   | 16.5×P |
| P : Air Pressure(kgf/cm <sup>2</sup> ) |  |           |           |           |           |        |
| Fitting Size                           |  | PT1/8     |           | PT1/4     |           |        |
| Weight(kgf)                            | 2.8 +  | 3.1 +     | 3.9 +     | 6.2 +     | 8.4 +     |        |
| S.T : Stroke                           | 0.009×S.T  | 0.011×S.T | 0.018×S.T | 0.022×S.T | 0.043×S.T |        |
| Fluid                                  | Clean Air <small>Note 1)</small>                                 |           |           |           |           |        |
| Pressure Range(kgf/cm <sup>2</sup> )   | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |           |           |           |           |        |
| Lubrication                            | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)  |           |           |           |           |        |
| Temperature Range(°C)                  | 5 ~ 60   |           |           |           |           |        |
| Moving Speed(mm/sec)                   | 50 ~ 500   |           |           |           |           |        |
| Operation Type                         | Double Acting  |           |           |           |           |        |
| Position Accuracy(mm)                  | Sliding Bearing : ±0.15  |           |           |           |           |        |
|  | L.M Bearing : ±0.08  |           |           |           |           |        |
| Stroke Adjustment Range(mm)            | 0 ~ 15   |           |           |           |           |        |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

# PGC Series

20

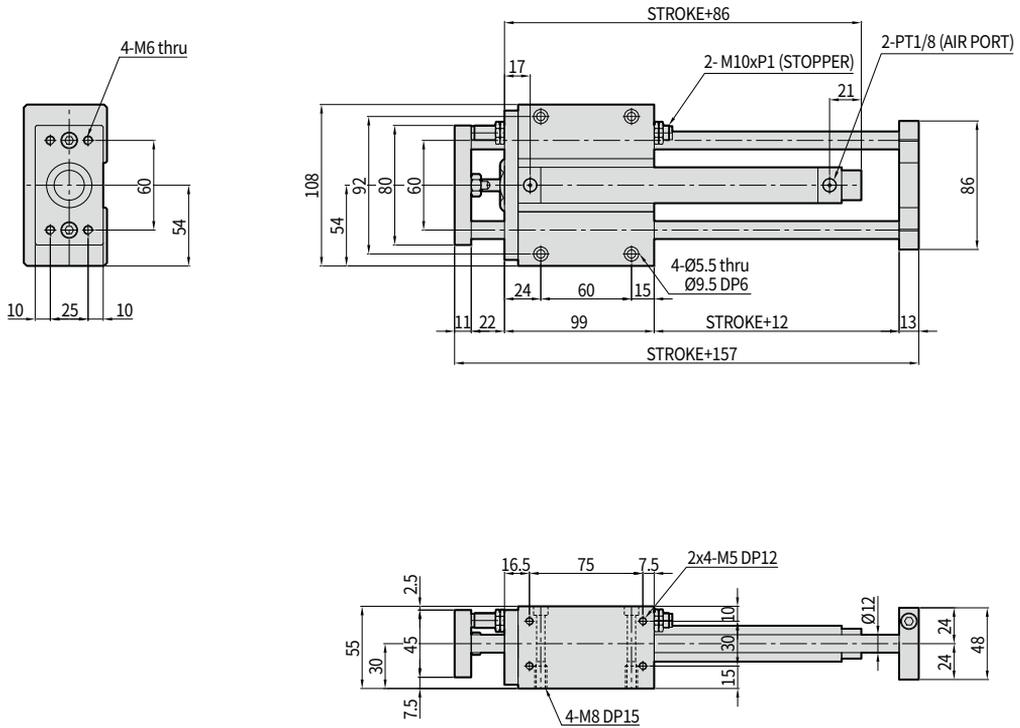
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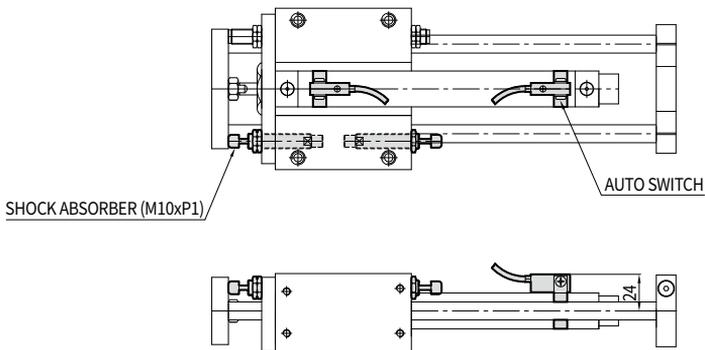
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## PGC20(B)



## PGC20(B) Example of Auto Switch installation



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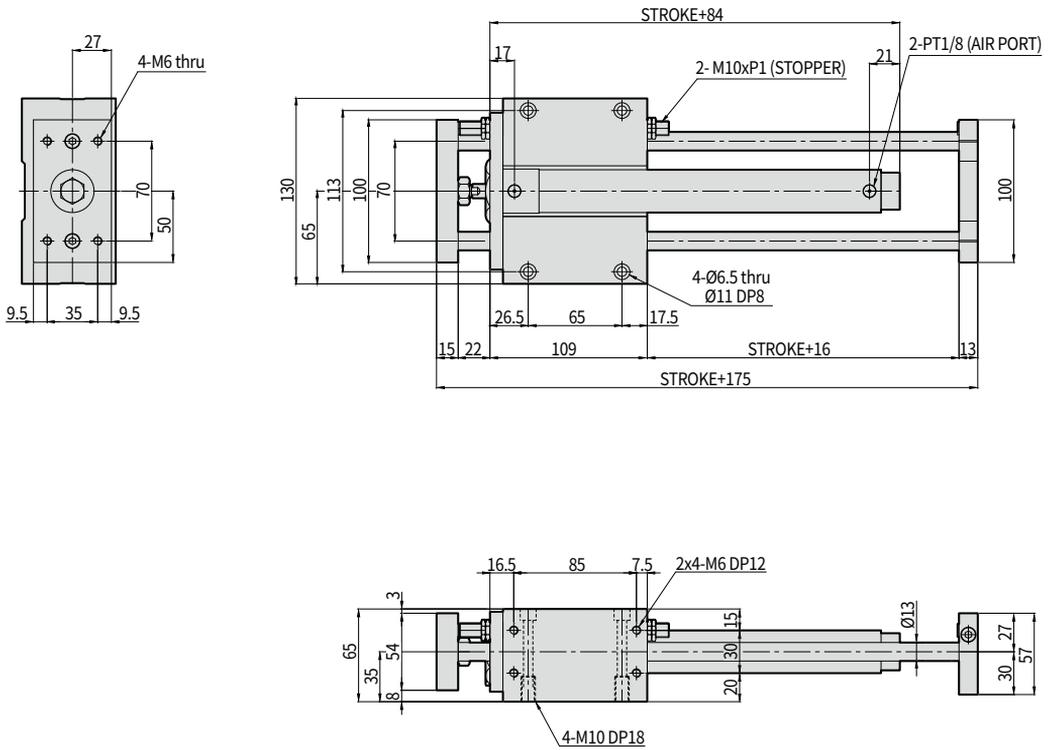
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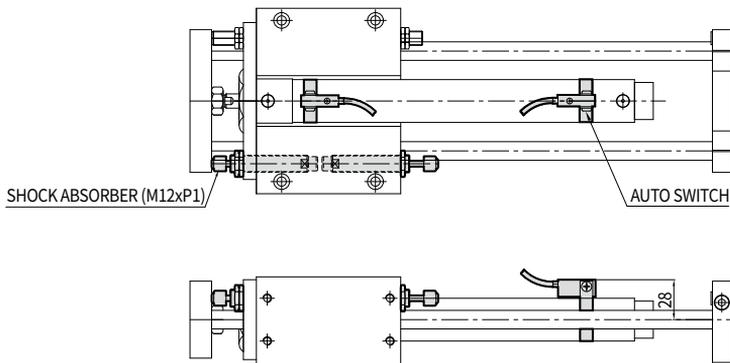
PGC25(B)



BLOCK

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC

PGC25(B) Example of Auto Switch installation



# PGC Series

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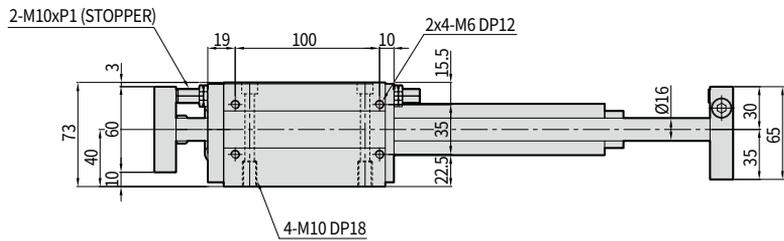
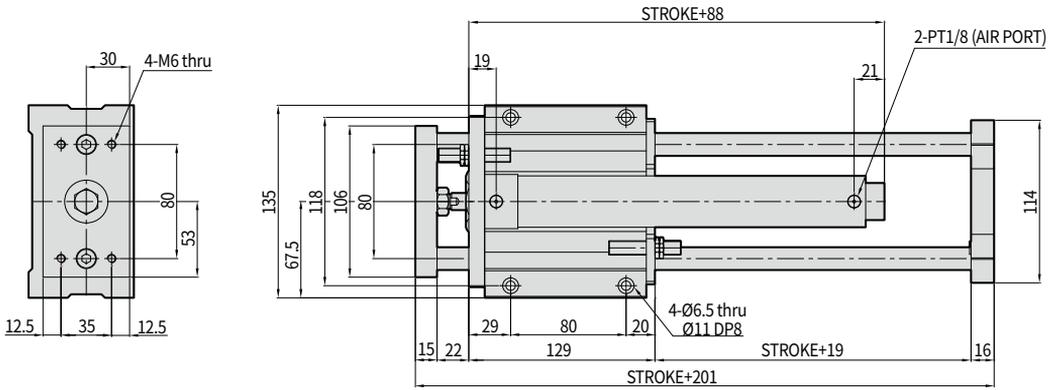
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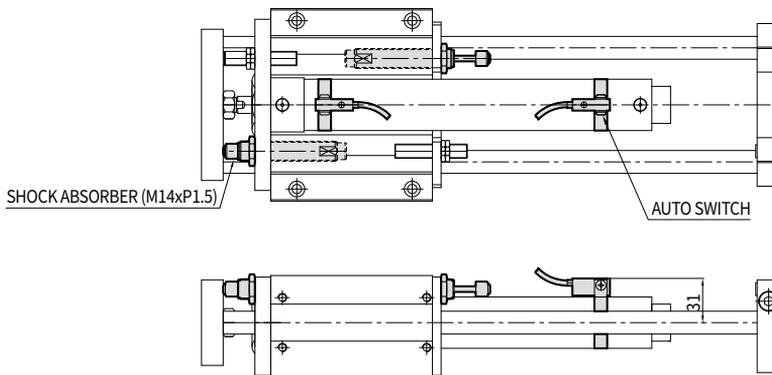
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## PGC30(B)

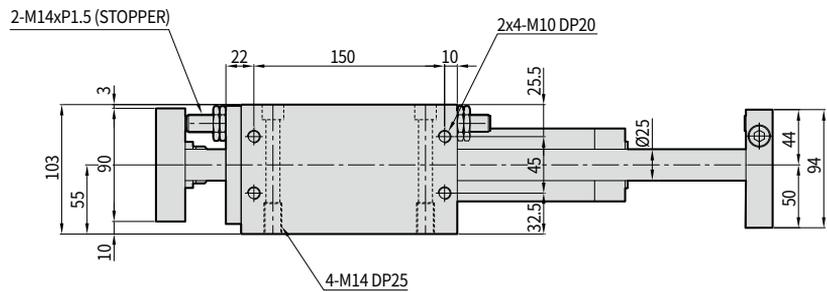
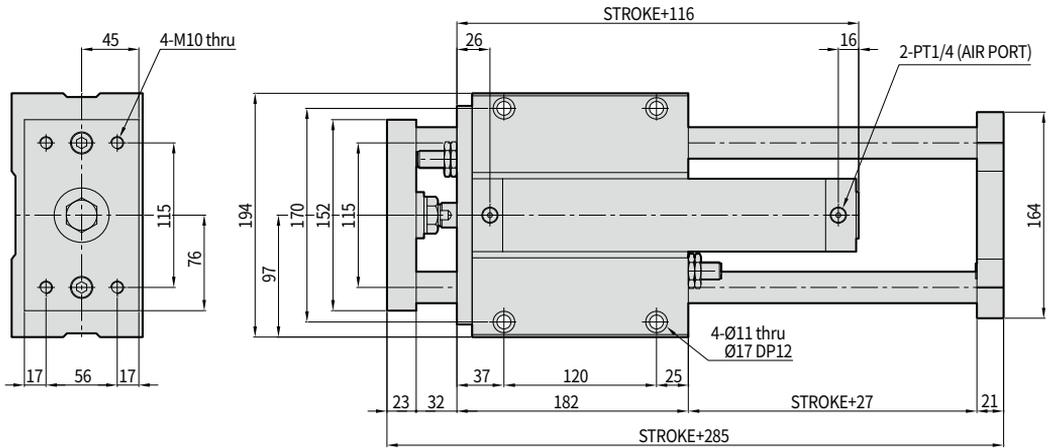


## PGC30(B) Example of Auto Switch installation

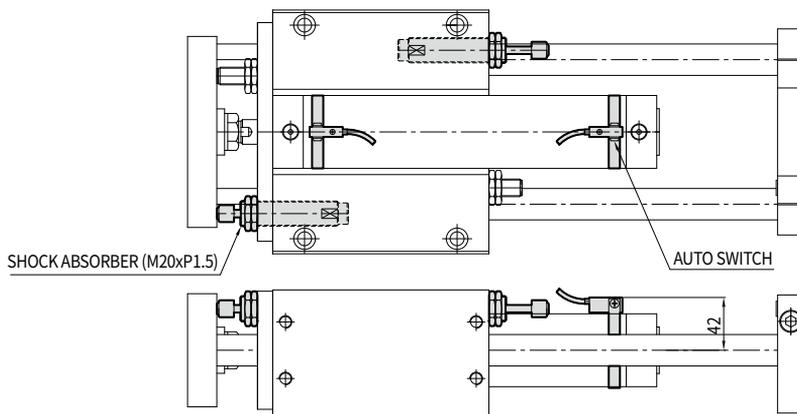




## PGC50(B)

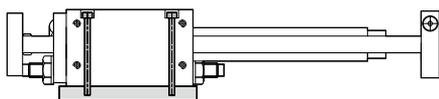


## PGC50(B) Example of Auto Switch installation



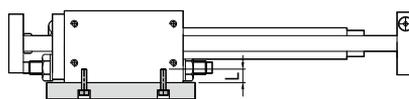
Installation Information

1. Installation by body through holes



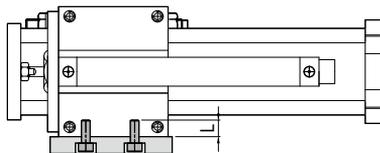
| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PGC20 | M5×P0.8        | 51                  |
| PGC25 | M6×P1          | 81                  |
| PGC30 | M6×P1          | 81                  |
| PGC40 | M8×P1.25       | 157                 |
| PGC50 | M10×P1.5       | 360                 |

2. Installation by body tap holes



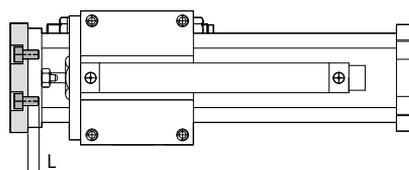
| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PGC20 | M8×P1.25       | 157                 | 15                     |
| PGC25 | M10×P1.5       | 360                 | 18                     |
| PGC30 | M10×P1.5       | 360                 | 18                     |
| PGC40 | M12×P1.75      | 670                 | 20                     |
| PGC50 | M14×P2         | 1067                | 25                     |

3. Installation by body tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PGC20 | M5×P0.8        | 51                  | 12                     |
| PGC25 | M6×P1          | 81                  | 12                     |
| PGC30 | M6×P1          | 81                  | 12                     |
| PGC40 | M8×P1.25       | 157                 | 16                     |
| PGC50 | M10×P1.5       | 360                 | 20                     |

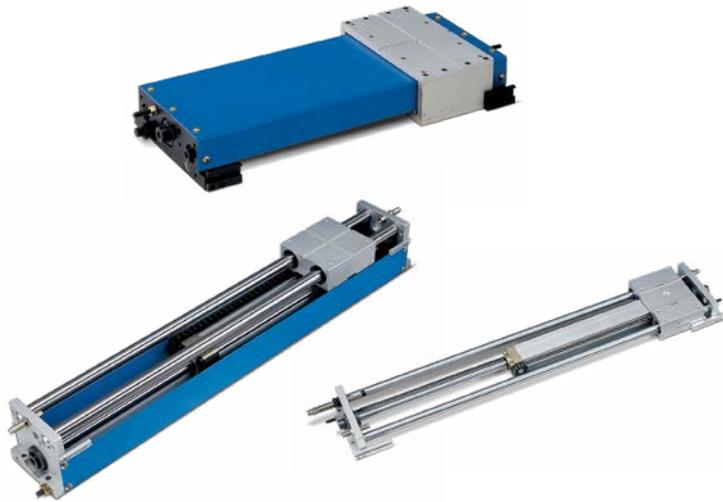
4. Installation by plate tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PGC20 | M6×P1          | 81                  | 11                     |
| PGC25 | M6×P1          | 81                  | 15                     |
| PGC30 | M6×P1          | 81                  | 15                     |
| PGC40 | M8×P1.25       | 157                 | 18                     |
| PGC50 | M10×P1.5       | 360                 | 23                     |

**BLOCK**

- PT
- PB
- PBM-N
- PQG
- PBF
- PGL
- PGC



**P&M Catalogue**

**SLIDE CYLINDER**

# SLIDE CYLINDER Model Selection Guide

- Exceeding allowable value for each model may cause operation disorder or problem in durability, so make sure to use within the specified allowable values.

## Static Load Applied to Shaft for Each Load

|   |   |   |
|---|---|---|
|   |   |   |
| $L_f = \frac{L \cdot W}{C} + \frac{W + S_w}{2}$ | $L_f = \frac{L \cdot W}{C} + \frac{W + S_w}{2}$ | $L_f = \frac{L \cdot W}{G} + \frac{W + S_w}{2}$   |
|   |   | <p> <math>L_f</math> (kgf) : Static load applied to shaft<br/> <math>W</math> (kgf) : Loaded weight<br/> <math>S_w</math> (kgf) : Slide block weight<br/> <math>L</math> (mm) : Weight loading point<br/> <math>C</math> (mm) : Shaft center distance<br/> <math>G</math> (mm) : Bearing center distance<br/> <math>D</math> (mm) : Shaft diameter         </p> |
| $L_f = \frac{L \cdot W}{G}$                     | $L_f = \frac{L \cdot W}{G}$                     |   |

## Static Load Applied to Random Point

- Calculate each component force in X, Y, and Z directions from the center of slide block to the center of load, as shown in figure 1.

Figure 1

|  |  |  |
|--|--|--|
|  |  |  |
| $W_1 = \frac{L_1}{L_1 + L_2} \times W, \quad W_2 = \frac{L_2}{L_1 + L_2} \times W$ |  |  |

$W$  : Loaded weight  
 $W_1, W_2$  : The component force of loaded weight  
 $L_1, L_2$  : Distance from the component force of loaded weight to the center of slide table

# SLIDE CYLINDER Model Selection Guide

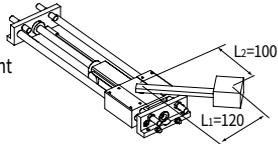
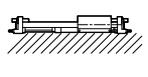
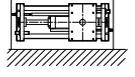
Calculation Table 1

| Model   | Sw (kgf) | G (mm) | C (mm) | D (mm) | E (mm) | K    |
|---------|----------|--------|--------|--------|--------|------|
| PSC30   | 0.6      | 50     | 39     | 16     | 130    | 0.1  |
| PSC40   | 1.1      | 70     | 58     | 20     | 152    | 0.11 |
| PSC50   | 2.1      | 59     | 70     | 25     | 162    | 0.12 |
| PSC60   | 2.7      | 64     | 80     | 30     | 174    | 0.13 |
| PSC80   | 5.1      | 114    | 100    | 40     | 230    | 0.13 |
| PSC16N  | 0.4      | 29     | 67     | 10     | 74     | 0.1  |
| PSC20N  | 0.5      | 30     | 76     | 12     | 80     | 0.1  |
| PSC30N  | 0.9      | 50     | 98     | 16     | 130    | 0.1  |
| PSC40N  | 1.1      | 70     | 135    | 20     | 152    | 0.11 |
| PSC60N  | 3.5      | 64     | 186    | 30     | 174    | 0.13 |
| PSC20NC | 0.8      | 33     | 76     | 12     | 80     | 0.1  |
| PSC30NC | 1.3      | 50     | 98     | 16     | 130    | 0.1  |
| PSC40NC | 2.9      | 70     | 138    | 20     | 132    | 0.11 |
| PSC50NC | 3.6      | 89     | 154    | 25     | 144    | 0.12 |

Maximum Effective Thrust Fr (@ 5kgf/cm<sup>2</sup>)

| Model   | Effective Thrust (kgf) |
|---------|------------------------|
| PSC30   | 10                     |
| PSC40   | 18.5                   |
| PSC50   | 29                     |
| PSC60   | 48                     |
| PSC80   | 81                     |
| PSC16N  | 2.4                    |
| PSC20N  | 4                      |
| PSC30N  | 10                     |
| PSC40N  | 18.5                   |
| PSC60N  | 48                     |
| PSC20NC | 4                      |
| PSC30NC | 10                     |
| PSC40NC | 18.5                   |
| PSC50NC | 29                     |

Model Selection Example

| Condition Check   | Applicable Formula   | Selection Example   |
|---|--|---|
| <ul style="list-style-type: none"> <li>Cylinder model selection</li> <li>Distance to the center of gravity of load</li> <li>Product installation</li> </ul> | <ul style="list-style-type: none"> <li>Air pressure</li> <li>Loaded weight</li> </ul>  | <ul style="list-style-type: none"> <li>PSC60N-500</li> <li>W= 6 kgf (Load weight)</li> <li>Air Pressure : 5 kgf/cm<sup>2</sup></li> <li>Horizontal installation</li> <li>Load center displacement<br/>L<sub>1</sub> = 120mm<br/>L<sub>2</sub> = 100mm</li> </ul>   |
| SLIDE SHAFT Deflection Check  | <p>Horizontal installation</p>  <p>Vertical installation</p>   | <p>Component force <math>W_1 = \frac{L_1}{L_1 + L_2} \times W</math> <b>[Figure 1]</b></p> <p>Component force <math>W_2 = \frac{L_2}{L_1 + L_2} \times W</math></p> <p>Static load <math>L_{f1} = \frac{L_1 \cdot W_1}{C} + \frac{(W_1 \cdot Sw)}{2}</math> <b>[Figure 2]</b></p> <p>Static load <math>L_{f2} = \frac{L_2 \cdot W_2}{G} + \frac{(W_2 \cdot Sw)}{2}</math></p> <p>Shaft deflection according to <math>\delta_1 = \frac{L_{f1} \times (S+E)^3}{15750 \times D^4}</math></p> <p><math>\delta_2 = \frac{L_{f2} \times (S+E)^3}{15750 \times D^4}</math></p> <p><math>\delta_t = \delta_1 + \delta_2</math></p> <p>Shaft allowable deflection <math>\delta_{max} = \frac{K \times (S+E)}{G}</math></p> <p>Applicable as <math>\delta_{max} &gt; \delta</math></p> <p style="text-align: right;">&lt;S: Stroke (mm)&gt;</p>   |
| Load Factor Check   | <p>Loaded weight <math>F_{c1}(kgf) = 2\mu \times L_{f1} + (1 - A) \times (W + Sw)</math></p> <p><math>F_{c2}(kgf) = 2\mu \times L_{f2} + (1 - A) \times (W + Sw)</math></p> <p><math>\mu = 0.1</math> (Bearing friction factor)</p> <p><math>A = 1</math> (Horizontal installation) / 0 (Vertical installation)</p> <p><math>F_{ct} = F_{c1} + F_{c2}</math></p> <p>Applicable if <math>\theta</math> (Load factor) = <math>\frac{F_{ct}}{Fr} &lt; 0.5</math></p> <p style="text-align: right;">Fr: Effective thrust (kgf)</p> | <p><math>W_1 = \frac{120}{120+100} \times 6 = 3.27 \text{ kgf}</math></p> <p><math>W_2 = \frac{100}{120+100} \times 6 = 2.73 \text{ kgf}</math></p> <p><math>L_{f1} = \frac{120 \cdot 3.27}{186} + \frac{(3.27+3.5)}{2} = 5.5 \text{ kgf}</math></p> <p><math>L_{f2} = \frac{100 \cdot 2.73}{64} + \frac{(2.73+3.5)}{2} = 7.4 \text{ kgf}</math></p> <p><math>\delta_1 = \frac{5.5 \times (500+174)^3}{15750 \times 30^4} = 0.13 \text{ mm}</math></p> <p><math>\delta_2 = \frac{7.4 \times (500+174)^3}{15750 \times 30^4} = 0.18 \text{ mm}</math></p> <p><math>\delta_t = \delta_1 + \delta_2 = 0.31 \text{ mm}</math></p> <p><math>\delta_{max} = \frac{0.13 \times (500+174)}{64} = 1.37 \text{ mm}</math></p> <p>As <math>\delta_{max} &gt; \delta_t</math>, PSC60N-500 is applicable</p> <p><math>F_{c1} (kgf) = 2 \times 0.1 \times 5.5 + (1 - 1) \times (6 + 3.5) = 1.1 \text{ kgf}</math></p> <p><math>F_{c2} (kgf) = 2 \times 0.1 \times 7.4 + (1 - 1) \times (6 + 3.5) = 1.48 \text{ kgf}</math></p> <p><math>F_{ct} = F_{c1} + F_{c2} = 2.58</math></p> <p><math>\theta = \frac{2.58}{48} = 0.05 &lt; 0.5 \Rightarrow \text{OK}</math></p> <p>PSC60N-500 is applicable</p> |

# SLIDE CYLINDER

## PSC Series

### Features

- Long distance traveling cylinder by combination with cylinder and moving pulley.
- High solidity and efficient structure for superior stability and durability.
- Long distance stroke production is possible and precise stroke adjustment by end positioned stopper.
- Air cushion as standard for shock absorbing.
- Various lines up for diverse purposes.
  - Standard. (PSC type)
  - Space saving with low body structure. (PSC-N)
  - Dust cover for protect from external substance. (PSC-NC)
- Auto Switch installation. (Optional)



### Order Form

**PSC 40 - 500 - A1 L S - SH2**

①      ②      ③      ④      ⑤      ⑥      ⑦

#### ① Series Name

#### ② CYL Bore

#### ③ Standard Strokes

| Order | CYL Bore(mm) | Order (=Stroke(mm)) |
|-------|--------------|---------------------|
| 30    | 30           | 200 ~ 600           |
| 40    | 40           | 200 ~ 1000          |
| 50    | 50           | 200 ~ 1000          |
| 60    | 63           | 200 ~ 1500          |
| 80    | 80           | 200 ~ 2000          |

#### ④ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |             | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|-------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC          | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |             |         |                |               |                |
| A1    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V         | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V) | -       | Less than 50mA | IP 67         | 1ms            |

#### ⑤ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ⑦ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

#### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ※ Shock Absorber Specification

| Item Name | Shock Absorber Specification |
|-----------|------------------------------|
| PSC30     | M14×P1.5                     |
| PSC40     | M20×P1.5                     |
| PSC50     | M25×P1.5                     |
| PSC60     | M25×P1.5                     |
| PSC80     | M36×P1.5                     |

Accessory Order Form

(1) Shock Absorber

**PSC 30 - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

Specification

| Item Name   | PSC30  | PSC40           | PSC50           | PSC60        | PSC80          |
|---|--|-----------------|-----------------|--------------|----------------|
| CYL Bore Size(mm)   | 30   | 40              | 50              | 63           | 80             |
| Rod Size(mm)  | 16   | 20              | 25              | 30           | 35             |
| Standard Strokes(mm)  | 200 ~ 600  | 200 ~ 1000      |                 | 200 ~ 1500   | 200 ~ 2000     |
| Effective Thrust(kgf)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 2×P  | 3.7×P           | 5.8×P           | 9.6×P        | 16.2×P         |
| Fitting Size  | PT1/8  |                 | PT1/4           |              | PT1/2          |
| Weight(kgf)<br>S.T : Stroke                                     | 1.4 + 0.01×S.T   | 4.7 + 0.015×S.T | 7.8 + 0.018×S.T | 9 + 0.02×S.T | 2.7 + 0.02×S.T |
| Fluid   | Clean Air <small>Note 1)</small>                                 |                 |                 |              |                |
| Pressure Range(kgf/cm <sup>2</sup> )                            | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |                 |                 |              |                |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)  |                 |                 |              |                |
| Temperature Range(°C)   | 5 ~ 60   |                 |                 |              |                |
| Moving Speed(mm/sec)  | 300 ~ 1000   | 250 ~ 1000      | 250 ~ 800       | 200 ~ 700    | 200 ~ 2000     |
| Operation Type  | Double Acting  |                 |                 |              |                |
| Position Accuracy(mm)   | L.M Bearing Type : ±0.08   |                 |                 |              |                |
| Stroke Adjustment Range(mm) <small>Note 3)</small>              | 0 ~ -20  | 0 ~ -30         | 0 ~ -30         | 0 ~ -40      | 0 ~ -40        |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) Above "Stroke Adjustment Range" refers maximum value for maximum adjustment range of both side adjust bolt.



# PSC Series

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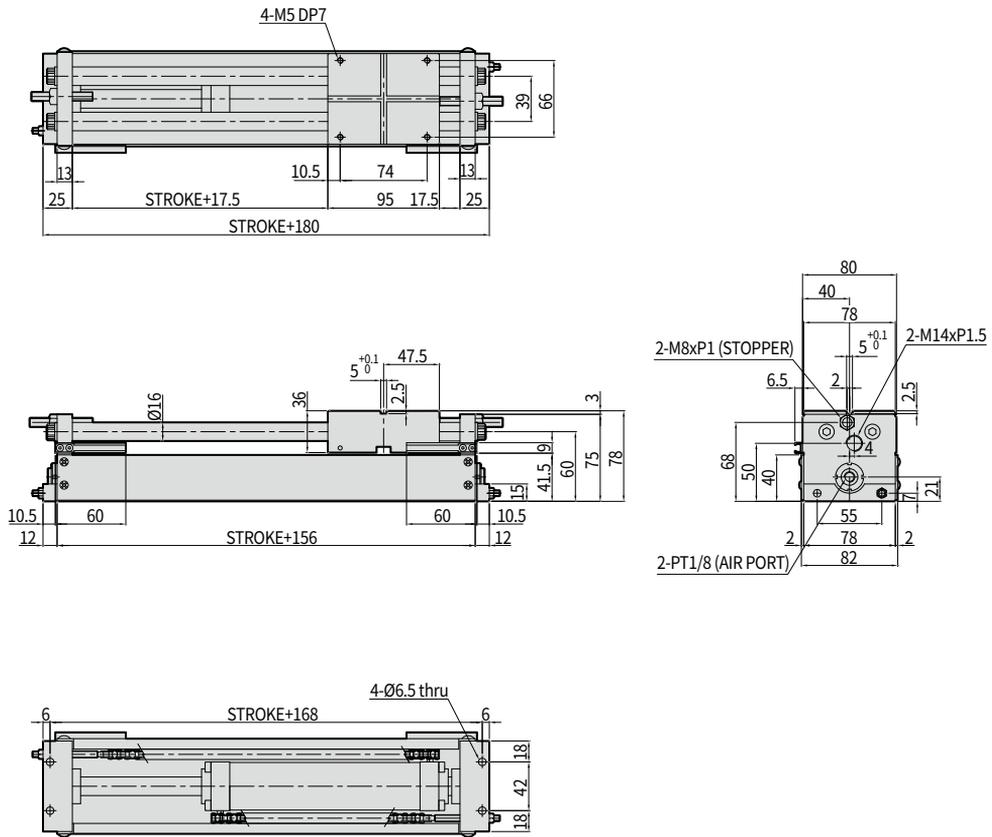
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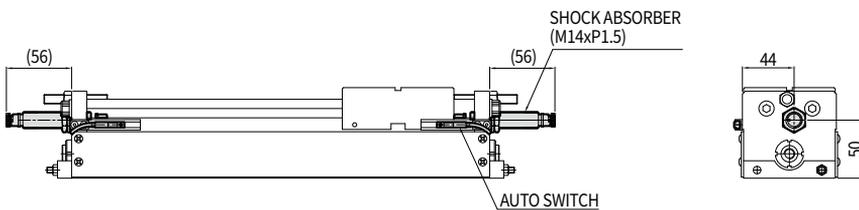
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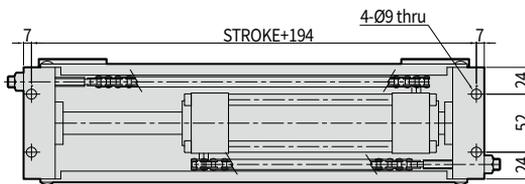
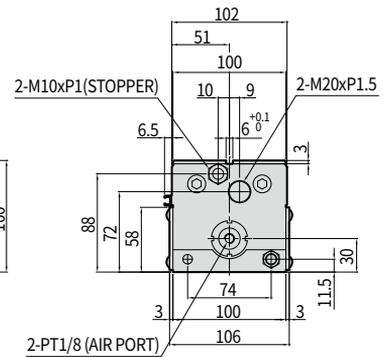
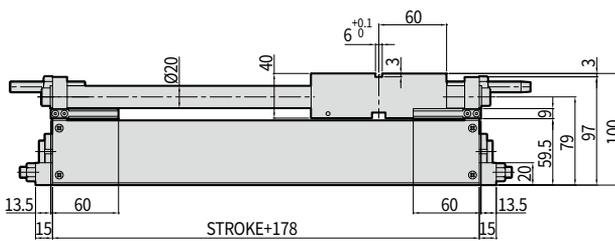
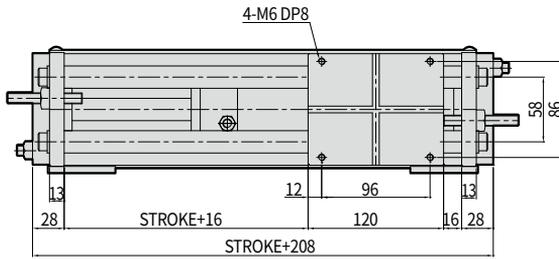
## PSC30



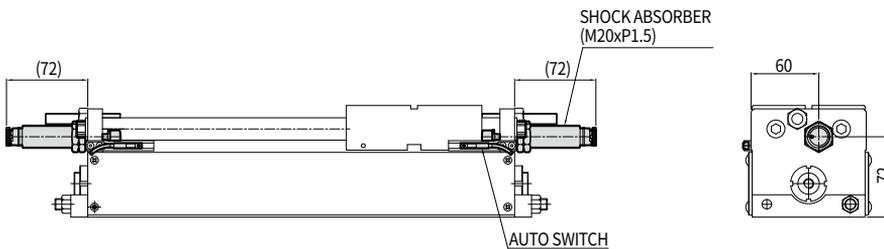
## PSC30 Example of Auto Switch installation



PSC40



PSC40 Example of Auto Switch installation



SLIDE

PSC  
PSC-N  
PSC-NC

# PSC Series

30

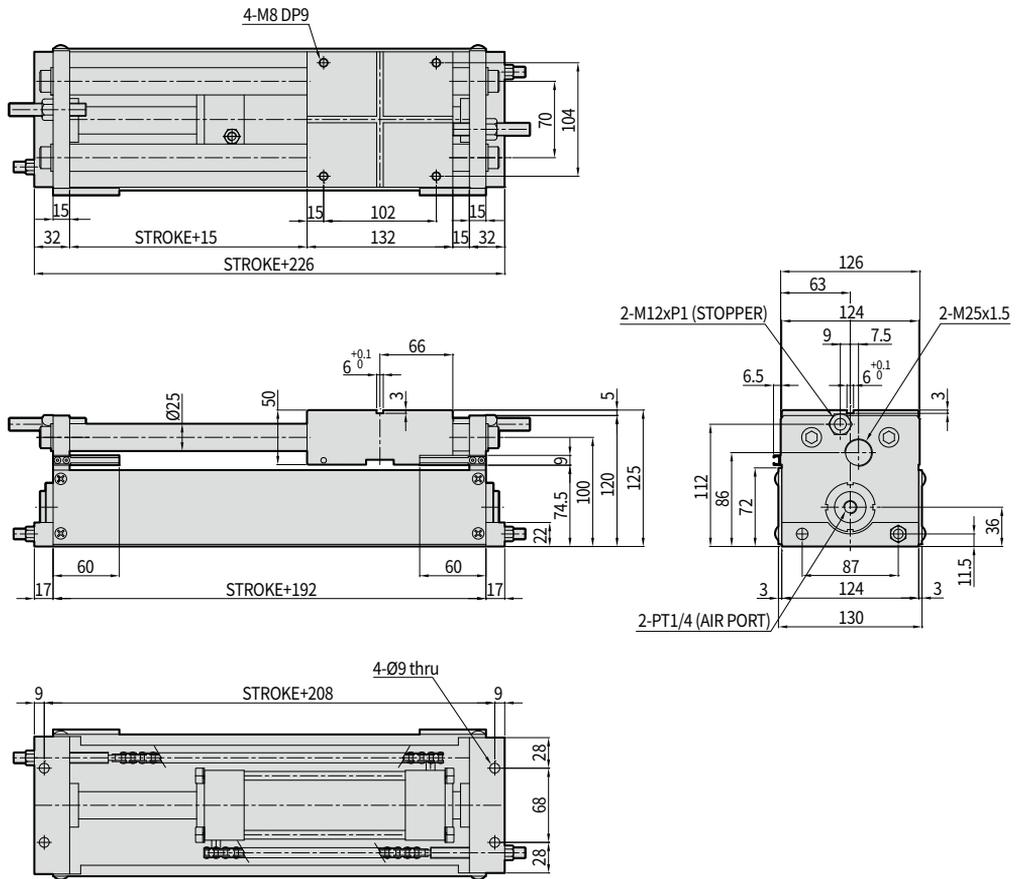
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50

