CAT.ES20-153 B-UK

SMC

## Mechanical Joint Type Rodless Cylinder

# Series MY2

### ø16, ø25, ø40



**Addition of new Series MY2C - Cam follower guide type**

Compact and low profile design

Mechanical Joint Type Rodless Cylinder

# Series MY2

## Compact and low profile design

A complete reduction in height of the cylinder allows mounting in a narrow space.
The low profile design of the cylinder built with a high precision single or double axis guide, provides same load capacity as the earlier Series MY1.
Three types of guide options to suit a variety of applications.

**MY2C** Cam Follower Guide

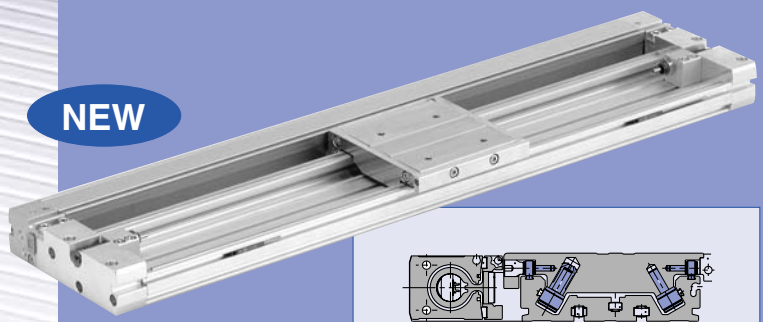
**MY2H** High precision type Single Axis Guide

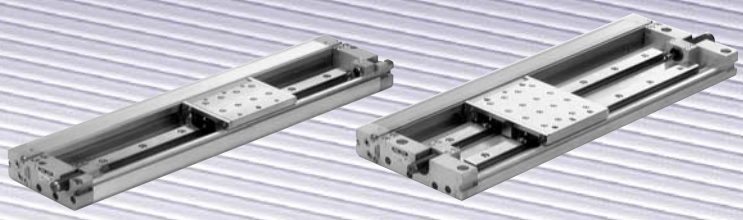
**MY2HT** High precision type Double Axis Guide

### *Available with long strokes*

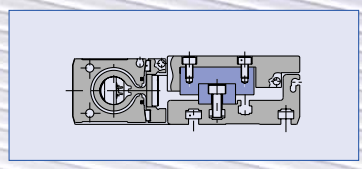
**The new Series MY2C accommodates longer strokes up to 5000mm.**

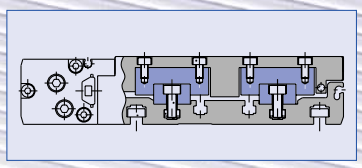
NEW











All 3 types have the same cylinder height and actuator (cylinder).

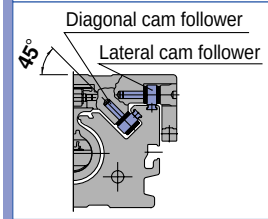
## *Increased load capacity*

The dynamic load weight has been increased with improved guide performance. (Compared to previous Series MY1.)

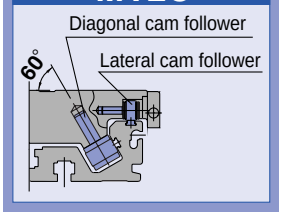
***Cam Follower Guide*** | ***High Precision Guide***

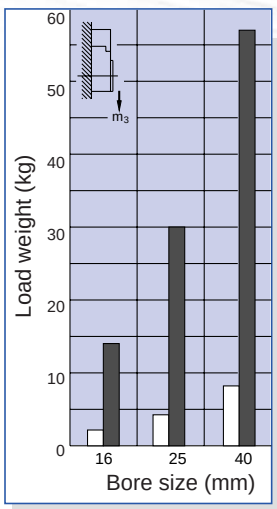
**Higher rigidity of the diagonal cam follower and change in the mounting angle provides improved load and moment capacity.**

**MY1C**

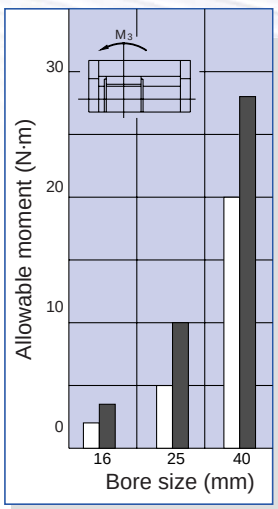



**MY2C**

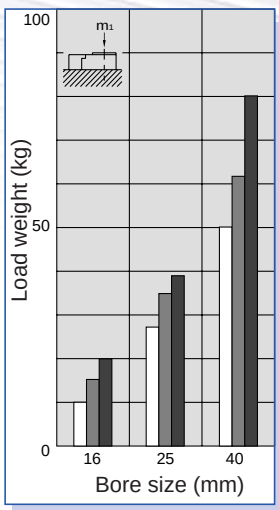


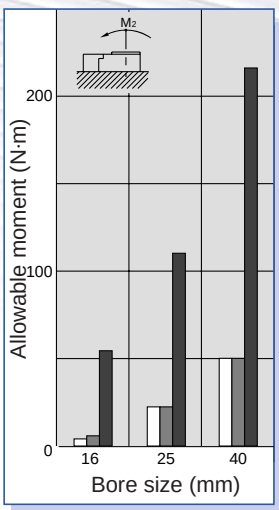

MY2C
MY1C




MY2C
MY1C




MY2HT
MY2H
MY1H




MY2HT
MY2H
MY1H



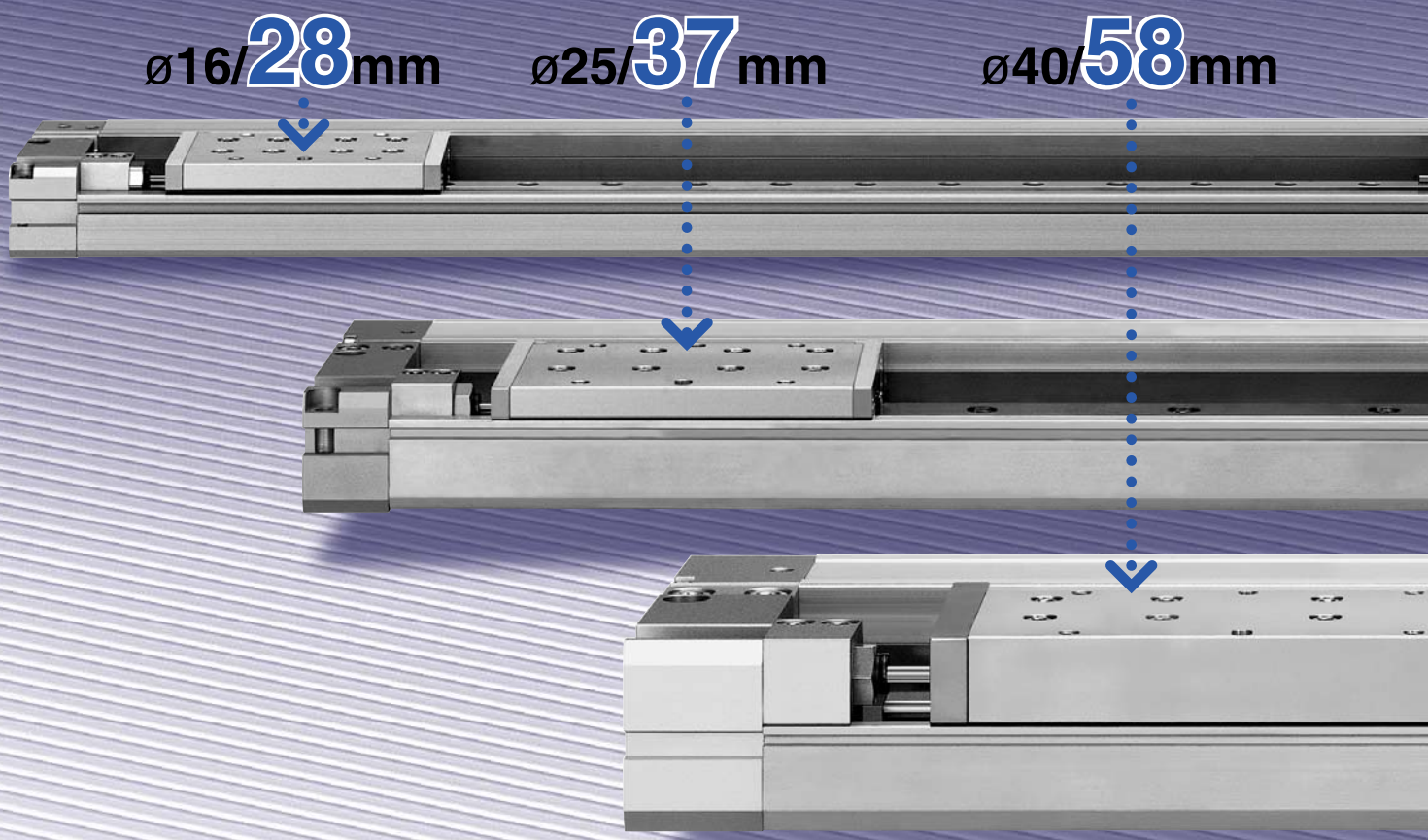
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# Height reduction by 30% (Compared to previous Series MY1.)

Low profile achieved by placing the guide unit and cylinder body next to one another.
(dimension reduced by 12mm to 26mm)

(mm)

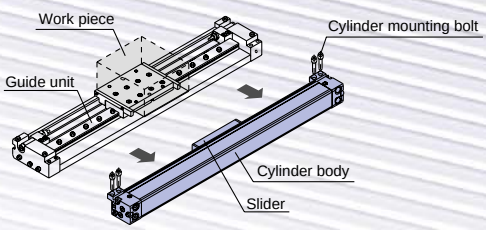
| Series | ø16 | ø25 | ø40 |
|---|---|---|---|
| MY2C<br>MY2H (single axis)<br>MY2HT (double axis) | 28 | 37 | 58 |
| MY1C, MY1H | 40 | 54 | 84 |




## Easy replacement of cylinder body

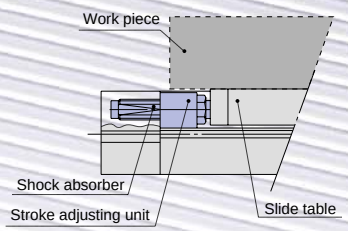
**The cylinder can be replaced without removing the work piece**

The cylinder can be detached by simply removing the four mounting bolts, and pulling it off in the direction of the arrows.