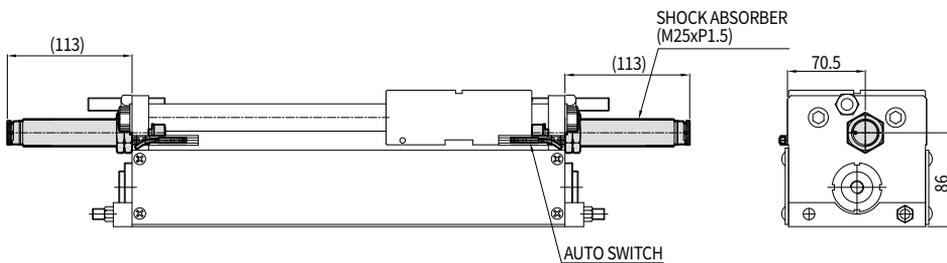
60

80

## PSC50



## PSC50 Example of Auto Switch installation



30

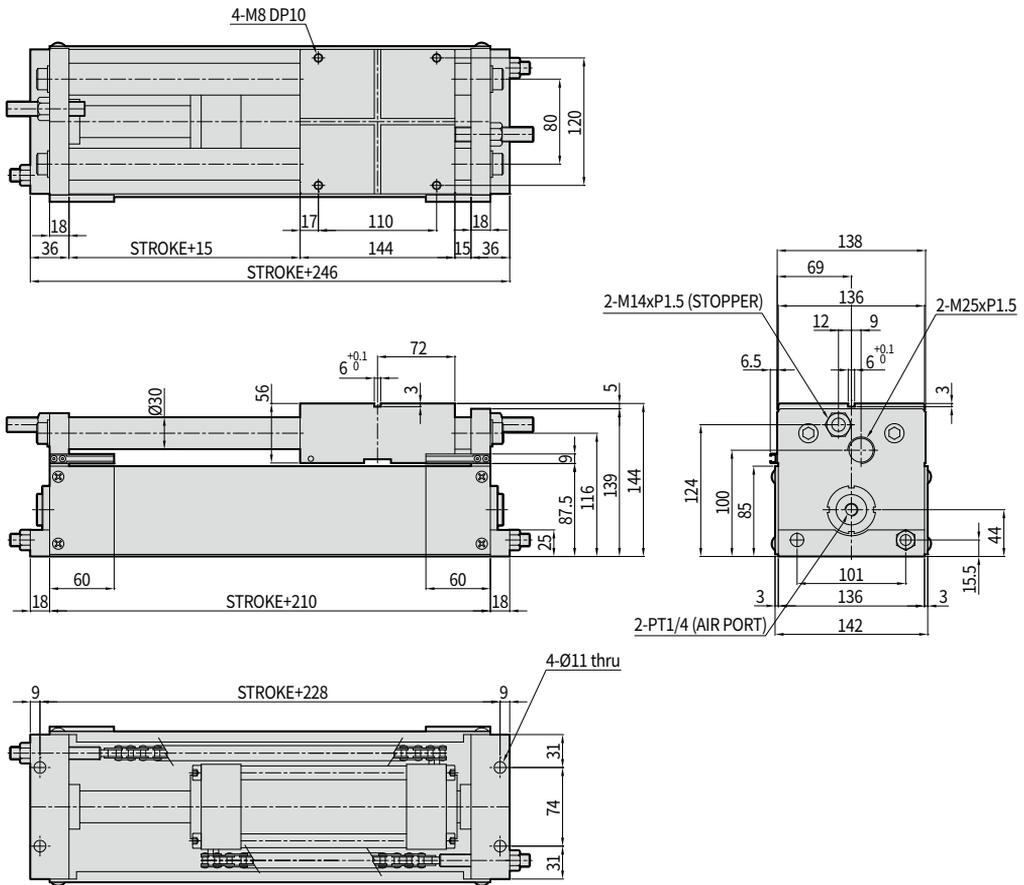
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50

60

80

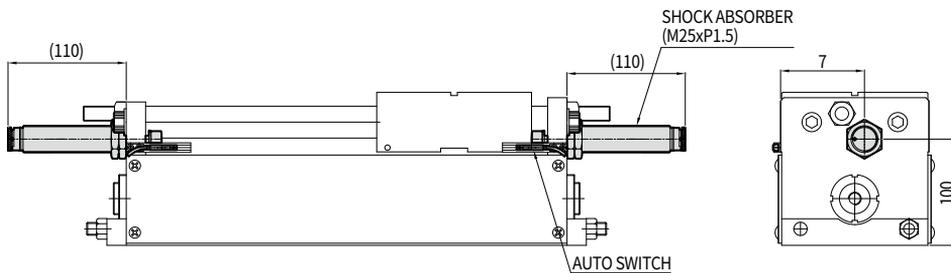
PSC60



SLIDE

PSC  
PSC-N  
PSC-NC

PSC60 Example of Auto Switch installation



# PSC Series

30

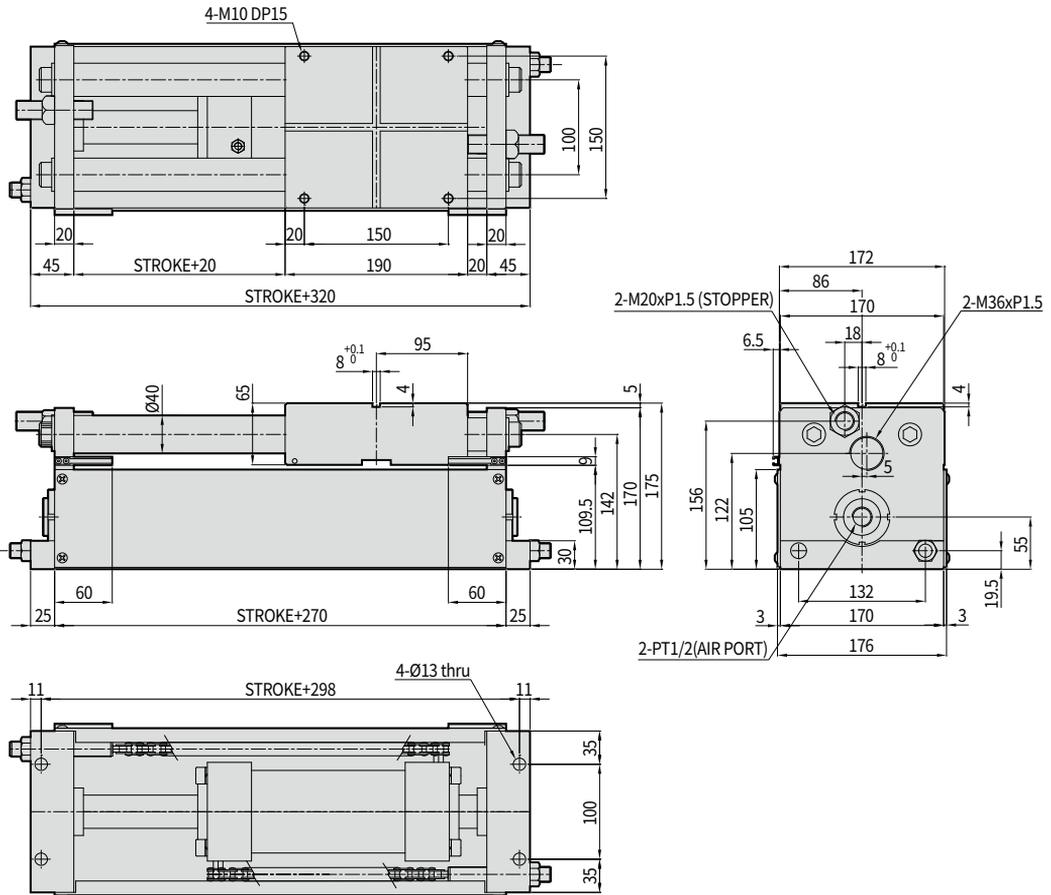
40

50

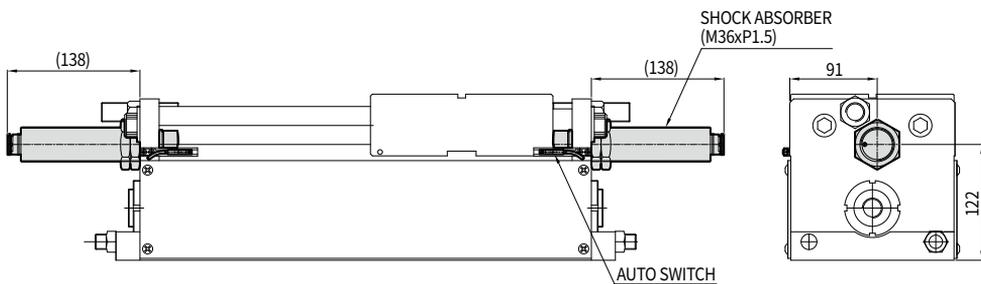
60

80

## PSC80

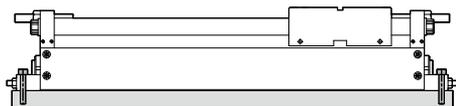


## PSC80 Example of Auto Switch installation



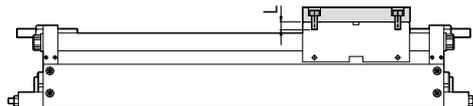
**Installation Information**

**1. Installation by support frame through holes**



| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PSC30 | M6×P1          | 81                  |
| PSC40 | M8×P1.25       | 157                 |
| PSC50 | M8×P1.25       | 157                 |
| PSC60 | M10×P1.5       | 360                 |
| PSC80 | M12×P1.75      | 670                 |

**2. Installation by slide block tap holes**



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PSC30 | M5×P0.8        | 51                  | 7                      |
| PSC40 | M6×P1          | 81                  | 8                      |
| PSC50 | M8×P1.25       | 157                 | 9                      |
| PSC60 | M8×P1.25       | 157                 | 10                     |
| PSC80 | M10×P1.5       | 360                 | 15                     |

**SLIDE**

PSC  
PSC-N  
PSC-NC

# SLIDE CYLINDER

## PSC-N Series

### Features

- Designed to handle heavy load based on PSC model, reduced height and widen distance between guide rod.
- Low body structure for narrow space limited height.
- L.M guide for high sliding performance applied for high-speed operation.
- Timing belt replaceable on chain to reduce vibration and noise. (Optional)
- Auto Switch installation. (Optional)



### Order Form

## PSC 30N T - 200 - A1 L S - SH2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Standard Strokes(mm)) |
|-------|--------------|-------------------------------|
| 16N   | 16           | 100 ~ 300                     |
| 20N   | 20           | 100 ~ 500                     |
| 30N   | 30           | 100 ~ 700                     |
| 40N   | 40           | 200 ~ 1000                    |
| 60N   | 63           | 200 ~ 1500                    |

#### ④ Standard Strokes

#### ③ Pulley Belt Options

| Order | Pulley Belt Options |
|-------|---------------------|
| Blank | Chain Type          |
| T     | Timing Belt Type    |

#### ⑤ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |             | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|-------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC          | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |             |         |                |               |                |
| A1    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V         | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V) | -       | Less than 50mA | IP 67         | 1ms            |

#### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑧ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

#### ⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ※ Shock Absorber Specification

| Item Name | Shock Absorber | Adjust Stopper |
|-----------|----------------|----------------|
| PSC16N    | M10×P1         | M6×P1          |
| PSC20N    | M12×P1         | M8×P1          |
| PSC30N    | M14×P1.5       | M10×P1         |
| PSC40N    | M20×P1.5       | M12×P1         |
| PSC60N    | M25×P1.5       | M12×P1         |

Accessory Order Form

(1) Shock Absorber

**PSC 30N - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

Specification

| Item Name   | PSC16N   | PSC20N    | PSC30N    | PSC40N     | PSC60N     |
|---|--|-----------|-----------|------------|------------|
| CYL Bore Size(mm)   | 16   | 20        | 30        | 40         | 63         |
| Rod Size(mm)  | 10   | 12        | 16        | 20         | 30         |
| Standard Strokes(mm)  | 100 ~ 300  | 100 ~ 500 | 100 ~ 700 | 200 ~ 1000 | 200 ~ 1500 |
| Effective Thrust(kgf)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 0.48×P   | 0.8×P     | 2×P       | 3.7×P      | 9.6×P      |
| Fitting Size  | M5   |           | PT1/8     |            | PT1/4      |
| Weight(kgf)   | 0.5+   | 0.76+     | 1.2+      | 3.8+       | 7.2+       |
| S.T : Stroke  | 0.003×S.T  | 0.005×S.T | 0.01×S.T  | 0.015×S.T  | 0.02×S.T   |
| Fluid   | Clean Air <small>Note 1)</small>                                 |           |           |            |            |
| Pressure Range(kgf/cm <sup>2</sup> )                            | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |           |           |            |            |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)  |           |           |            |            |
| Temperature Range(°C)   | 5 ~ 60   |           |           |            |            |
| Moving Speed(mm/sec)  | 250 ~ 1000   |           |           |            |            |
| Operation Type  | Double Acting  |           |           |            |            |
| Position Accuracy(mm)   | L.M Bearing Type : ±0.08   |           |           |            |            |
| Stroke Adjustment Range(mm) <small>Note 3)</small>              | 0 ~ -5   | 0 ~ -10   | 0 ~ -20   | 0 ~ -20    | 0 ~ -30    |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) Above "Stroke Adjustment Range" refers maximum value for maximum adjustment range of both side adjust bolt.



# PSC-N Series

16N

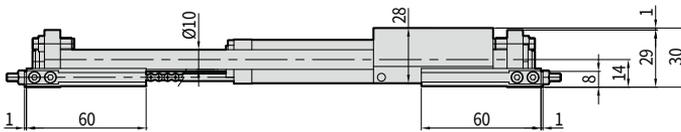
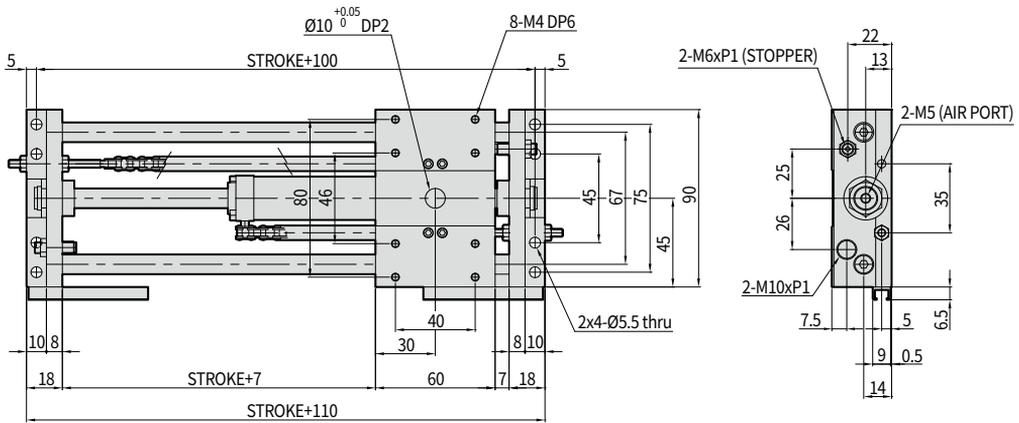
20N

30N

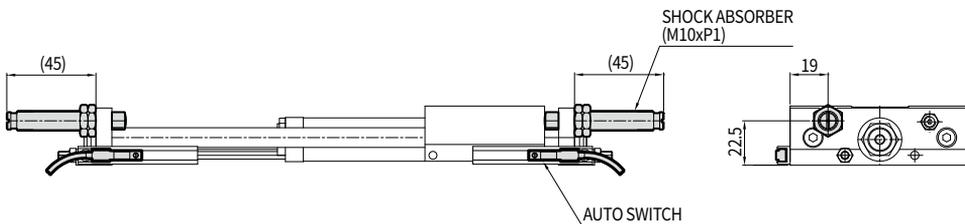
40N

60N

## PSC16N



## PSC16N Example of Auto Switch installation



16N

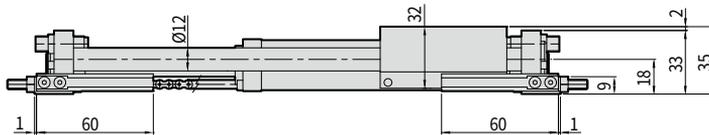
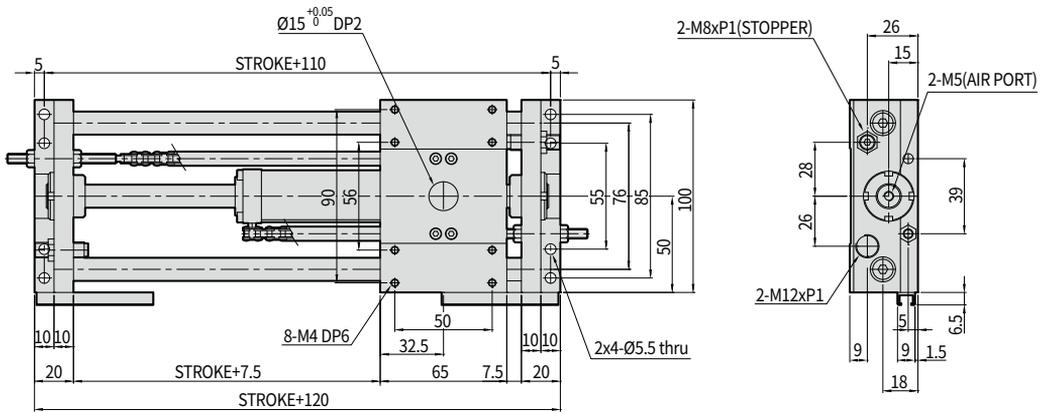
20N

30N

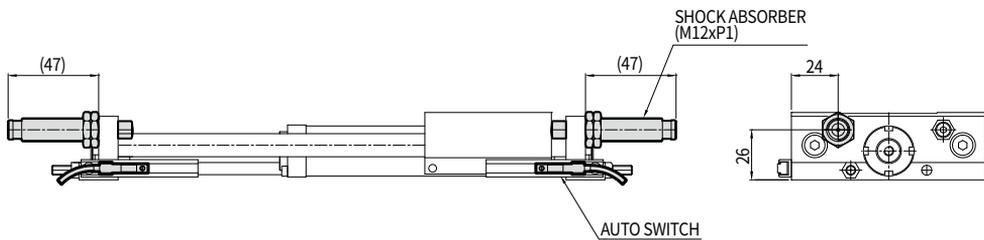
40N

60N

PSC20N



PSC20N Example of Auto Switch installation



SLIDE

PSC  
PSC-N  
PSC-NC

# PSC-N Series

16N

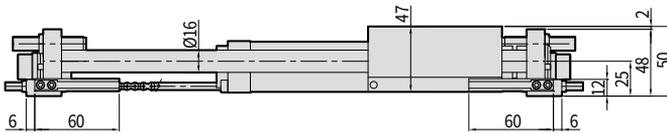
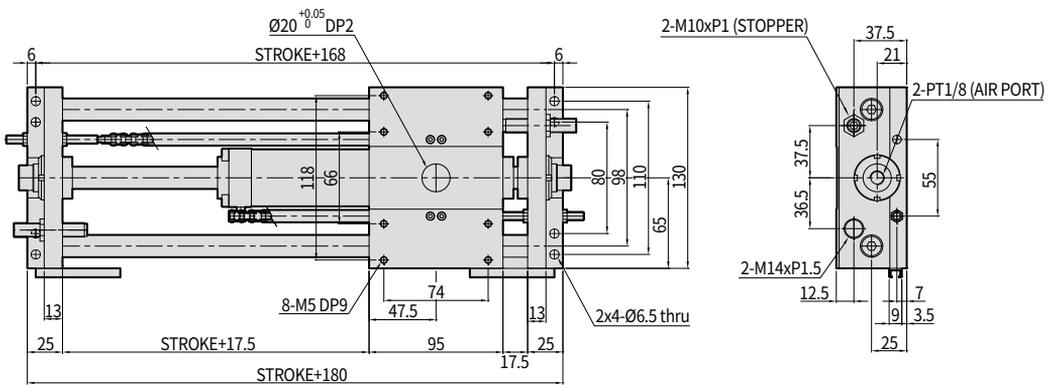
20N

30N

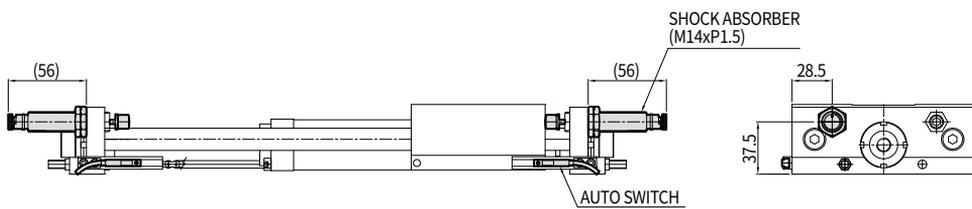
40N

60N

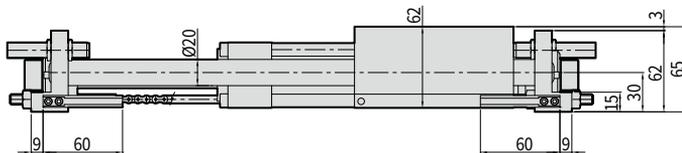
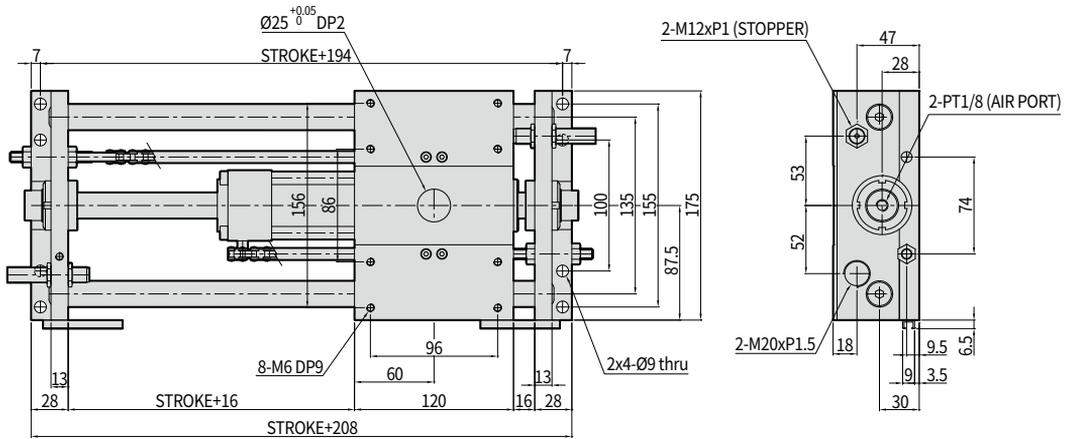
## PSC30N



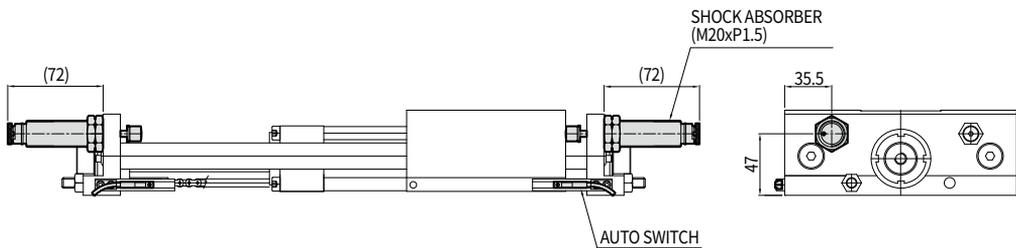
## PSC30N Example of Auto Switch installation



PSC40N



PSC40N Example of Auto Switch installation



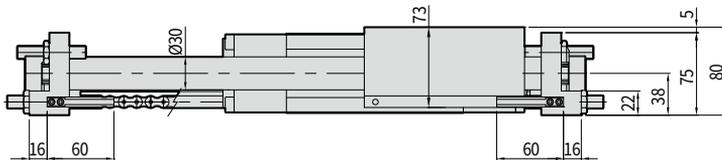
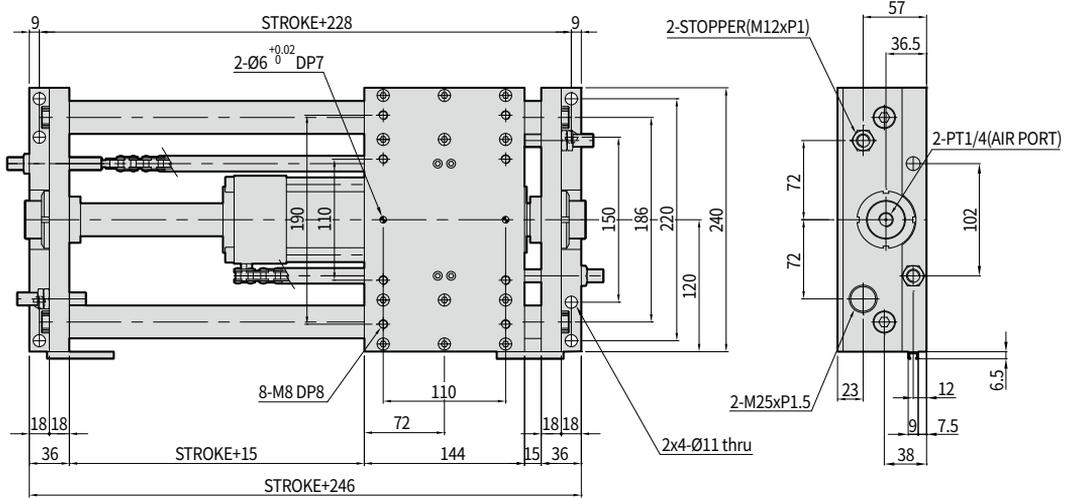
SLIDE

PSC  
PSC-N  
PSC-NC

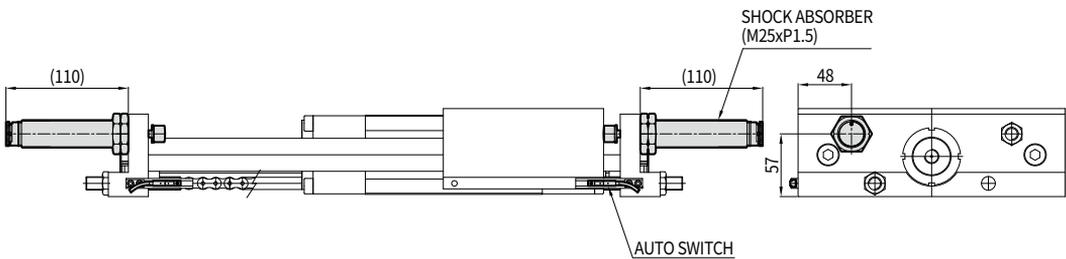
# PSC-N Series

16N 20N 30N 40N 60N

## PSC60N



## PSC60N Example of Auto Switch installation



**Installation Information**

**1. Installation by support frame through holes**



| Item   | Fastening Bolt | Max Torque (kgf·cm) |
|--------|----------------|---------------------|
| PSC16N | M5×P0.8        | 51                  |
| PSC20N | M5×P0.8        | 51                  |
| PSC30N | M6×P1          | 81                  |
| PSC40N | M8×P1.25       | 157                 |
| PSC60N | M10×P1.5       | 360                 |

**2. Installation by slide block tap holes**



| Item   | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|--------|----------------|---------------------|------------------------|
| PSC16N | M4×P0.7        | 25                  | 6                      |
| PSC20N | M4×P0.7        | 25                  | 6                      |
| PSC30N | M5×P0.8        | 51                  | 9                      |
| PSC40N | M6×P1          | 81                  | 9                      |
| PSC60N | M8×P1.25       | 157                 | 7                      |

SLIDE

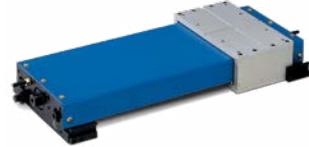
PSC  
**PSC-N**  
 PSC-NC

# SLIDE CYLINDER

## PSC-NC Series

### Features

- Long traveling cylinder by combination with both side acting cylinder and pulley for two times moving speed and stroke.
- Low body structure for narrow space limited height.
- Dust cover for protect from external substance.
- High solidity and efficient structure for superior stability and durability.
- Possible to produce for long stroke and precise adjustment for end stroke point.
- Air cushion for shock absorbing as standard.
- Auto Switch installation. (Optional)



### Order Form

**PSC 30NC - 500 - A1 L S - SH2**

①                      ②                      ③                      ④                      ⑤                      ⑥                      ⑦

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) |
|-------|--------------|
| 20NC  | 20           |
| 30NC  | 30           |
| 40NC  | 40           |
| 50NC  | 50           |

#### ③ Standard Strokes

| Order (=Standard Strokes(mm)) |
|-------------------------------|
| 100 ~ 500                     |
| 100 ~ 700                     |
| 200 ~ 1000                    |
| 200 ~ 1000                    |

#### ④ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |             | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|-------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC          | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |             |         |                |               |                |
| A1    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V         | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V) | -       | Less than 50mA | IP 67         | 1ms            |

#### ⑤ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑦ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

#### ⑥ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ※ Shock Absorber Specification

| Item Name | Shock Absorber Specification |
|-----------|------------------------------|
| PSC20NC   | M12×P1                       |
| PSC30NC   | M14×P1.5                     |
| PSC40NC   | M20×P1.5                     |
| PSC50NC   | M25×P1.5                     |

Accessory Order Form

(1) Shock Absorber

**PSC 30NC - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

Specification

| Item Name   | PSC20NC   | PSC30NC          | PSC40NC           | PSC50NC           |
|---|---|------------------|-------------------|-------------------|
| CYL Bore Size(mm)   | 20  | 30               | 40                | 50                |
| Rod Size(mm)  | 12  | 16               | 20                | 25                |
| Standard Strokes(mm)  | 100 ~ 500   | 100 ~ 700        | 200 ~ 1000        | 200 ~ 1000        |
| Effective Thrust(kgf)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 0.8 × P   | 2 × P            | 3.7 × P           | 5.8 × P           |
| Fitting Size  | M5  |                  | PT1/8             | PT1/4             |
| Weight(kgf)<br>S.T : Stroke                                     | 1.3 + 0.005 × S.T   | 3.3 + 0.01 × S.T | 6.5 + 0.011 × S.T | 10.1 + 0.02 × S.T |
| Fluid   | Clean Air Note 1)   |                  |                   |                   |
| Pressure Range(kgf/cm <sup>2</sup> )                            | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) Note 2)               |                  |                   |                   |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32) |                  |                   |                   |
| Temperature Range(°C)   | 5 ~ 60  |                  |                   |                   |
| Moving Speed(mm/sec)  | 250 ~ 1000  |                  |                   |                   |
| Operation Type  | Double Acting   |                  |                   |                   |
| Position Accuracy(mm)   | L.M Bearing Type : ±0.08  |                  |                   |                   |
| Stroke Adjustment Range(mm)<br>Note 3)                          | 0 ~ -10   |                  | 0 ~ -20           |                   |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) Above "Stroke Adjustment Range" refers maximum value for maximum adjustment range of both side adjust bolt.



# PSC-NC Series

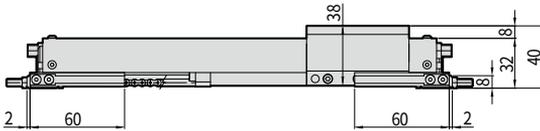
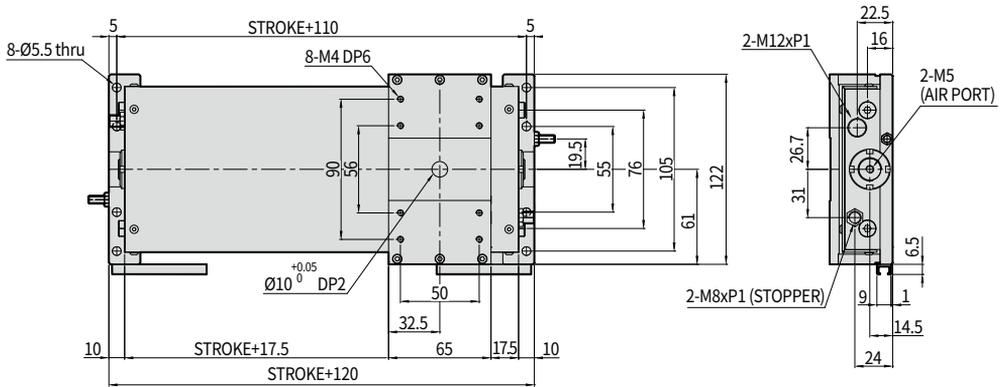
20NC

30NC

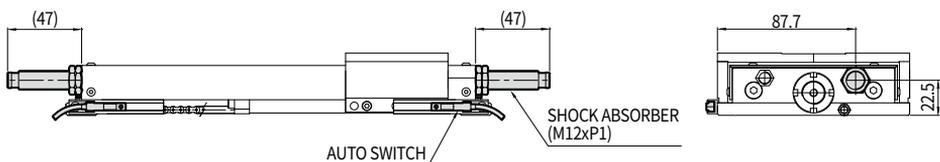
40NC

50NC

## PSC20NC



## PSC20NC Example of Auto Switch installation



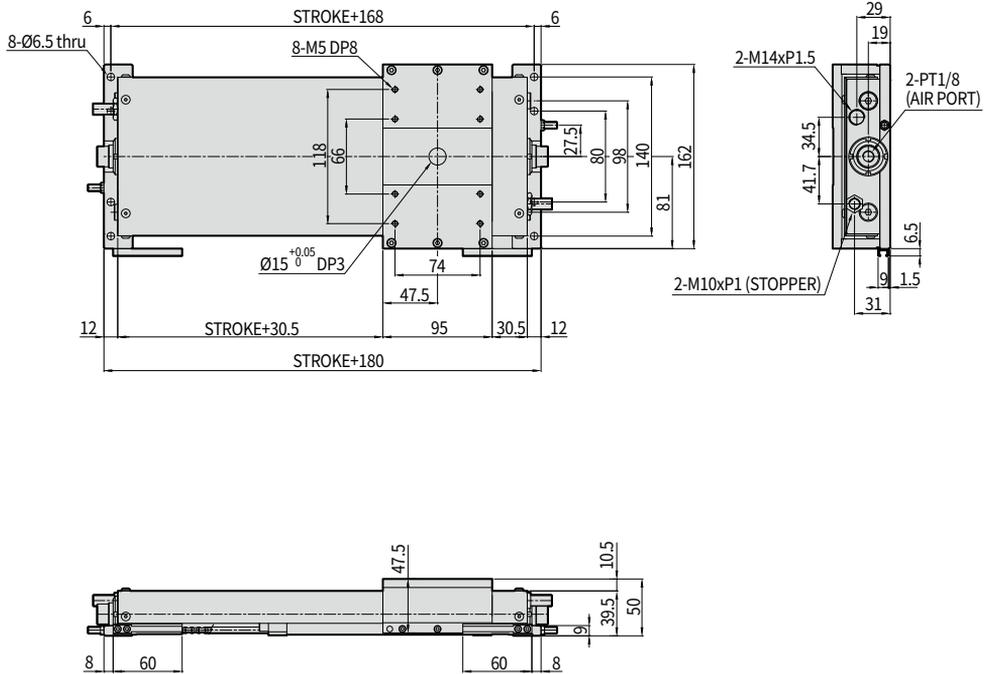
20NC

30NC

40NC

50NC

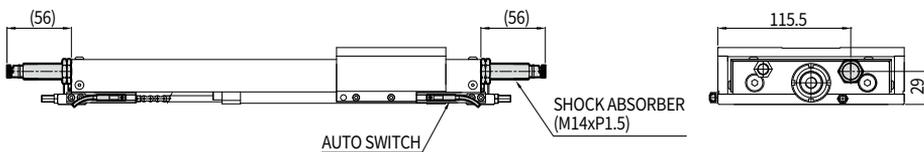
PSC30NC



SLIDE

- PSC
- PSC-N
- PSC-NC

PSC30NC Example of Auto Switch installation



# PSC-NC Series

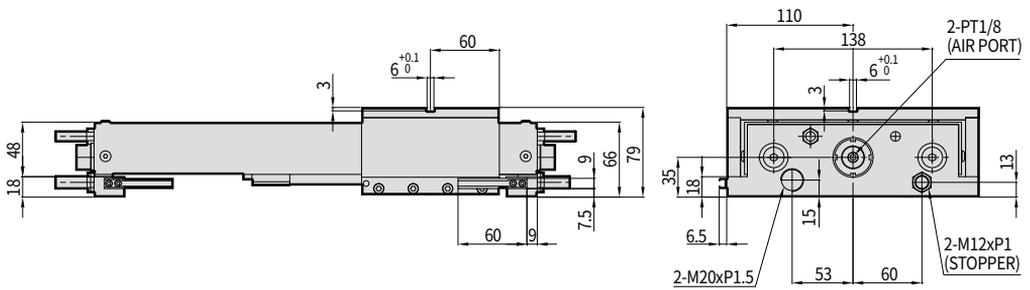
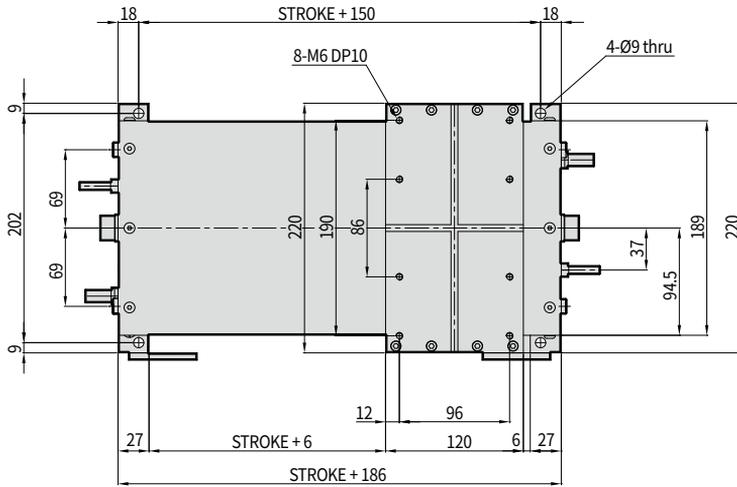
20NC

30NC

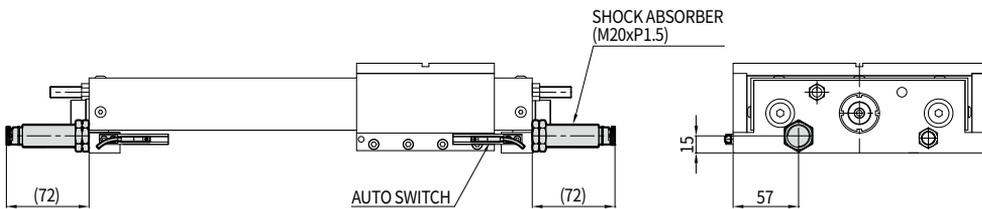
40NC

50NC

## PSC40NC

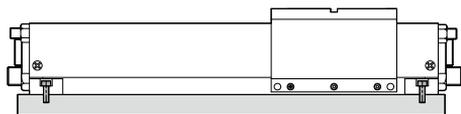


## PSC40NC Example of Auto Switch installation



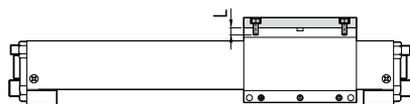


1. Installation by support frame through holes



| Item    | Fastening Bolt | Max Torque (kgf·cm) |
|---------|----------------|---------------------|
| PSC20NC | M5×P0.8        | 51                  |
| PSC30NC | M6×P1          | 81                  |
| PSC40NC | M8×P1.25       | 157                 |
| PSC50NC | M10×P1.5       | 360                 |

2. Installation by slide block tap holes



| Item    | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PSC20NC | M4×P0.7        | 25                  | 6                      |
| PSC30NC | M5×P0.8        | 51                  | 8                      |
| PSC40NC | M6×P1          | 81                  | 10                     |
| PSC50NC | M8×P1.25       | 157                 | 15                     |

MEMO

Horizontal dotted lines for writing.

SLIDE

|        |
|--------|
| PSC    |
| PSC-N  |
| PSC-NC |



**P&M Catalogue**

**ROTARY CYLINDER**

## Basic Safety Notes for ROTARY CYLINDER ①

### Caution

#### ■ Do NOT disassemble or remodel to Air Cylinder.

Do NOT disassemble or remodel to Air Cylinder for other purpose. It could bring human injury or electrical shocks, fire due to abnormal operation.

#### ■ Checklists before maintenance.

Check if there is preventive measure for load from drop, deflection, and projection, and conduct inspection after block compressed air and power, and exhaust remained air in system. If air pressure is remained in cylinder, the actuator may cause injury to human body due to accidental operation.

### Notes in Maintenance

#### ■ Checklists after maintenance.

Check anti-protrusion action for re-starting, and inspect leakage and appropriate function by supplying compressed air or power to the pneumatic system. If the machine is not operated due to leakage, stop using it and check if the installation is correct.

#### ■ Frequent inspection item.

With daily frequent inspection, check the deterioration of durability and function in pneumatic devices to prevent accident in advance.

### Caution

### Notes in Cylinder Angle Adjustment

#### ■ For cylinder angle adjustment, loosen fixed Stopper Bolt (Shock Absorber), adjust it to required work scope, and then fix and tighten it again.

#### ■ The urethane damper and shock absorber used for shock absorption is a consumable part, so it shall be replaced if any damage occurs.

#### ■ Can select various angle adjustment unit. Check it before model selection.

When controlling the cylinder stroke(Angle), three different types of cushions can be used according to the intended use.

1. Urethane Stopper : generalized stroke adjusting unit. It should be used in low-speed range.
2. Shock Absorber : Soft stop by absorbing the shock at the end of stroke. It can be used in high-speed range.

## Basic Safety Notes for ROTARY CYLINDER ②

### Warning

- **Workpiece equipped on the cylinder should be designed to be mounted as near as the rotary center of cylinder.**
- **The weight of attachments to be mounted on the cylinder, such as the mounting bracket, other adapters should be light as much as possible.**
- **If there is a possibility to lead any danger in human body, please attach safety devices such as protective cover.**

If during cylinder on operating, the load or the rotation area of cylinder may lead danger in human body. In this case, please prepare safety device such as protective cover.
- **Establish measures for power failure**

Set up safety measures in case of power failure, for devices powered by air pressure or electricity.
- **Emergency stop should be considered during cylinder operation**

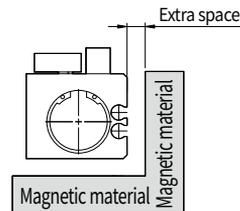
When the machine makes an emergency stop, cylinder may cause risk to mechanical equipment depending on usage environment, so appropriate measures should be taken.

### Notes in Design

- **Re-operation of cylinder after emergency stop needs to be considered.**

Re-operation after emergency stop may cause damage to human body or machine, so appropriate measures shall be taken.
- **Use the cylinder within the specified torque limit.**

If exceeding the specified torque limit, it may cause excessive load to mating surfaces or have an adverse effect on the life of cylinder. Refer to the limit for each series.
- **When there are magnetic materials like steel plate near the auto switch of cylinder, most likely they may cause malfunction in the auto switch, therefore they need to be designed and installed with sufficient space from the surface of cylinder.**



# ROTARY CYLINDER Model Selection Guide

## 1. TORQUE Check

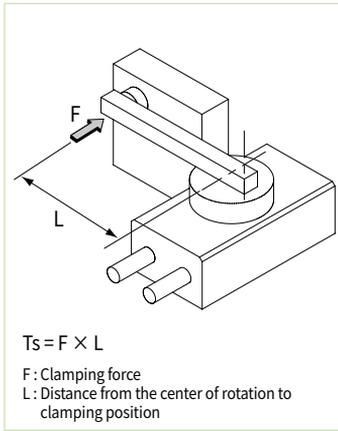
### ■ Torque Calculation According to Load Type

- Static load: load that requires only static force (pressing power) such as clamping force) → Calculate static torque
- Dynamic load: load that requires force moving or rotating work

- ① Resistance load: Load of applied external forces such as friction force or gravity → Calculate resistance torque
- ② Accelerative load: Load created by inertia from constant speed rotation → Calculate inertial moment, acceleration

#### ▶ Static Torque Calculation

Table 1



#### ▶ Calculate Resistance Torque

Table 2

| Resistance Torque Calculation  | Body Installation   |   |
|--|---|---|
|  | Horizontal Installation   | Vertical Installation   |
| <b>Need to Calculate</b><br><br>$T_r = 2 \times W \times L$<br>W : Resistance Load<br>L : Distance from the center of rotation to center of load | <b>Resistance Load(F) exist</b><br><br><br>Balanced load    Unbalanced load     | <b>Resistance Load(F) exist</b><br><br><br>Balanced load    Unbalanced load |
| <b>Not Need to Calculate</b>   | <b>Resistance Load(F) not exist</b><br><br><br>Balanced load    Unbalanced load | <b>Resistance Load(F) not exist</b><br><br><br>Balanced load                |

- When exceeded allowable torque of product, cannot control rotation speed or cannot use constant speed rotation therefore, select product in the consideration of sufficient limit for torque.

## 2. Kinetic Energy Check

- Calculate kinetic energy(shock absorption power) according to the inertia of the load, use within the specified allowable kinetic energy of rotary cylinder.

- Use it within the specified allowable rotation time according to the inertia of load for each model.

- Shock absorption power within the same specification is generally in the order of Shock Absorber > Air Cushion > urethane damper.

- Shock absorption power is different depending on the type of Shock absorber or stopper, so use appropriate stopper equipment.

- ① Urethane damper : Shock absorption by installing elastic body at urethane material at the end of stopper.
- ② Air Cushion : Shock absorption using the character of compressed air by adjusting volume of exhaustion air at the end of rotary. → According to the size of load, it is possible to control rotation speed but shock absorption power is not different.
- ③ Shock Absorber : The most excellent shock buffer and replaceable as stopper.

## 3. Allowable Load Check

- Following axial load check may be required depending on usage conditions.

- ① Thrust load (vertical load) check  
: When the load is applied in thrust direction, use it within allowable thrust load of applied cylinder.
- ② Radial load (Horizontal load) check  
: When the load is applied in radial direction, use it within allowable radial load of applied cylinder.
- ③ Moment check  
: When excessive moment is generated, check allowable

moment of applied cylinder, and use it within allowable moment.

- When a composite load is generated, calculate component force in each direction, and use it within allowable value for each direction.

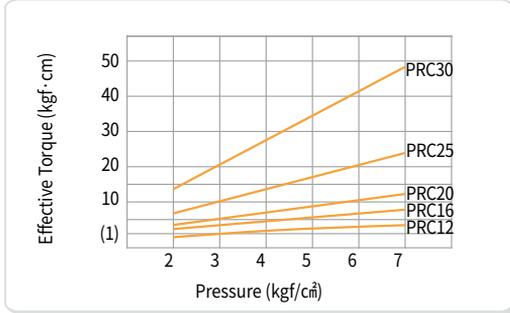
- Allowable weight of product refers from allowable value of applied bearing as reference. Pay attention it is not related with allowable displacement of turn table(turn shaft).

# ROTARY CYLINDER Model Selection Guide

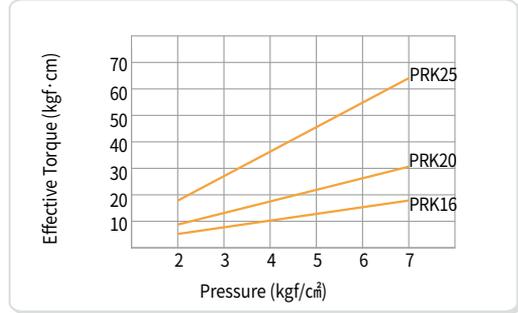
Table 3

## Effective Torque by Model

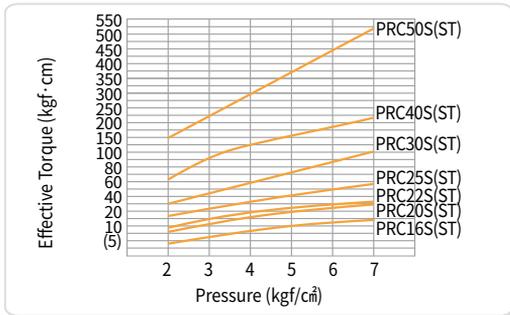
### ► PRC Series



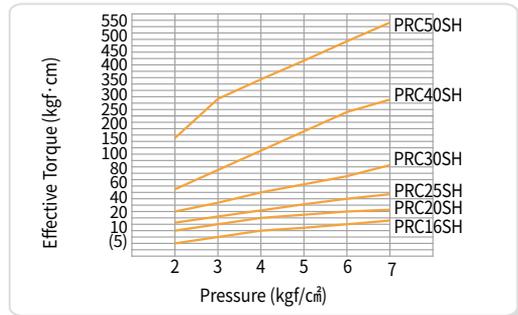
### ► PRK Series



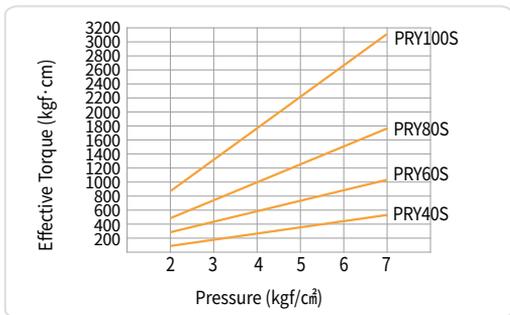
### ► PRC-S(ST) Series



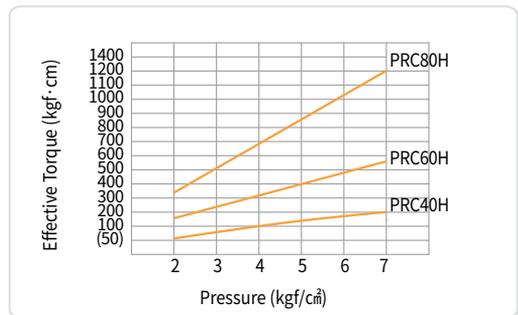
### ► PRC-SH Series



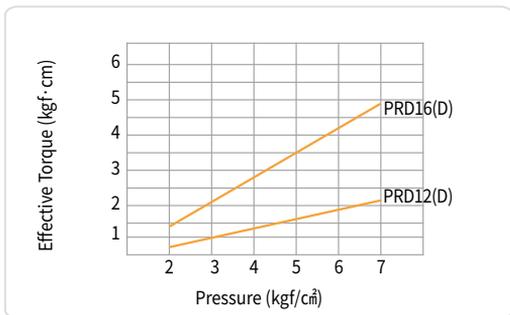
### ► PRY-S Series



### ► PRC-H Series



### ► PRD-(D) Series



# ROTARY CYLINDER Model Selection Guide

## Allowable Kinetic Energy by Model

Table 4

| Model           |     | Allowable Kinetic Energy (kgf·cm)  |             |                | Rotation Time Adjustment Range (sec/90°) |
|-----------------|-----|------------------------------------|-------------|----------------|--|
|                 |     | Urethane Damper (Standard Stopper) | Air Cushion | Shock Absorber |  |
| PRC             | 12  | -                                  | 0.48        | -              | 0.2 ~ 0.5                                |
|                 | 16  | -                                  | 0.65        | -              | 0.2 ~ 0.7                                |
|                 | 20  | -                                  | 1.4         | -              | 0.2 ~ 1.0                                |
|                 | 25  | -                                  | 2.7         | -              | 0.2 ~ 1.0                                |
|                 | 30  | -                                  | 4.8         | -              | 0.3 ~ 1.0                                |
| PRK             | 16  | -                                  | 1.1         | 3.26           | 0.15 ~ 1                                 |
|                 | 20  | -                                  | 1.73        | 6.45           | 0.15 ~ 1                                 |
|                 | 25  | -                                  | 3.15        | 8.27           | 0.15 ~ 1.5                               |
| PRC-S<br>PRC-ST | 16  | 0.25                               | -           | 2.2            | 0.2 ~ 0.9                                |
|                 | 20  | 0.38                               | -           | 4              | 0.2 ~ 1.2                                |
|                 | 22  | 0.38                               | -           | 4              | 0.2 ~ 1.2                                |
|                 | 25  | 0.45                               | -           | 5              | 0.3 ~ 1.2                                |
|                 | 30  | 1.35                               | -           | 24             | 0.3 ~ 1.4                                |
|                 | 40  | 3.76                               | -           | 48             | 0.3 ~ 1.5                                |
|                 | 50  | 3.76                               | -           | 103            | 0.5 ~ 1.5                                |
| PRC-SH          | 16  | -                                  | -           | 3.7            | 0.2 ~ 0.9                                |
|                 | 20  | -                                  | -           | 7              | 0.2 ~ 1.2                                |
|                 | 25  | -                                  | -           | 8.5            | 0.2 ~ 1.2                                |
|                 | 30  | -                                  | -           | 32             | 0.3 ~ 1.2                                |
|                 | 40  | -                                  | -           | 72             | 0.3 ~ 1.4                                |
|                 | 50  | -                                  | -           | 112            | 0.5 ~ 1.5                                |
| PRC-H           | 40  | -                                  | 7.5         | -              | 0.5 ~ 2.5                                |
|                 | 60  | -                                  | 19          | -              | 0.7 ~ 3.5                                |
|                 | 80  | -                                  | 25          | -              | 1.5 ~ 4                                  |
| PRD             | 12  | 0.06                               | -           | -              | 0.2 ~ 0.5                                |
|                 | 16  | 0.1                                | -           | -              | 0.2 ~ 0.7                                |
| PRY-S           | 40  | -                                  | -           | 77             | 0.7 ~ 2.0                                |
|                 | 60  | -                                  | -           | 175.5          | 1.2 ~ 2.5                                |
|                 | 80  | -                                  | -           | 331.4          | 1.5 ~ 3.5                                |
|                 | 100 | -                                  | -           | 669.3          | 2.0 ~ 4.0                                |

※ The standard Rotation time adjustment range for PRD series is sec/60°.

※ Rotation time adjustment range can be changed according to load amount.

※ For PRK Series, Metal Stopper with air cushion function as standard. (Even though Shock absorber option selected, air cushion still as standard)

※ Listed allowable kinetic energy of PRK series is when equipped meter-in type speed controller. (For PRK series model, usage of meter-out type speed controller could be a cause of protrusion when it working to anti-clockwise direction, meter-in type is recommended.)

# ROTARY CYLINDER Model Selection Guide

## Allowable Load by Model

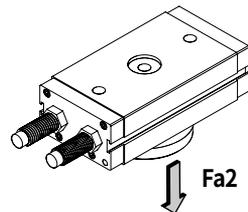
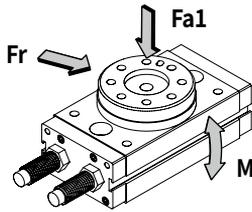


Table 5

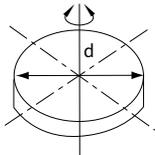
| Model  | Allowable Load (kgf) |                 |                 | Allowable Moment M (kgf-cm) |
|--------|----------------------|-----------------|-----------------|-----------------------------|
|        | Radial Load Fr       | Thrust Load Fa1 | Thrust Load Fa2 |                             |
| PRC    | 12                   | 6.9             | 2               | 12                          |
|        | 16                   | 7.4             | 2.3             | 15                          |
|        | 20                   | 13              | 4               | 17                          |
|        | 25                   | 18.5            | 5.5             | 49                          |
|        | 30                   | 20              | 6               | 60                          |
| PRK    | 16                   | 14.9            | 9.9             | 23                          |
|        | 20                   | 23              | 12.7            | 36                          |
|        | 25                   | 33              | 17.5            | 75                          |
| PRC-ST | 16                   | 11              | 6.5             | 17                          |
|        | 20                   | 14              | 9.3             | 26                          |
|        | 22                   | 21              | 10              | 41                          |
|        | 25                   | 31              | 16              | 66                          |
|        | 30                   | 35              | 17              | 80                          |
|        | 40                   | 46              | 20              | 157                         |
|        | 50                   | 85              | 44              | 298                         |
| PRC-SH | 16                   | 22              | 8.5             | 34                          |
|        | 20                   | 22              | 8.4             | 43                          |
|        | 25                   | 31              | 16              | 66                          |
|        | 30                   | 35              | 17              | 80                          |
|        | 40                   | 46              | 20              | 157                         |
|        | 50                   | 85              | 44              | 298                         |
| PRC-H  | 40                   | 47              | 14              | 232                         |
|        | 60                   | 65              | 19              | 390                         |
|        | 80                   | 80              | 24              | 580                         |
| PRD    | 12                   | 1.7             | 0.3             | 2.3                         |
|        | 16                   | 2.5             | 0.5             | 3.4                         |
| PRY-S  | 40                   | 193             | 105             | 853                         |
|        | 60                   | 320             | 181             | 1842                        |
|        | 80                   | 467             | 240             | 2984                        |
|        | 100                  | 619             | 306             | 3593                        |

- ※ Above allowable load refers maximum value can be affect at the shaft when dynamic load is not applied.
- ※ The radial allowable load is an allowable value at turntable or shaft.
- ※ If the moment is applied high, install auxiliary guide equipment additionally to protect the shaft from direct load.

# ROTARY CYLINDER Model Selection Guide

## Classification of Moment (Inertial Resistance)

### ① Disc at the central line of rotation

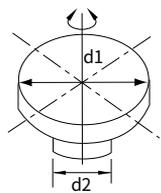


W : Weight (kgf)

$$J = \frac{Wd^2}{8g}$$

Unit: cm

### ② Single stroke disc at the central line of rotation

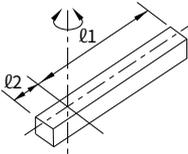


W<sub>1</sub> : d<sub>1</sub> Partial weight (kgf)  
W<sub>2</sub> : d<sub>2</sub> Partial weight (kgf)

$$J = \frac{1}{8g} (W_1 d_1^2 + W_2 d_2^2)$$

Unit: cm

### ③ Stick displaced from the center of rotation

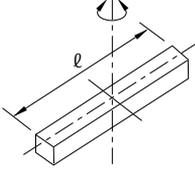


W<sub>1</sub> : l<sub>1</sub> Partial weight (kgf)  
W<sub>2</sub> : l<sub>2</sub> Partial weight (kgf)

$$J = \frac{W_1 l_1^2 + W_2 l_2^2}{3g}$$

Unit: cm

### ④ Stick at the center of rotation

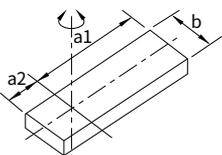


W: Weight (kgf)

$$J = \frac{Wl^2}{12g}$$

Unit: cm

### ⑤ Plate displaced from the center of rotation

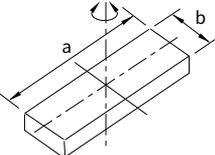


W<sub>1</sub> : a<sub>1</sub> Partial weight (kgf)  
W<sub>2</sub> : a<sub>2</sub> Partial weight (kgf)

$$J = \frac{W_1}{12g} (4a_1^2 + b^2) + \frac{W_2}{12g} (4a_2^2 + b^2)$$

Unit: cm

### ⑥ Plate at the center of rotation (Horizontal)

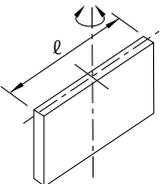


W: Weight (kgf)

$$J = \frac{W}{12g} (a^2 + b^2)$$

Unit: cm

### ⑦ Plate at the center of rotate (Vertical)

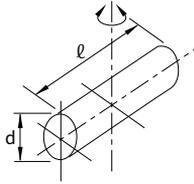


W : Weight (kgf)

$$J = \frac{Wl^2}{12g}$$

Unit: cm

### ⑧ Cylinder at the center of rotation

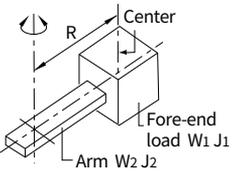


W: Weight (kgf)

$$J = \frac{W}{12g} \left( \frac{d^2}{4} + \frac{l^2}{3} \right)$$

Unit: cm

### ⑨ Load with arm structure

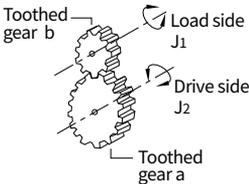


J<sub>1</sub> : Inertial moment on the central line of fore-end load  
J<sub>2</sub> : Inertial moment on the rotary shaft of arm  
W<sub>1</sub> : Weight of fore-end (kgf)  
W<sub>2</sub> : Weight of arm (kgf)  
R : Distance between rotary shaft and the center of fore-end load

$$J = J_1 + \frac{W_1}{g} R^2 + J_2$$

Unit: cm

### ⑩ Gear combination



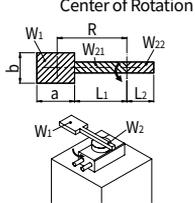
J<sub>1</sub> : Inertial moment of load side  
J<sub>2</sub> : Inertial moment of drive side

$$J = J_2 + \left( \frac{W_2}{g} \right)^2 + J_1$$

Unit: cm

# ROTARY CYLINDER Model Selection Guide

## Example of Model Selection

|                      | Applicable Formula  | Selection Example   |
|----------------------|---|---|
| Condition Check      | <ul style="list-style-type: none"> <li>Model of Rotary Cylinder</li> <li>Air pressure(kgf/cm<sup>2</sup>)</li> <li>Rotation time(sec/180°)</li> <li>Rotation angle(rad)</li> <li>Load shape</li> <li>Load weight(kgf)</li> <li>Distance from rotary center to the center of load weight</li> <li>Installation (Horizontal installation, Vertical installation)</li> </ul>   | <ul style="list-style-type: none"> <li>Applicable cylinder : PRC30ST-180-SH2</li> <li>Horizontal installation</li> <li>Air pressure : 5 kgf/cm<sup>2</sup></li> <li>Rotation time : 1 sec/180°</li> <li>R = 250, L<sub>1</sub> = 200, L<sub>2</sub> = 80, a = 120, b = 100 (Unit: mm)</li> <li>W<sub>1</sub> = 1, W<sub>21</sub> = 0.35, W<sub>22</sub> = 0.15 (Unit: kgf)</li> </ul>   |
| Rotation Time Check  | <ul style="list-style-type: none"> <li>Load Rotation time t (sec/180°) <span style="float:right">Table 4</span></li> <li>Applicable when t is included in the range of tc</li> <li>tc : allowable rotation time range of applicable cylinder (sec/180°)</li> </ul>  | t = 1 sec/180°<br>tc = 0.3 ~ 1.4 sec/90° → tc = 0.6 ~ 2.8 sec/180°<br>⇒ Applicable if t(1) is included in the range of tc (0.4~2.4)   |
| Torque Check         | <ul style="list-style-type: none"> <li>Inertial moment calculation J (kgf·cm·s<sup>2</sup>) <span style="float:right">Table 5</span></li> <li> <math display="block">J_1 = \frac{W_1}{12g} (a^2 + b^2)</math> <math display="block">J_2 = \frac{W_{21} L_1^2 + W_{22} L_2^2}{3g}</math> <math display="block">J_t = J_1 + J_2 + \frac{W_1}{g} R^2</math> </li> <li>a : Width of the first rotary object(cm)</li> <li>b : Overall length of the first rotary object(cm)</li> <li>L<sub>1</sub> : Rotary lateral side length for the second rotary arm(cm)</li> <li>L<sub>2</sub> : Length of the opposite side for the second rotary arm(cm)</li> <li>g : Gravity acceleration(cm/s<sup>2</sup>)</li> <li>Required torque calculation Ts, Td (kgf·cm) <span style="float:right">Table 1</span></li> <li>① If static load is applied               <ul style="list-style-type: none"> <li>Required static torque : Ts = F × L</li> <li>- Available if Ts &lt; Tc</li> </ul> </li> <li>② If dynamic load is effect <span style="float:right">Table 2</span> <ul style="list-style-type: none"> <li>Resistant Torque : Tr = 2 × F × L</li> <li>Acceleration Torque : Ta = J × ωa × K</li> <li> <math display="block">\omega a = \frac{2\theta}{T^2}</math> </li> <li>- Required total dynamic torque : Td = Tr + Ta <span style="float:right">Table 3</span></li> <li>- Applicable if Td &lt; Tc</li> </ul> </li> <li>F : Load size(kgf)</li> <li>L : Distance from the center of rotation to the center of load(mm)</li> <li>Tc : Allowable torque of applicable cylinder(kgf·cm)</li> <li>ωa : Angular acceleration(rad/sec<sup>2</sup>)</li> <li>t : Rotation time(sec/180°)</li> <li>θ : Rotating angle(rad)</li> <li>90° = 1.57 rad, 180° = 3.14 rad</li> </ul> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 10px;"> <p style="text-align: center;">K (Safety Factor)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <br/>           Horizontal K=5         </div> <div style="text-align: center;"> <br/>           Vertical K=10         </div> </div> </div> | $J_1 = \frac{1}{12 \cdot 980} (12^2 + 10^2) = 0.021 \text{ kgf} \cdot \text{cm} \cdot \text{s}^2$ $J_2 = \frac{0.35 \cdot 20^2 + 0.15 \cdot 8^2}{3 \cdot 980} = 0.051 \text{ kgf} \cdot \text{cm} \cdot \text{s}^2$ $J_t = 0.021 + 0.051 + \frac{1}{980} \cdot 25^2 = 0.71 \text{ kgf} \cdot \text{cm} \cdot \text{s}^2$ <p>As dynamic load is applied,</p> $T_r = 0$ $\omega a = \frac{2 \cdot 3.14}{1^2} = 6.28 \text{ rad/sec}^2$ $T_a = 0.71 \times 6.28 \times 5 = 22.3 \text{ kgf} \cdot \text{cm}$ $T_d = T_r + T_a = 22.3 \text{ kgf} \cdot \text{cm}$ <p>When the air pressure of PRC30ST-180 is 5 kgf/cm<sup>2</sup>,</p> $T_c = 74 \text{ kgf} \cdot \text{cm}$ <p>⇒ Applicable if Td (22.3) &lt; Tc (74), PRC30ST-180</p> |
| Kinetic Energy Check | <ul style="list-style-type: none"> <li>Load kinetic energy E (kgf·cm) <span style="float:right">Table 4</span></li> <li> <math display="block">E = \frac{1}{2} \times J \times \omega^2</math> </li> <li> <math display="block">\omega = \frac{2\theta}{t}</math> </li> <li>Applicable if E &lt; Ec</li> <li>Ec : Allowable kinetic energy for applicable cylinder(kgf·cm)</li> <li>ω : Angular speed(rad/sec)</li> <li>t : Rotation time(sec/180°)</li> <li>θ : Rotating angle(rad)</li> </ul>   | $\omega = \frac{2 \cdot 3.14}{1} = 6.28 \text{ rad/sec}$ $E = \frac{1}{2} \times 0.71 \times 6.28^2 = 14 \text{ kgf} \cdot \text{cm}$ <p>The allowable kinetic energy Ec for PRC30ST-180-SH2 = 24 kgf·cm</p> <p>⇒ As if E (14) &lt; Ec (24), PRC30ST-180</p>  |
| 허용하중 점검              | <ul style="list-style-type: none"> <li>Radial load(Fr), Thrust load(Fa), Allowable moment(M) <span style="float:right">Table 5</span></li> <li>Applicable if radial load: Fr &lt; Fcr</li> <li>Applicable if thrust load: Fa &lt; Fca</li> <li>Applicable if moment: M &lt; Mc</li> <li>Fcr : Allowable radial load for applicable cylinder(kgf)</li> <li>Fca : Allowable thrust load for applicable cylinder(kgf)</li> <li>Mc : Allowable moment for applicable cylinder(kgf·cm)</li> </ul>  | $F_{cr} \text{ in PRC30ST-180} = 17 \text{ kgf}$ $M_c \text{ in PRC30ST-180} = 80 \text{ kgf} \cdot \text{cm}$ $\text{Thrust load } F_a = 1 + 0.35 + 0.15 = 1.5 \text{ kgf}$ $\text{Load moment } M = F_a \times R = 1.5 \times 25 = 37.5 \text{ kgf} \cdot \text{cm}$ <p>⇒ Fa (1.5) &lt; Fca (17)</p> <p>Applicable if M (37.5) &lt; Mc (80), PRC30ST-180</p>  |

※ For detailed information for static load and load resistance, please refer [Table 1](#) and [Table 2](#) .

# ROTARY CYLINDER

## PRC Series

### Features

- Rotary cylinder by Rack & Pinion structure.
- Suitable as line reversing or separator or valve switch application in FA field.
- Minimized backlash at the end of stroke by double rack structure for precise position control.
- Easy control and wiring, piping by locating air cushion and stopper at the same position of air port.
- Possible to adjust rotating angle setting and cushion stroke equally.
- Improved durability by application of abrasion resistance synthetic resist at the frictional surface.
- Auto Switch installation. (Optional)



### Order Form

## PRC 20 - 180 - E - A1 L S

① ② ③ ④ ⑤ ⑥ ⑦

#### ① Series Name

#### ② Cylinder Bore Size

#### ③ Rotating Angle

#### ⑤ Available Auto Switches

| Order | CYL Bore(mm) | Order (=Rotating Angle(°)) | Order                 |                       |                       |                       |                       |                       |                       |
|-------|--------------|----------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
|       |              |                            | A1                    | A2                    | A2C                   | A2V                   | B1                    | B2                    | B2B                   |
| 12    | 12           | 90, 180                    |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       | <input type="radio"/> | <input type="radio"/> |
| 16    | 16           |                            |                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |                       | <input type="radio"/> | <input type="radio"/> |
| 20    | 20           |                            | <input type="radio"/> |                       |                       |                       | <input type="radio"/> |                       |                       |
| 25    | 25           |                            | <input type="radio"/> |                       |                       |                       | <input type="radio"/> |                       |                       |
| 30    | 30           |                            | <input type="radio"/> |                       |                       |                       | <input type="radio"/> |                       |                       |

※ For "Blank", no Auto Switch is provided.

#### ④ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

#### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ※ Auto Switch Specification

| Order | Sensing Type         | Cable Spec |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires      | Direction | AC      | DC           | AC      | DC             |               |                |
| A1    | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2    | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire     | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2V   | Magnetic reed switch | 2-Wire     | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B1    | Magnetic solid state | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2    | Magnetic solid state | 3-Wire     | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire     | Horiz     | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

**Specification**

| Item Name                                       | PRC12  |         | PRC16   |         | PRC20   |         | PRC25   |         | PRC30   |         |
|---|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|
|   | 90   | 180     | 90      | 180     | 90      | 180     | 90      | 180     | 90      | 180     |
| Rotating Angle(°)                               | 90   | 180     | 90      | 180     | 90      | 180     | 90      | 180     | 90      | 180     |
| CYL Bore Size(mm)                               | 12   |         | 16      |         | 20      |         | 25      |         | 30      |         |
| Cushion(Shock Absorbing)                        | Air Cushion (Adjustable)   |         |         |         |         |         |         |         |         |         |
| Air Cushion(Adjusting Type)(°)                  | Single direction less than 35°   |         |         |         |         |         |         |         |         |         |
| Effective Cushion Angle(kgf·cm)                 | 0.5×P  |         | 1.1×P   |         | 1.8×P   |         | 3.4×P   |         | 6.9×P   |         |
| P : Air Pressure(kgf/cm <sup>2</sup> )          |  |         |         |         |         |         |         |         |         |         |
| Effective Torque(kgf·cm)                        | 0.48   |         | 0.65    |         | 1.4     |         | 2.7     |         | 4.8     |         |
| Fitting Size                                    | M5   |         |         |         |         | PT1/8   |         |         |         |         |
| Maximum Radial Load(kgf) <small>Note 3)</small> | 6.9  |         | 7.4     |         | 13      |         | 18.5    |         | 20      |         |
| Maximum Thrust Load(kgf)                        | 2  |         | 2.3     |         | 4       |         | 5.5     |         | 6       |         |
| Weight(kgf)                                     | 0.18   | 0.21    | 0.26    | 0.31    | 0.5     | 0.58    | 0.8     | 1.0     | 1.38    | 1.79    |
| Rotation Time(sec/90°)                          | 0.2~0.5  | 0.4~0.7 | 0.2~0.7 | 0.4~0.9 | 0.2~1.0 | 0.4~1.2 | 0.2~1.0 | 0.2~1.2 | 0.3~1.0 | 0.5~1.3 |
| Fluid   | Clean Air <small>Note 1)</small>   |         |         |         |         |         |         |         |         |         |
| Pressure Range(kgf/cm <sup>2</sup> )            | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small>               |         |         |         |         |         |         |         |         |         |
| Lubrication                                     | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)                |         |         |         |         |         |         |         |         |         |
| Temperature Range(°C)                           | 5 ~ 60   |         |         |         |         |         |         |         |         |         |
| Operation Type                                  | Double Acting (Structure : Rack & Pinion, Guide : Synthetic Resins Type Guide) |         |         |         |         |         |         |         |         |         |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

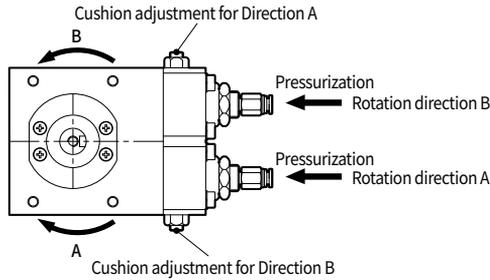
Note 3) Above radial load means maximum allowable load at the end of rotating shaft.

※ For detailed model selection, please refer <ROTARY CYLINDER Model Selection Guide>.

**ROTARY**

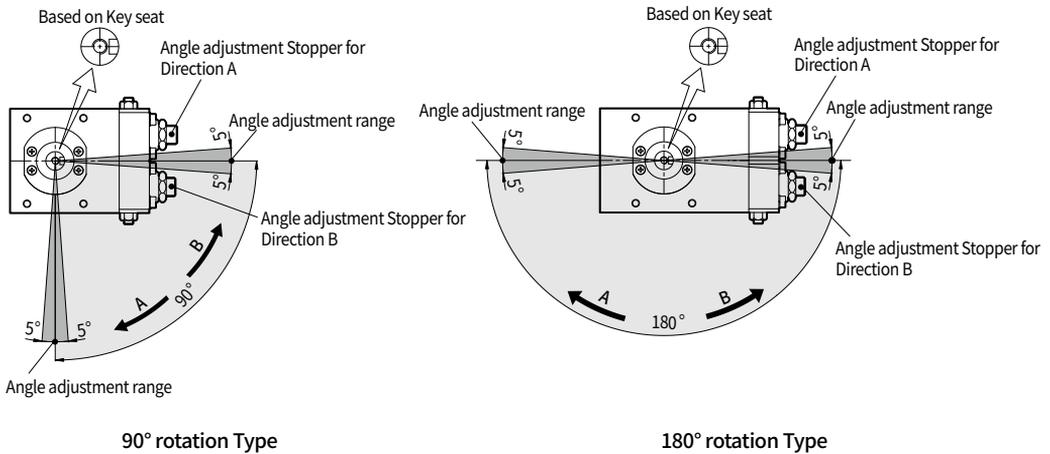
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

## Rotation Direction / Cushion Adjustment



- Above figure shows air port position and air cushion adjusting position for each direction.
- Rotation direction is marked based on the key seat in shaft.
- Turning cushion adjustable needle to clockwise makes shock buffer speed slower, while tuning to counter-clockwise makes shock buffer speed faster. Please adjust it in optimal state according to the size and shape of load.