## Improved mounting flexibility

**The low profile design allows mounting of heavy-duty shock absorber (H unit) without interfering with the work piece.**



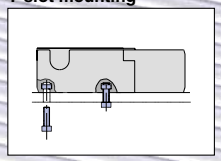

## Option

**Optional side support is available (Series MY2C)**

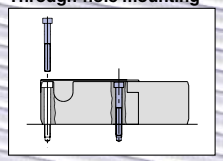
A side support prevents guide deflection for the long stroke application.

## Two mounting styles

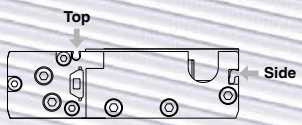
T-slot mounting



Through-hole mounting



## Auto switch mounting on two sides




## Standard with air cushion and centralized piping

## Series Variations

| Model | Bore size (mm) | Standard stroke (mm) 50 100 150 200 250 300 350 400 450 500 550 600 700 800 900 1000 1200 1400 1600 1800 2000 | Maximum available stroke (mm) | Made to order |
|---|---|---|---|---|
| **MY2C** NEW<br>Cam follower guide | 16<br>·<br>25<br>·<br>40 | | 5000 (3000 for ø16) | ·Intermediate strokes (Standardized with MY2C)<br>·Long strokes<br>·Helical insert threads<br>·Holder mounting brackets<br>·Compatible with CRT |
| **MY2H**<br>High precision guide/Single axis | | | 1500 (1000 for ø16) | |
| **MY2HT**<br>High precision guide/Double axis | | | | |

# *Series MY2*
# Model Selection 1

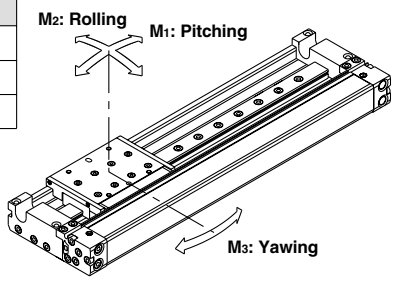
The following are the steps for selection of the series MY2 best suited to your application.

## Standards for Tentative Model Selection

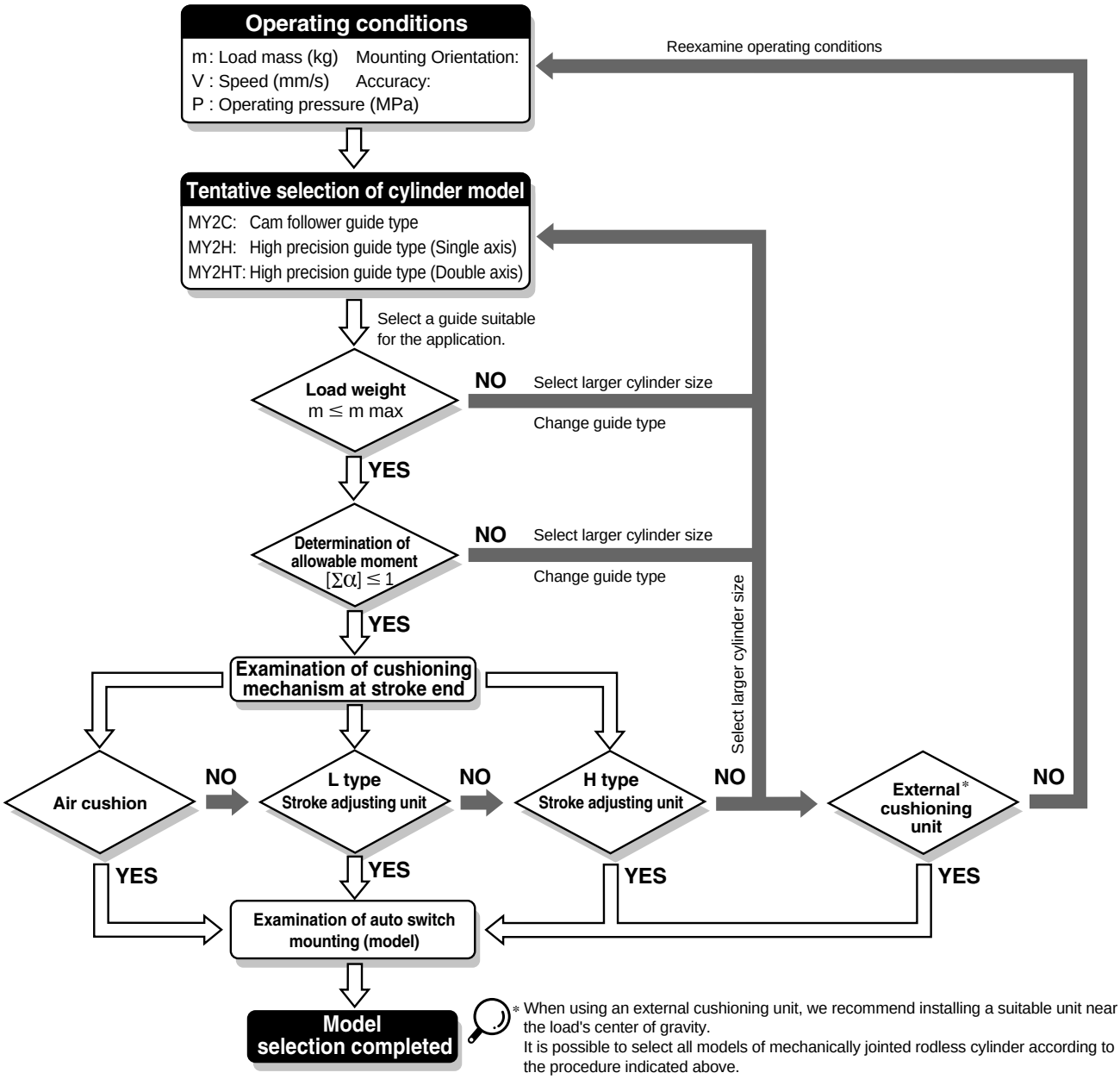
| Cylinder model | Guide type | Standards for guide selection | Graphs for related allowable values |
|---|---|---|---|
| **MY2C** | **Cam follower guide** | Slide table accuracy approx. ±0.05mm Note 2) | Refer to page 4. |
| **MY2H** | **High precision guide (Single axis)** | Slide table accuracy approx. ±0.05mm Note 2) | Refer to page 5. |
| **MY2HT** | **High precision guide (Double axis)** | Slide table accuracy approx. ±0.05mm Note 2) | Refer to page 6. |

Note 1) Please use the precision of each guide as a guideline for selection. Please contact SMC if warranty on precision is required.

Note 2) Accuracy indicates displacement of the table (at stroke end) when 50% of the allowable moment shown in the catalog is applied.




## Selection Flow Chart

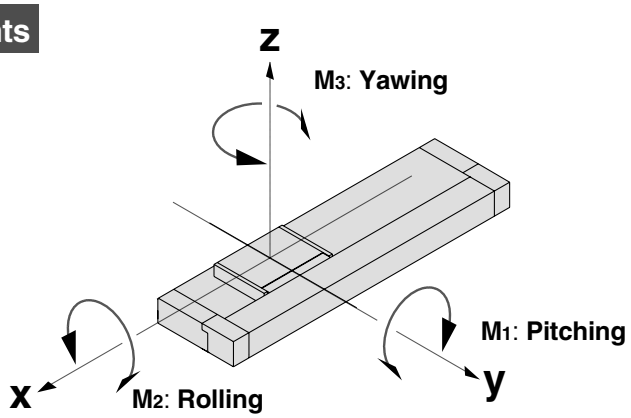



* When using an external cushioning unit, we recommend installing a suitable unit near the load's center of gravity.
It is possible to select all models of mechanically jointed rodless cylinder according to the procedure indicated above.
Refer to the separate instruction manual for further explanation, and consult SMC regarding any questions.

## Types of Moment Applied to Rodless Cylinders

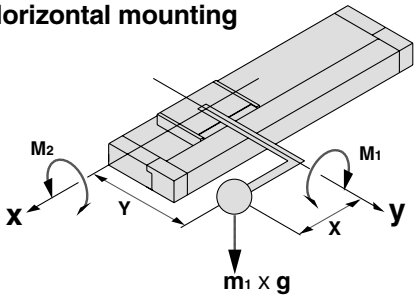
**Multiple moments may be generated depending on the mounting orientation, load, and position of the center of gravity.**