## Rotation Angle Adjustment



90° rotation Type

180° rotation Type

- Rotation angle can be adjusted within range at the end of rotation with the control of side stopper as shown in figure.
- Rotation adjustment range per each direction is marked based on the key seat in figure.
- Angle adjustment Stopper is set at a random position within the adjustment range of rotary angle. Readjust it as required for before use.

| Rotary Cylinder | Angle adjustment range at the end of rotation |
|-----------------|---|
| PRCØ-90         | ±5°   |
| PRCØ-180        |   |

PRC Series

12

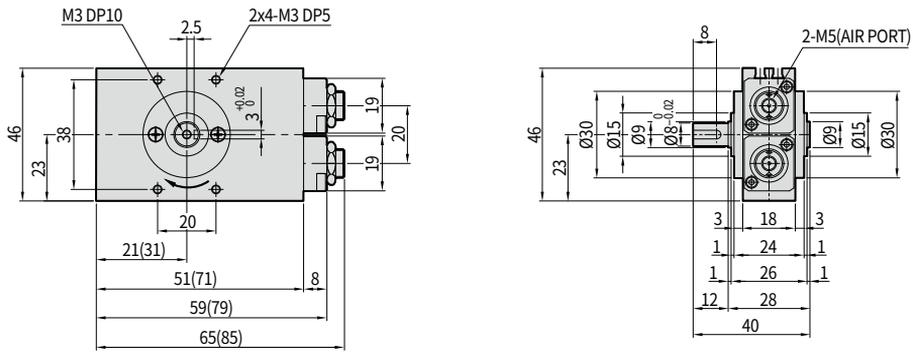
16

20

25

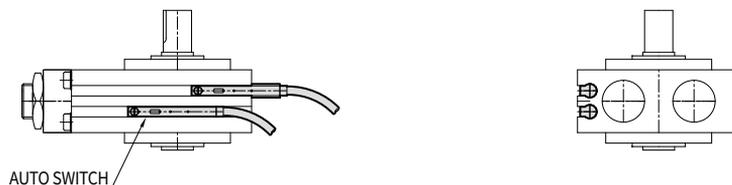
30

PRC12



\*( ) Size 180° TYPE

PRC12 Example of Auto Switch installation



ROTARY

PRC

PRK

PRC-S

PRC-ST

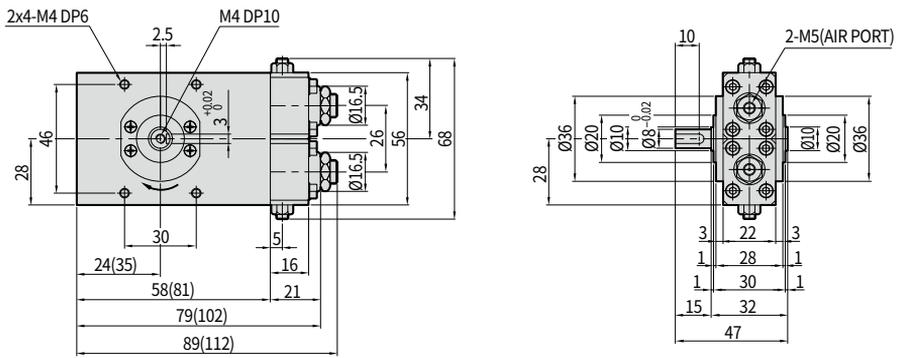
PRC-SH

PRY-S

PRC-H

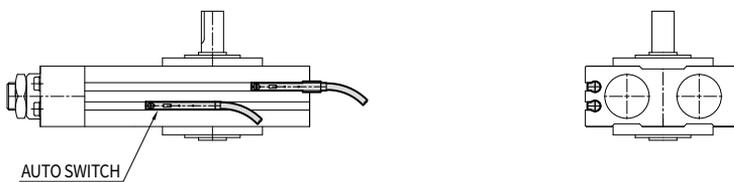
PRD

## PRC16



\*( ) Size 180° TYPE

## PRC16 Example of Auto Switch installation





# PRC Series

12

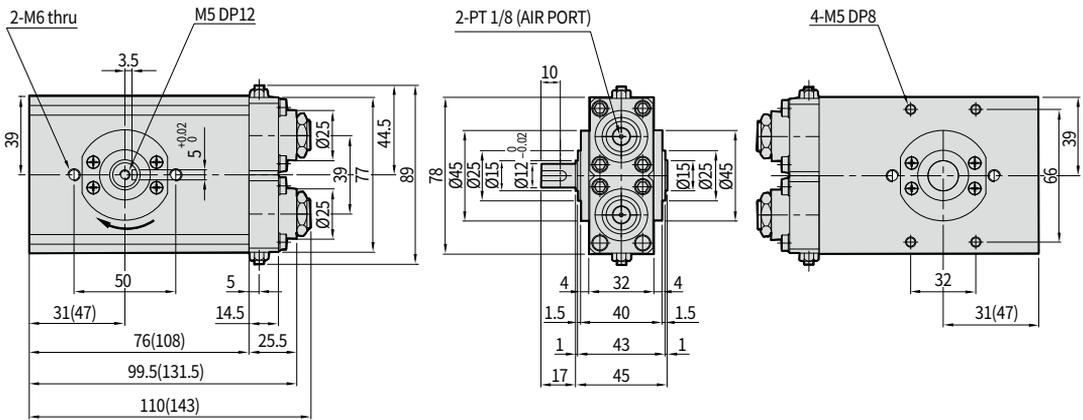
16

20

25

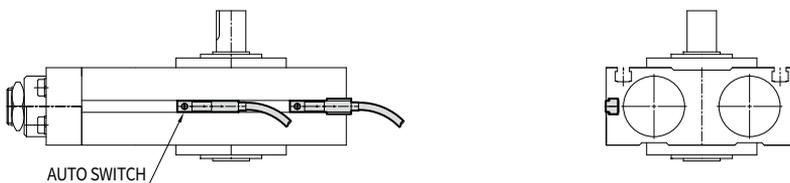
30

## PRC25

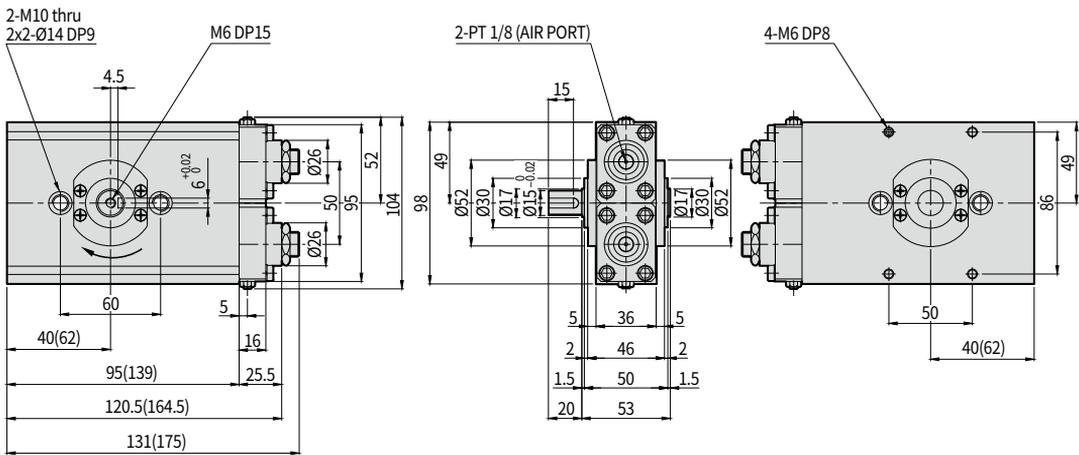


\*( ) Size 180° TYPE

## PRC25 Example of Auto Switch installation

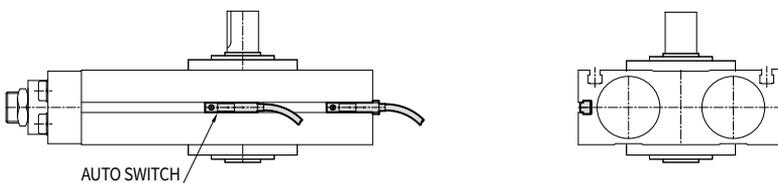


PRC30



\* ( ) Size 180° TYPE

PRC30 Example of Auto Switch installation



ROTARY

PRC

PRK

PRC-S

PRC-ST

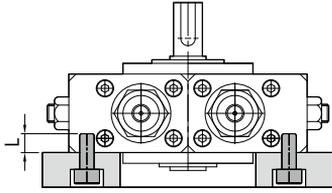
PRC-SH

PRY-S

PRC-H

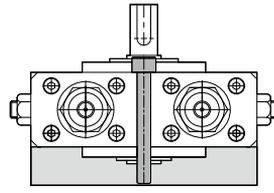
PRD

1. Installation by body tap holes



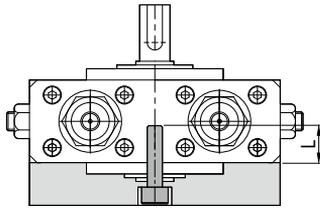
| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PRC12 | M3×P0.5        | 11                  | 5                      |
| PRC16 | M4×P0.7        | 25                  | 6                      |
| PRC20 | M4×P0.7        | 25                  | 7                      |
| PRC25 | M5×P0.8        | 51                  | 8                      |
| PRC30 | M6×P1          | 81                  | 8                      |

2. Installation by body through holes



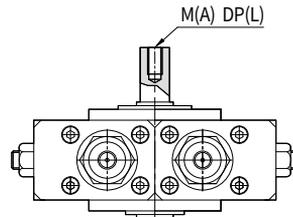
| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PRC12 |                | Non usable          |
| PRC16 |                | Non usable          |
| PRC20 | M5×P0.8        | 51                  |
| PRC25 | M5×P0.8        | 51                  |
| PRC30 | M8×P1.25       | 157                 |

3. Installation by body tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PRC12 |                | Non usable          |                        |
| PRC16 |                | Non usable          |                        |
| PRC20 | M6×P1          | 81                  | 26                     |
| PRC25 | M6×P1          | 81                  | 32                     |
| PRC30 | M10×P1.5       | 360                 | 27                     |

4. Installation by rotating shaft tap hole



| Item  | Fastening Bolt A | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|------------------|---------------------|------------------------|
| PRC12 | M3×P0.5          | 11                  | 10                     |
| PRC16 | M4×P0.7          | 25                  | 10                     |
| PRC20 | M4×P0.7          | 25                  | 10                     |
| PRC25 | M5×P0.8          | 51                  | 12                     |
| PRC30 | M6×P1            | 81                  | 15                     |



ROTARY CYLINDER

# PRK Series

---

Ultra low height, high torque,  
For heavy load handling



### Enhanced space utility from innovative design

- Most lowest height compare to other domestic brand models.
- Stable structure of separated pinion gear and turntable.
- Two turntable height options.

**-25% decreased height than PRC-S series**

| Bore Size | Height H (mm) |      |
|-----------|---------------|------|
|           | PRC-S         | PRK  |
| Ø16       | 47            | 35.5 |
| Ø20       | 54            | 39   |
| Ø25       | 66            | 51.5 |

※ Height for standard model.



<Standard>

<Height compatible option>

※ Height compatible option : Height compatible for same bore size PRC-S series models.

### Improved performance from Unique structure

- Superior torque performance.

**Average +18% increased torque compare with PRC-S Series**

※ At air pressure 5kgf/cm<sup>2</sup>

| Bore Size | Torque (kgf-cm) |      |
|-----------|-----------------|------|
|           | PRC-S           | PRK  |
| Ø16       | 9.8             | 12.7 |
| Ø20       | 19.8            | 22   |
| Ø25       | 41.2            | 46.4 |

※ Because of different of safety factor for each manufacturer, it is impossible to compare listed torque to the other brand models directly.

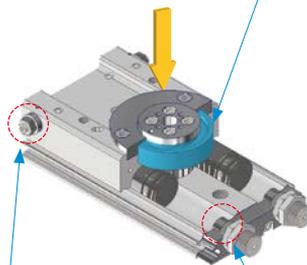
- Air cushion of specialized design as standard.

**5.3 times Increased allowable kinetic energy than PRC-S series**

| Bore Size | Allowable Kinetic Energy (kgf-cm) |      |
|-----------|-----------------------------------|------|
|           | PRC-S                             | PRK  |
| Ø16       | 0.25                              | 1.1  |
| Ø20       | 0.38                              | 1.73 |
| Ø25       | 0.45                              | 3.15 |

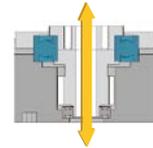
※ It is based on standard stopper.

Allowable load F



- Enhanced allowable load by application of heavy load bearing.

- Significant allowable load from stable bearing assembly design



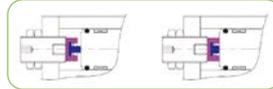
Suitable to use both side direction allowable load

**+32% increased allowable load than PRC-S Series**

| Bore Size | Allowable Load F(kg) |      |
|-----------|----------------------|------|
|           | PRC-S                | PRK  |
| Ø16       | 6.5                  | 9.9  |
| Ø20       | 9.3                  | 12.7 |
| Ø25       | 16                   | 17.5 |

※ It is based on non load applied.

- Improved repeatability by new style metal stopper application.



<New style metal stopper>

### Improved customer convenience

**Enlarged hollow hole size**

- Hollow hole for tube and wire for actuator equipped on turntable.
- Increased convenience of insert and extract of wire and tube by expanded hollow hole.

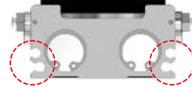
| Bore Size | Hollow Hole Size (Ø) |     |
|-----------|----------------------|-----|
|           | PRC-S                | PRK |
| Ø16       | 5                    | 7   |
| Ø20       | 9                    | 12  |
| Ø25       | 12                   | 14  |



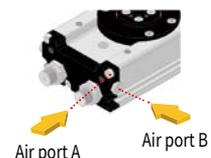
Hollow hole

**Various sensor options**

- Both side sensor slots.



**Various air port positions**



※ Air Port B : closed by plug as initial.

Please read it before use, with individual notes for each series as well, for your safe use.

## Individual Safety Notes for PRK Series ①

### Caution

■ Pay attention to bearing which is assembled on turntable could be break by significant damage.

■ 4 or more fasten bolts need to be used for turntable installation.

Maximum installation bolts are 4 for PRK and 8 for PRK-S. 4 or more bolts installation needed to prevent unexpected workpiece lose.

### Notes in Installation

■ For mounting workpiece on turntable, fasten it with specified fasten torque with sufficient length bolts.

Fasten unstable bolts over or insufficient length could be a reason of defects and lack of fasten torque could be a reason of position out or unexpected lose.

### Caution

■ Meter-in type speed controller is recommended for smooth operation.

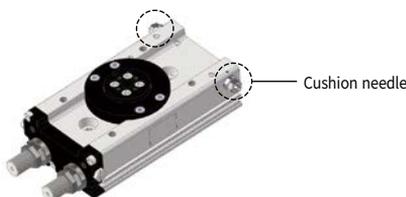
Usage of meter-out type speed controller could be a reason of unexpected rash when air cushion released.

■ Make sure to use within specified rotation time(rotation speed) in this manual.

For lower speed operation, unexpected rash could be occurred when air cushion released for reversing direction, for higher speed could make defect of air cushion at forward direction.

■ Basically all of PRK series equipped air cushion as standard. The air cushion equipped this model has unique design considering for small size. According to weight of shape of workpiece it looks like not working but it is normal. If powerful shock absorbing is needed, shock absorber option should be selected.

■ Be careful If the cushion needle is loosened excessively, it could be a reason of air leakage.



### Notes in Environment and Usage

■ Adjust the cushion needle by rotating it after product and workpiece installed when compressed air supplied.

If cushion adjusting bolt fasten too tight to clockwise direction the bounding phenomenon (defect of repeatability) could be occurred. Also, could be occurred rash when anti-clockwise.

According to the character of workpiece, adjust cushion needle appropriately for smooth operation.

■ Metal stopper equipped for standard PRK Series Some of noise could be according to degree of Air Cushion and character of workpiece.

■ When used around heat source of high temperature, product can be heated by radiant heat and cause failure. Therefore, install protective covers to block heat source.

■ Do not use in the environment that can be affected by foreign substances such as dust and chip, and cutting oil.

It may cause vibration, frictional resistance, and air leakage. In such environment, please install appropriate protective cover through the consultation with our company.

■ If significant moment applied on product or gravity center of workpiece far from rotate center, make sure additional enhancing bearing on the rotation part.

Be careful the rotation working could be bad if the bearing damaged.

Please read it before use, with individual notes for each series as well, for your safe use.

## Individual Safety Notes for PRK Series ②

### Warning

### Notes in Model Selection

- **The effective torque (stopping force) at the rotary end position will be 50% of torque specified on data sheet. Pay attention if significant stopping force is needed at the end of rotation position.**

For the stopping force at the end of rotation position, a single side piston rack stopped by the stopper and it is kept by opposite side piston rack so it be half of effective torque.

Please contact to us if significant stopping force is needed.

- **If it using for stops at middle position, air cushion will not work. Make sure to select Shock Absorber option.**

If you want to use it more small rotation angle specified on this catalogue, make sure to use shock absorber to prevent damage on the end position.

- **For all of PRK series model has air cushion as standard. The air cushion newly designed for downsizing and double piston could have weak shock absorbing performance than typical air cushion slightly. Please refer the model selection guide for each character of workpieces. If significant shock absorbing performance needed, make sure to select "Shock Absorber" option.**

# ROTARY CYLINDER

## PRK Series

### Features

NEW

- Rotary cylinder by Rack & Pinion structure with double piston inside.
- Dramatically reduced size and weight by innovative design.
- Height compatible to PRC-S(T) series turntable. (Option)
- Superior torque performance among equivalent models.
- Improved allowable kinetic energy and downsizing by new style air cushion application.
- Improved repeatability by new style metal stopper as standard.
- Enhanced allowable load by application of heavy load bearing.
- Enlarged hollow hole size and improved customer convenience by various air port and sensor slots.



### Order Form

**PRK 16 S - 180 - SH2 - A2 L S**

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) |
|-------|--------------|
| 16    | 16           |
| 20    | 20           |
| 25    | 25           |

#### ③ Table Options

| Order | Table Options     |
|-------|-------------------|
| Blank | Standard          |
| S     | Height compatible |

※ For "S" Option, total height and table tap is compatible to PRC-S(T) series.

#### ④ Rotating Angle

| Order | Rotating Angle |
|-------|----------------|
| 90    | 90°            |
| 180   | 180°           |

※ For middle position usage, air cushion cannot work. For use it, please contact to office.

#### ⑤ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |        | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|--------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC     |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |        |               |                |
| A2    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA | IP 67         | 1ms            |
| A2V   | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA | IP 67         | 1ms            |
| B2    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V)  | -       | 50mA   | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire                  | Horiz     | -       | 24V (10~28V) | -       | 50mA   | IP 67         | 1ms            |
| B3B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | 50mA   | IP 67         | 1ms            |
| B3C   | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~28V)  | -       | 50mA   | IP 67         | 1ms            |

#### ⑥ Stopper Options

| Order | Stopper Options             |
|-------|-----------------------------|
| Blank | Metal Stopper + Air Cushion |
| SH1   | Shock Absorber 1PCS         |
| SH2   | Shock Absorber 2PCS         |

※ For SH1 option selection, only one shock absorber will be mounted on 0° (standard) position.

※ Air cushion will be applied even SH1(SH2) option selected.

#### ⑦ Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑧ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

Accessory Order Form

(1) Shock Absorber

**PRK 16 - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for 1 set of product.

Specification

| Item Name  | PRK16  | PRK20    | PRK25      |      |
|--|--|----------|------------|------|
| Cylinder Bore Size(mm)   | 16   | 20       | 25         |      |
| Rotation Angle(°) <small>Note 3)</small>   | 90° model : 80~110 / 180° model : 170~190                          |          |            |      |
| Cushion(Shock Absorbing)   | Air Cushion / Shock Absorber                                       |          |            |      |
| Effective Cushion Angle(kgf·cm)<br><small>P : Air Pressure(kgf/cm<sup>2</sup>)</small> | 2.5XP  | 4.4XP    | 9.3XP      |      |
| Weight(kgf)  | Standard   | 1        | 1.85       |      |
|  | Height Compatible  | 0.63     | 1.05       | 1.9  |
| Allowable Kinetic Energy (kgf·cm)  | Air Cushion  | 1.1      | 1.73       | 3.15 |
|  | Shock Absorber <small>Note 4)</small>                              | 3.26     | 6.45       | 8.27 |
| Fitting Size   | M5   |          | PT1/8      |      |
| Maximum Radial Load(kgf)   | 14.9   | 23       | 33         |      |
| Maximum Thrust Load(kgf)   | 9.9  | 12.7     | 17.5       |      |
| Rotation Time(sec/90°) <small>Note 5)</small>  | 0.15 ~ 1   | 0.15 ~ 1 | 0.15 ~ 1.5 |      |
| Fluid  | Clean Air <small>Note 1)</small>                                   |          |            |      |
| Pressure Range(kgf/cm <sup>2</sup> )   | 1.5 ~ 7 (Guaranteed Resist Pressure : 10.2) <small>Note 2)</small> |          |            |      |
| Lubrication  | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)    |          |            |      |
| Temperature Range(°C)  | 5 ~ 60   |          |            |      |
| Operation Type   | Double Acting (Structure : Rack & Pinion Type)                     |          |            |      |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded. Usage under 3kgf/cm<sup>2</sup> could make dramatical bad repeatability performance due to the reacting force of metal stopper cushion pad.

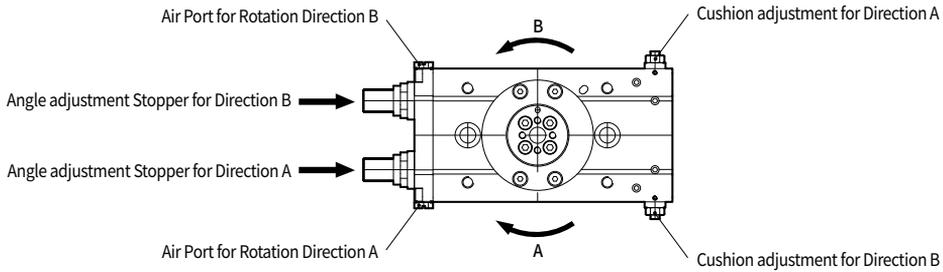
Note 3) Pay attention for usage small than listed angle makes dramatically down of allowable kinetic energy due to not working of air cushion. If shock absorber applied, smaller angle than list can be used but it need to be used between not reduce energy efficiency.

Note 4) Listed allowable kinetic energy for shock absorber has included air cushion performance together.

Note 5) For smooth operation and air cushion function, meter-in type speed controller is recommended. For more details, please refer <Individual notes for PRK Series>.

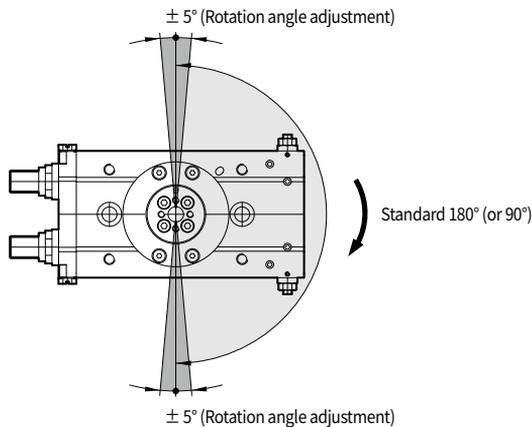


## Rotation Direction / Stopper Adjustment



- Above figure shows air port position and air cushion adjusting position for each direction.
- Rotation direction is marked based on the position hole of turntable.
- Angle adjustment Stopper is set at a random position. Readjust it as required for before use.
- Pay attention for air leakage when releasing stopper nuts for adjustment of rotation angle.
- For shock absorber option selection, stopper will be replaced by shock absorber. The way of adjustment is same with stopper.
- If fully fasten cushion adjustment needle to clockwise direction, vibration could be occurred at the end of rotation by a character of product. The cushion needle need to be adjusted by character of workpiece and operation speed.

## Rotation Angle Adjustment



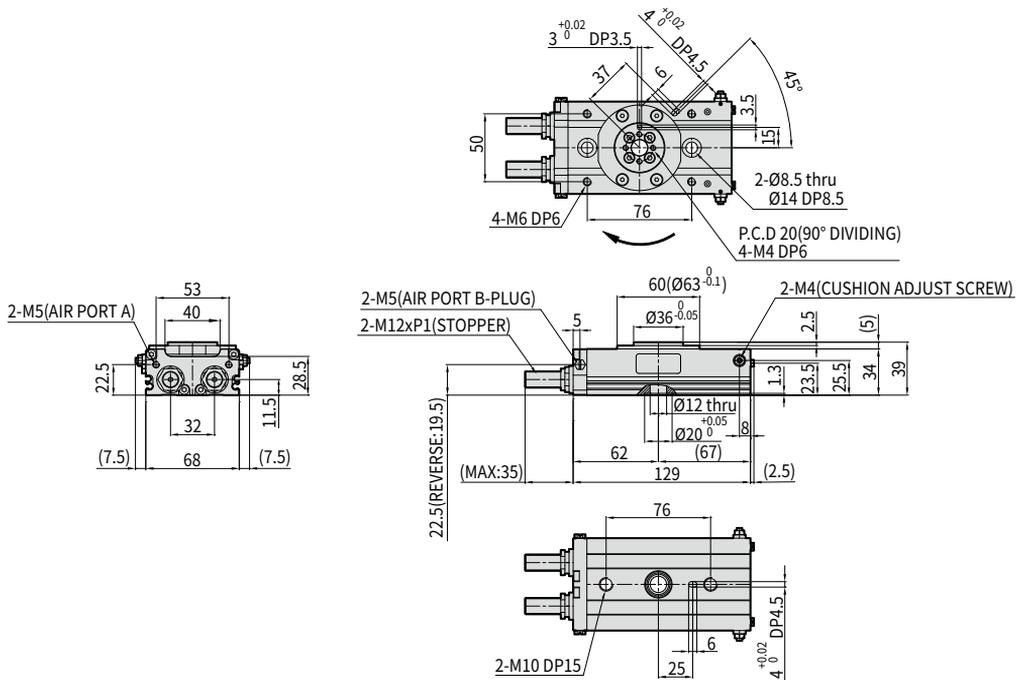
- As shown in the figure, turn it to clockwise and then turn back to counter clockwise based on positioning hole.
- For standard stopper, it can use within adjustable degree ( $\pm 5$ ) from standard rotation angle ( $180^\circ$  or  $90^\circ$ ) by adjusting stopper bolt. Pay attention if use it over  $-5$  makes malfunction of air cushion brings dramatical reduce of allowable kinetic energy.
- If using shock absorber, can use over  $-5$  usage so, can use more small rotation angle. However, please use it within range of Minimum rotation angle that has no degraded energy absorption capability below written. If the rotation angle is smaller than effective stroke of shock absorber, the performance of absorbing could be weak.

※ Minimum rotation angle that has no degraded energy absorption capability

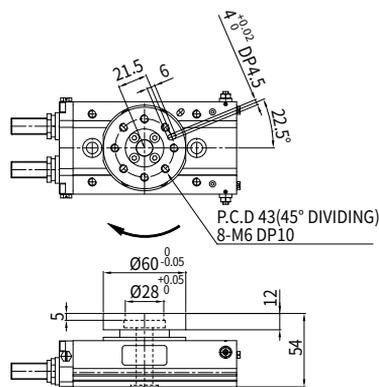
|                                    |    |    |    |
|------------------------------------|----|----|----|
| CYL Bore                           | 16 | 20 | 25 |
| Minimum Rotation Angle( $^\circ$ ) | 50 | 60 | 70 |



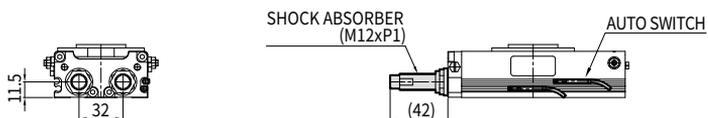
## PRK20



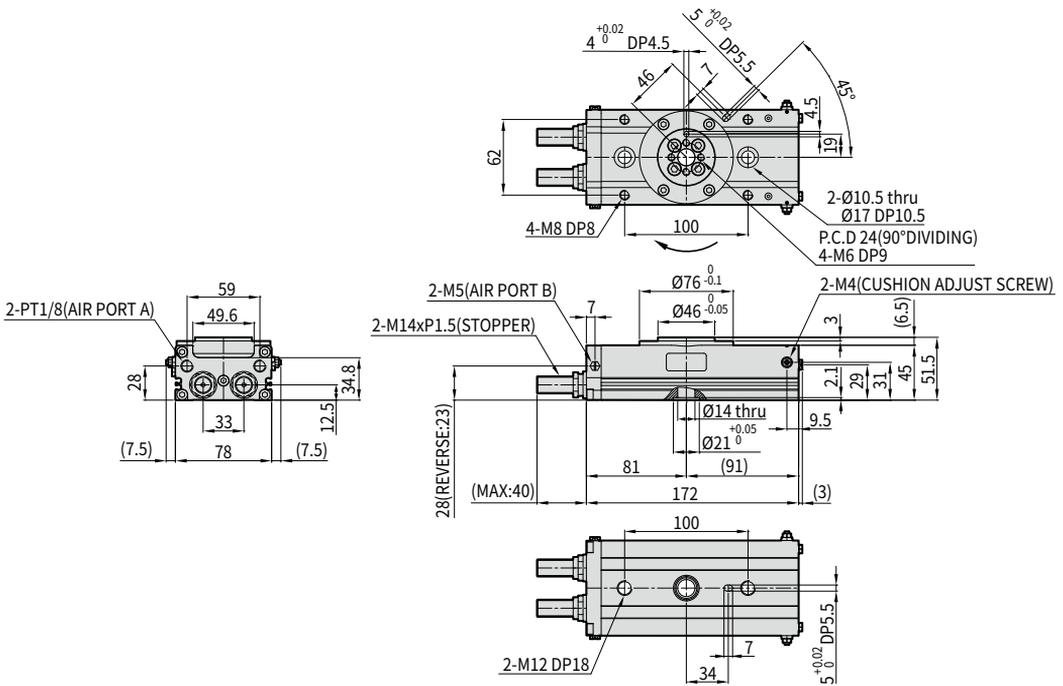
## PRK20S



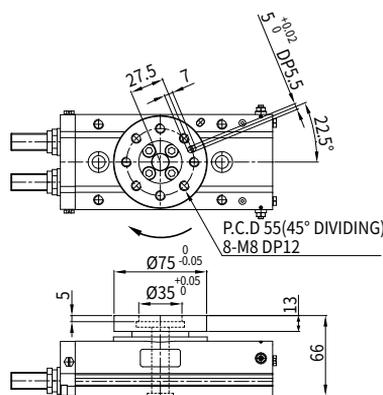
## PRK20 Example of Auto Switch & Shock Absorber installation



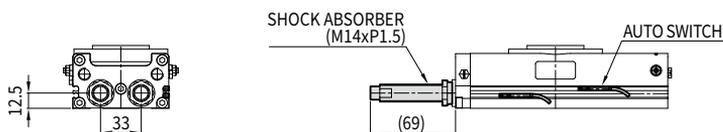
PRK25



PRK25S



PRK25 Example of Auto Switch & Shock Absorber installation

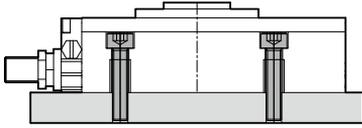


ROTARY

- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

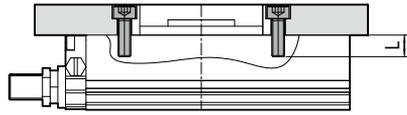
## Installation Information

### 1. Installation by body through holes



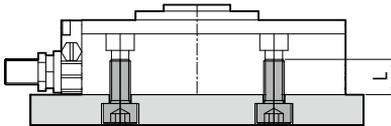
| Item  | Fastening Bolt | Max Torque (kgf-cm) |
|-------|----------------|---------------------|
| PRK16 | M6×1           | 81                  |
| PRK20 | M8×1.25        | 157                 |
| PRK25 | M10×1.5        | 360                 |

### 2. Installation by body tap holes



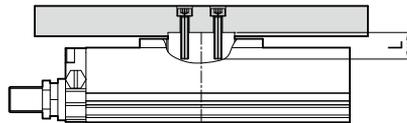
| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PRK16 | M5×0.8         | 51                  | 5.5                    |
| PRK20 | M6×1           | 81                  | 6                      |
| PRK25 | M8×1.25        | 157                 | 8                      |

### 3. Installation by body tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PRK16 | M8×1.25        | 157                 | 13                     |
| PRK20 | M10×1.5        | 360                 | 15                     |
| PRK25 | M12×1.75       | 670                 | 18                     |

### 4. Installation by table tap holes



| Item  | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|-------|----------------|---------------------|------------------------|
| PRK16 | M3×0.5         | 11                  | 5                      |
| PRK20 | M4×0.7         | 25                  | 6                      |
| PRK25 | M6×1           | 81                  | 9                      |



## Application

Suitable as line reversing or valve switch application in FA field.

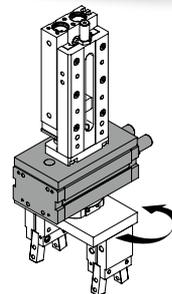
RACK & PINION STRUCTURE  
ROTARY CYLINDER

# PRC-S Series PRC-ST Series PRC-SH Series

Turntable type rotary cylinder with reduced height

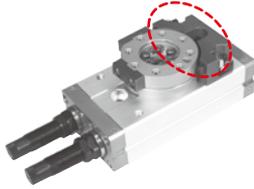


## Application



### External Stopper application (PRC-ST)

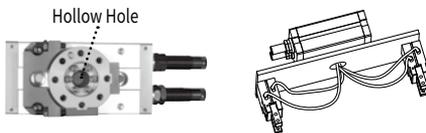
- Double **stopping power** by double piston inside.
- Easy precise angle adjustment.



### Hollow hole in turntable

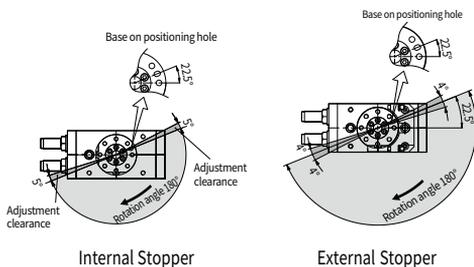
- Easy piping and wiring by hollow hole in turntable and cylinder body.

| Bore Size(Ø) | Hollow Hole Size (mm) |        |
|--------------|-----------------------|--------|
|              | PRC-S, PRC-ST         | PRC-SH |
| 16           | 5                     | 11     |
| 20           | 9                     | 13     |
| 25           | 12                    | 14     |
| 30           | 16                    | 16     |
| 40           | 20                    | 20     |
| 50           | 25                    | 25     |



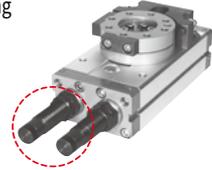
### Easy angle adjustment (Stopper control)

- Internal Stopper  
- Various angle control (0 ~ 190°)
- External Stopper & Shock Absorber  
- PRC-ST : ±4°, PRC-SH : ±3°



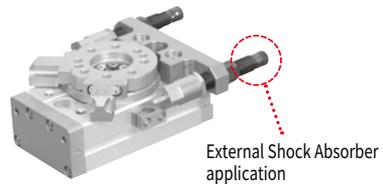
### Powerful shock absorbing performance

- **2~4 times** allowable kinetic energy than stopper bolt.
- Even though applied shock absorber, it is finally controlled by external stopper could gain 2 times stopping power.



### External Shock Absorber application (PRC-SH)

- **4~10 times** allowable kinetic energy than internal shock absorber.
- High performance shock absorbing.



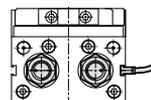
### Double rack and double torque

- Double torque performance by double **piston** inside.

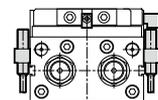


### Various options for Auto Switches

- Various optional Auto Switches for using conditions. (Magnetic, Proximity Sensor)



Magnetic Sensor



Proximity Sensor

※ PRC-S : magnetic sensor is applicable only.

# ROTARY CYLINDER

## PRC-S Series

### Features

- High torque rotary cylinder by rack & pinion structure with double pistons.
- Various ways of installation.
- Easy piping by central hollow hole.
- Shock Absorber for shock absorption installation. (Optional)
- Freely rotate angle control range within 0~190°.
- Auto Switch installation. (Optional)



### Order Form

## PRC 20S - 90 - E - A3 L S - SH2

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | ③ Rotating Angle<br>Order (=Rotating Angle(°))<br><br>90, 180 |
|-------|--------------|---|
| 16S   | 16           |   |
| 20S   | 20           |   |
| 22S   | 22           |   |
| 25S   | 25           |   |
| 30S   | 30           |   |
| 40S   | 40           |   |
| 50S   | 50           |   |

#### ④ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

#### ⑤ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |                |               |                |
| A3    | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B4    | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B4B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

#### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ⑧ Stopper Options

| Order | Stopper Options     |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

Accessory Order Form

(1) Shock Absorber

**PRC 20S - SH - ASSY**

①                      ②                      ③                      ④

① Series Name

③ Shock Absorber

② Cylinder Bore Size

④ Order Name for Accessory

- Based for only one set for single side of product.

Specification

| Item Name   | PRC16S  | PRC20S    | PRC22S    | PRC25S    | PRC30S    | PRC40S    | PRC50S    |
|---|---|-----------|-----------|-----------|-----------|-----------|-----------|
| CYL Bore Size(mm)   | 16  | 20        | 22        | 25        | 30        | 40        | 50        |
| Cushion(Shock Absorbing)  | Urethane Stopper / Shock Absorber                               |           |           |           |           |           |           |
| Angle Adjustment Range(°) <small>Note 2)</small>                          | 0 ~ 190 (Standard 180 + Clearance 10)                           |           |           |           |           |           |           |
| Effective Cushion Angle(kgf·cm)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 2×P   | 4×P       | 4.8×P     | 8.2×P     | 14.8×P    | 31×P      | 74×P      |
| Effective Torque (kgf·cm)   | Urethane Stopper  | 0.25      | 0.38      | 0.38      | 0.45      | 1.35      | 3.8       |
|   | Shock Absorber  | 2.2       | 4         | 4         | 5         | 24        | 103       |
| Fitting Size  | M5  |           |           | PT1/8     |           |           |           |
| Maximum Radial Load(kgf) <small>Note 3)</small>                           | 11  | 14        | 21        | 31        | 35        | 46        | 85        |
| Maximum Thrust Load(kgf)  | 6.5   | 9.3       | 10        | 16        | 17        | 20        | 44        |
| Weight(kgf)   | 0.65  | 1.18      | 1.29      | 2.14      | 3.17      | 6.03      | 12.00     |
| Rotation Time(sec/90°)  | 0.2 ~ 0.9   | 0.2 ~ 1.2 | 0.2 ~ 1.2 | 0.3 ~ 1.2 | 0.3 ~ 1.4 | 0.3 ~ 1.5 | 0.5 ~ 1.5 |
| Fluid   | Clean Air <small>Note 1)</small>                                |           |           |           |           |           |           |
| Pressure Range(kgf/cm <sup>2</sup> )                                      | 3 ~ 7   |           |           |           |           |           |           |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32) |           |           |           |           |           |           |
| Temperature Range(°C)   | 5 ~ 60  |           |           |           |           |           |           |
| Operation Type  | Double Acting (Structure : Rack & Pinion)                       |           |           |           |           |           |           |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10μm degree of filtering.

Note 2) Use the angle adjustment range within the minimum rotation angle that does not reduce energy efficiency.

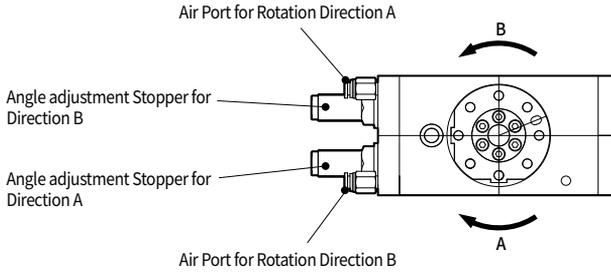
Note 3) Maximum radial load refers the allowable value at the end of turntable.

※ For detailed model selection, please refer <ROTARY CYLINDER Model Selection Guide>.

**ROTARY**

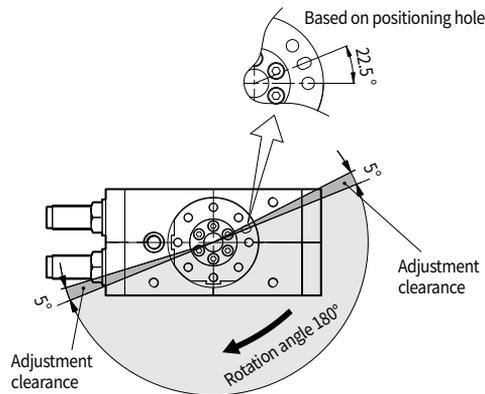
- PRC
- PRK
- PRC-S**
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

## Rotation Direction / Stopper Adjustment



- Above figure shows air port position and air cushion adjusting position for each direction.
- Rotation direction is marked based on the position hole of turntable.
- Angle adjustment Stopper is set at a random position. Readjust it as required for before use.
- If shock absorber selected as stopper option, stopper will be replaced by shock absorber.

## Rotation Angle Adjustment



- As shown in the figure, turn it to clockwise and then turn back to counter clockwise based on positioning hole.
- Angle can be set freely within 190° (Standard 180° and clearance angle 10°) as shown in the figure by side stopper.
- Such setting is available even with the mounting of internal shock absorber.
- It is highly recommended to use more than minimum rotation angle where energy efficiency is not degraded. (If the rotation stroke is shorter than the effective stroke of shock absorber, energy absorption power might be degraded)

※ Minimum rotation angle that has no degraded energy absorption capability

| CYL Bore                  | 16 | 20 | 22 | 25 | 30 | 40 | 50 |
|---------------------------|----|----|----|----|----|----|----|
| Minimum Rotation Angle(°) | 67 | 65 | 65 | 59 | 63 | 80 | 85 |

# PRC-S Series

16S

20S

22S

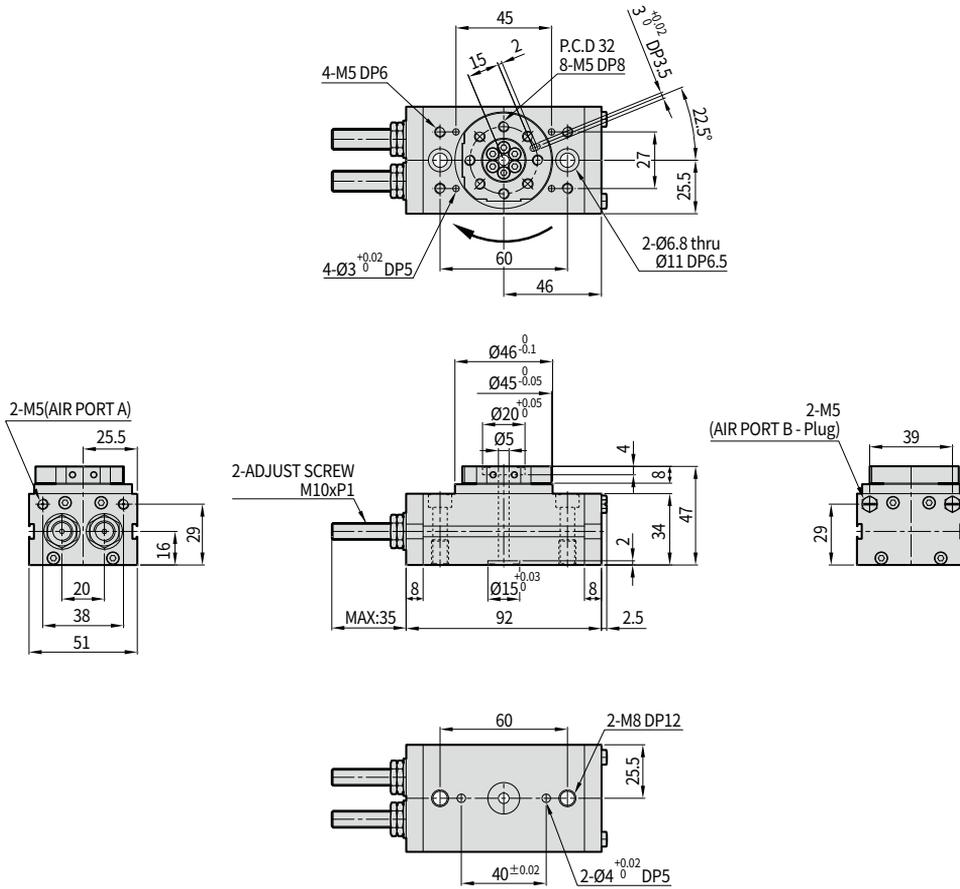
25S

30S

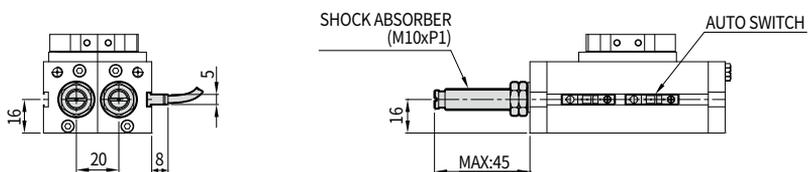
40S

50S

## PRC16S



## PRC16S Example of Auto Switch installation



ROTARY

PRC

PRK

PRC-S

PRC-ST

PRC-SH

PRY-S

PRC-H

PRD

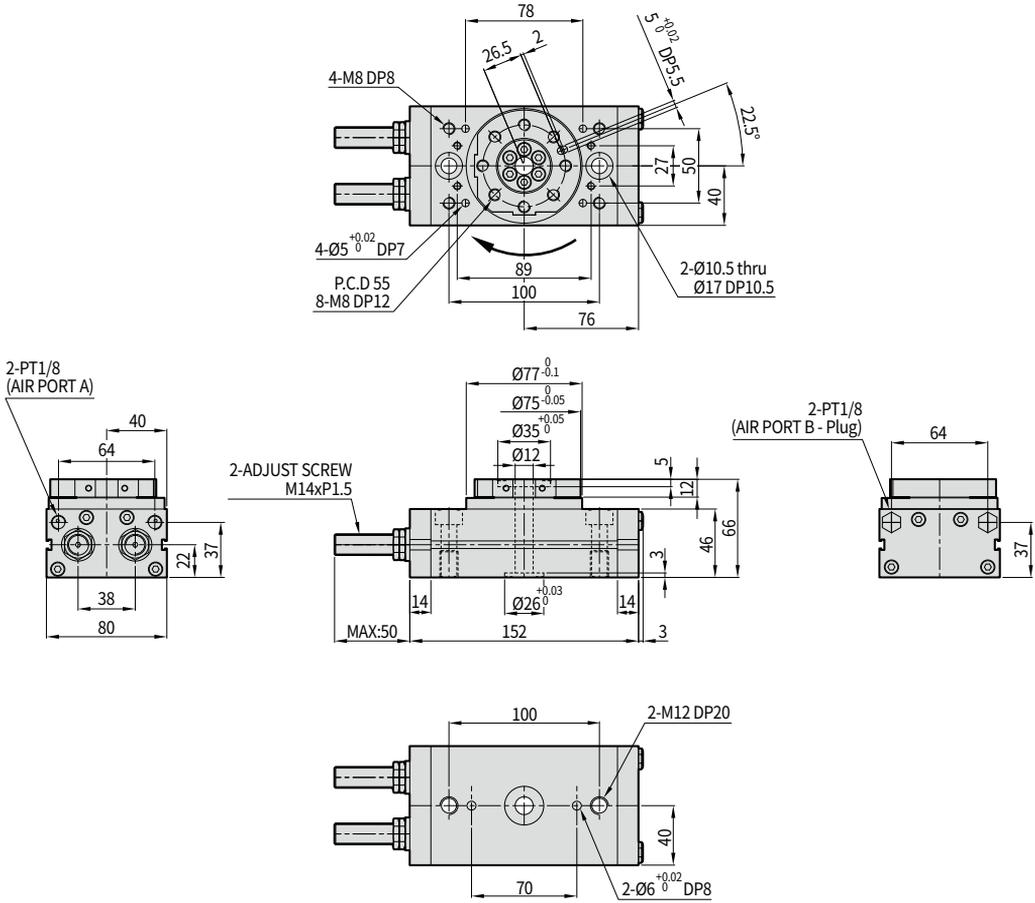




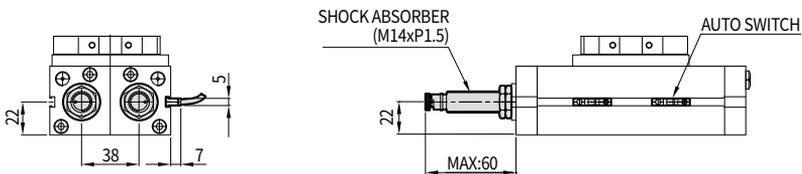
# PRC-S Series

16S 20S 22S **25S** 30S 40S 50S

## PRC25S



## PRC25S Example of Auto Switch installation





# PRC-S Series

16S

20S

22S

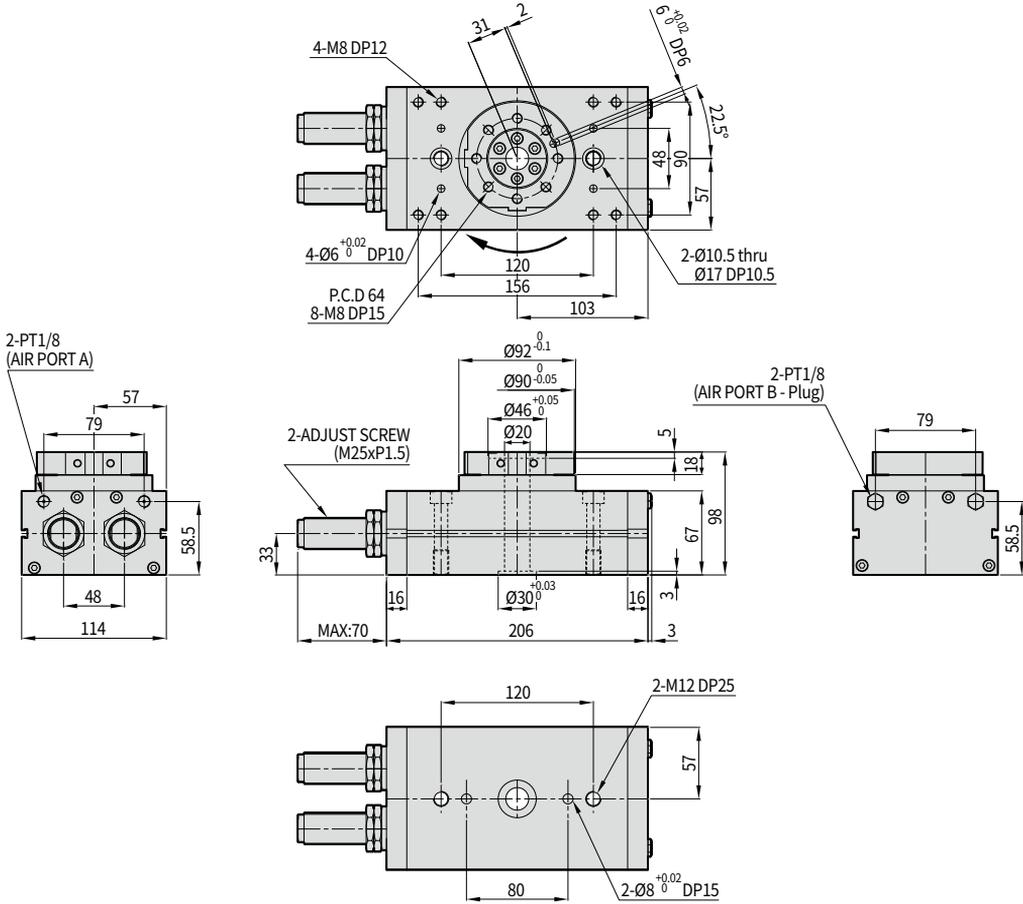
25S

30S

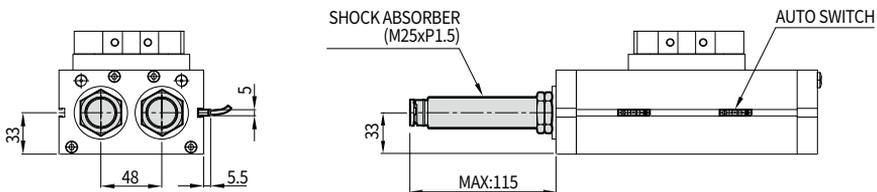
40S

50S

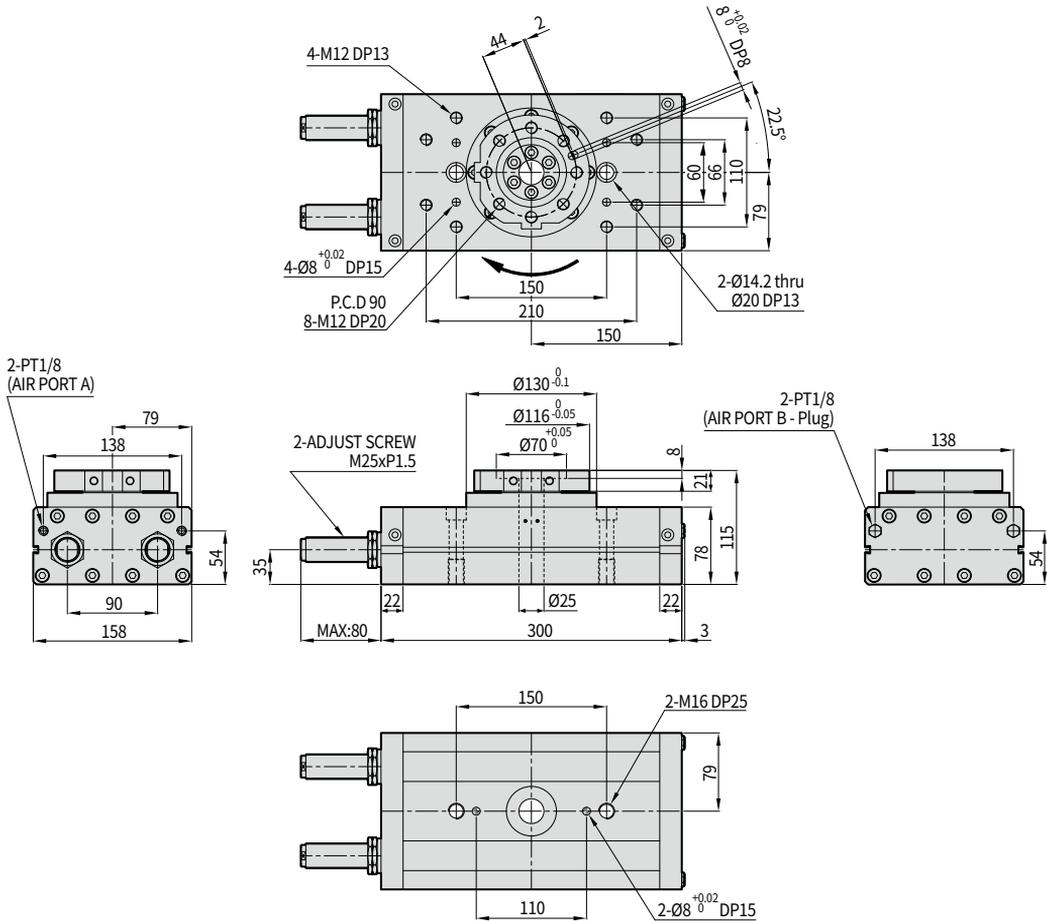
## PRC40S



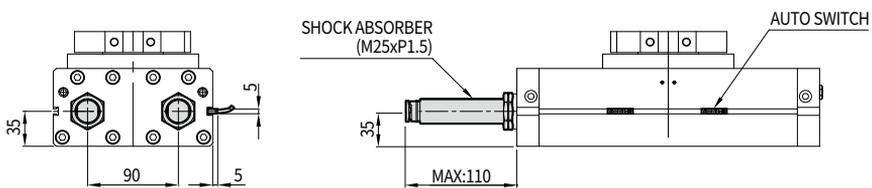
## PRC40S Example of Auto Switch installation



PRC50S



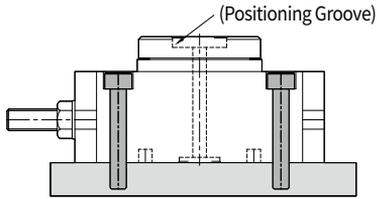
PRC50S Example of Auto Switch installation



ROTARY

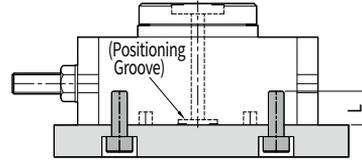
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

1. Installation by body through holes



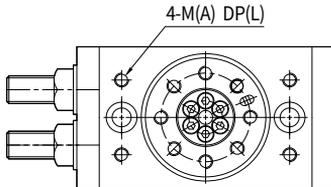
| Item   | Fastening Bolt | Max Torque (kgf·cm) |
|--------|----------------|---------------------|
| PRC16S | M6×P1          | 81                  |
| PRC20S | M8×P1.25       | 157                 |
| PRC22S | M8×P1.25       | 157                 |
| PRC25S | M10×P1.5       | 360                 |
| PRC30S | M10×P1.5       | 360                 |
| PRC40S | M10×P1.5       | 360                 |
| PRC50S | M14×P2         | 1067                |

2. Installation by body tap holes



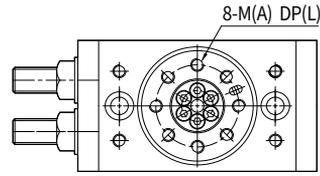
| Item   | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|--------|----------------|---------------------|------------------------|
| PRC16S | M8×P1.25       | 157                 | 12                     |
| PRC20S | M10×P1.5       | 360                 | 15                     |
| PRC22S | M10×P1.5       | 360                 | 14                     |
| PRC25S | M12×P1.75      | 670                 | 20                     |
| PRC30S | M12×P1.75      | 670                 | 18                     |
| PRC40S | M12×P1.75      | 670                 | 25                     |
| PRC50S | M16×P2         | 1650                | 25                     |

3. Installation by body tap holes



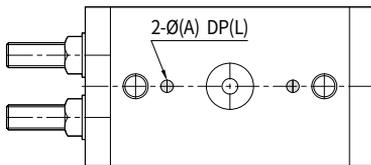
| Item   | Fastening Bolt A | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|--------|------------------|---------------------|------------------------|
| PRC16S | M5×P0.8          | 51                  | 7                      |
| PRC20S | M6×P1            | 81                  | 7                      |
| PRC22S | M6×P1            | 81                  | 7                      |
| PRC25S | M8×P1.25         | 157                 | 8                      |
| PRC30S | M8×P1.25         | 157                 | 8                      |
| PRC40S | M8×P1.25         | 157                 | 10                     |
| PRC50S | M12×P1.75        | 670                 | 12                     |

4. Installation by table tap holes



| Item   | Fastening Bolt A | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|--------|------------------|---------------------|------------------------|
| PRC16S | M5×P0.8          | 51                  | 8                      |
| PRC20S | M6×P1            | 81                  | 10                     |
| PRC22S | M6×P1            | 81                  | 10                     |
| PRC25S | M8×P1.25         | 157                 | 12                     |
| PRC30S | M8×P1.25         | 157                 | 15                     |
| PRC40S | M8×P1.25         | 157                 | 15                     |
| PRC50S | M12×P1.75        | 670                 | 20                     |

5. Cylinder body position determination



| Item   | Positioning Pin A | Depth for Pin Holes L (mm) |
|--------|-------------------|----------------------------|
| PRC16S | ∅4                | 5                          |
| PRC20S | ∅5                | 5                          |
| PRC22S | ∅5                | 6                          |
| PRC25S | ∅6                | 8                          |
| PRC30S | ∅6                | 10                         |
| PRC40S | ∅8                | 15                         |
| PRC50S | ∅8                | 15                         |



# ROTARY CYLINDER

## PRC-ST Series

### Features

- High torque rotary cylinder by rack & pinion structure with double pistons.
- Various ways of installation.
- Minimized backlash and double stopping power by external stopper.
- Easy piping by central hollow hole.
- Shock Absorber for shock absorption installation. (Optional)
- Auto Switch installation. (Optional)



### Order Form

**PRC 20ST - 90 - W - P L S - PNP - SH2**

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧      ⑨

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | ③ Rotating Angle<br>Order (=Rotating Angle(°)) |
|-------|--------------|--|
| 16ST  | 16           |  |
| 20ST  | 20           |  |
| 22ST  | 22           |  |
| 25ST  | 25           |  |
| 30ST  | 30           |  |
| 40ST  | 40           |  |
| 50ST  | 50           |  |

#### ③ Rotating Angle

#### ④ Bracket for Proximity Sensing Type Auto Switch

| Order | Bracket for Proximity Sensing Type Auto Switch |
|-------|--|
| Blank | Non-Mounted                                    |
| W     | Mounted  |

\* For "Blank", magnetic sensing Auto Switch is available.

#### ⑤ Auto Switch Specification

##### ※ Magnetic Sensing Auto Switch

| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |                |               |                |
| A3    | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B4    | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B4B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

##### ※ Proximity Auto Switch

| Order | Sensing Type | Cable Spec              |           | Voltage | Current   | Body Length | Sensing Distance | Frequency | Protect Level |
|-------|--------------|-------------------------|-----------|---------|-----------|-------------|------------------|-----------|---------------|
|       |              | Wires                   | Direction | DC      |           |             |                  |           |               |
| Blank |              | No Auto Switch provided |           |         |           |             |                  |           |               |
| P     | Proximity    | 3-Wire                  | Horiz     | 10~30V  | Max 200mA | 32mm        | 1mm ± 10%        | 800Hz     | IP 67         |

⑥ Magnetic Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

\* Proximity auto switch cable length is 2m. Please contact to office if needs longer.

⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

⑧ Proximity Auto Switch Output

| Order | Output |
|-------|--------|
| Blank | NPN    |
| PNP   | PNP    |

⑨ Stopper Options

| Order | Stopper             |
|-------|---------------------|
| Blank | Urethane Stopper    |
| SH1   | Shock Absorber 1PCS |
| SH2   | Shock Absorber 2PCS |

**Accessory Order Form**

**(1) Shock Absorber**

**PRC 20ST - SH - ASSY**

①                      ②                      ③                      ④

① Series Name

② Cylinder Bore Size

③ Shock Absorber

④ Order Name for Accessory  
 - All package of protect cover for Shock Absorber.  
 - Based for only one set for single side of product.

**(2) Bracket for Proximity Sensing Type Auto Switch**

**PRC 20ST - W - ASSY**

①                      ②                      ③                      ④

① Series Name

② Cylinder Bore Size

③ Bracket for Proximity Sensing Type Auto Switch

④ Order Name for Accessory  
 - Based for only one set for single side of product.

**Specification**

| Item Name   | PRC16ST   | PRC20ST   | PRC22ST   | PRC25ST   | PRC30ST   | PRC40ST   | PRC50ST   |
|---|---|-----------|-----------|-----------|-----------|-----------|-----------|
| CYL Bore Size(mm)   | 16  | 20        | 22        | 25        | 30        | 40        | 50        |
| Angle Adjustment Range(°) <small>Note 2)</small>                          | Standard (90, 180) + Clearance (8)                              |           |           |           |           |           |           |
| Cushion(Shock Absorbing)  | Urethane Stopper / Shock Absorber                               |           |           |           |           |           |           |
| Effective Cushion Angle(kgf·cm)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 2×P   | 4×P       | 4.8×P     | 8.2×P     | 14.8×P    | 31×P      | 74×P      |
| Effective Torque (kgf·cm)   | Urethane Stopper  | 0.25      | 0.38      | 0.38      | 0.45      | 1.35      | 3.8       |
|   | Shock Absorber  | 2.2       | 4         | 4         | 5         | 24        | 103       |
| Fitting Size  | M5  |           |           | PT1/8     |           |           |           |
| Maximum Radial Load(kgf) <small>Note 3)</small>                           | 11  | 14        | 21        | 31        | 35        | 46        | 85        |
| Maximum Thrust Load(kgf)  | 6.5   | 9.3       | 10        | 16        | 17        | 20        | 44        |
| Weight(kgf)   | 0.69  | 1.27      | 1.39      | 2.29      | 3.43      | 6.44      | 12.90     |
| Rotation Time(sec/90°)  | 0.2 ~ 0.9   | 0.2 ~ 1.2 | 0.2 ~ 1.2 | 0.3 ~ 1.2 | 0.3 ~ 1.4 | 0.3 ~ 1.5 | 0.5 ~ 1.5 |
| Fluid   | Clean Air <small>Note 1)</small>                                |           |           |           |           |           |           |
| Pressure Range(kgf/cm <sup>2</sup> )                                      | 3 ~ 7   |           |           |           |           |           |           |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32) |           |           |           |           |           |           |
| Temperature Range(°C)   | 5 ~ 60  |           |           |           |           |           |           |
| Operation Type  | Double Acting (Structure : Rack & Pinion)                       |           |           |           |           |           |           |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

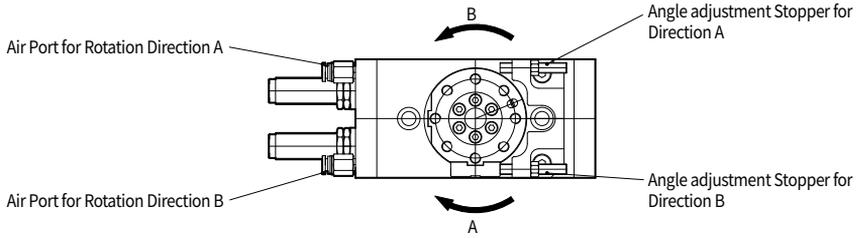
Note 2) Use the angle adjustment range within the minimum rotation angle that does not reduce energy efficiency.

Note 3) Maximum radial load refers the allowable value at the end of turntable.

※ For detailed model selection, please refer <ROTARY CYLINDER Model Selection Guide>.

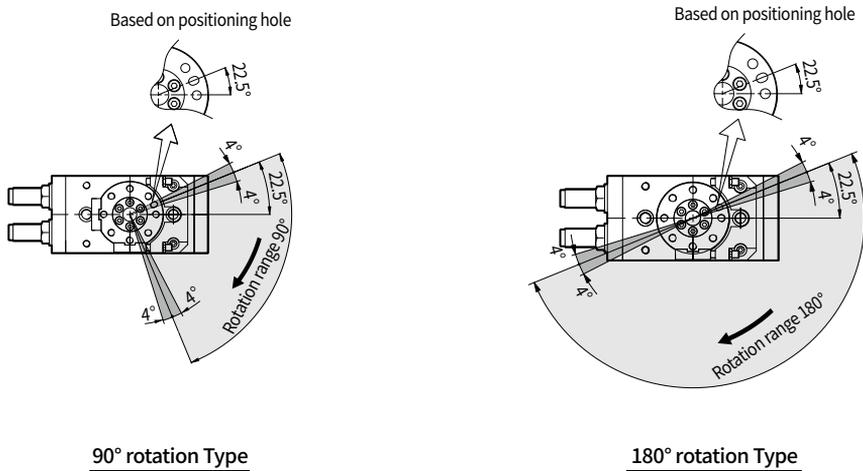


## Rotation Direction / Stopper Adjustment



- Above figure shows air port position and air cushion adjusting position for each direction.
- Rotation direction is marked based on the position hole of turntable.
- Angle adjustment Stopper is set at a random position. Readjust it as required for before use.
- If shock absorber selected as stopper option, stopper will be replaced by shock absorber.

## Rotation Angle Adjustment



- As shown in the figure, turn it to clockwise and then turn back to counter clockwise based on positioning hole.
- Rotation angle adjustment range is  $\pm 4$  at the end of rotation only as above figure shown.

# PRC-ST Series

16ST

20ST

22ST

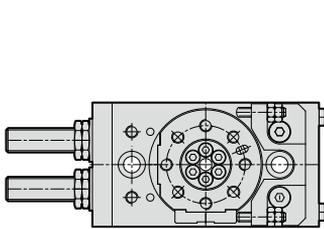
25ST

30ST

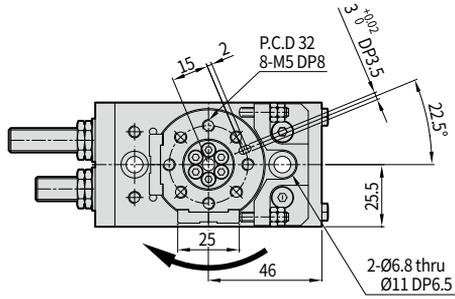
40ST

50ST

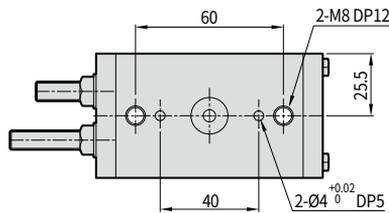
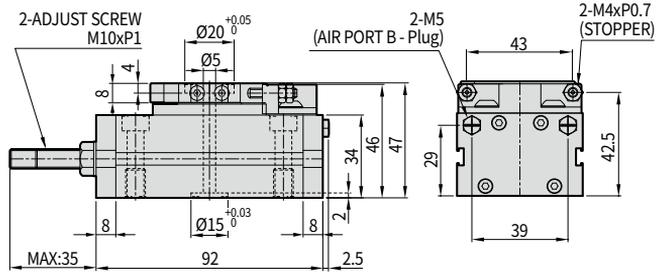
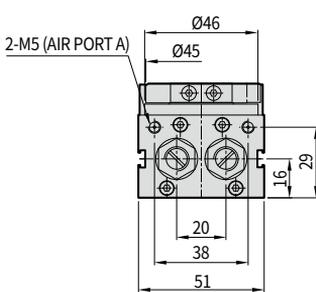
## PRC16ST



180° Type

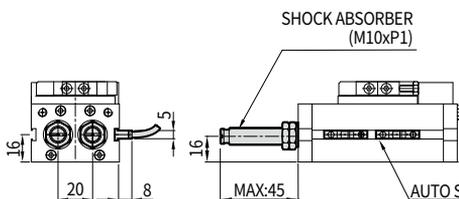


90° Type

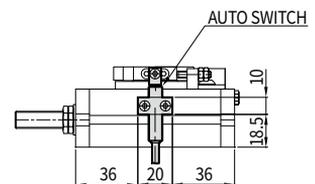


## PRC16ST Example of Auto Switch installation

### 1. MAGNETIC SENSOR



### 2. PROXIMITY SENSOR



ROTARY

- PRC
- PRK
- PRC-S
- PRC-ST**
- PRC-SH
- PRY-S
- PRC-H
- PRD

# PRC-ST Series

16ST

20ST

22ST

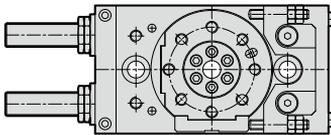
25ST

30ST

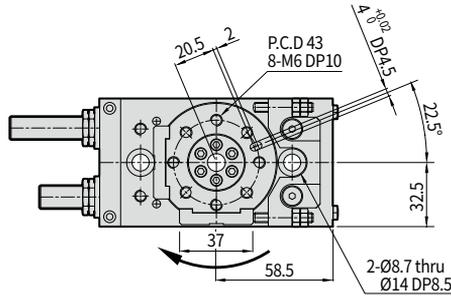
40ST

50ST

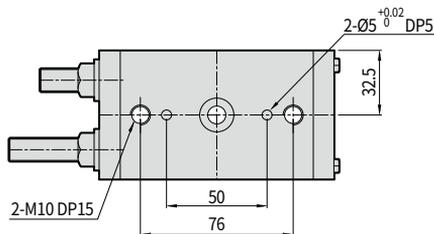
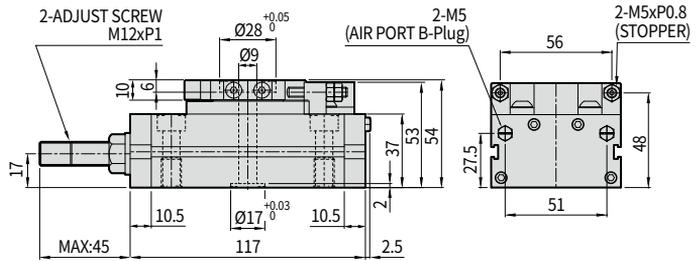
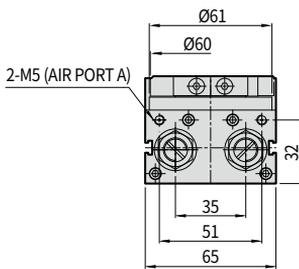
## PRC20ST



180° Type

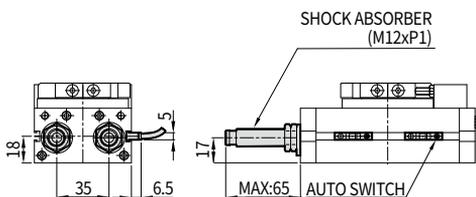


90° Type

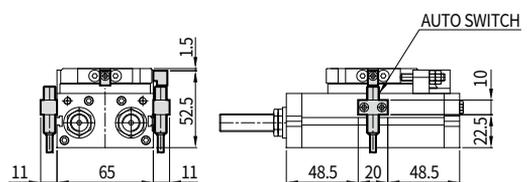


## PRC20ST Example of Auto Switch installation

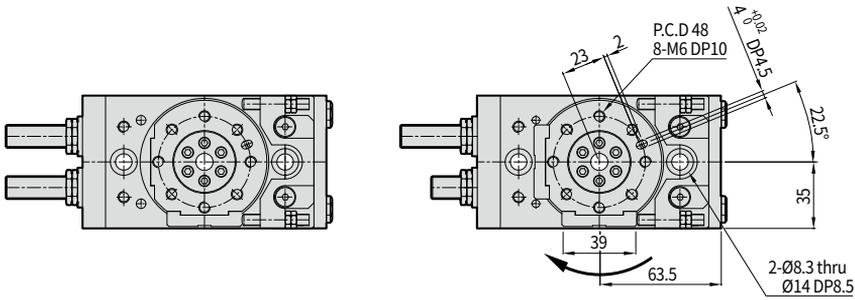
### 1. MAGNETIC SENSOR



### 2. PROXIMITY SENSOR

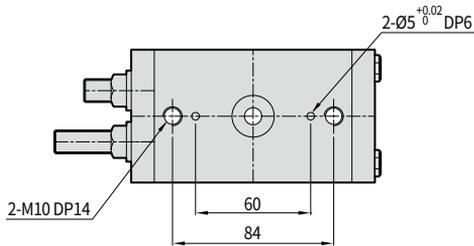
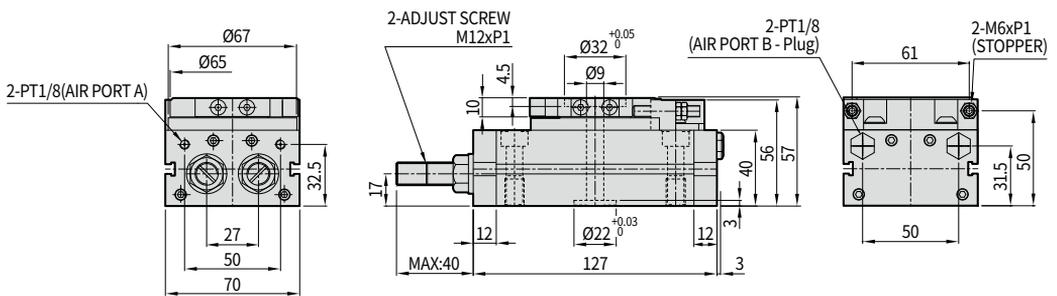