### Coordinates and moments

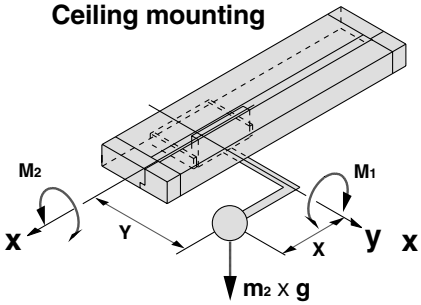



### Static moment

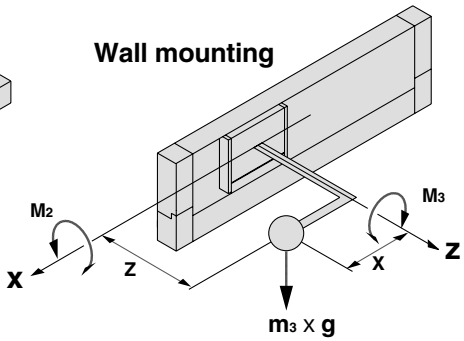
**Horizontal mounting**



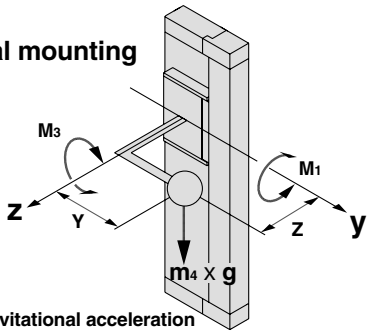

**Ceiling mounting**




**Wall mounting**




**Vertical mounting**

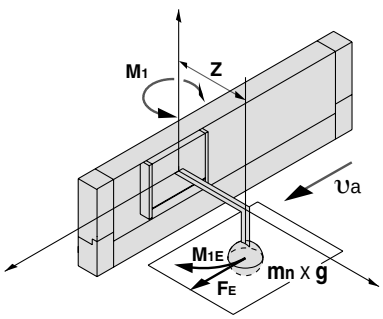


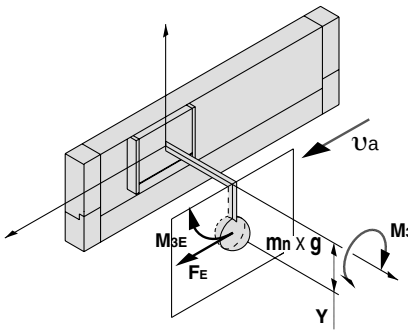

**g: Gravitational acceleration**

| Mounting orientation | | Horizontal | Ceiling | Wall | Vertical |
|---|---|---|---|---|---|
| Static load m | | $m_1$ | $m_2$ | $m_3$ | $m_4$ Note) |
| Static moment | $M_1$ | $m_1 \times g \times X$ | $m_2 \times g \times X$ | —— | $m_4 \times g \times Z$ |
| | $M_2$ | $m_1 \times g \times Y$ | $m_2 \times g \times Y$ | $m_3 \times g \times Z$ | —— |
| | $M_3$ | —— | —— | $m_3 \times g \times X$ | $m_4 \times g \times Y$ |

Note) $m_4$ is a weight movable by thrust. Use 0.3 to 0.7 times the thrust (differs depending on the operating speed) as a guide for actual use.

### Dynamic moment




| Mounting orientation | | Horizontal | Ceiling | Wall | Vertical |
|---|---|---|---|---|---|
| Dynamic load $F_E$ | | $\frac{1.4}{100} \times \upsilon a \times m_n \times g$ | | | |
| Dynamic moment | $M_{1E}$ | $\frac{1}{3} \times F_E \times Z$ | | | |
| | $M_{2E}$ | **Dynamic moment $M_{2E}$ does not occur.** | | | |
| | $M_{3E}$ | $\frac{1}{3} \times F_E \times Y$ | | | |

Note) Regardless of the mounting orientation, dynamic moment is calculated with the formulas above.

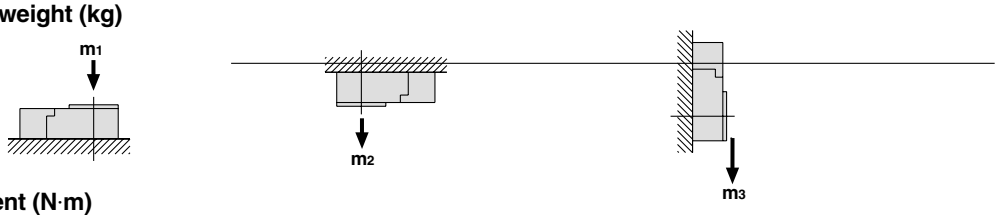
**g: Gravitational acceleration, υa: Average speed**

## Maximum Allowable Moment/Maximum Load Weight

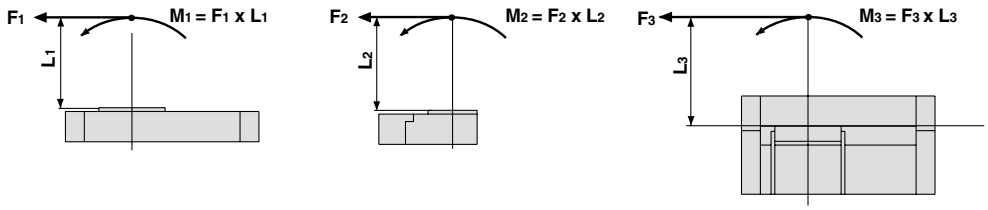
| Model | Bore size (mm) | Maximum allowable moment (N·m) | | | Maximum load weight (kg) | | |
|---|---|---|---|---|---|---|---|
| | | $M_1$ | $M_2$ | $M_3$ | $m_1$ | $m_2$ | $m_3$ |
| MY2C | 16 | 5 | 4 | 3.5 | 18 | 16 | 14 |
| | 25 | 13 | 14 | 10 | 35 | 35 | 30 |
| | 40 | 45 | 33 | 28 | 68 | 66 | 57 |
| MY2H | 16 | 7 | 6 | 7 | 15 | 13 | 13 |
| | 25 | 28 | 26 | 26 | 32 | 30 | 30 |
| | 40 | 60 | 50 | 60 | 62 | 62 | 62 |
| MY2HT | 16 | 46 | 55 | 46 | 20 | 18 | 18 |
| | 25 | 100 | 120 | 100 | 38 | 35 | 35 |
| | 40 | 200 | 220 | 200 | 80 | 80 | 80 |

The above values are the maximum allowable values for moment and load. Refer to each graph regarding the maximum allowable moment and maximum load weight for a particular piston speed.

### Load weight (kg)




### Moment (N·m)




### <Calculation of guide load factor>

1. Maximum load weight (1), static moment (2), and dynamic moment (3) (at the time of impact with stopper) must be examined for the selection calculations.

∗To evaluate, use $\upsilon a$ (average speed) for (1) and (2), and $\upsilon$ (impact speed $\upsilon = 1.4\upsilon a$) for (3).
Calculate m max for (1) from the maximum load weight graph ($m_1$, $m_2$, $m_3$) and Mmax for (2) and (3) from the maximum allowable moment graph ($M_1$, $M_2$, $M_3$).

$$\text{Sum of guide load factors } \Sigma\alpha = \frac{\text{Load weight [m]}}{\text{Maximum load weight [m max]}} + \frac{\text{Static moment [M] Note 1)}}{\text{Allowable static moment [Mmax]}} + \frac{\text{Dynamic moment [ME] Note 2)}}{\text{Allowable dynamic moment [MEmax]}} \leq 1$$

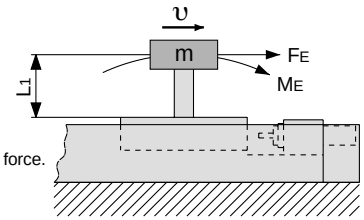
Note 1) Moment caused by the load, etc., with cylinder in resting condition.
Note 2) Moment caused by the impact load equivalent at the stroke end (at the time of impact with stopper).
Note 3) Depending on the shape of the work piece, multiple moments may occur. When this happens, the sum of the load factors ($\Sigma\alpha$) is the total of all such moments.

2. Reference formulas [Dynamic moment at impact]
Use the following formulas to calculate dynamic moment when taking stopper impact into consideration.

m : Load weight (kg)
F : Load (N)
$F_E$ : Load equivalent to impact (at impact with stopper) (N)
$\upsilon a$ : Average speed (mm/s)
M : Static moment (N·m)
$\upsilon$ : Impact speed (mm/s)
$L_1$ : Distance to the load's center of gravity (m)
$M_E$ : Dynamic moment (N·m)
g : Gravitational acceleration (9.8m/s²)

$\upsilon = 1.4\upsilon a$ (mm/s) $\quad F_E = \frac{1.4}{100}\upsilon a \cdot g \cdot m$ Note 4)

$\therefore M_E = \frac{1}{3} \cdot F_E \cdot L_1 = 0.05\upsilon a\, m\, L_1$ (N·m) Note 5)




Note 4) $\frac{1.4}{100}\upsilon a$ is a dimensionless coefficient for calculating impact force.
Note 5) Average load coefficient (= $\frac{1}{3}$):
This coefficient is for averaging the maximum load moment at the time of stopper impact according to service life calculations.

3. Refer to pages 9 and 10 for detailed selection procedures.

### Maximum allowable moment

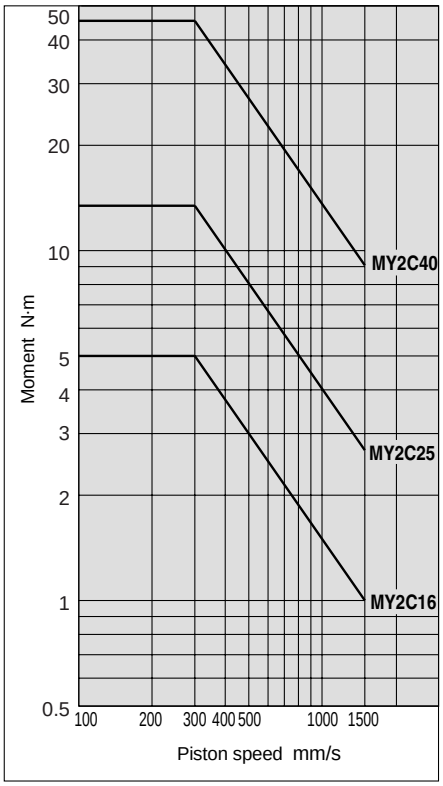
Select the moment from within the range of operating limits shown in the graphs. Note that the maximum load weight value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

### Maximum load weight

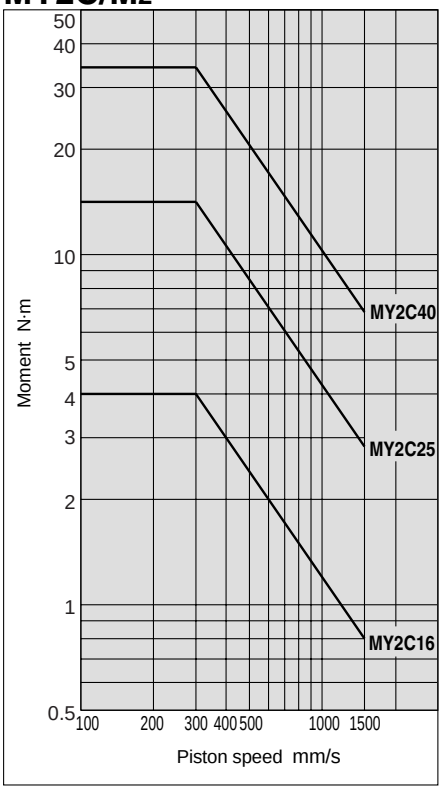
Select the load weight from within the range of limits shown in the graphs. Note that the maximum allowable moment value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable moment for the selected conditions.