PRC22ST



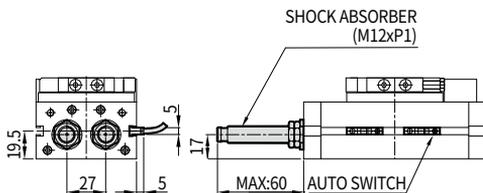
180° Type

90° Type

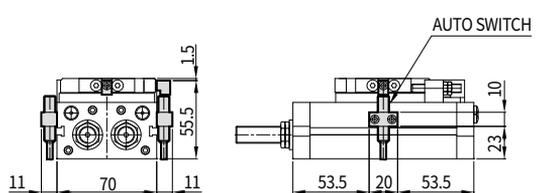


PRC22ST Example of Auto Switch installation

1. MAGNETIC SENSOR

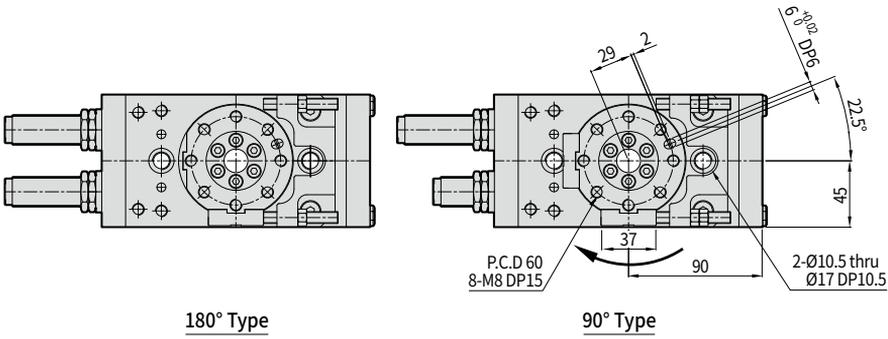


2. PROXIMITY SENSOR



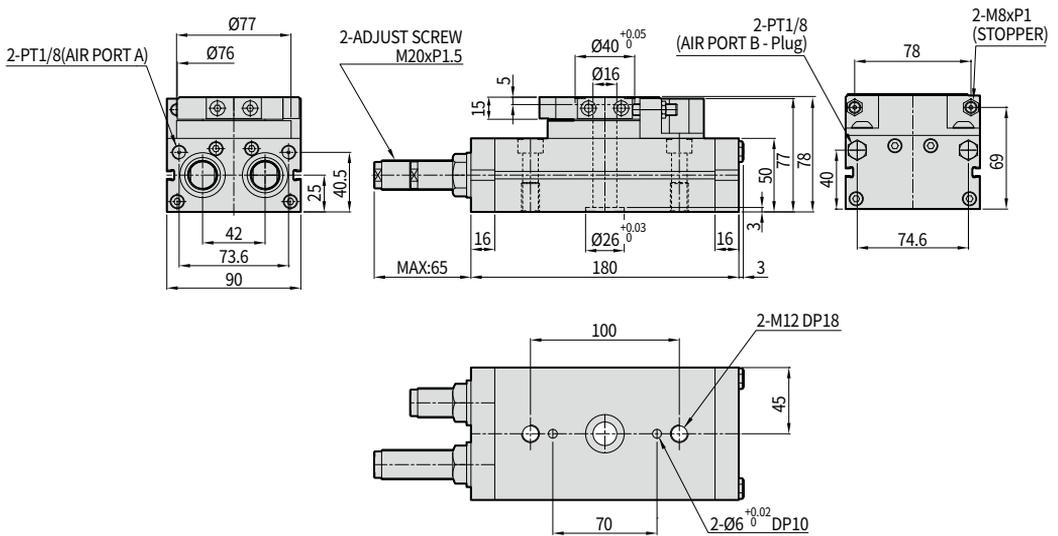


PRC30ST



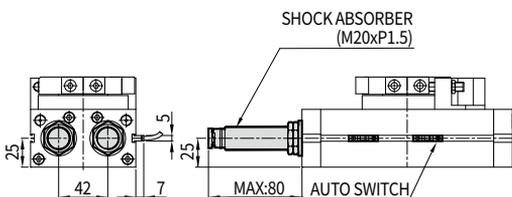
180° Type

90° Type

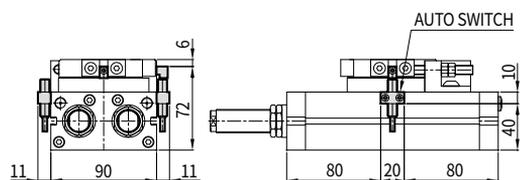


PRC30ST Example of Auto Switch installation

1. MAGNETIC SENSOR



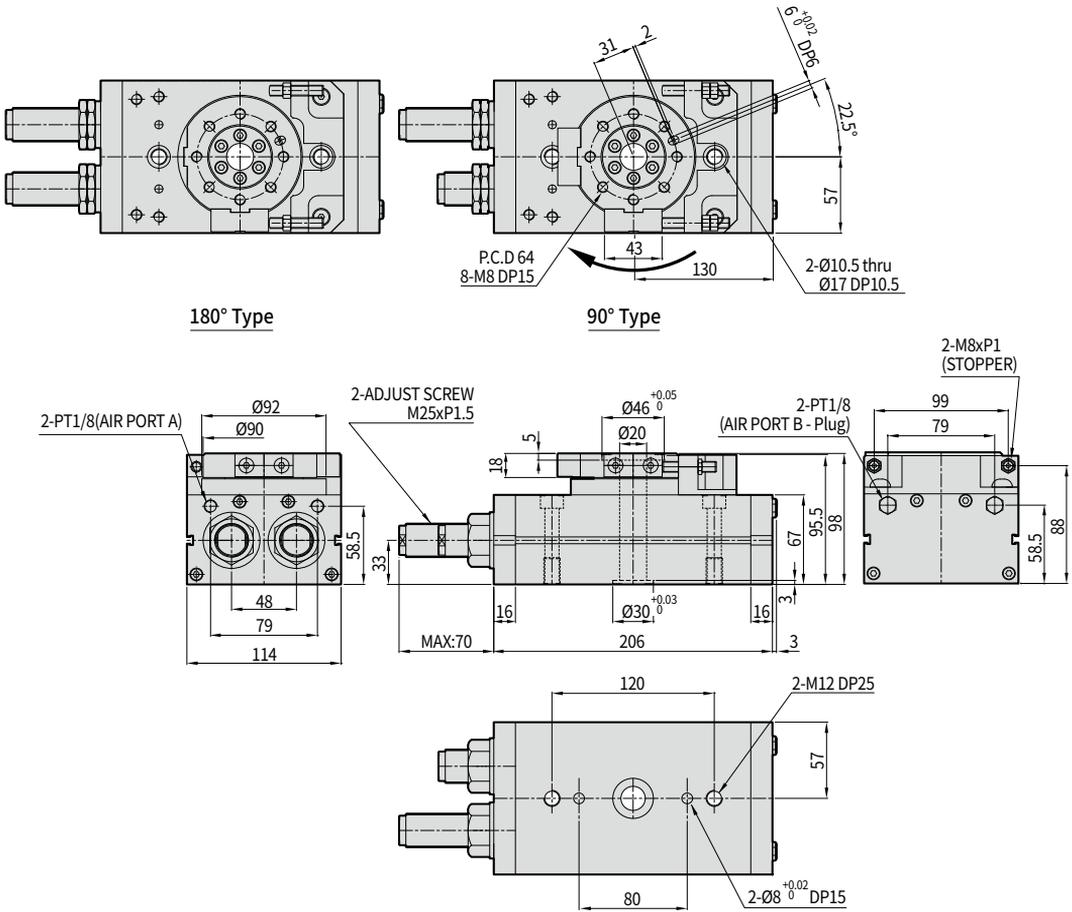
2. PROXIMITY SENSOR



# PRC-ST Series

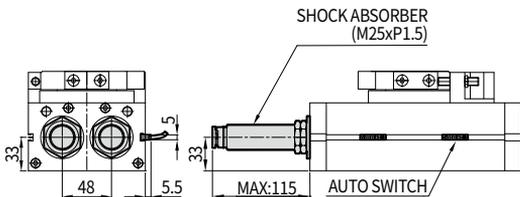
16ST 20ST 22ST 25ST 30ST **40ST** 50ST

## PRC40ST

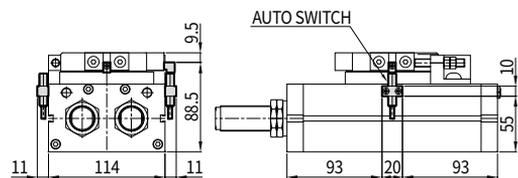


## PRC40ST Example of Auto Switch installation

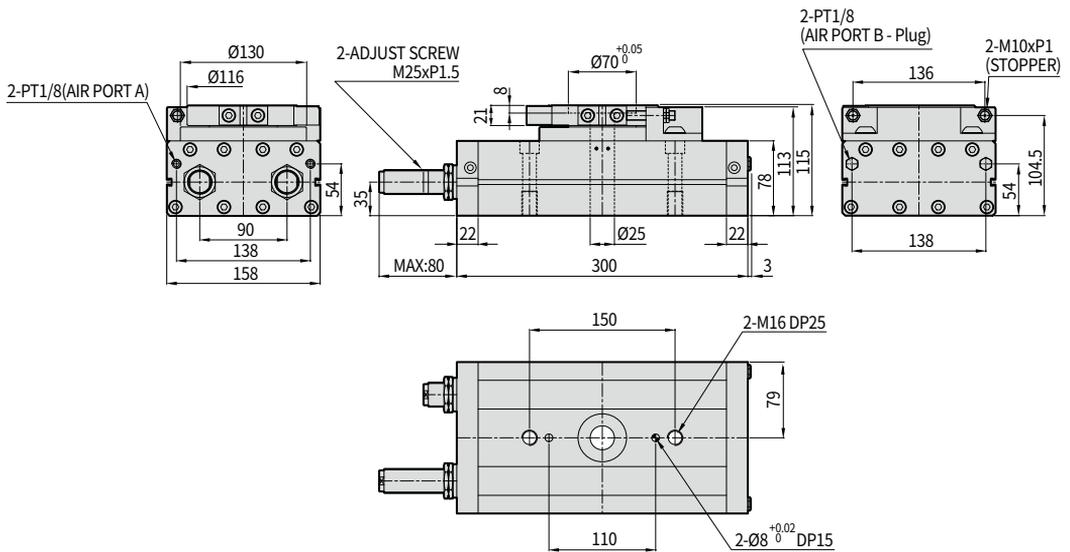
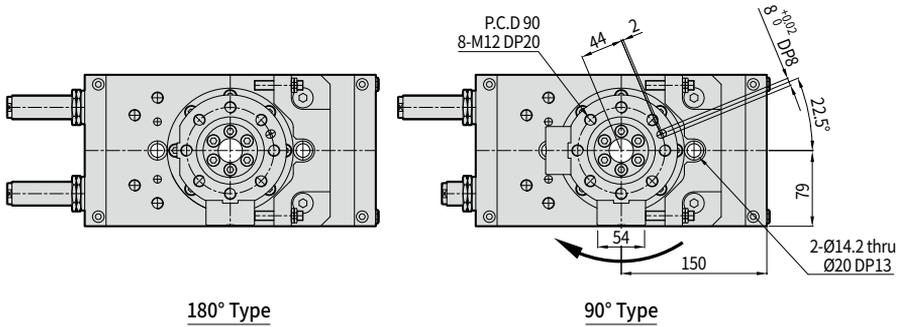
### 1. MAGNETIC SENSOR



### 2. PROXIMITY SENSOR



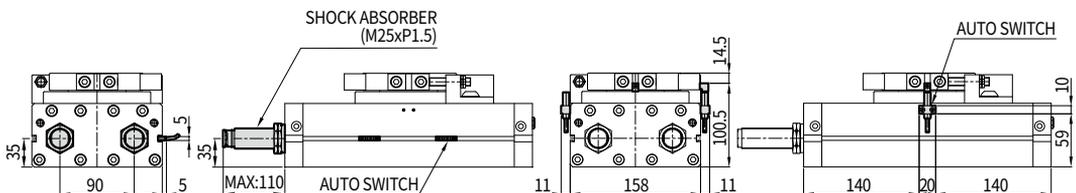
PRC50ST



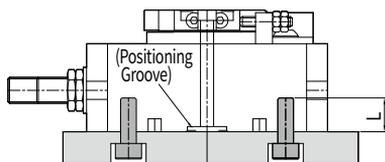
PRC50ST Example of Auto Switch installation

1. MAGNETIC SENSOR

2. PROXIMITY SENSOR

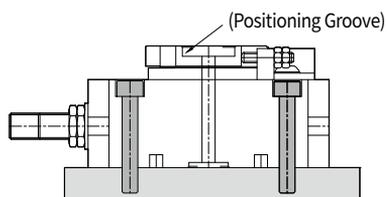


### 1. Installation by body tap holes



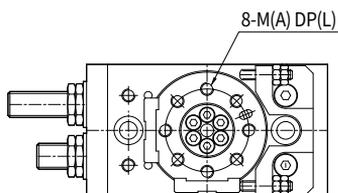
| Item    | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PRC16ST | M8×P1.25       | 157                 | 12                     |
| PRC20ST | M10×P1.5       | 360                 | 15                     |
| PRC22ST | M10×P1.5       | 360                 | 14                     |
| PRC25ST | M12×P1.75      | 670                 | 20                     |
| PRC30ST | M12×P1.75      | 670                 | 18                     |
| PRC40ST | M12×P1.75      | 670                 | 25                     |
| PRC50ST | M16×P2         | 1650                | 25                     |

### 2. Installation by body through holes



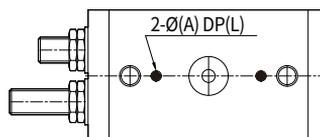
| Item    | Fastening Bolt | Max Torque (kgf-cm) |
|---------|----------------|---------------------|
| PRC16ST | M6×P1          | 81                  |
| PRC20ST | M8×P1.25       | 157                 |
| PRC22ST | M8×P1.25       | 157                 |
| PRC25ST | M10×P1.5       | 360                 |
| PRC30ST | M10×P1.5       | 360                 |
| PRC40ST | M10×P1.5       | 360                 |
| PRC50ST | M14×P2         | 1067                |

### 3. Installation by table tap holes



| Item    | Fastening Bolt A | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|---------|------------------|---------------------|------------------------|
| PRC16ST | M5×P0.8          | 51                  | 8                      |
| PRC20ST | M6×P1            | 81                  | 10                     |
| PRC22ST | M6×P1            | 81                  | 10                     |
| PRC25ST | M8×P1.25         | 157                 | 12                     |
| PRC30ST | M8×P1.25         | 157                 | 15                     |
| PRC40ST | M8×P1.25         | 157                 | 15                     |
| PRC50ST | M12×P1.75        | 670                 | 20                     |

### 4. Cylinder body position determination



| Item    | Positioning Pin A | Depth for Pin Holes L (mm) |
|---------|-------------------|----------------------------|
| PRC16ST | Ø4                | 5                          |
| PRC20ST | Ø5                | 5                          |
| PRC22ST | Ø5                | 6                          |
| PRC25ST | Ø6                | 8                          |
| PRC30ST | Ø6                | 10                         |
| PRC40ST | Ø8                | 15                         |
| PRC50ST | Ø8                | 15                         |

MEMO

Horizontal dotted lines for writing.

|               |
|---------------|
| ROTARY        |
| PRC           |
| PRK           |
| PRC-S         |
| <b>PRC-ST</b> |
| PRC-SH        |
| PRY-S         |
| PRC-H         |
| PRD           |

# ROTARY CYLINDER

## PRC-SH Series

### Features

- High torque rotary cylinder by rack & pinion structure with double pistons.
- Improved shock absorption and stopping power by basically mounted external shock absorber.
- Precise angle adjustment by direct controlling of turntable.
- Improved durability of shock absorber by mounting stopper holder.
- Enlarged central hollow hole for more convenience easy piping and wiring.
- Various Auto Switch installation. (Optional)



### Order Form

## PRC 16SH - 90 - W - P L S - PNP

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | ③ Rotating Angle<br>Order (=Rotating Angle(°)) |
|-------|--------------|--|
| 16SH  | 16           |  |
| 20SH  | 20           |  |
| 25SH  | 25           |  |
| 30SH  | 30           |  |
| 40SH  | 40           |  |
| 50SH  | 50           | 90, 180  |

#### ④ Bracket for Proximity Sensing Type Auto Switch

| Order | Bracket for Proximity Sensing Type Auto Switch |
|-------|--|
| Blank | Non-Mounted                                    |
| W     | Mounted  |

\* For "Blank", magnetic sensing Auto Switch is available.

#### ⑤ Auto Switch Specification

##### ※ Magnetic Sensing Auto Switch

| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |                |               |                |
| A3    | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B4    | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B4B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

##### ※ Proximity Auto Switch

| Order | Sensing Type | Cable Spec              |           | Voltage DC | Current   | Body Length | Sensing Distance | Frequency | Protect Level |
|-------|--------------|-------------------------|-----------|------------|-----------|-------------|------------------|-----------|---------------|
|       |              | Wires                   | Direction |            |           |             |                  |           |               |
| Blank |              | No Auto Switch provided |           |            |           |             |                  |           |               |
| P     | Proximity    | 3-Wire                  | Horiz     | 10~30V     | Max 200mA | 32mm        | 1mm ± 10%        | 800Hz     | IP 67         |

#### ⑥ Magnetic Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

\* Proximity auto switch cable length is 2m. Please contact to office if needs longer.

#### ⑦ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ⑧ Proximity Auto Switch Output

| Order | Output |
|-------|--------|
| Blank | NPN    |
| PNP   | PNP    |

Accessory Order Form

(1) Shock Absorber

**PRC 16SH - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

(2) Shock Absorber CAP

**PRC 16SH - CB - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber CAP
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

(3) External Stopper Package

**PRC 16SH - ESA - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ External Stopper Package
- ④ Order Name for Accessory  
- Included 2 sets of Shock Absorber. (with Protect CAP)  
- Based for 1 piece of product.

Specification

| Item Name   | PRC16SH   | PRC20SH   | PRC25SH   | PRC30SH   | PRC40SH   | PRC50SH   |
|---|---|-----------|-----------|-----------|-----------|-----------|
| CYL Bore Size(mm)   | 16  | 20        | 25        | 30        | 40        | 50        |
| Rotating Angle(°)   | 90, 180 (Clearance : ±3°)                                       |           |           |           |           |           |
| Cushion(Shock Absorbing)  | External Shock Absorber as Standard                             |           |           |           |           |           |
| Effective Cushion Angle(kgf·cm)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 2.5×P   | 4.8×P     | 8.2×P     | 14.8×P    | 31.7×P    | 74×P      |
| Effective Torque(kgf·cm)  | 3.7   | 7         | 9         | 32        | 72        | 112       |
| Maximum Radial Load(kgf) <small>Note 2)</small>                           | 22  | 22        | 48        | 35        | 46        | 85        |
| Maximum Thrust Load(kgf)  | 8.6   | 8.4       | 16        | 17        | 20        | 44        |
| Weight(kgf)   | 0.76  | 1.40      | 2.52      | 3.77      | 7.73      | 15.48     |
| Rotation Time(sec/90°)  | 0.2 ~ 0.9   | 0.2 ~ 1.2 | 0.3 ~ 1.2 | 0.3 ~ 1.4 | 0.3 ~ 1.5 | 0.5 ~ 1.5 |
| Fitting Size  | M5  |           | PT1/8     |           |           |           |
| Fluid   | Clean Air <small>Note 1)</small>                                |           |           |           |           |           |
| Pressure Range(kgf/cm <sup>2</sup> )                                      | 3 ~ 7   |           |           |           |           |           |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32) |           |           |           |           |           |
| Temperature Range(°C)   | 5 ~ 60  |           |           |           |           |           |
| Operation Type  | Double Acting (Structure : Rack & Pinion)                       |           |           |           |           |           |

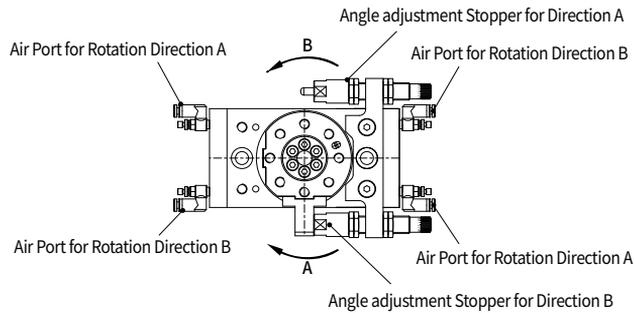
Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Maximum radial load refers the allowable value at the end of turntable.

※ For detailed model selection, please refer <ROTARY CYLINDER Model Selection Guide>.

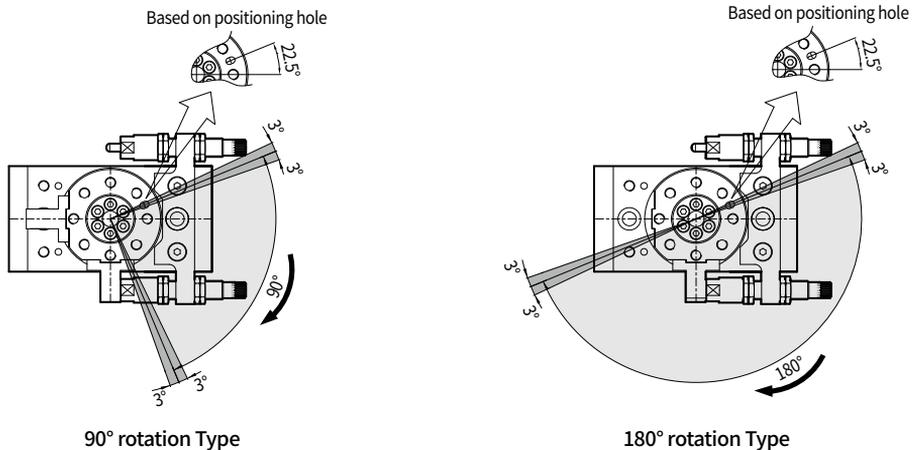


## Rotation Direction / Stopper Adjustment



- Above figure shows air port position and air stopper(Shock Absorber) adjusting position for each direction.
- Rotation direction is marked based on the position hole of turntable.
- Note that the direction of rotation is different depending on the air port position at left and right.
- Initially, the right air port is sealed with a plug as shown above. If you need to use the right side air port, unscrew the right plug and make sure assemble it to the left port before use.
- Angle adjustment Stopper is set at a random position. Readjust it as required for before use.

## Rotation Angle Adjustment

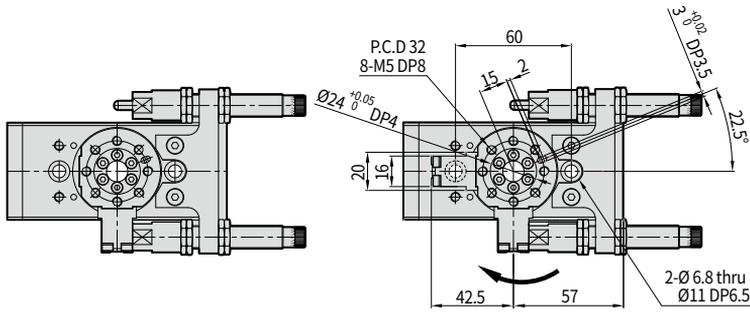


- As shown in the figure, turn it to clockwise and then turn back to counter clockwise based on positioning hole.
- Rotation angle adjustment range is about  $\pm 3$  at the end of rotation. Please note that damage to the stopper and shock absorber may occur if the angle is used beyond the adjustable angle.
- The range from which the cushion starts at the end of rotation is approximately 11° to 16° for each product based on the standard angle.
- For smooth rotation, appropriately adjust the impact speed of the shock absorber according to the work size and rotation speed.

# PRC-SH Series

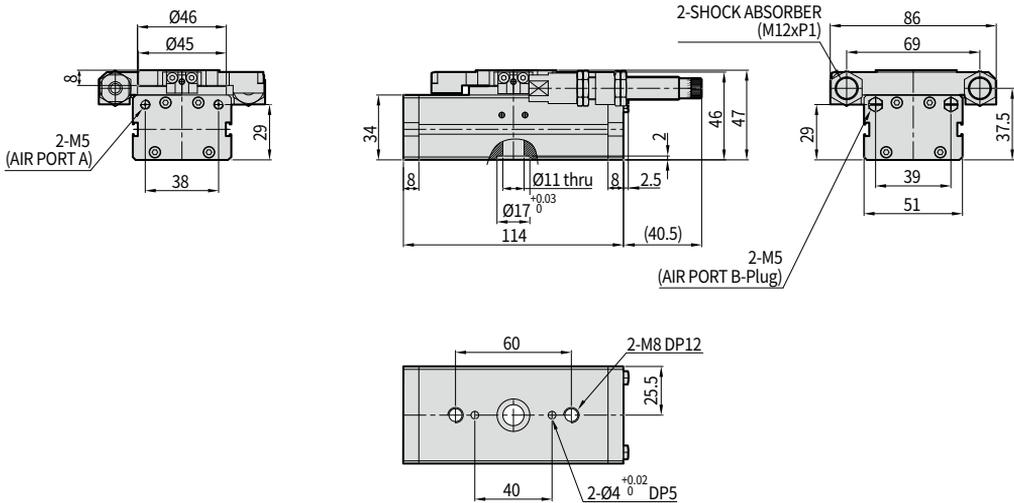
- 16SH
- 20SH
- 25SH
- 30SH
- 40SH
- 50SH

## PRC16SH



180° Type

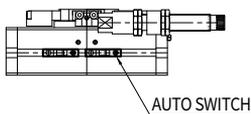
90° Type



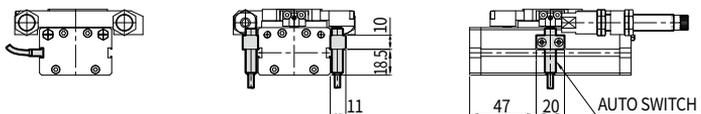
- ROTARY
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

## PRC16SH Example of Auto Switch installation

### 1. MAGNETIC SENSOR



### 2. PROXIMITY SENSOR



# PRC-SH Series

16SH

20SH

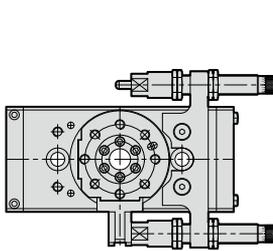
25SH

30SH

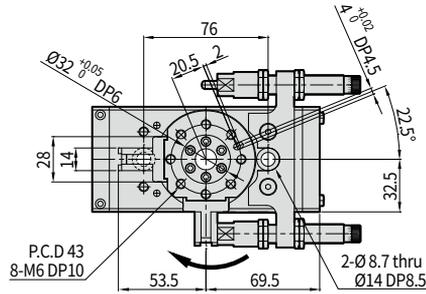
40SH

50SH

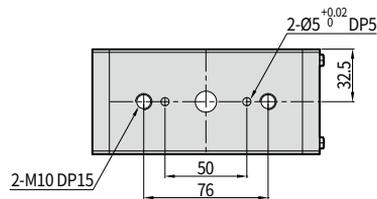
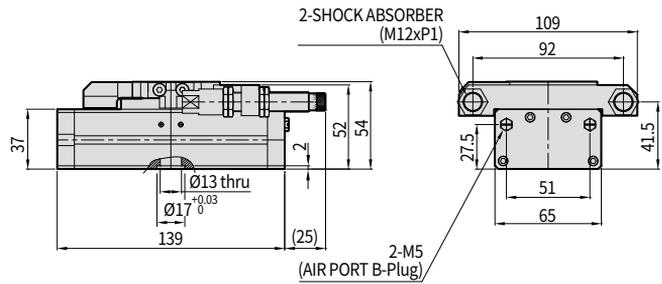
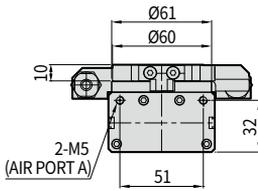
## PRC20SH



180° Type

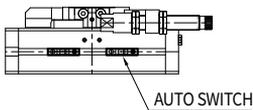


90° Type

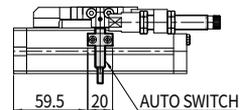
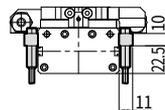
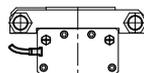


## PRC20SH Example of Auto Switch installation

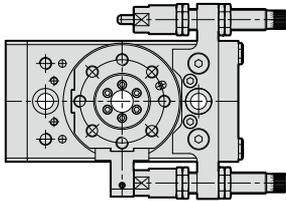
### 1. MAGNETIC SENSOR



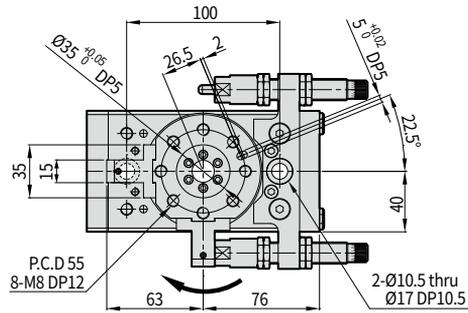
### 2. PROXIMITY SENSOR



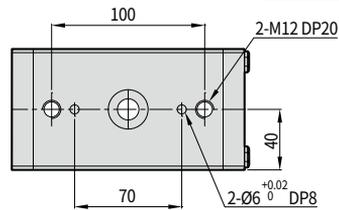
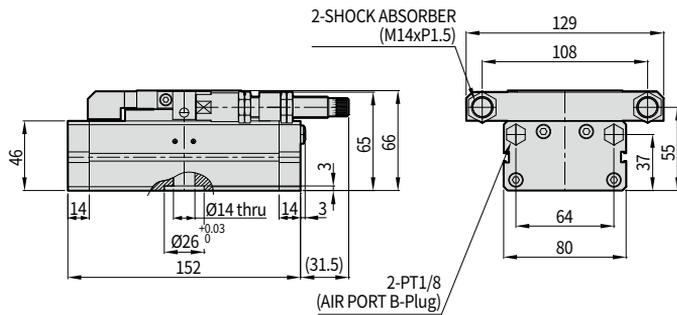
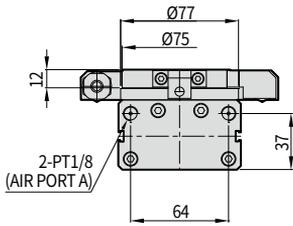
PRC25SH



180° Type



90° Type

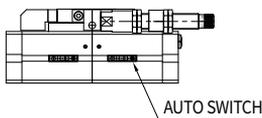


ROTARY

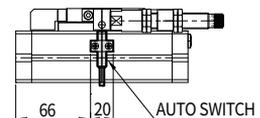
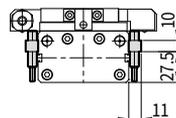
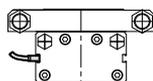
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

PRC25SH Example of Auto Switch installation

1. MAGNETIC SENSOR



2. PROXIMITY SENSOR



# PRC-SH Series

16SH

20SH

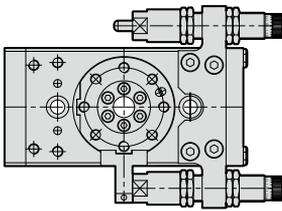
25SH

**30SH**

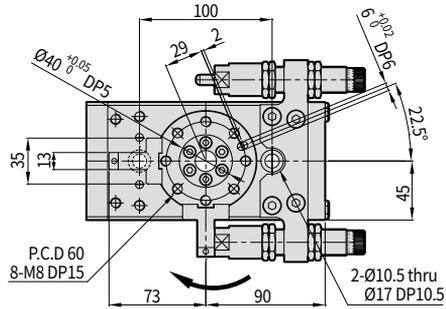
40SH

50SH

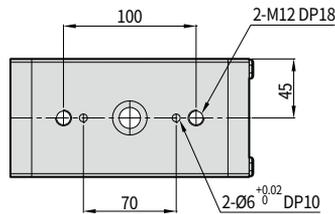
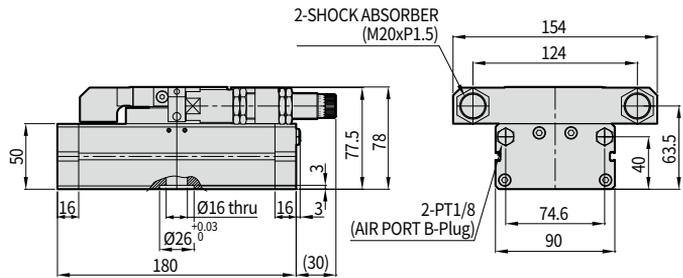
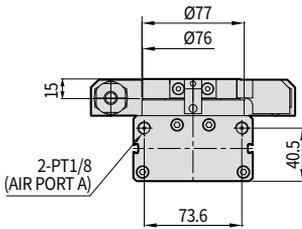
## PRC30SH



180° Type

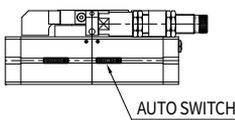


90° Type

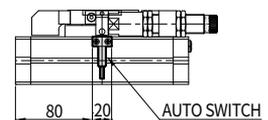
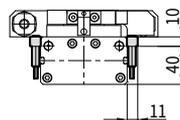
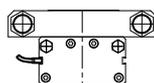


## PRC30SH Example of Auto Switch installation

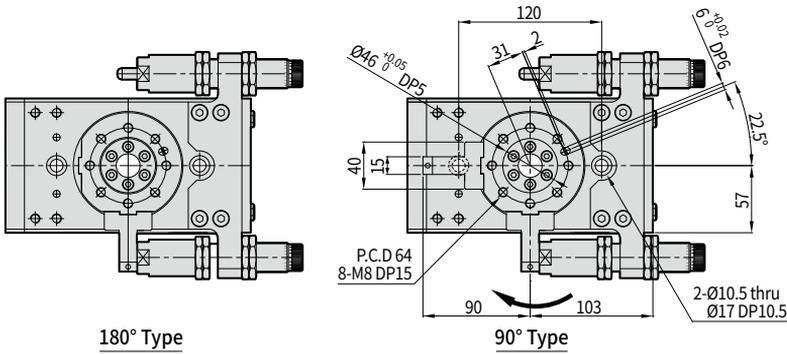
### 1. MAGNETIC SENSOR



### 2. PROXIMITY SENSOR

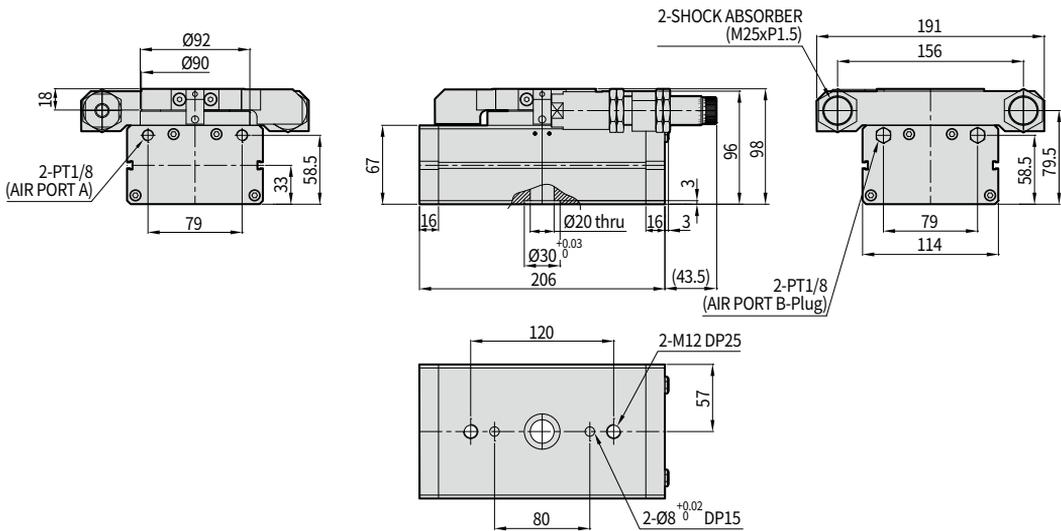


PRC40SH



180° Type

90° Type

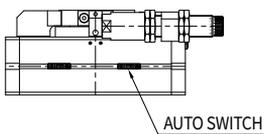


ROTARY

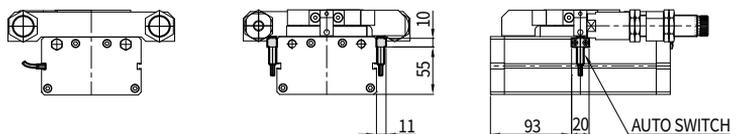
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

PRC40SH Example of Auto Switch installation

1. MAGNETIC SENSOR



2. PROXIMITY SENSOR



# PRC-SH Series

16SH

20SH

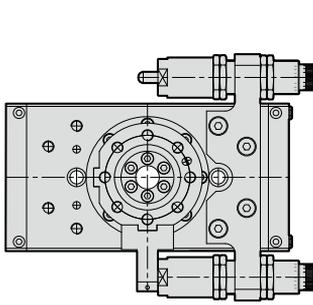
25SH

30SH

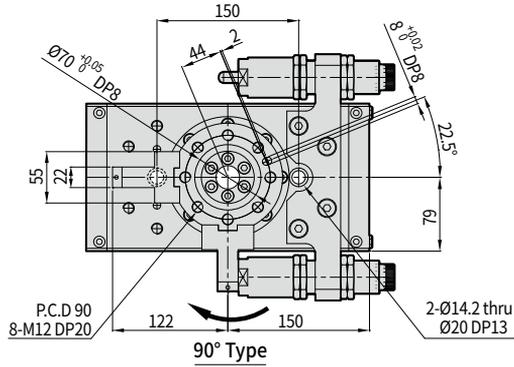
40SH

50SH

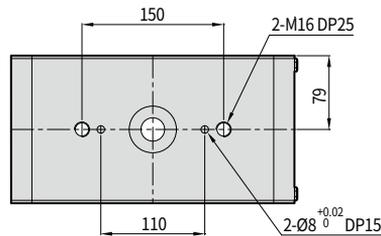
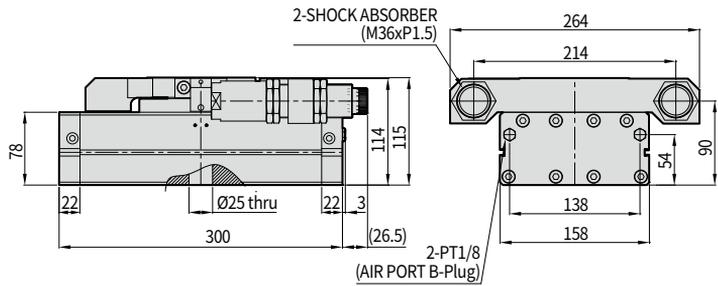
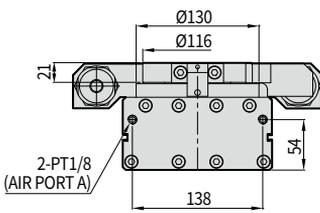
## PRC50SH



180° Type

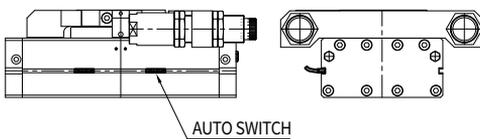


90° Type

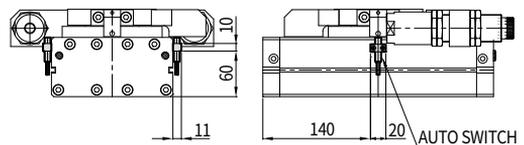


## PRC50SH Example of Auto Switch installation

### 1. MAGNETIC SENSOR

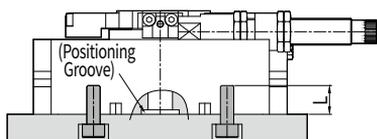


### 2. PROXIMITY SENSOR



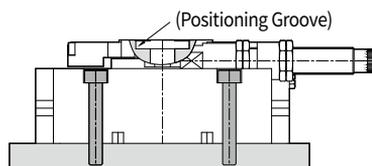
Installation Information

1. Installation by body tap holes



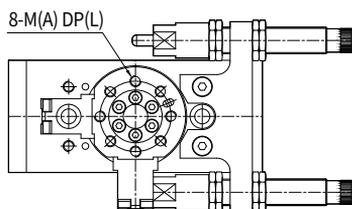
| Item    | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PRC16SH | M8×P1.25       | 157                 | 12                     |
| PRC20SH | M10×P1.5       | 360                 | 15                     |
| PRC25SH | M10×P1.5       | 360                 | 14                     |
| PRC30SH | M12×P1.75      | 670                 | 20                     |
| PRC40SH | M12×P1.75      | 670                 | 25                     |
| PRC50SH | M16×P2         | 1650                | 25                     |

2. Installation by body through holes



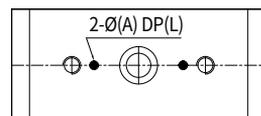
| Item    | Fastening Bolt | Max Torque (kgf-cm) |
|---------|----------------|---------------------|
| PRC16SH | M6×P1          | 81                  |
| PRC20SH | M8×P1.25       | 157                 |
| PRC25SH | M10×P1.5       | 360                 |
| PRC30SH | M10×P1.5       | 360                 |
| PRC40SH | M10×P1.5       | 360                 |
| PRC50SH | M14×P2         | 1067                |

3. Installation by table tap holes



| Item    | Fastening Bolt A | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|---------|------------------|---------------------|------------------------|
| PRC16SH | M5×P0.8          | 51                  | 8                      |
| PRC20SH | M6×P1            | 81                  | 10                     |
| PRC25SH | M8×P1.25         | 157                 | 12                     |
| PRC30SH | M8×P1.25         | 157                 | 15                     |
| PRC40SH | M8×P1.25         | 157                 | 15                     |
| PRC50SH | M12×P1.75        | 670                 | 20                     |

4. Cylinder body position determination



| Item    | Positioning Pin A | Depth for Pin Holes L (mm) |
|---------|-------------------|----------------------------|
| PRC16SH | Ø4                | 5                          |
| PRC20SH | Ø5                | 5                          |
| PRC25SH | Ø6                | 8                          |
| PRC30SH | Ø6                | 10                         |
| PRC40SH | Ø8                | 15                         |
| PRC50SH | Ø8                | 15                         |

ROTARY

- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

# ROTARY CYLINDER

## PRY-S Series

### Features

- Rotary cylinder by Rack & Pinion structure with double piston inside.
- Suitable for heavy load by high solidity bearing application.
- Lighten weight and convenience of maintenance by application of tube type cylinders.
- Minimized backlash by basically mounted external stopper.
- Easy piping and wiring by hollow hole in turntable.
- Standard mounting of heavy load shock absorber.
- Auto Switch installation. (Optional)



### Order Form

## PRY 40S - 90 - P S - PNP

① ② ③ ④ ⑤ ⑥

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | ③ Rotating Angle<br>Order (=Rotating Angle(°)) |
|-------|--------------|--|
| 40S   | 40           |  |
| 60S   | 63           |  |
| 80S   | 80           |  |
| 100S  | 100          |  |

#### ③ Rotating Angle

#### ⑤ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ④ Auto Switch Specification

| Order | Sensing Type | Cable Spec              |           | Voltage DC | Current   | Body Length | Sensing Distance | Frequency | Protect Level |
|-------|--------------|-------------------------|-----------|------------|-----------|-------------|------------------|-----------|---------------|
|       |              | Wires                   | Direction |            |           |             |                  |           |               |
| Blank |              | No Auto Switch provided |           |            |           |             |                  |           |               |
| P     | Proximity    | 3-Wire                  | Horiz     | 10~30V     | Max 200mA | 32mm        | 1mm ± 10%        | 800Hz     | IP 67         |

#### ⑥ Auto Switch Output

| Order | Output |
|-------|--------|
| Blank | NPN    |
| PNP   | PNP    |

#### ※Shock Absorber Specification

| Item Name | Shock Absorber Specification |
|-----------|------------------------------|
| PRY40S    | M25×P1.5 (S.T 25mm)          |
| PRY60S    | M36×P1.5 (S.T 25mm)          |
| PRY80S    | M45×P1.5 (S.T 25mm)          |
| PRY100S   | M45×P1.5 (S.T 50mm)          |

Accessory Order Form

(1) Shock Absorber

**PRY 40S - SH - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber
- ④ Order Name for Accessory  
- Based for only one set for single side of product.