## Moment/MY2C

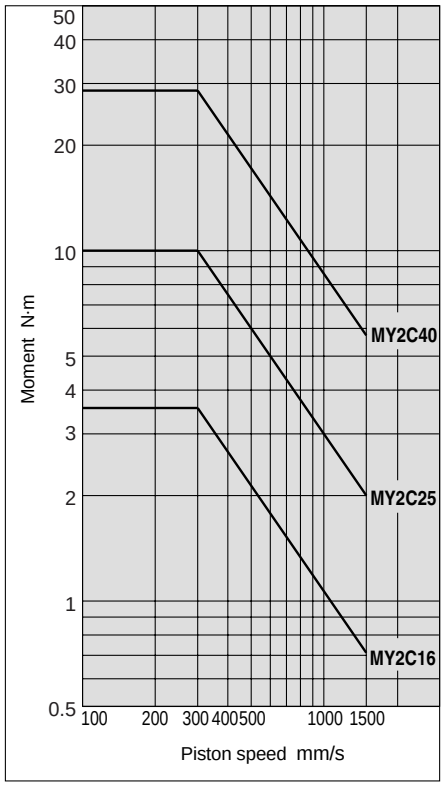
### MY2C/M1




### MY2C/M2

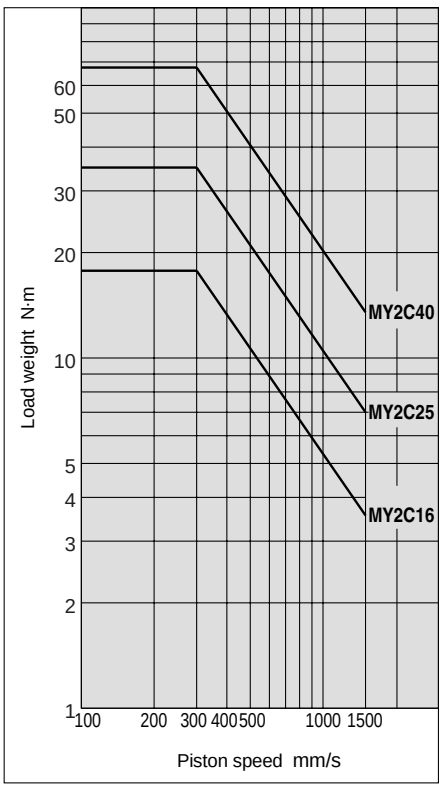



### MY2C/M3

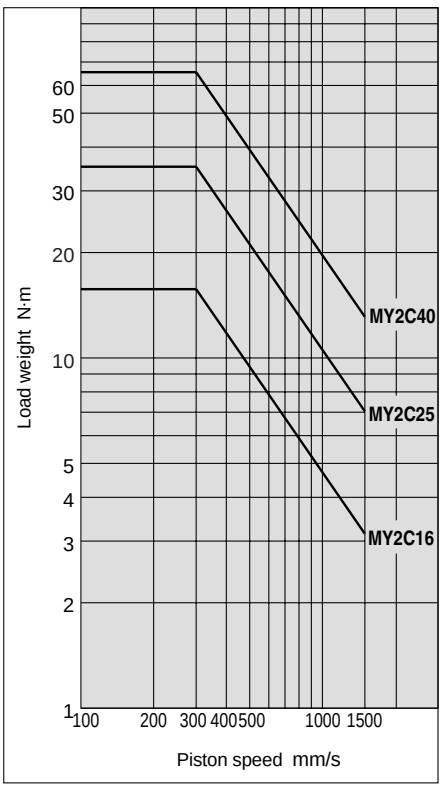



## Load weight/MY2C

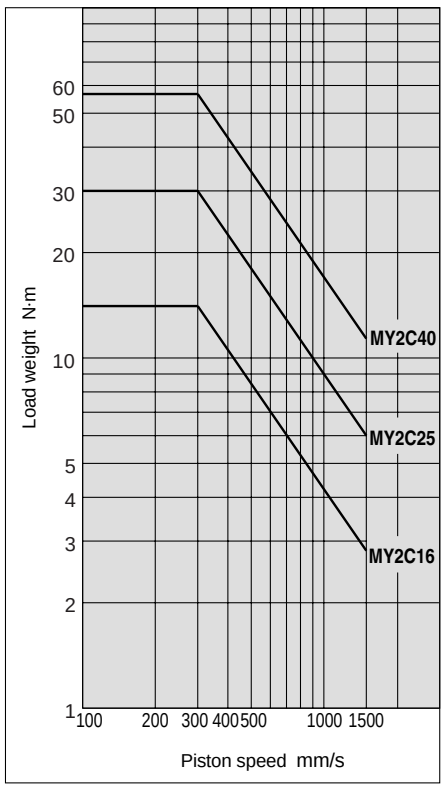
### MY2C/m1




### MY2C/m2



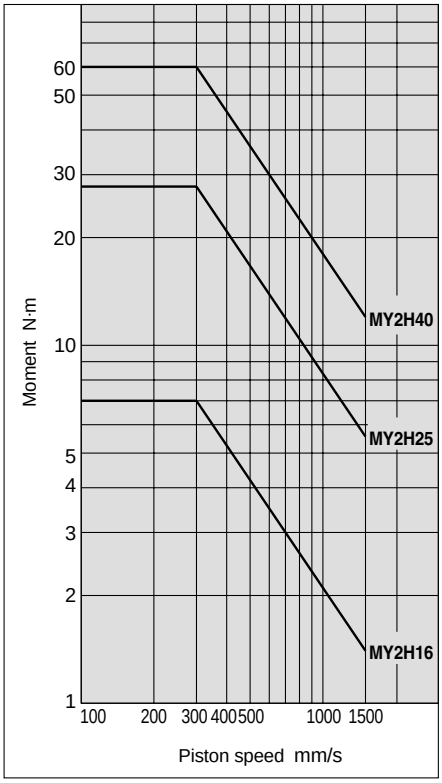

### MY2C/m3



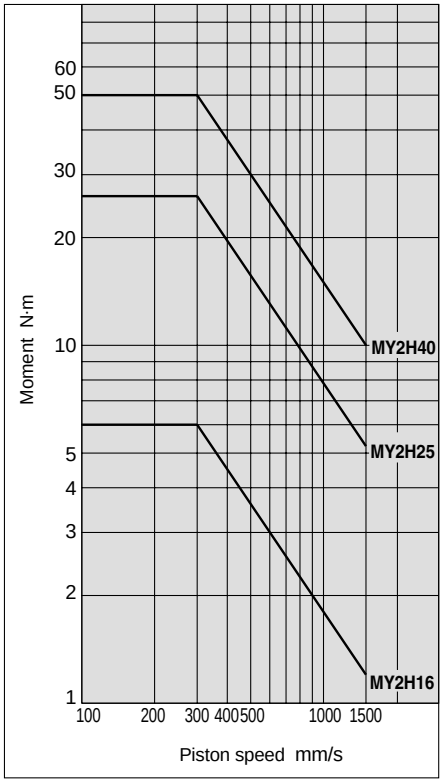
## Maximum Allowable Moment/Maximum Load Weight

### Moment/MY2H (Single axis)

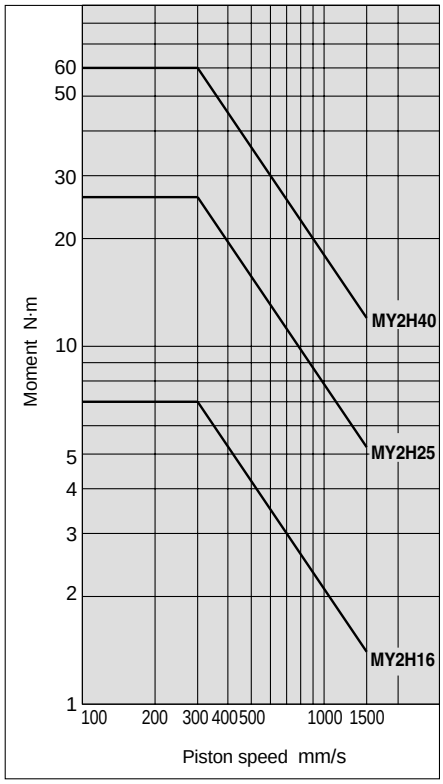
**MY2H/M1**




**MY2H/M2**

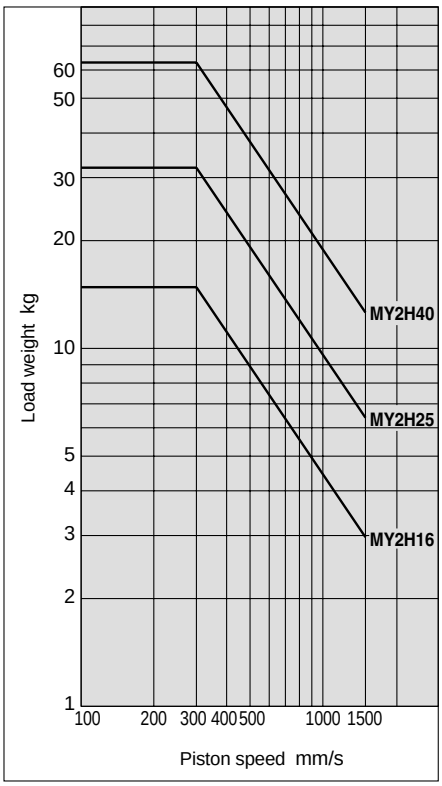



**MY2H/M3**

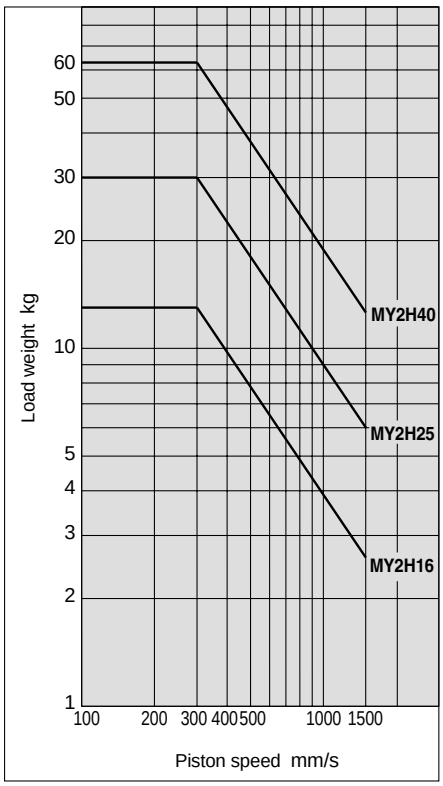



### Load weight/MY2H (Single axis)

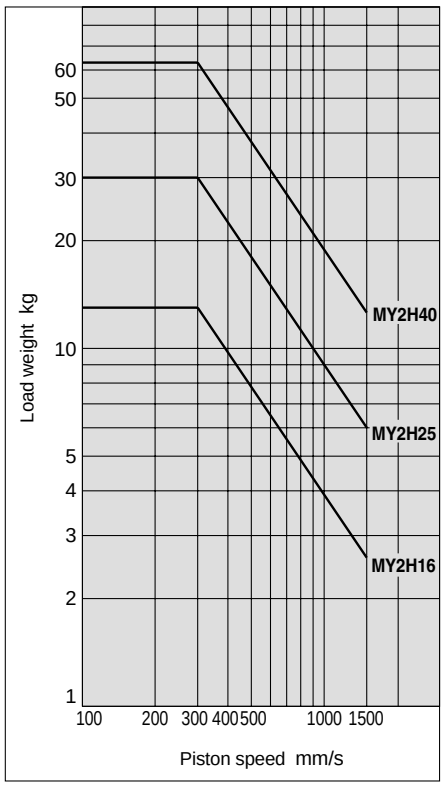
**MY2H/m1**




**MY2H/m2**

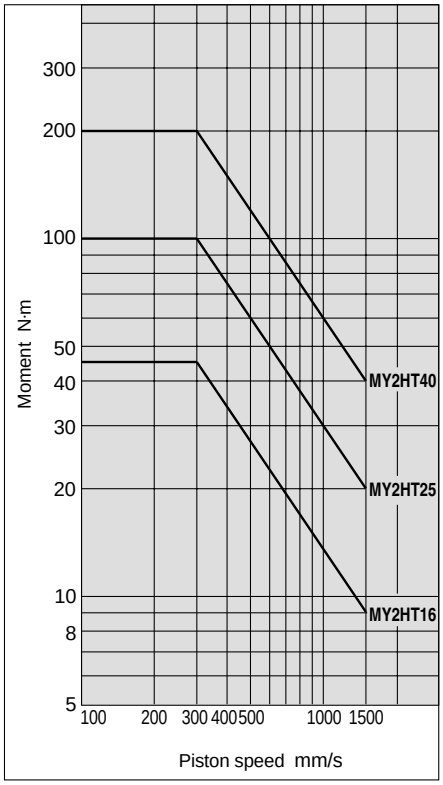



**MY2H/m3**

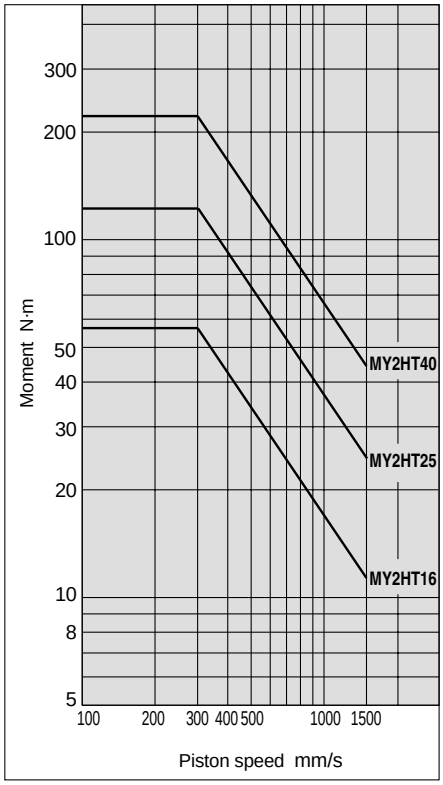


## Moment/MY2HT (Double axis)

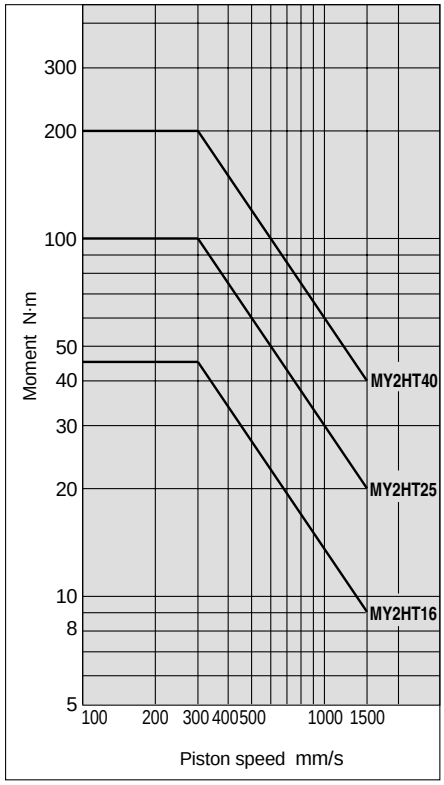
### MY2HT/M1




### MY2HT/M2

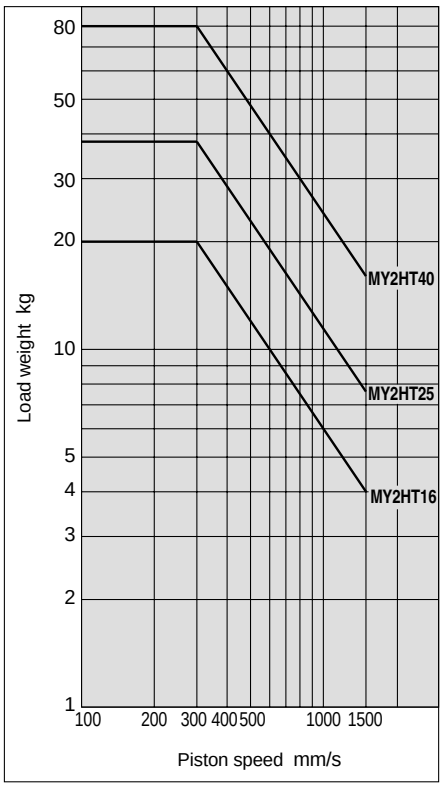



### MY2HT/M3

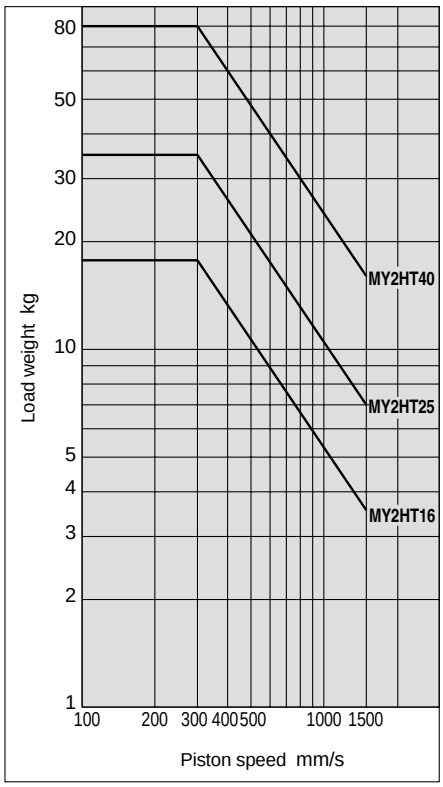



## Load weight/MY2HT (Double axis)

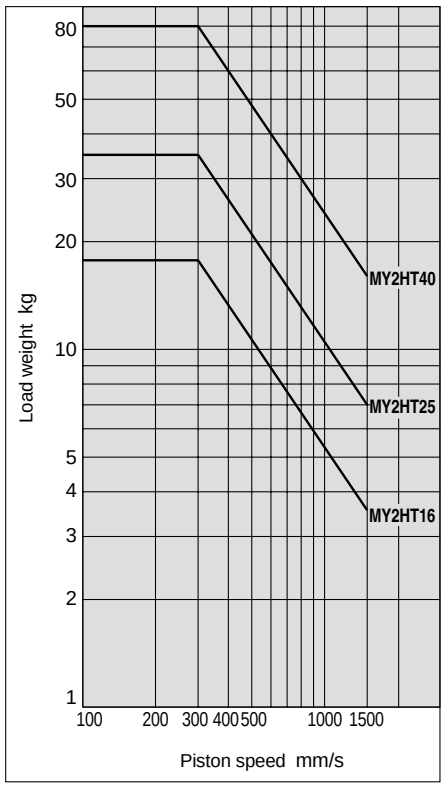
### MY2HT/m1




### MY2HT/m2




### MY2HT/m3



## Cushion Capacity

### Cushion selection

**<Air cushion>**

Air cushions are a standard feature on mechanically jointed rodless cylinders.
The air cushion mechanism is installed to avoid excessive impact of the piston at the stroke end during high speed operation. The air cushion does not act to decelerate the piston near the stroke end.
The ranges of load and speed that air cushions can absorb are within the air cushion limit lines shown in the graphs.

**<Stroke adjusting unit with shock absorber>**

Use this unit when operating with a load or speed exceeding the air cushion limit line, or when cushioning is necessary because the cylinder stroke is outside of the effective air cushion stroke range due to stroke adjustment.

**L unit**

Use this unit when cushioning is necessary outside of the effective air cushion range even if the load and speed are within the air cushion limit line, or when the cylinder is operated in a load and speed range above the air cushion limit line and below the L unit limit line.