(2) Shock Absorber CAP

**PRY 40S - CB - ASSY**

①                      ②                      ③                      ④

- ① Series Name
- ② Cylinder Bore Size
- ③ Shock Absorber CAP
- ④ Order Name for Accessory  
- All package of protect cover for Shock Absorber.  
- Based for only one set for single side of product.

Specification

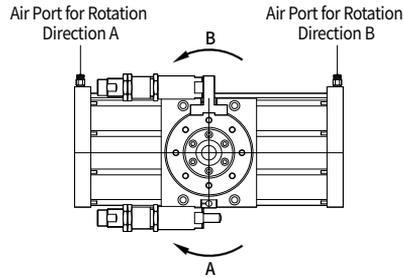
| Item Name   | PRY40S  |           | PRY60S    |           | PRY80S    |         | PRY100S |       |
|---|---|-----------|-----------|-----------|-----------|---------|---------|-------|
| Rotating Angle(°)   | 90  | 180       | 90        | 180       | 90        | 180     | 90      | 180   |
| CYL Bore Size(mm)   | 40  |           | 63        |           | 80        |         | 100     |       |
| Cushion(Shock Absorbing)  | Shock Absorber as Standard                                      |           |           |           |           |         |         |       |
| Effective Cushion Angle(kgf·cm)<br>P : Air Pressure(kgf/cm <sup>2</sup> ) | 74×P  |           | 144×P     |           | 253×P     |         | 439×P   |       |
| Effective Torque(kgf·cm)  | 77  |           | 175.5     |           | 331.4     |         | 669.3   |       |
| Fitting Size  | PT1/8   |           |           |           | PT1/4     |         | PT3/8   |       |
| Maximum Radial Load(kgf) <small>Note 2)</small>                           | 193   |           | 320       |           | 467       |         | 619     |       |
| Maximum Thrust Load(kgf)  | 105   |           | 181       |           | 240       |         | 306     |       |
| Weight(kgf)   | 10.5  | 11.4      | 18.6      | 20        | 33        | 35.5    | 49.5    | 53.5  |
| Rotation Time(sec/90°)  | 0.7 ~ 2   | 1.2 ~ 3.5 | 1.2 ~ 2.5 | 1.7 ~ 3.5 | 1.5 ~ 3.5 | 2.2 ~ 5 | 2 ~ 4   | 3 ~ 6 |
| Fluid   | Clean Air <small>Note 1)</small>                                |           |           |           |           |         |         |       |
| Pressure Range(kgf/cm <sup>2</sup> )                                      | 3 ~ 7   |           |           |           |           |         |         |       |
| Lubrication   | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32) |           |           |           |           |         |         |       |
| Temperature Range(°C)   | 5 ~ 60  |           |           |           |           |         |         |       |
| Operation Type  | Double Acting (Structure : Rack & Pinion)                       |           |           |           |           |         |         |       |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3~10µm degree of filtering.

Note 2) Maximum radial load refers the allowable value at the end of turntable.

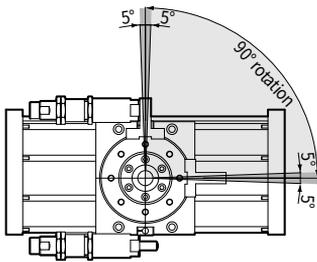


## Rotation Direction

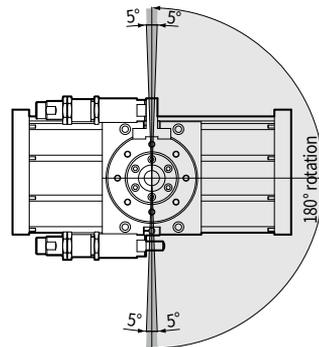


- Above figure shows air port position and air stopper(Shock Absorber) adjusting position for each direction.
- Rotation direction is marked based on the position of stopper on the turntable.

## Rotation Angle Adjustment



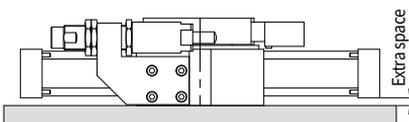
90° rotation Type



180° rotation Type

- The stopper is set to the standard position, 90° or 180° to maximize shock absorption of energy at the front of shock absorber. Therefore, do not adjust the angle arbitrarily, if possible.
- If an arbitrary angle adjustment is unavoidable during the use, make the adjustment within  $\pm 5^\circ$ .
- The figure represents angle adjustment range in each rotation direction based on the stopper of Turn Table.

## Notes in use



- As the character of product, there has some space between base to the end plate when it correctly mounted there, do not mount this product using plate to base directly or be careful not to damage or shock on the plate.

# PRY-S Series

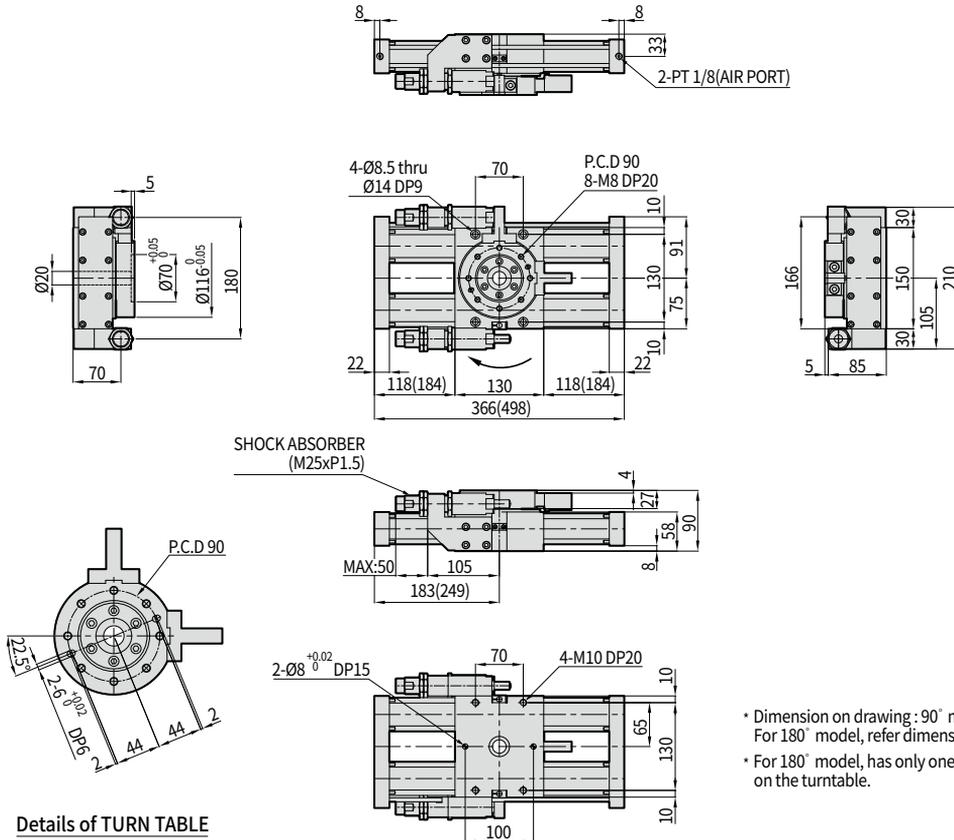
40S

60S

80S

100S

## PRY40S



- Dimension on drawing : 90° model.  
For 180° model, refer dimension in ( ).
- For 180° model, has only one stopper on the turntable.

Details of TURN TABLE

ROTARY

PRC

PRK

PRC-S

PRC-ST

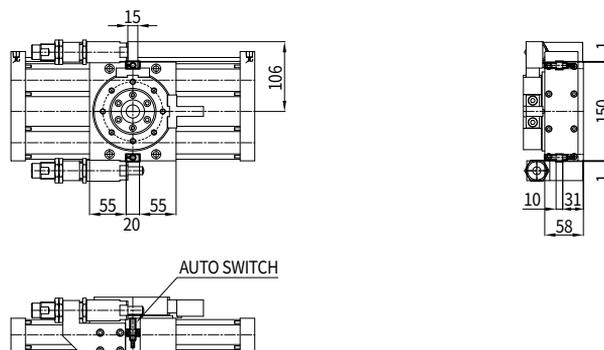
PRC-SH

PRY-S

PRC-H

PRD

## PRY40S Example of Auto Switch installation



# PRY-S Series

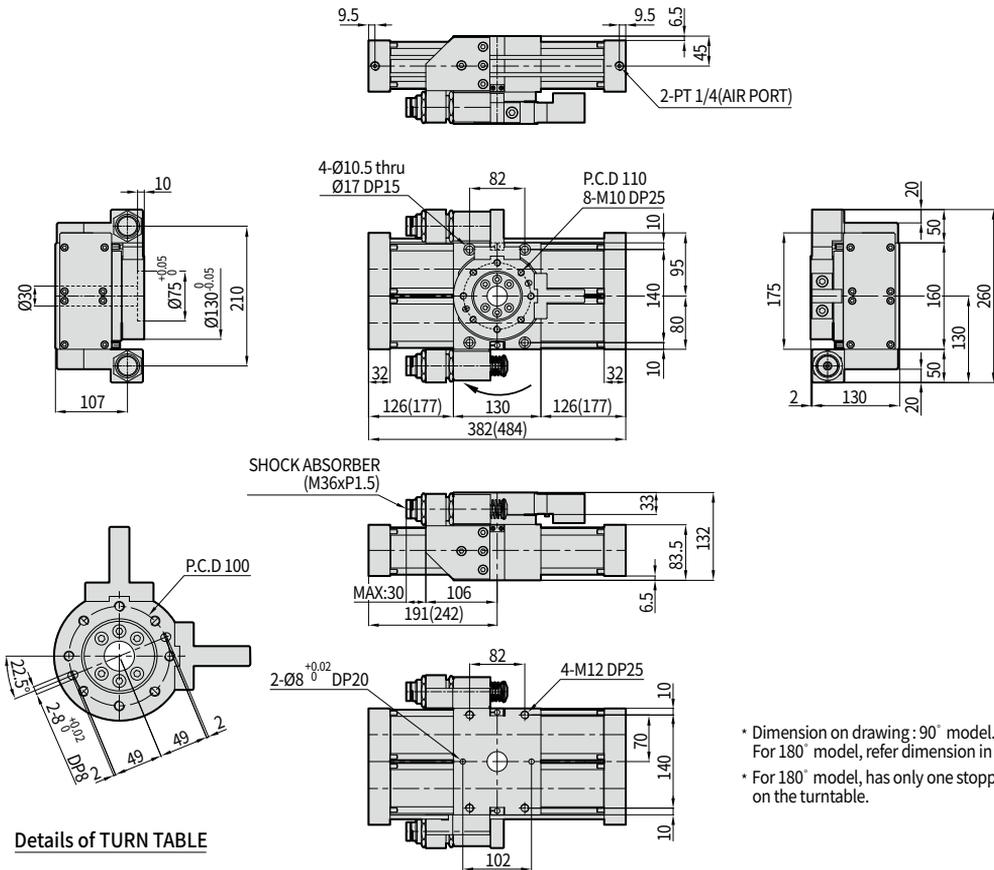
40S

60S

80S

100S

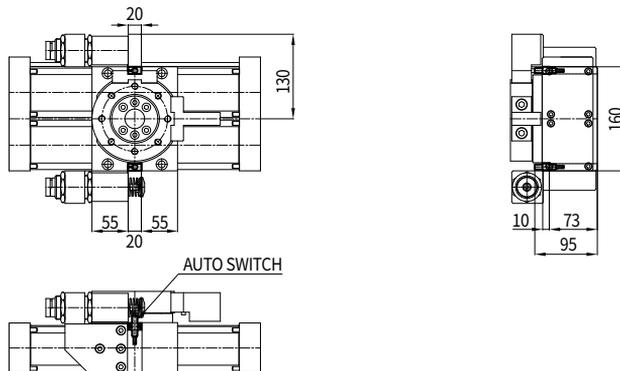
## PRY60S



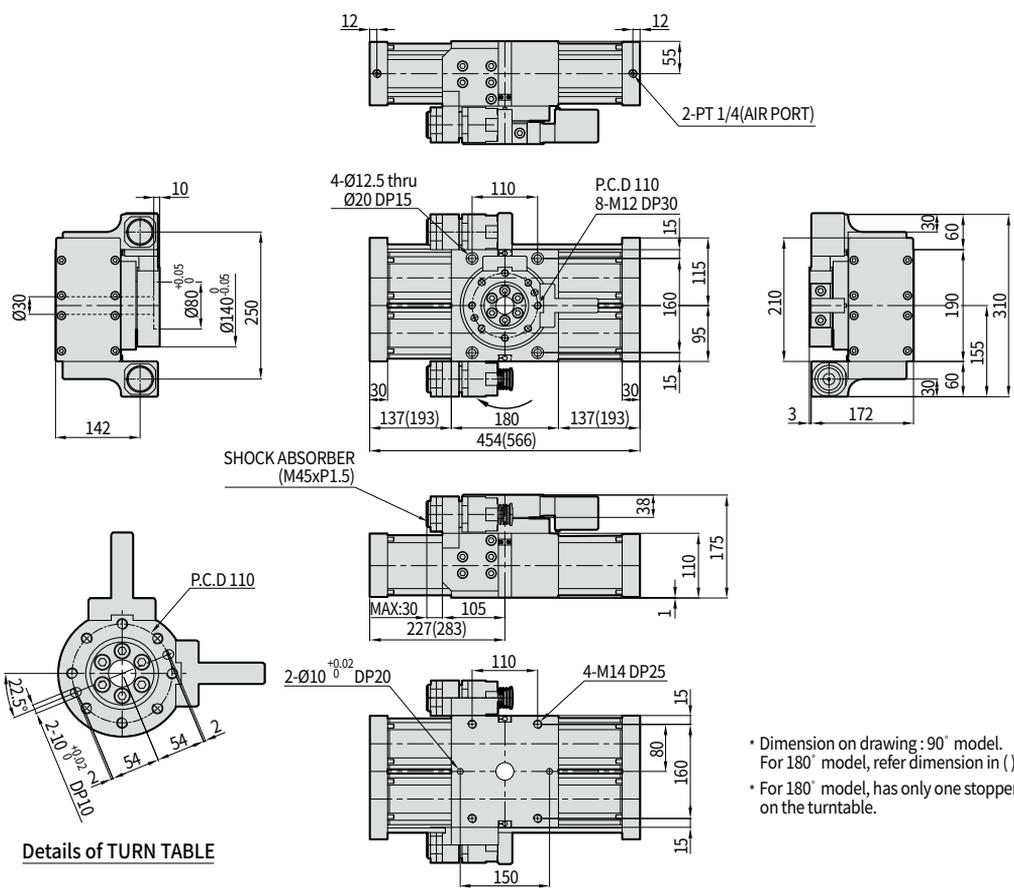
Details of TURN TABLE

- \* Dimension on drawing : 90° model. For 180° model, refer dimension in ( ).
- \* For 180° model, has only one stopper on the turntable.

## PRY60S Example of Auto Switch installation

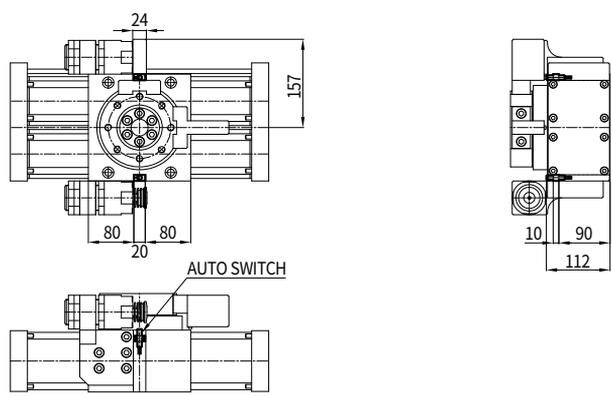


PRY80S



• Dimension on drawing : 90° model.  
For 180° model, refer dimension in ( ).  
• For 180° model, has only one stopper on the turntable.

PRY80S Example of Auto Switch installation



ROTARY

|        |
|--------|
| PRC    |
| PRK    |
| PRC-S  |
| PRC-ST |
| PRC-SH |
| PRY-S  |
| PRC-H  |
| PRD    |

# PRY-S Series

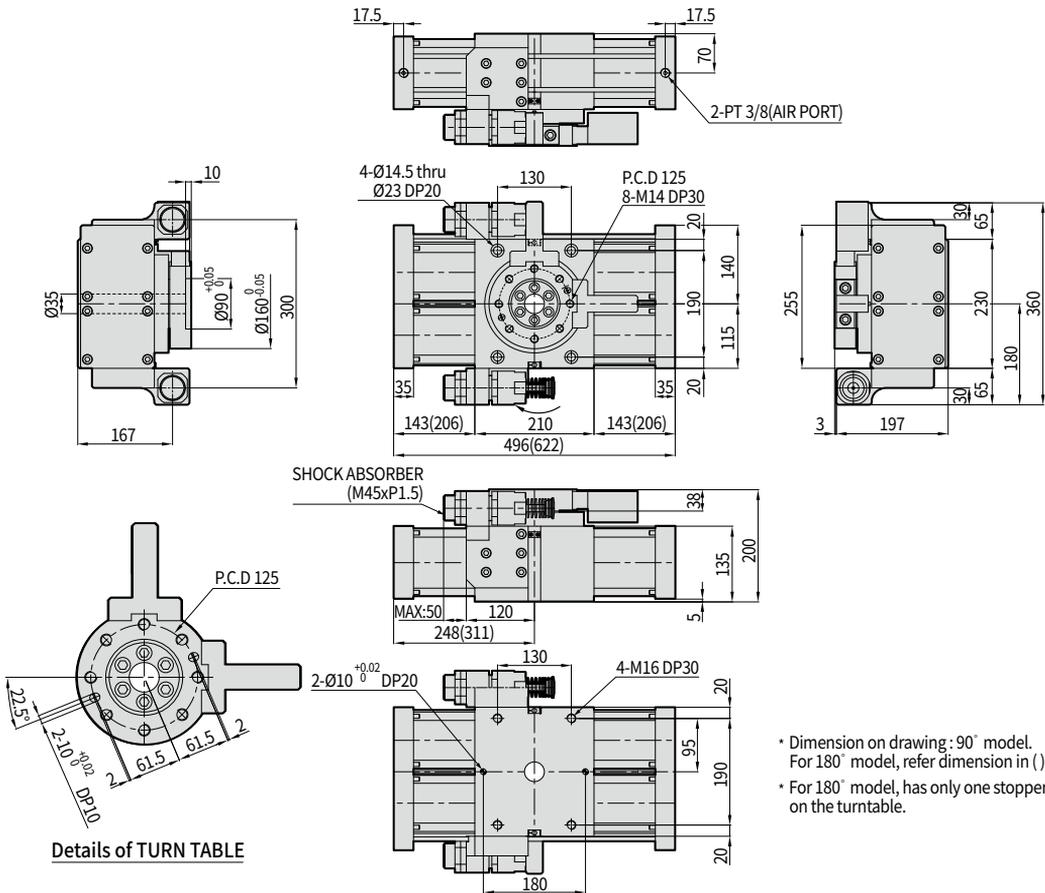
40S

60S

80S

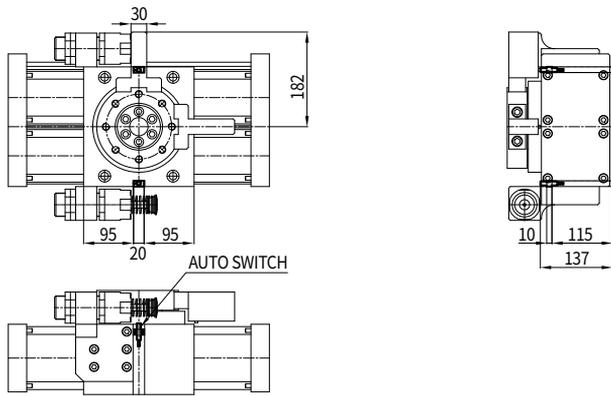
100S

## PRY100S



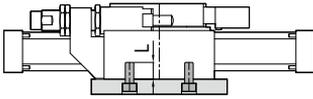
\* Dimension on drawing : 90° model.  
 For 180° model, refer dimension in ( ).  
 \* For 180° model, has only one stopper on the turntable.

## PRY100S Example of Auto Switch installation



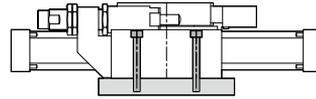
Installation Information

1. Installation by body tap holes



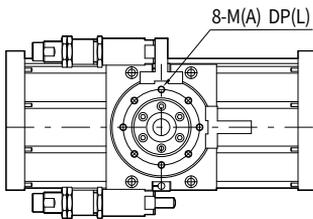
| Item    | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|---------|----------------|---------------------|------------------------|
| PRY40S  | M10×P1.5       | 360                 | 20                     |
| PRY60S  | M12×P1.75      | 670                 | 25                     |
| PRY80S  | M14×P2         | 1067                | 25                     |
| PRY100S | M16×P2         | 1650                | 30                     |

2. Installation by body through holes



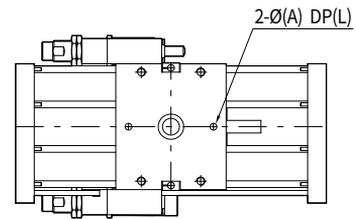
| Item    | Fastening Bolt | Max Torque (kgf·cm) |
|---------|----------------|---------------------|
| PRY40S  | M8×P1.25       | 157                 |
| PRY60S  | M10×P1.5       | 360                 |
| PRY80S  | M12×P1.75      | 670                 |
| PRY100S | M14×P2         | 1067                |

3. Installation by table tap holes



| Item    | Fastening Bolt A | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|---------|------------------|---------------------|------------------------|
| PRY40S  | M8×P1.25         | 157                 | 20                     |
| PRY60S  | M10×P1.5         | 360                 | 25                     |
| PRY80S  | M12×P1.75        | 670                 | 30                     |
| PRY100S | M14×P2           | 1067                | 30                     |

4. Cylinder body position determination



| Item    | Positioning Pin A | Depth for Pin Holes L (mm) |
|---------|-------------------|----------------------------|
| PRY40S  | Ø8                | 15                         |
| PRY60S  | Ø8                | 20                         |
| PRY80S  | Ø10               | 20                         |
| PRY100S | Ø10               | 20                         |

# ROTARY CYLINDER

## PRC-H Series

### Features

- Rotary cylinder of combination with pneumatic and hydraulic by double piston linked by chain on rotating shaft.
- Smooth rotating even in low-speed by principle of hydro check.
- Even in small oil leakage zero-backlash by standard mounting of check valve.
- Heavy load and high durability structure for high moment.
- Standard mounted external stopper for precise rotate positioning.
- Easy piping and wiring by hollow hole in rotating shaft.
- Suitable for assembling and transfer line of F.A field as a reversing device for pick and place.
- Auto Switch installation. (Optional)



### Order Form

**PRC 40H - 180 - P S - PNP**

①                      ②                      ③                      ④                      ⑤                      ⑥

#### ① Series Name

#### ② Cylinder Bore Size

#### ③ Rotating Angle

| Order | CYL Bore(mm) | Order (=Rotating Angle(°)) |
|-------|--------------|----------------------------|
| 40H   | 40           | 90, 180                    |
| 60H   | 63           |                            |
| 80H   | 80           |                            |

#### ④ Auto Switch Specification

| Order | Sensing Type | Cable Spec              |           | Voltage | Current   | Body Length | Sensing Distance | Frequency | Protect Level |
|-------|--------------|-------------------------|-----------|---------|-----------|-------------|------------------|-----------|---------------|
|       |              | Wires                   | Direction | DC      |           |             |                  |           |               |
| Blank |              | No Auto Switch provided |           |         |           |             |                  |           |               |
| P     | Proximity    | 3-Wire                  | Horiz     | 10~30V  | Max 200mA | 32mm        | 1mm ± 10%        | 800Hz     | IP 67         |

#### ⑤ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

#### ⑥ Auto Switch Output

| Order | Output |
|-------|--------|
| Blank | NPN    |
| PNP   | PNP    |

Specification

| Item Name                                       | PRC40H  |           | PRC60H    |           | PRC80H    |           |
|---|---|-----------|-----------|-----------|-----------|-----------|
|   | 90  | 180       | 90        | 180       | 90        | 180       |
| Rotating Angle(°)                               | 90  | 180       | 90        | 180       | 90        | 180       |
| CYL Bore Size(mm)                               | 40  |           | 63        |           | 80        |           |
| Cushion(Shock Absorbing)                        | Hydro Cushion (Adjustable)  |           |           |           |           |           |
| Air Cushion(Adjusting Type)(°)                  | Single direction less than 35°  |           |           |           |           |           |
| Effective Cushion Angle(kgf·cm)                 | 28×P  |           | 80×P      |           | 171×P     |           |
| P: Air Pressure(kgf/cm <sup>2</sup> )           |   |           |           |           |           |           |
| Effective Torque(kgf·cm)                        | 7.5   |           | 19        |           | 25        |           |
| Fitting Size                                    | PT1/8   |           | PT1/4     |           |           |           |
| Maximum Radial Load(kgf) <small>Note 3)</small> | 47  |           | 65        |           | 80        |           |
| Maximum Thrust Load(kgf)                        | 14  |           | 19        |           | 24        |           |
| Weight(kgf)                                     | 6.0   | 6.5       | 11.5      | 12        | 18.5      | 21        |
| Rotation Time(sec/90°)                          | 0.5 ~ 2.5   | 0.7 ~ 3.0 | 0.7 ~ 3.5 | 1.0 ~ 4.0 | 1.5 ~ 4.0 | 2.0 ~ 5.0 |
| Fluid   | Clean Air <small>Note 1)</small>  |           |           |           |           |           |
| Pressure Range(kgf/cm <sup>2</sup> )            | 3 ~ 7 (Guaranteed Resist Pressure : 10.2) <small>Note 2)</small>                |           |           |           |           |           |
| Lubrication                                     | Not Need (If need, use one sort of turbine oil : SPEC ISOVG 32)                 |           |           |           |           |           |
| Temperature Range(°C)                           | 5 ~ 60  |           |           |           |           |           |
| Operation Type                                  | Double Acting (Structure : Chain & sprocket wheel - principle of Hydro Checker) |           |           |           |           |           |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10μm degree of filtering.

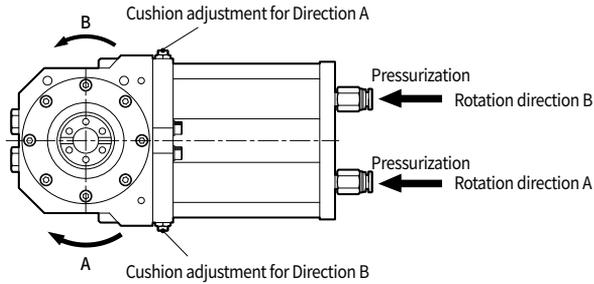
Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) Above radial load means maximum allowable load at the end of rotating shaft.

※ For detailed model selection, please refer <ROTARY CYLINDER Model Selection Guide>.

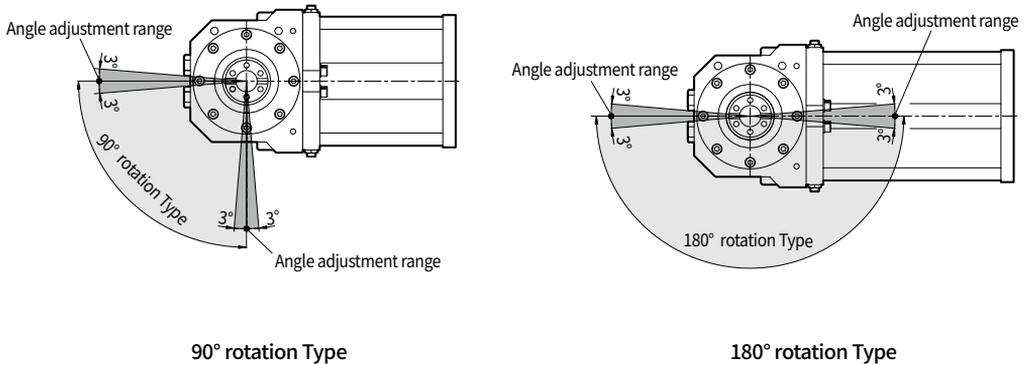
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H**
- PRD

## Rotation Direction / Cushion Adjustment



- Above figure shows air port position and air cushion adjusting position for each direction.
- Rotation direction is marked based on the key seat in shaft.
- Turning cushion adjustable needle to clockwise makes shock buffer speed slower, while tuning to counter-clockwise makes shock buffer speed faster. Please adjust it in optimal state according to the size and shape of load.
- Caution: Long time storage or Improper cushion adjustment with overload or when using this product may cause damage to internal parts due to natural evaporation of internal oil or oil leakage.
- If the cushion adjustment needle becomes too loose, it may cause oil leakage or damage to internal parts, so adjust it within the resistance range.

## Rotation Angle Adjustment



90° rotation Type

180° rotation Type

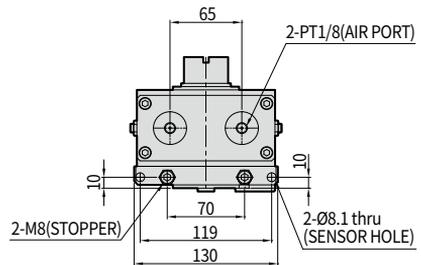
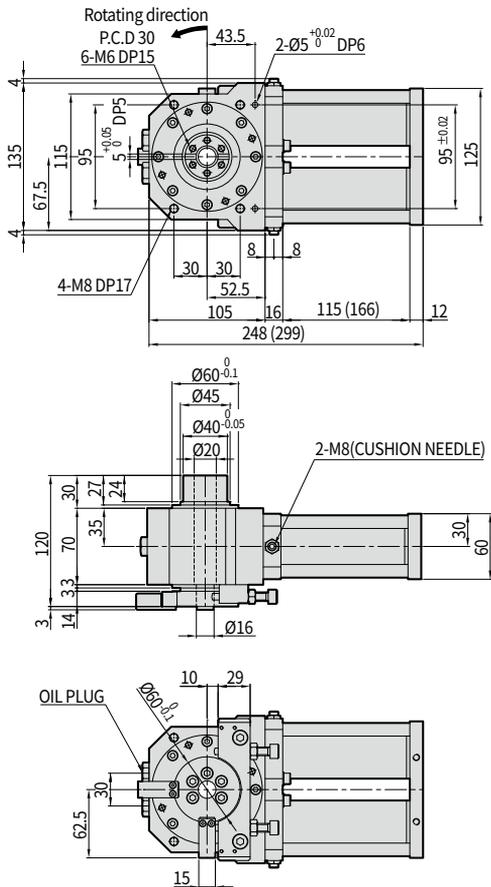
- Rotation angle can be adjusted within range at the end of rotation with the control of angle adjustment stopper as shown in figure.
- Rotation adjustment range per each direction is marked based on the key seat in figure.
- Angle adjustment Stopper is set at a random position within the adjustment range of rotary angle. Readjust it as required for before use.

| Rotary Cylinder | Angle adjustment range at the end of rotation |
|-----------------|---|
| PRC□H-90        | ±3°   |
| PRC□H-180       |   |

# PRC-H Series

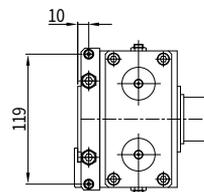
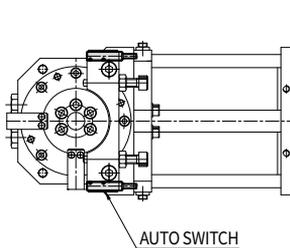
40H 60H 80H

## PRC40H



- \* Dimension on drawing : 90° model. For 180° model, refer dimension in ( ).
- \* For 180° model, has only one stopper on the turntable.

## PRC40H Example of Auto Switch installation



|        |
|--------|
| ROTARY |
| PRC    |
| PRK    |
| PRC-S  |
| PRC-ST |
| PRC-SH |
| PRY-S  |
| PRC-H  |
| PRD    |

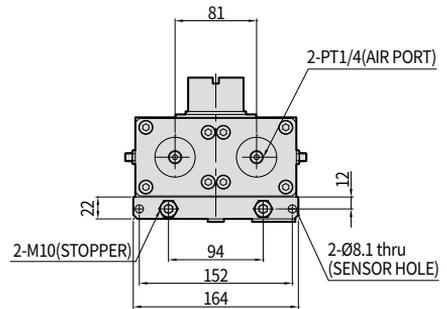
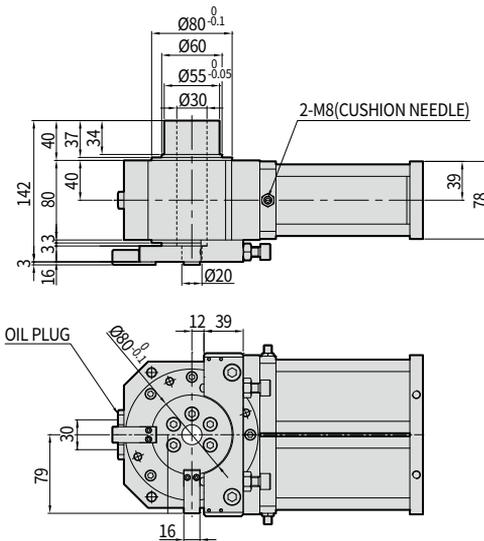
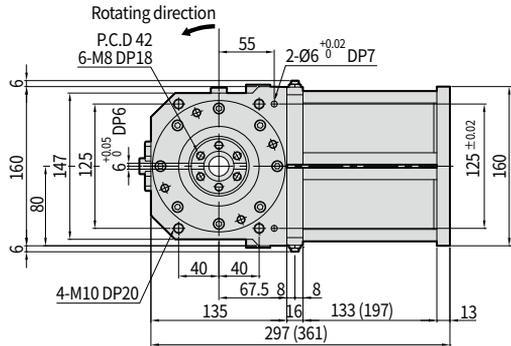
# PRC-H Series

40H

60H

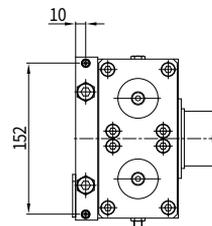
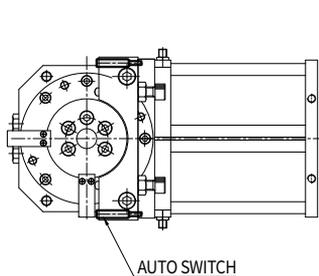
80H

## PRC60H

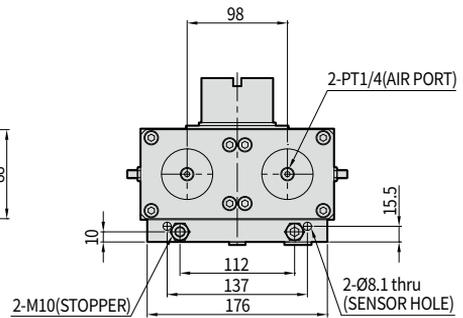
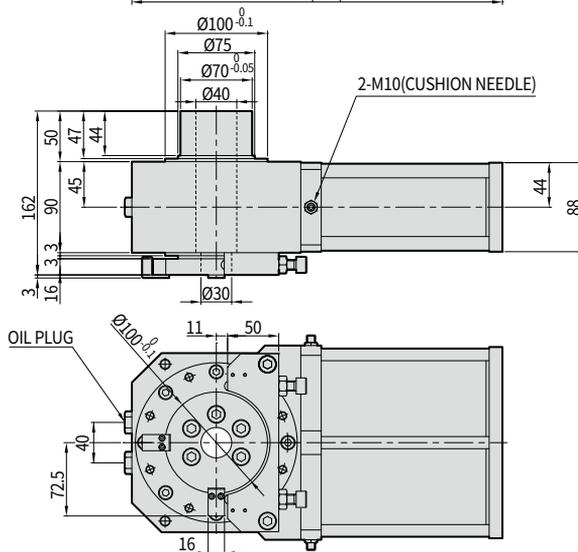
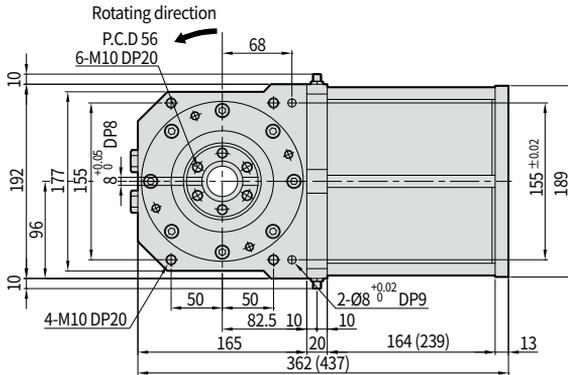


- \* Dimension on drawing : 90° model. For 180° model, refer dimension in ( ).
- \* For 180° model, has only one stopper on the turntable.

## PRC60H Example of Auto Switch installation

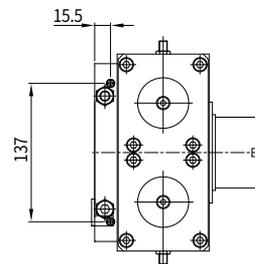
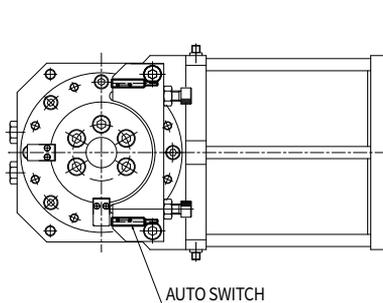


PRC80H



- \* Dimension on drawing : 90° model. For 180° model, refer dimension in ( ).
- \* For 180° model, has only one stopper on the turntable.

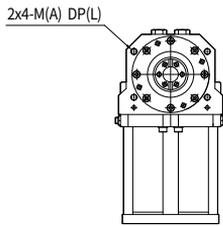
PRC80H Example of Auto Switch installation



ROTARY

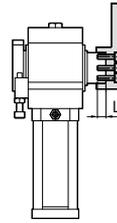
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

1. Installation by body tap holes



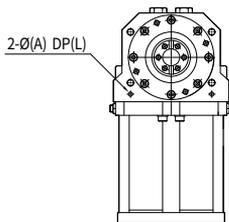
| Item   | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|--------|----------------|---------------------|------------------------|
| PRC40H | M8×P1.25       | 157                 | 20                     |
| PRC60H | M10×P1.5       | 360                 | 20                     |
| PRC80H | M10×P1.5       | 360                 | 20                     |

2. Installation by rotate shaft tap holes



| Item   | Fastening Bolt | Max Torque (kgf-cm) | Max Bolt Length L (mm) |
|--------|----------------|---------------------|------------------------|
| PRC40H | M6×P1          | 81                  | 15                     |
| PRC60H | M8×P1.25       | 157                 | 18                     |
| PRC80H | M10×P1.5       | 360                 | 20                     |

3. Cylinder body position determination



| Item   | Positioning Pin A | Depth for Pin Holes L (mm) |
|--------|-------------------|----------------------------|
| PRC40H | Ø5                | 6                          |
| PRC60H | Ø6                | 7                          |
| PRC80H | Ø8                | 9                          |



# ROTARY CYLINDER PRD Series

## Features

- Suitable as line reversing or separator or valve switch application in FA field.
- Various ways of installation and application.
- Optimized for narrow space from small and lighten air cylinder structure.
- Auto Switch installation. (Optional)



## Order Form

**PRD 12 - 60 D - A2 L S**

①      ②      ③      ④      ⑤      ⑥      ⑦

### ① Series Name

### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Rotating Angle (°)) |
|-------|--------------|-----------------------------|
| 12    | 12           | 60                          |
| 16    | 16           |                             |

### ③ Rotating Angle

### ④ Cylinder Configuration

### ⑦ Auto Switch Quantity

| Order | Qty    | Order | Quantity                        |
|-------|--------|-------|---------------------------------|
| Blank | Single | Blank | 2PCS                            |
|       |        | S     | 1PCS                            |
| D     | Double | Blank | 2 PCS for single cylinder       |
|       |        | S     | 1 PCS for each single cylinders |
|       |        | D     | 2 PCS for each single cylinders |

### ⑤ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |                |               |                |
| A2    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2V   | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B2    | Magnetic solid state | 3-Wire                  | Horiz     | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire                  | Horiz     | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3C   | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

### ⑥ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

**Specification**

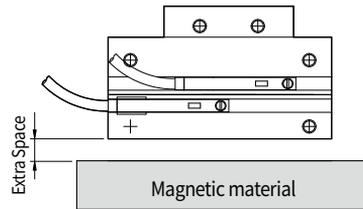
| Item Name                                       | PRD12  | PRD16     |
|---|--|-----------|
| CYL Bore Size(mm)                               | 12   | 16        |
| Fitting Size                                    | M3   | M5        |
| Rotating Angle(°)                               | 60   | 60        |
| Effective Torque(kgf·cm)                        | 0.06   | 0.1       |
| Effective Cushion Angle(kgf·cm)                 | 0.3×P  | 0.7×P     |
| P : Air Pressure(kgf/cm <sup>2</sup> )          |  |           |
| Allowable Moment(kgf·cm)                        | 2.3  | 3.4       |
| Maximum Radial Load(kgf) <small>Note 3)</small> | 1.7  | 2.5       |
| Maximum Thrust Load(kgf)                        | 0.3  | 0.5       |
| Rotation Time(sec/60°)                          | 0.2 ~ 0.5  | 0.2 ~ 0.7 |
| Fluid   | Clean Air <small>Note 1)</small>                                   |           |
| Pressure Range(kgf/cm <sup>2</sup> )            | 1.5 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |           |
| Temperature Range(°C)                           | 5 ~ 60   |           |
| Operation Type                                  | Double Acting  |           |
| Lubrication                                     | Not Need   |           |
| Cushion(Shock Absorbing)                        | External stopper as standard                                       |           |

Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

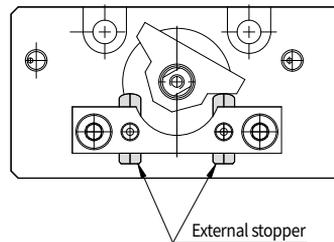
Note 3) Above radial load means maximum allowable load at the end of rotating shaft.(In the case of heavy moment applied, it is highly recommended extra guide parts to prevent direct load to the cylinder.)

## Notes for Auto Switch Installation



- When there are magnetic materials like steel plate near the switch of cylinder, most likely they may cause malfunction in the switch, therefore they need to be designed and installed with sufficient clearance from the surface of cylinder.

## Notes in Use External Stopper



- Do not use without external stopper which installed as standard. It may be a reason of malfunction.

## Rotation Angle Adjustment

- Use cylinder as rotation speed within 0.2~0.5 (for  $\varnothing 16$ , 0.2~0.7) sec/60° by speed controller setting. For safety working, adjust speed controller from fully closed status to open slowly.

# PRD Series

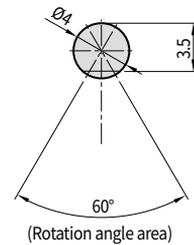
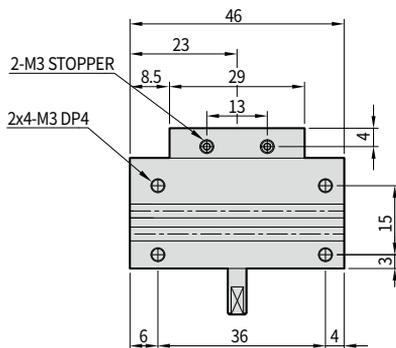
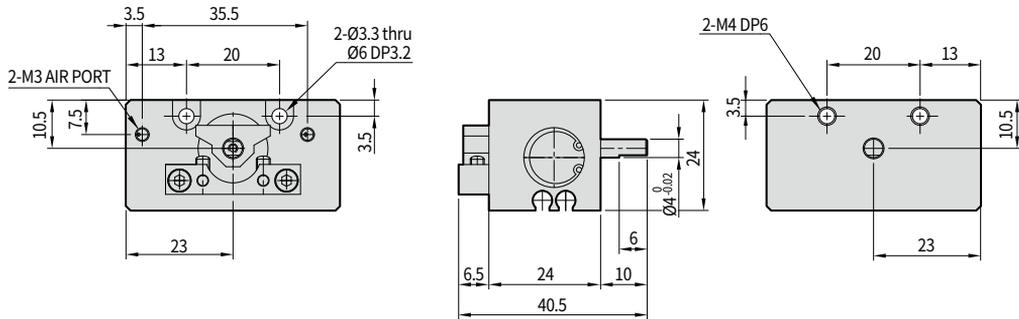
12

16

60

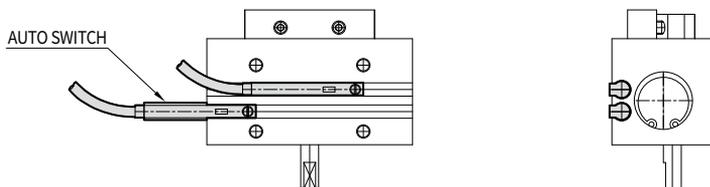
60D

## PRD12-60



Details of shaft

## PRD12-60 Example of Auto Switch installation



ROTARY

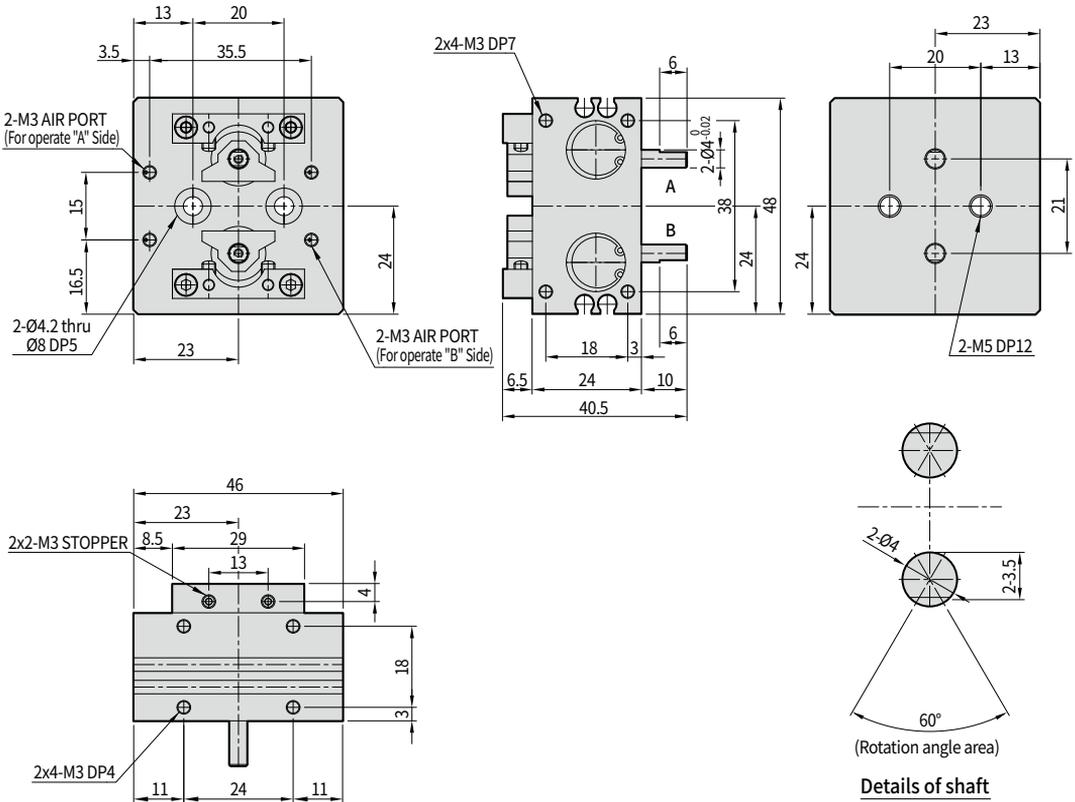
- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD

# PRD Series

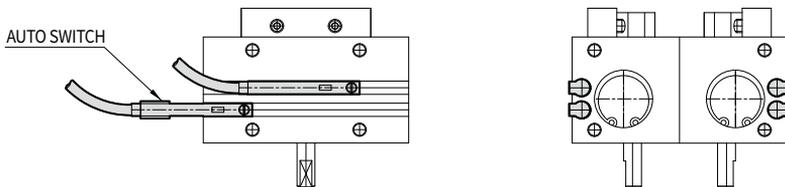
12 16

60 60D

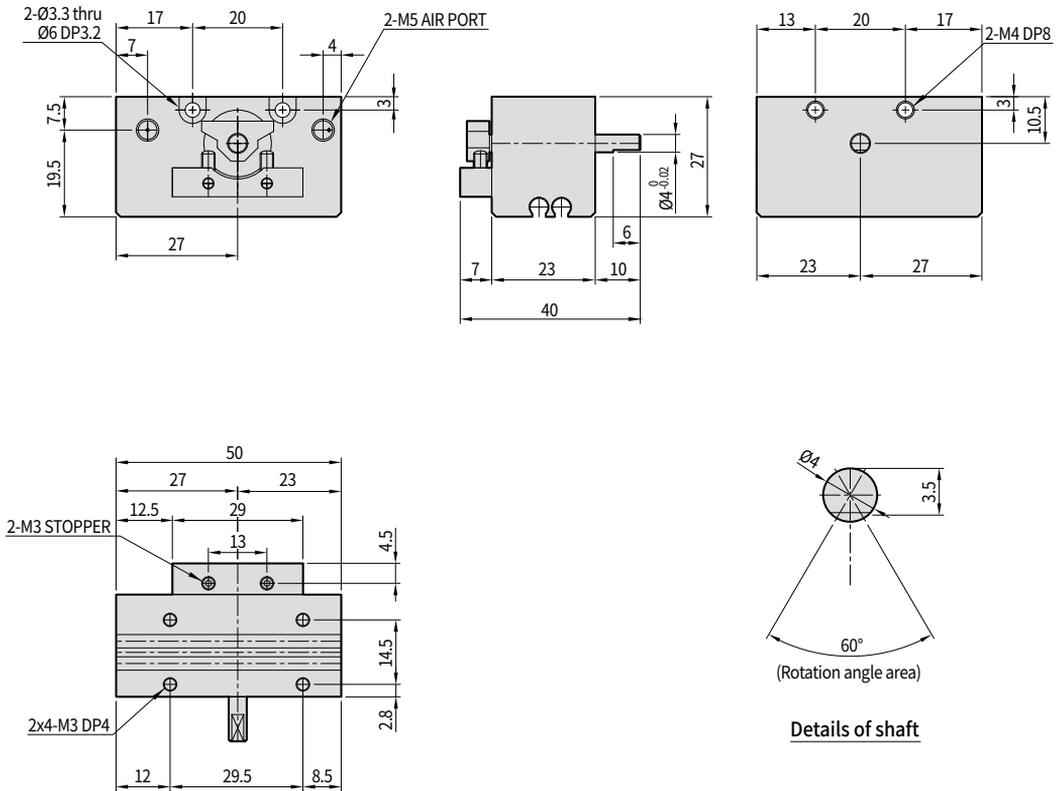
## PRD12-60D



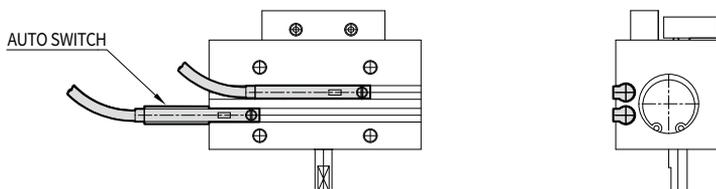
## PRD12-60D Example of Auto Switch installation



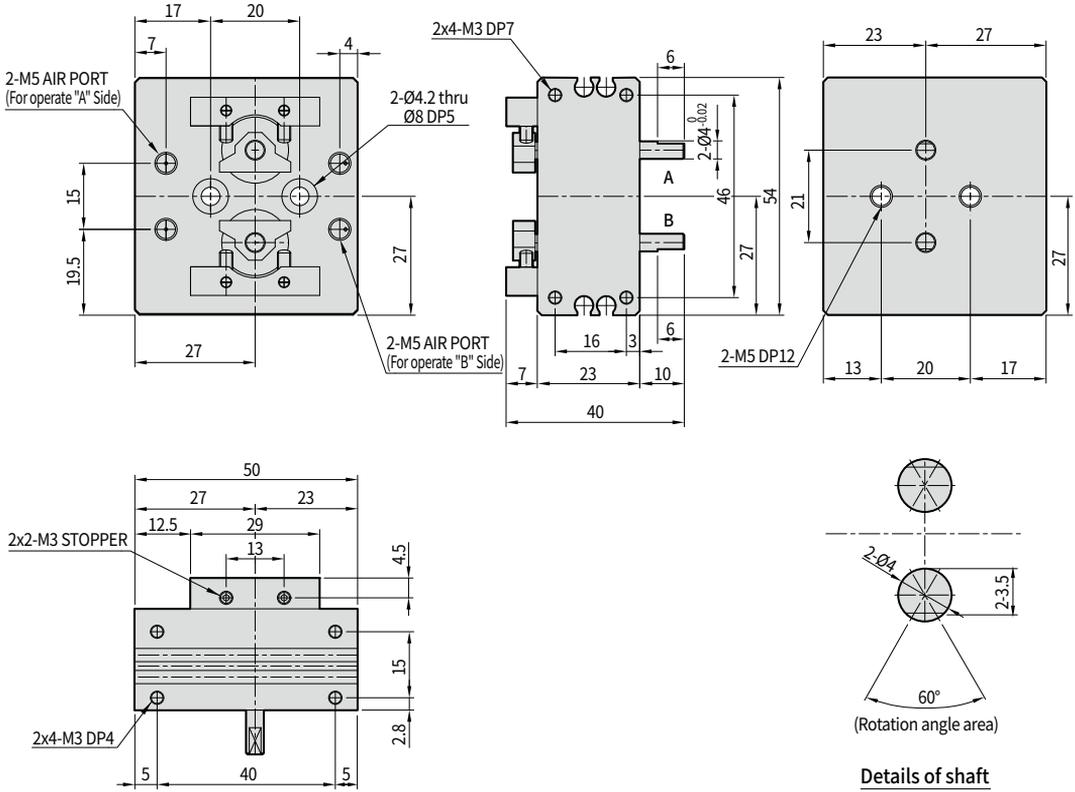
PRD16-60



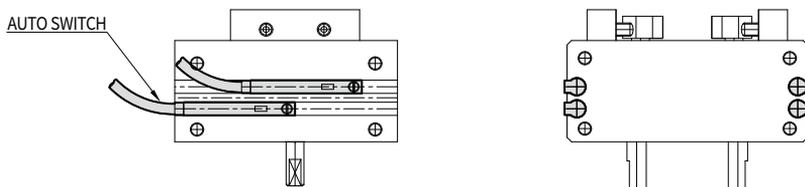
PRD16-60 Example of Auto Switch installation



## PRD16-60D

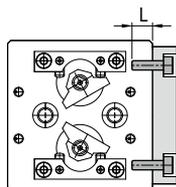


## PRD16-60D Example of Auto Switch installation



Installation Information

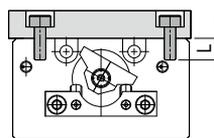
1. Installation by body tap holes



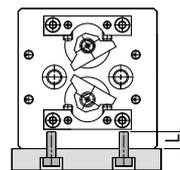
PRD-D

| Item      | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|-----------|----------------|---------------------|------------------------|
| PRD12-60  |                | Not usable          |                        |
| PRD16-60  |                | Not usable          |                        |
| PRD12-60D | M3×P0.5        | 11                  | 7                      |
| PRD16-60D | M3×P0.5        | 11                  | 7                      |

2. Installation by body tap holes



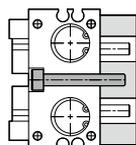
PRD



PRD-D

| Item      | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|-----------|----------------|---------------------|------------------------|
| PRD12-60  | M3×P0.5        | 11                  | 4                      |
| PRD16-60  | M3×P0.5        | 11                  | 4                      |
| PRD12-60D | M3×P0.5        | 11                  | 4                      |
| PRD16-60D | M3×P0.5        | 11                  | 4                      |

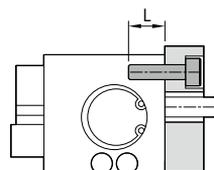
3. Installation by body through holes



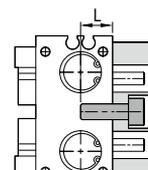
PRD-D

| Item      | Fastening Bolt | Max Torque (kgf·cm) |
|-----------|----------------|---------------------|
| PRD12-60  |                | Not usable          |
| PRD16-60  |                | Not usable          |
| PRD12-60D | M4×P0.7        | 25                  |
| PRD16-60D | M4×P0.7        | 25                  |

4. Installation by body tap holes



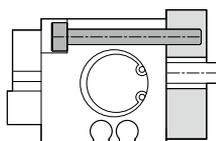
PRD



PRD-D

| Item      | Fastening Bolt | Max Torque (kgf·cm) | Max Bolt Length L (mm) |
|-----------|----------------|---------------------|------------------------|
| PRD12-60  | M4×P0.7        | 25                  | 6                      |
| PRD16-60  | M4×P0.7        | 25                  | 8                      |
| PRD12-60D | M5×P0.8        | 51                  | 15                     |
| PRD16-60D | M5×P0.8        | 51                  | 15                     |

5. Installation by body through holes



PRD-D

| Item      | Fastening Bolt | Max Torque (kgf·cm) |
|-----------|----------------|---------------------|
| PRD12-60  | M3×P0.5        | 11                  |
| PRD16-60  | M3×P0.5        | 11                  |
| PRD12-60D |                | Not usable          |
| PRD16-60D |                | Not usable          |

ROTARY

- PRC
- PRK
- PRC-S
- PRC-ST
- PRC-SH
- PRY-S
- PRC-H
- PRD



**P&M Catalogue**

**SWING CLAMP CYLINDER  
ROTARY JOINT  
SEPARATOR CYLINDER**

# SWING CLAMP CYLINDER

## SW-N Series

### Features

- 90° Swing Clamp Cylinder by guide cam.
- Free from interfere by 90° turn and clamping motion in the small workpiece clamping.
- Optimized for clamp of electronic components tester or narrow space not enough installation space.
- Auto Switch installation. (Optional)



### Order Form

**SW 16N - 15 - R - E - A2 L S**

①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧

#### ① Series Name

#### ② Cylinder Bore Size

| Order | CYL Bore(mm) | Order (=Clamp Stroke(mm)) |
|-------|--------------|---------------------------|
| 16N   | 16           | 15                        |
| 25N   | 25           | 15                        |

#### ③ Clamp Stroke

#### ④ Rotate Direction

| Order | Rotate Direction  |
|-------|-------------------|
| R     | Clockwise         |
| L     | Counter Clockwise |

#### ⑤ Special Option

| Order | Special Option          |
|-------|-------------------------|
| Blank | Standard                |
| E     | Secondary battery field |

#### ⑥ Auto Switch Specification

| Order | Sensing Type         | Cable Spec              |           | Voltage |              | Current |                | Protect Level | Operation Time |
|-------|----------------------|-------------------------|-----------|---------|--------------|---------|----------------|---------------|----------------|
|       |                      | Wires                   | Direction | AC      | DC           | AC      | DC             |               |                |
| Blank |                      | No Auto Switch provided |           |         |              |         |                |               |                |
| A2    | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2C   | Magnetic reed switch | 2-Wire                  | Horiz     | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| A2V   | Magnetic reed switch | 2-Wire                  | Ver       | 100V    | 24V          | 5~20mA  | 5~40mA         | IP 67         | 1ms            |
| B2    | Magnetic solid state | 2-Wire                  | Horiz     | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B2B   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |
| B3B   | Magnetic solid state | 3-Wire                  | Ver       | -       | 24V (5~28V)  | -       | Less than 50mA | IP 67         | 1ms            |
| B3C   | Magnetic solid state | 2-Wire                  | Ver       | -       | 24V (10~28V) | -       | Less than 50mA | IP 67         | 1ms            |

\* Be careful of projection for vertical wire exposed type Auto Switch model. (Please refer technical information of Auto Switch)

#### ⑦ Auto Switch Cable Length

| Order | Cable Length |
|-------|--------------|
| Blank | 1M           |
| L     | 3M           |

#### ⑧ Auto Switch Quantity

| Order | Quantity |
|-------|----------|
| Blank | 2PCS     |
| S     | 1PCS     |

Specification

| Item Name                                |          | SW16N  | SW25N  |
|--|----------|--|--------|
| CYL Bore Size(mm)                        |          | 16   | 25     |
| Rod Size(mm)                             |          | 8  | 12     |
| Rotate Stroke(mm) <small>Note 4)</small> |          | 6  | 7      |
| Clamp Stroke(mm)                         |          | 15   | 15     |
| Theoretical Clamping Thrust(kgf)         | Forward  | 2.0×P  | 4.9×P  |
|  | Backward | 1.5×P  | 3.8×P  |
| P : Air Pressure(kgf/cm <sup>2</sup> )   |          |  |        |
| Fitting Size                             |          | M5   | M5     |
| Rotating Angle(°) <small>Note 5)</small> |          | 90 ± 5   | 90 ± 5 |
| Anti-Rotation Degree(°)                  |          | ± 1.5  | ± 1.2  |
| Weight(kgf)                              |          | 0.11   | 0.26   |
| Fluid                                    |          | Clean Air <small>Note 1)</small>                                 |        |
| Pressure Range(kgf/cm <sup>2</sup> )     |          | 3 ~ 7 (Guaranteed Resist Pressure : 10.5) <small>Note 2)</small> |        |
| Lubrication                              |          | Not Need   |        |
| Temperature Range(°C)                    |          | 5 ~ 60   |        |
| Moving Speed(mm/sec)                     |          | 50 ~ 200   |        |
| Operation Type                           |          | Double Acting  |        |
| Rotate Direction(CW, CCW)                |          | Clockwise (CW), Counter Clockwise (CCW) <small>Note 3)</small>   |        |
| Stroke Tolerance(mm)                     |          | 0 ~ +1   |        |
| Cushion(Shock Absorbing)                 |          | Urethane Damper  |        |

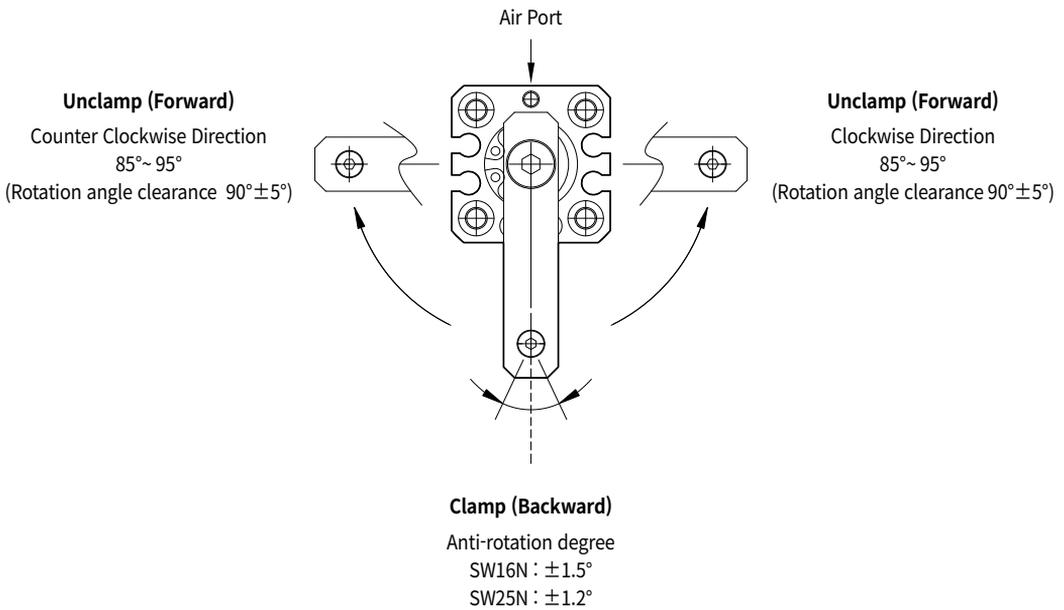
Note 1) Clean Air : Fresh air containing solid matters with 0.3% of supersaturated moisture and 99.9% of liquid oil that passed through the 3-10µm degree of filtering.

Note 2) Guaranteed Resist Pressure : A pressure that does not cause an abnormality in parts when it is applied for 1 minute without any weight loaded.

Note 3) Rotation direction of the rod moves backward to the cylinder chamber when viewed from the rod side.

Note 4) It is the stroke when the rod rotational and linear motion in same time. Regarding backward motion, rotation stroke is ahead than clamp stroke.

Note 5) Please refer <Swing Clamp Rotation degree> .



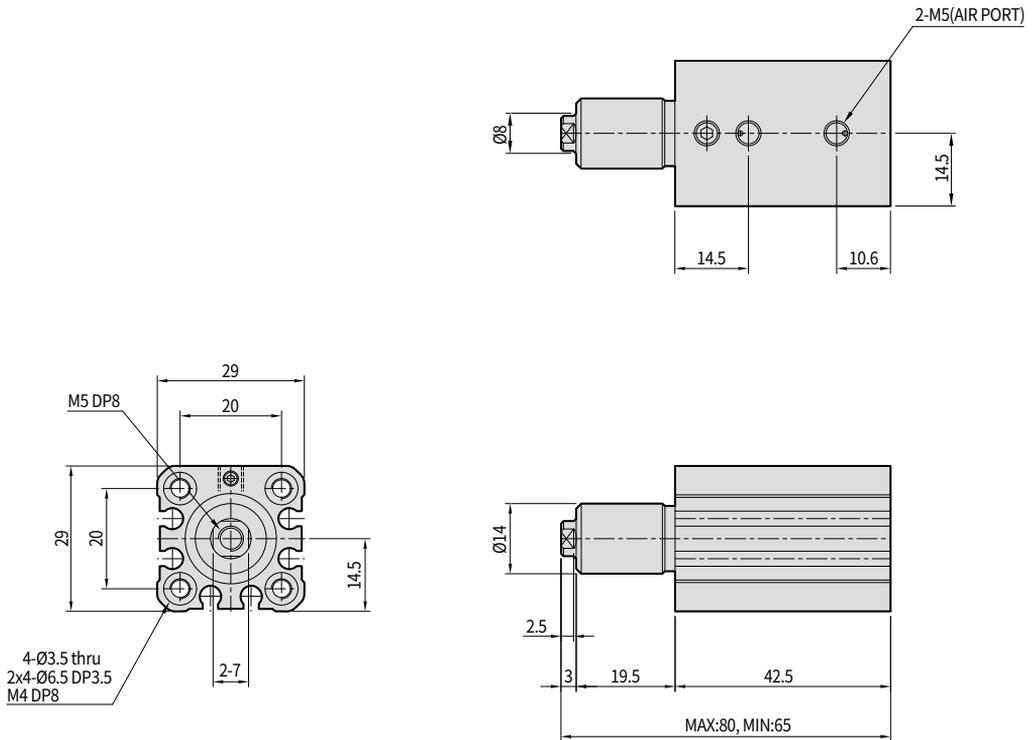
- Use cylinder as moving speed within 50~200mm/sec by speed controller setting.  
For safety working, adjust speed controller from fully closed status to open slowly.
- How to use Swing Clamp Cylinder
  - ❶ Do not install as horizontal.
  - ❷ Do not use for claming in rotation stroke.
  - ❸ Do not make workpiece moving by external force while it clamped.
  - ❹ Pay attention not to make any external rotary force on piston rod of cylinder.
  - ❺ Make sure that the clamping surface of the workpiece is perpendicular to the cylinder rod.

# SW-N Series

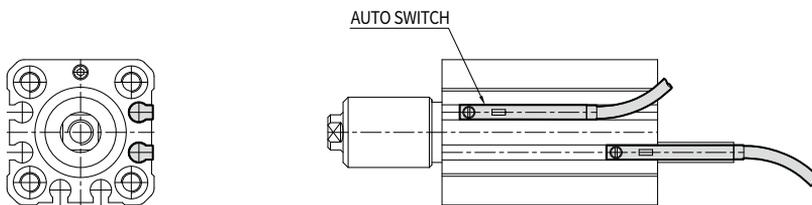
16N 25N

15

## SW16N-15



## SW16N-15 Example of Auto Switch installation



SWING CLAMP  
SW-N

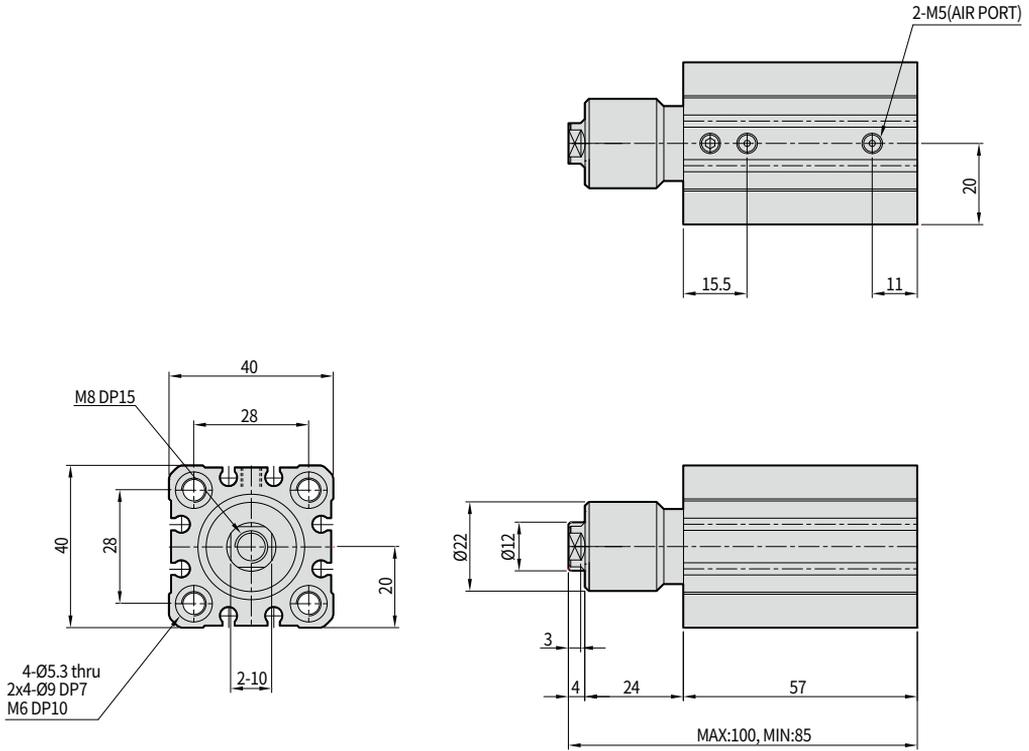
# SW-N Series

16N

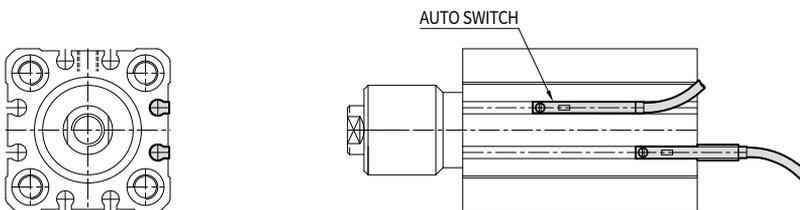
25N

15

SW25N-15



SW25N-15 Example of Auto Switch installation





SLIP RING INSIDE  
ROTARY JOINT

# RJS Series

---

Rotary Joint with Slip Ring inside



Signal Distributor Slip Ring Mounted Air Distributor

Low friction Quad Ring



[ Quad Ring ]

- 4 point frictional surface : as double sealing surface, superior sealing performance than O-Ring.
- Stable operation free from twist for linear and rotary motion.
- Excellent wear resistance by evenly distributing pressure load.

Slip Ring Inside



[ Slip Ring ]

- Power and signal transmission between static and moving parts.
- 6 line, 12 line signal options.

- Slip Ring inside Rotary Joint  
→ Stable distribution both of electric and compressed air.

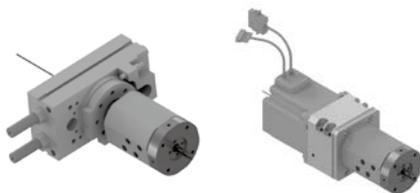
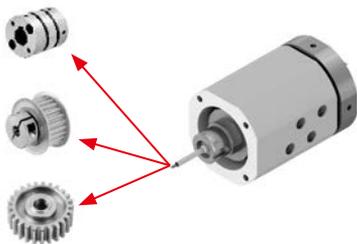
Shrink tube for cable protection



※ For stable usage, make sure to fix the shrink tube for cable protection to external object.

Various options and driving source

- Various application of coupling, belt pulley and gear.
- Easy application to extra driving source such as motor and rotary cylinder.



Rotary Cylinder  
+ Rotary Joint

Hollow shaft motor  
+ Rotary Joint

Application

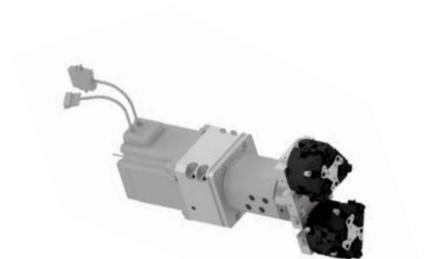
- Configuration of 2, 4, 6 ports.



< 2 port >

< 4 port >

< 6 port >



< Application >  
Rotary Joint (4 port) + 2 Hands

Please read it before use, with individual notes for each series as well, for your safe use.

## Individual Notes for ROTARY JOINT

### Caution

#### ■ Do NOT disassemble or remodel to Rotary Joint.

Do NOT disassemble or remodel to Rotary Joint for other purpose. It could bring human injury or electrical shocks, fire due to abnormal operation.

#### ■ Checklists before maintenance.

Check if there is preventive measure for load from drop, deflection, and projection, and conduct inspection after block compressed air and power, and exhaust remained air in system. If air pressure is remained in cylinder, the actuator may cause injury to human body.

### Notes in Maintenance

#### ■ Checklists after maintenance.

Check anti-protrusion action for re-starting, and inspect leakage and appropriate function by supplying compressed air or power to the pneumatic system. If the machine is not operated due to leakage, stop using it and check if the installation is correct.

#### ■ Frequent inspection item.

With daily frequent inspection, check the deterioration of durability and function in pneumatic devices to prevent accident in advance.

### Caution

#### ■ Workpiece equipped on the rotary joint should be designed to be mounted as near as the rotary center of product.

#### ■ If there is a possibility to lead any danger in human body, please attach safety devices such as protective cover.

If during cylinder on operating, the load or the rotation area of cylinder may lead danger in human body. In this case, please prepare safety device such as protective cover.

### Notes in Design

#### ■ Establish measures for power failure.

Set up safety measures in case of power failure, for devices powered by air pressure or electricity.

#### ■ Re-operation of cylinder after emergency stop needs to be considered.

Re-operation after emergency stop may cause damage to human body or machine, so appropriate measures shall be taken.

#### ■ Use Rotary Joint within the rotatable torque range.

Select suitable motor or rotary joint with refer each minimum torque specified on this catalogue.

### Caution

### Notes in operating Environment and Handling

#### ■ Be careful of using in the place where vibration or shock occurs frequently, it may cause a failure.

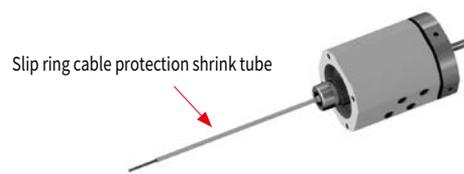
#### ■ When used around heat source of high temperature, product can be heated by radiant heat and cause failure. Therefore, install protective covers to block heat source.

#### ■ Do not use in the environment that can be affected by foreign substances such as dust and chip, and cutting oil.

It may cause vibration, increase of frictional resistance, and air leakage. In such environment, please install appropriate protective covers after the consultation with our company.

#### ■ Shrink tube to protect slip ring cable is on the rotary shaft. Make sure fix shrink tube to external object not to move.

Pay attention to fix slip ring cable protection shrink tube to external object not to move to prevent durability problem on slip ring.



< Slip ring cable protection shrink tube >

MEMO

Horizontal dotted lines for writing.

ROTARY JOINT  
RJS  
PRJ

## SLIP RING INSIDE ROTARY JOINT

# RJS Series

### Features

NEW

- A rotary type air distributor that supplies air while the spindle shaft rotates with housing fixed status.
- High solidity structure with both side applied bearings
- Components to prevent twist of air tubes when actuator working rotational motion, it needs extra rotational source separately.
- Slip Ring for power or signal distributing located at the end of spindle head makes free from twist cable between static and spindle parts.
- As the number of air port increases, multiple applications can be mounted on the rotary joint spindle head.



### Order Form

**RJS**   **60**   **D**

①

②

③

① Series Name

② Housing External Diameter

| Order | Housing External Diameter(mm) |
|-------|-------------------------------|
| 60    | 60                            |
| 70    | 70                            |
| 90    | 90                            |

③ Number of Cables

| Order | Number of Cables |
|-------|------------------|
| Blank | 6 Lines          |
| D     | 12 Lines         |