**H unit**

Use this unit when the cylinder is operated in a load and speed range above the L unit limit line and below the H unit limit line.

## ⚠ Caution

Do not use a shock absorber and air cushion together.

### Air cushion stroke

Unit: mm

| Bore size (mm) | Cushion stroke |
|---|---|
| **16** | 12 |
| **25** | 15 |
| **40** | 24 |

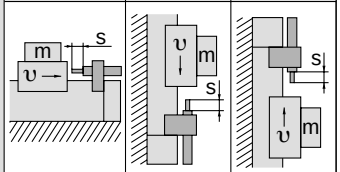
### Stroke adjusting unit holding bolt tightening torque

Unit: N·m

| Bore size (mm) | Tightening torque |
|---|---|
| **16** | 0.6 |
| **25** | 1.5 |
| **40** | 5.0 |

### Calculation of absorbed energy for stroke adjusting unit with shock absorber

Unit: N·m

| | Horizontal | Vertical (downward) | Vertical (upward) |
|---|---|---|---|
| Type of impact |  | | |
| Kinetic energy $E_1$ | $\frac{1}{2} m \cdot \upsilon^2$ | | |
| Thrust energy $E_2$ | $F \cdot s$ | $F \cdot s + m \cdot g \cdot s$ | $F \cdot s - m \cdot g \cdot s$ |
| Absorbed energy E | $E_1 + E_2$ | | |

Symbols

$\upsilon$: Speed of impacting object (m/s) m: Mass of impacting object (kg)

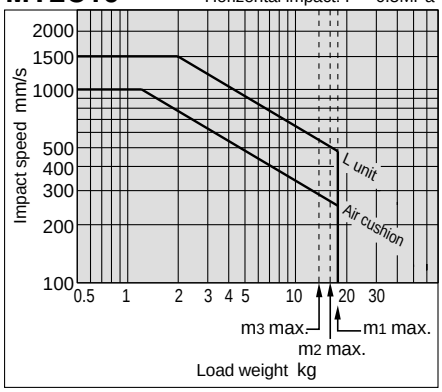
F: Cylinder thrust (N) g: Gravitational acceleration (9.8m/s$^2$)

s: Shock absorber stroke (m)

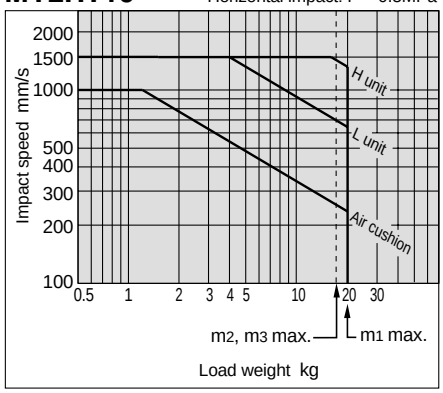
Note) The speed of the impacting object is measured at the time of impact with the shock absorber.

### Absorption capacity of air cushion and stroke adjusting units

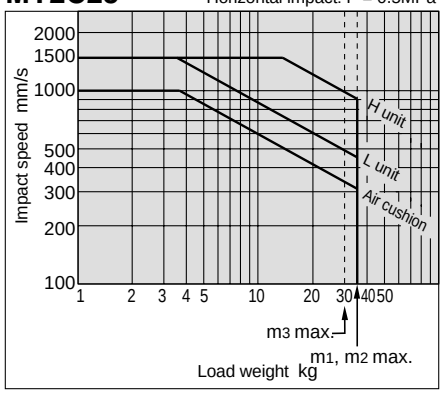
**MY2C16** Horizontal impact: P = 0.5MPa



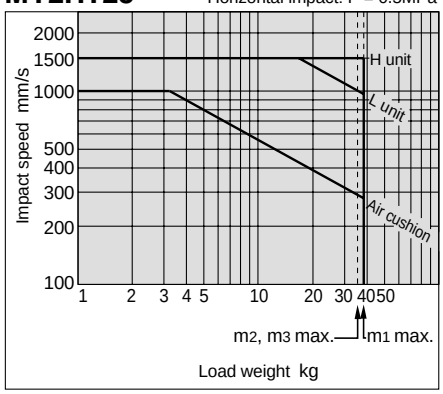

**MY2HT16** Horizontal impact: P = 0.5MPa



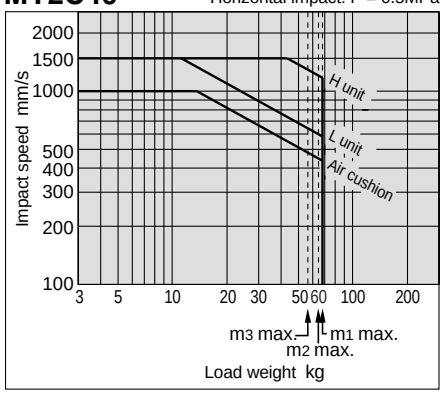

**MY2C25** Horizontal impact: P = 0.5MPa



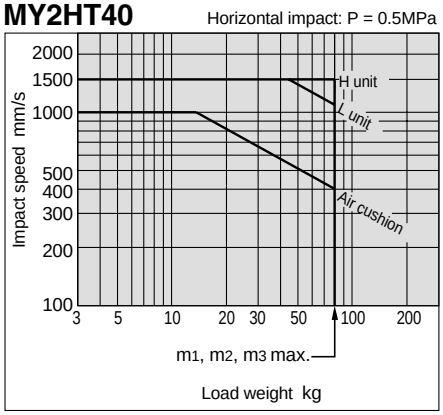

**MY2HT25** Horizontal impact: P = 0.5MPa



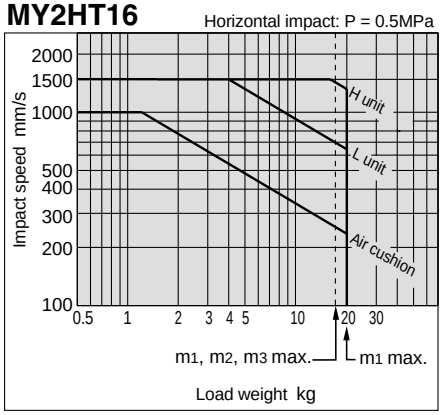

**MY2C40** Horizontal impact: P = 0.5MPa



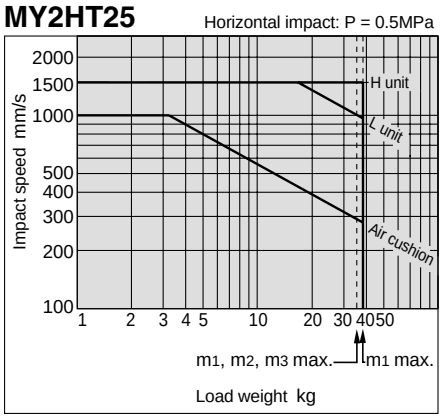

**MY2HT40** Horizontal impact: P = 0.5MPa



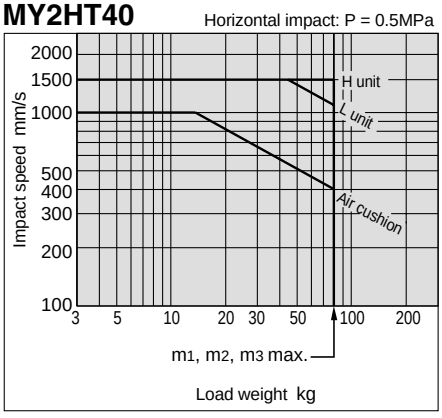
**MY2HT16**




**MY2HT25**




**MY2HT40**



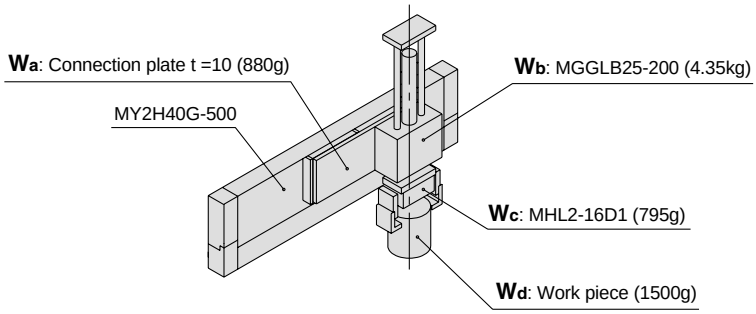
# *Series MY2*
# Model Selection 2

The following are the steps for selection of the series MY2 best suited to your application.

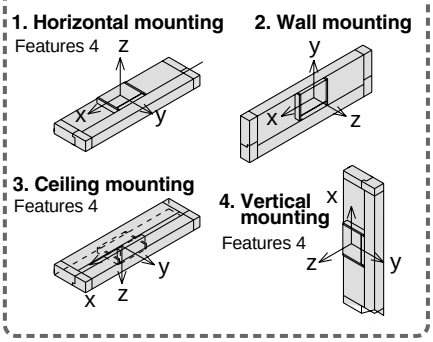
## Calculation of Guide Load Factors

### 1 Operating conditions

**Cylinder** ..... **MY2H40G-500**
**Average operating speed** υa ... **300mm/s**
**Mounting orientation** ..... **Wall mounting**

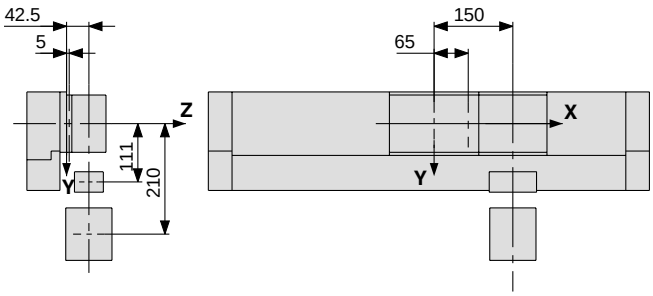



**Mounting orientation**




Refer to the pages above for actual examples of calculation for each orientation.

### 2 Load blocking




**Weight and centre of gravity for each work piece**

| Work piece no. $W_n$ | Weight $m_n$ | Center of gravity | | |
|---|---|---|---|---|
| | | X-axis $X_n$ | Y-axis $Y_n$ | Z-axis $Z_n$ |
| **Wa** | 0.88kg | 65mm | 0mm | 5mm |
| **Wb** | 4.35kg | 150mm | 0mm | 42.5mm |
| **Wc** | 0.795kg | 150mm | 111mm | 42.5mm |
| **Wd** | 1.5kg | 150mm | 210mm | 42.5mm |

n = a, b, c, d

### 3 Composite centre of gravity calculation

$m_3 = \Sigma m_n$
$= 0.88 + 4.35 + 0.795 + 1.5 =$ **7.525kg**

$$X = \frac{1}{m_3} \times \Sigma\ (m_n \times x_n)$$
$$= \frac{1}{7.525}\ (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 1.5 \times 150) =$$ **140.1mm**

$$Y = \frac{1}{m_3} \times \Sigma\ (m_n \times y_n)$$
$$= \frac{1}{7.525}\ (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 1.5 \times 210) =$$ **53.6mm**

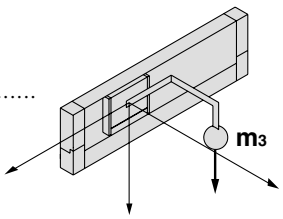
$$Z = \frac{1}{m_3} \times \Sigma\ (m_n \times z_n)$$
$$= \frac{1}{7.525}\ (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 1.5 \times 42.5) =$$ **38.1mm**

### 4 Calculation of load factor for static load

**$m_3$:** Weight

$m_3$ max (from 1 of graph MY2H/$m_3$) = 62 (kg) .....

Load factor $\alpha_1 = m_3 / m_3$ max = 7.525/62 = **0.12**

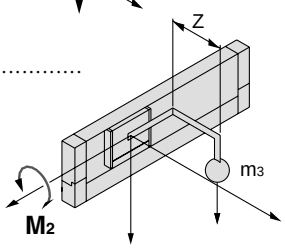



**$M_2$:** Moment

$M_2$ max (from 2 of graph MY2H/$M_2$) = 50 (N·m) .....

$M_2 = m_3 \times g \times Z = 7.525 \times 9.8 \times 38.1 \times 10^{-3} = 2.81$ (N·m)

Load factor $\alpha_2 = M_2 / M_2$ max = 2.81/50 = **0.06**



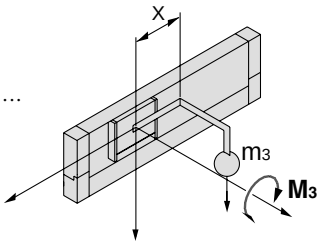
## Calculation of Guide Load Factors

**$M_3$:** Moment

$M_3$ max (from 3 of graph MY2H/$M_3$) = 60 (N·m) .....

$M_3 = m_3 \times g \times X = 7.525 \times 9.8 \times 140.1 \times 10^{-3} = 10.33$ (N·m)

Load factor $\alpha_3 = M_3/M_3$ max = 10.33/60 = **0.17**




### 5 Calculation of load factor for dynamic moment

**Equivalent load $F_E$ at impact**

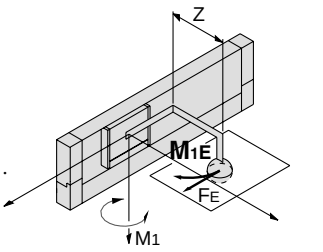
$F_E = \frac{1.4}{100} \times \upsilon a \times g \times m = \frac{1.4}{100} \times 300 \times 9.8 \times 7.525 = 309.7$ (N)

**$M_{1E}$:** Moment

$M_{1E}$ max (from 4 of graph MY2H/$M_1$ where 1.4$\upsilon$a = 420mm/s) = 42.9 (N·m) .....

$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 309.7 \times 38.1 \times 10^{-3} = 3.93$ (N·m)

Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 3.93/42.9 = **0.09**

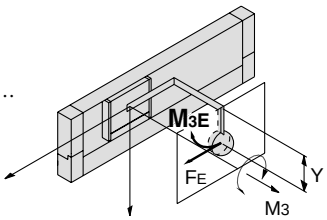



**$M_{3E}$:** Moment

$M_{3E}$ max (from 5 of graph MY2H/$M_3$ where 1.4$\upsilon$a = 420mm/s) = 42.9 (N·m) .....

$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 309.7 \times 53.6 \times 10^{-3} = 5.53$ (N·m)

Load factor $\alpha_5 = M_{3E}/M_{3E}$ max = 5.53/42.9 = **0.13**



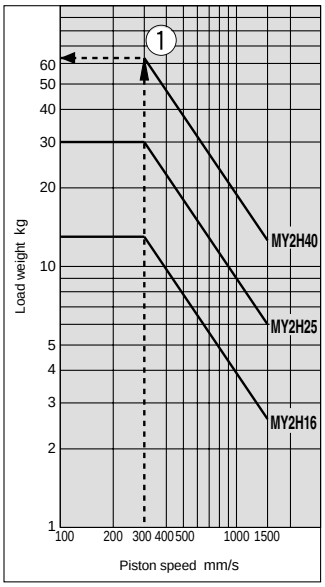

### 6 Sum and examination of guide load factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.57 \leq 1$

The above calculation is within the allowable value and the selected model can be used.
Select a separate shock absorber.
In an actual calculation, when the sum of guide load factors $\Sigma\alpha$ in the formula above is more than 1, consider decreasing the speed, increasing the bore size, or changing the product series. Also, this calculation can be performed easily with the "SMC Pneumatics CAD System".

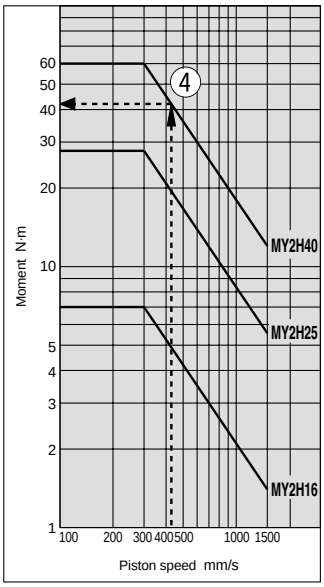
### Load weight

**MY2H/$m_3$**

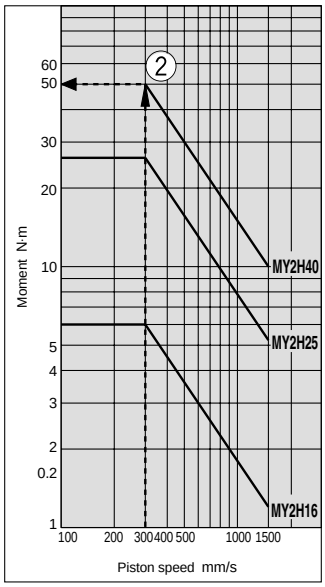



### Allowable moment

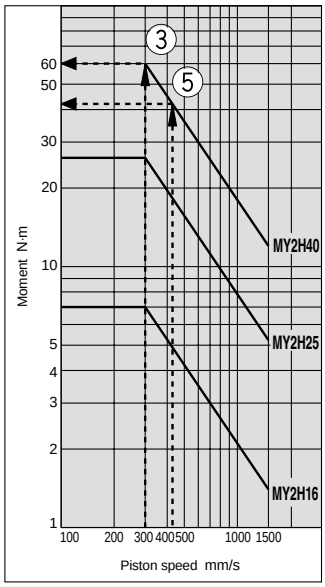
**MY2H/$M_1$**




**MY2H/$M_2$**




**MY2H/$M_3$**



# Mechanical Joint Type Rodless Cylinder

# Series MY2C

## Cam Follower Guide Type/ø16, ø25, ø40

## How to Order

**Cam Follower Guide Type**

**MY2 C 16 ☐ G — 300 L ☐ — F9N ☐**

**Guide suffix**

| | |
|---|---|
| **C** | Cam follower guide |

**Bore size**

| | |
|---|---|
| **16** | 16mm |
| **25** | 25mm |
| **40** | 40mm |

**Port thread type**

| Symbol | Type | Bore size |
|---|---|---|
| **Nil** | M threads | ø16 |
| | Rc | ø25, ø40 |
| **TN** | NPT | |
| **TF** | G | |

**Piping**

| | |
|---|---|
| **G** | Centralized piping type (standard) |

**Stroke**

Refer to the standard stroke table.

**Number of auto switches**

| | |
|---|---|
| **Nil** | 2 pcs. |
| **S** | 1 pc. |
| **n** | "n" pcs. |

**Auto switch**

| | |
|---|---|
| **Nil** | Without auto switch |

∗Refer to the table below for auto switch model numbers.

**Stroke adjusting unit suffix**

| | |
|---|---|
| **Nil** | Both ends |
| **S** | One end |

∗"S" is applicable for stroke adjusting units L and H.

**Stroke adjusting unit**

| | |
|---|---|
| **Nil** | Without adjusting unit |
| **L** | With low load shock absorber |
| **H** | With high load shock absorber |
| **LH** | With one L unit and one H unit each |

**Shock absorbers for L and H units**

| Unit type \ Bore size (mm) | 16 | 25 | 40 |
|---|---|---|---|
| **L unit** | RB0806 | RB1007 | RB1412 |
| **H unit** | —— | RB1412 | RB2015 |

These auto switches have been changed
Contact SMC or view www.smcworld.com

| | |
|---|---|
| F9N➡**M9N** | F9NV➡**M9NV** |
| F9P➡**M9P** | F9PV➡**M9PV** |
| F9B➡**M9B** | F9BV➡**M9BV** |

**Applicable auto switches/**Refer to pages 28 through 32 for detailed auto switch specifications.

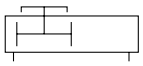
| Type | Special function | Electrical entry | Indicator light | Wiring (output) | Load voltage DC | Load voltage DC | Load voltage AC | Auto switch models: Electrical entry direction: Perpendicular | Auto switch models: Electrical entry direction: In-line | Lead wire length (m)∗: 0.5 (Nil) | Lead wire length (m)∗: 3 (L) | Lead wire length (m)∗: 5 (Z) | Applicable loads | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Reed switch** | – | Grommet | No | 2-wire | 24V | 5V 12V | 100V or less | **A90V** | **A90** | ● | ● | – | IC circuit | Relay, PLC |
| | | | Yes | | | 12V | 100V | **A93V** | **A93** | ● | ● | – | – | |
| | | | | 3-wire (NPN equiv.) | – | 5V | – | **A96V** | **A96** | ● | ● | – | IC circuit | – |
| **Solid state switch** | – | Grommet | Yes | 3-wire (NPN) | 24V | 12V | – | **F9NV** | **F9N** | ● | ● | – | – | Relay, PLC |
| | | | | 3-wire (PNP) | | | | **F9PV** | **F9P** | ● | ● | – | | |
| | | | | 2-wire | | | | **F9BV** | **F9B** | ● | ● | – | | |
| | Diagnostic indication (2-color display) | | | 3-wire (NPN) | | | | **F9NWV** | **F9NW** | ● | ● | ○ | | |
| | | | | 3-wire (PNP) | | | | **F9PWV** | **F9PW** | ● | ● | ○ | | |
| | | | | 2-wire | | | | **F9BWV** | **F9BW** | ● | ● | ○ | | |

∗Lead wire length symbols: 0.5m..... Nil (Example) F9NW
3m..... L F9NWL
5m..... Z F9NWZ

∗Solid state switches marked "○" are produced upon receipt of order.



Symbol



## Specifications

| Bore size (mm) | 16 | 25 | 40 |
|---|---|---|---|
| **Fluid** | Air | | |
| **Action** | Double acting | | |
| **Operating pressure range** | 0.1 to 0.8MPa | | |
| **Proof pressure** | 1.2MPa | | |
| **Ambient and fluid temperature** | 5 to 60°C | | |
| **Cushion** | Air cushion | | |
| **Lubrication** | Non-lube | | |
| **Stroke length tolerance** | 1000 or less $^{+1.8}_{0}$<br>1001 to 3000 $^{+2.8}_{0}$ | 2700 or less $^{+1.8}_{0}$, 2701 to 5000 $^{+2.8}_{0}$ | |
| **Port size** | M5 | 1/8 | 1/4 |

## Shock Absorber Specifications

| Model | | RB 0806 | RB 1007 | RB 1412 | RB 2015 |
|---|---|---|---|---|---|
| **Max. energy absorption (J)** | | 2.9 | 5.9 | 19.6 | 58.8 |
| **Stroke absorption (mm)** | | 6 | 7 | 12 | 15 |
| **Max. impact speed (mm/s)** | | 1500 | 1500 | 1500 | 1500 |
| **Max. operating frequency (cycles/min)** | | 80 | 70 | 45 | 25 |
| **Spring force (N)** | **Extended** | 1.96 | 4.22 | 6.86 | 8.34 |
| | **Compressed** | 4.22 | 6.86 | 15.98 | 20.50 |
| **Operating temperature range (°C)** | | 5 to 60 | | | |

## Stroke Adjusting Unit Specifications

| Bore size (mm) | 16 | 25 | | 40 | |
|---|---|---|---|---|---|
| **Unit symbol** | L | L | H | L | H |
| **Shock absorber model** | RB0806 | RB1007 | RB1412 | RB1412 | RB2015 |
| **Stroke fine adjusting range (mm)** | 0 to –5.6 | 0 to –11.5 | | 0 to –16 | |
| **Stroke adjusting range** | When exceeding the stroke fine adjusting range: Use the Made to Order Specifications "-X416" and "-X417". (Refer to page 35 for details.) | | | | |

## Piston Speed

| Bore size (mm) | | 16 | 25 | 40 |
|---|---|---|---|---|
| Without stroke adjusting unit | | 100 to 1000mm/s Note 1) | | |
| Stroke adjusting unit | L unit and H unit | 100 to 1500mm/s | | |

Note 1) When exceeding the air cushion stroke ranges on page 7, the **piston speed** should be **100 to 200mm/s.**
Note 2) Use at a piston speed within the absorption capacity range. Refer to page 7.

## Standard Strokes

| Bore size (mm) | Standard stroke (mm) * | Maximum manufacturable stroke (mm) |
|---|---|---|
| **16** | 100,200,300,400,500,600,700,800,900<br>1000,1200,1400,1600,1800,2000 | 3000 |
| **25, 40** | | 5000 |

*Strokes are manufacturable in 1mm increments, up to the maximum stroke.
When exceeding a 2000mm stroke, specify "-XB11" at the end of the model number.
Refer to the Made to Order Specifications on page 33.

**Made to Order Specifications**
Refer to pages 33 through 35 for details.

## Theoretical Output

Unit: N

| Bore size (mm) | Piston area ($mm^2$) | Operating pressure (MPa) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 |
| **16** | 200 | 40 | 60 | 80 | 100 | 120 | 140 | 160 |
| **25** | 490 | 98 | 147 | 196 | 245 | 294 | 343 | 392 |
| **40** | 1256 | 251 | 377 | 502 | 628 | 754 | 879 | 1005 |

Note) Theoretical output (N) = Pressure (MPa) x Piston area ($mm^2$)

## Weights

Unit: kg

| Bore size (mm) | Basic weight | Additional weight per 50mm of stroke | Side support bracket weight (per set) | Stroke adjusting unit weight (per unit) | |
|---|---|---|---|---|---|
| | | | | L unit | H unit |
| **16** | 1.05 | 0.13 | 0.01 | 0.03 | — |
| **25** | 2.59 | 0.29 | 0.02 | 0.06 | 0.09 |
| **40** | 8.78 | 0.67 | 0.04 | 0.17 | 0.23 |

Calculation method Example: **MY2C25G-300L**

Basic weight ..... 2.59kg
Additional weight ..... 0.29/50mm
Weight of L unit ..... 0.06kg
Cylinder stroke ..... 300mm

2.59 + 0.29 x 300 ÷ 50 + 0.06 x 2 = Approx. 4.45kg

## Options

### Stroke adjusting unit numbers

| Unit type \ Bore size (mm) | 16 | 25 | 40 |
|---|---|---|---|
| **L unit** | MY2H-A16L | MY2H-A25L | MY2C-A40L |
| **H unit** | — | MY2H-A25H | MY2C-A40H |

## Replacement Parts

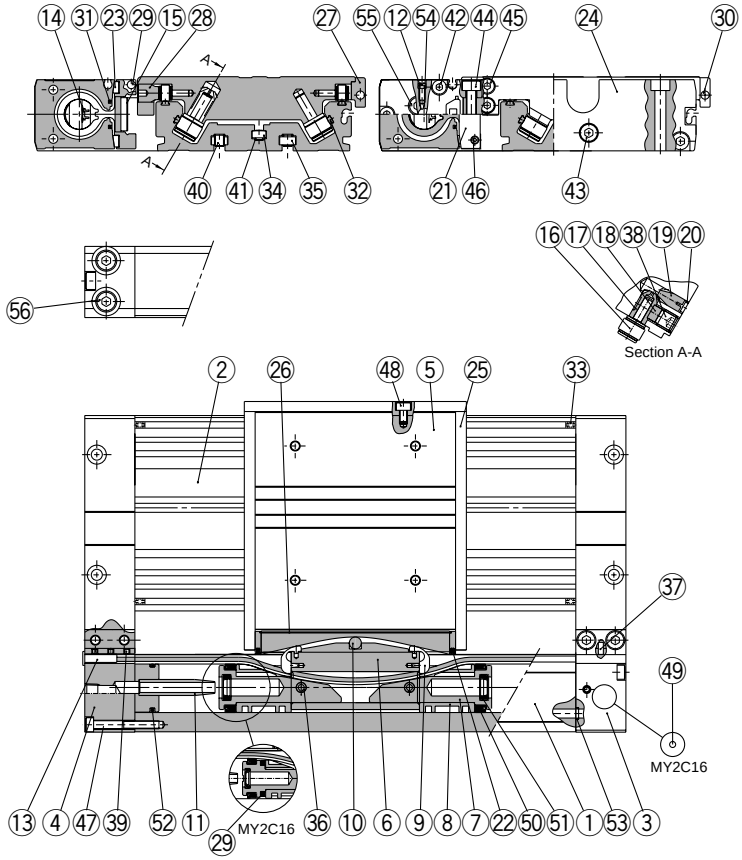
### Drive unit (cylinder) replacement part nos.

| Bore size (mm) \ Model | MY2C |
|---|---|
| **16** | MY2BH16G- Stroke |
| **25** | MY2BH25☐G- Stroke |
| **40** | MY2BH40☐G- Stroke |

Enter a symbol for port thread type inside ☐.

## Construction

### MY2C




**Parts list**

| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Cylinder tube** | Aluminium alloy | Hard anodized |
| 2 | **Body** | Aluminium alloy | Hard anodized |
| 3 | **Head cover WR** | Aluminium alloy | Hard anodized |
| 4 | **Head cover WL** | Aluminium alloy | Hard anodized |
| 5 | **Slide table** | Aluminium alloy | Hard anodized |
| 6 | **Piston yoke** | Aluminium alloy | Hard anodized |
| 7 | **Piston** | Aluminium alloy | Chromate |
| 8 | **Wear ring** | Special resin | |
| 9 | **Belt separator** | Special resin | |
| 10 | **Parallel pin** | Stainless steel | |
| 11 | **Cushion ring** | Brass | |
| 12 | **Cushion needle** | Rolled steel | Nickel plated |
| 13 | **Belt clamp** | Special resin | |
| 16 | **Cam follower** | — | |
| 17 | **Eccentric gear** | Stainless steel | |
| 18 | **Gear fixture** | Stainless steel | |
| 19 | **Adjustment gear** | Stainless steel | |
| 20 | **Retaining ring** | Stainless steel | |
| 21 | **End cover** | Aluminium alloy | Hard anodized |
| 23 | **Bearing** | Special resin | |
| 24 | **End plate** | Aluminium alloy | Hard anodized |
| 25 | **Stopper screw** | Carbon steel | Nickel plated after quenching |
| 26 | **Top cover** | Stainless steel | |
| 27 | **Side cover** | Aluminium alloy | Hard anodized |

**Parts list**

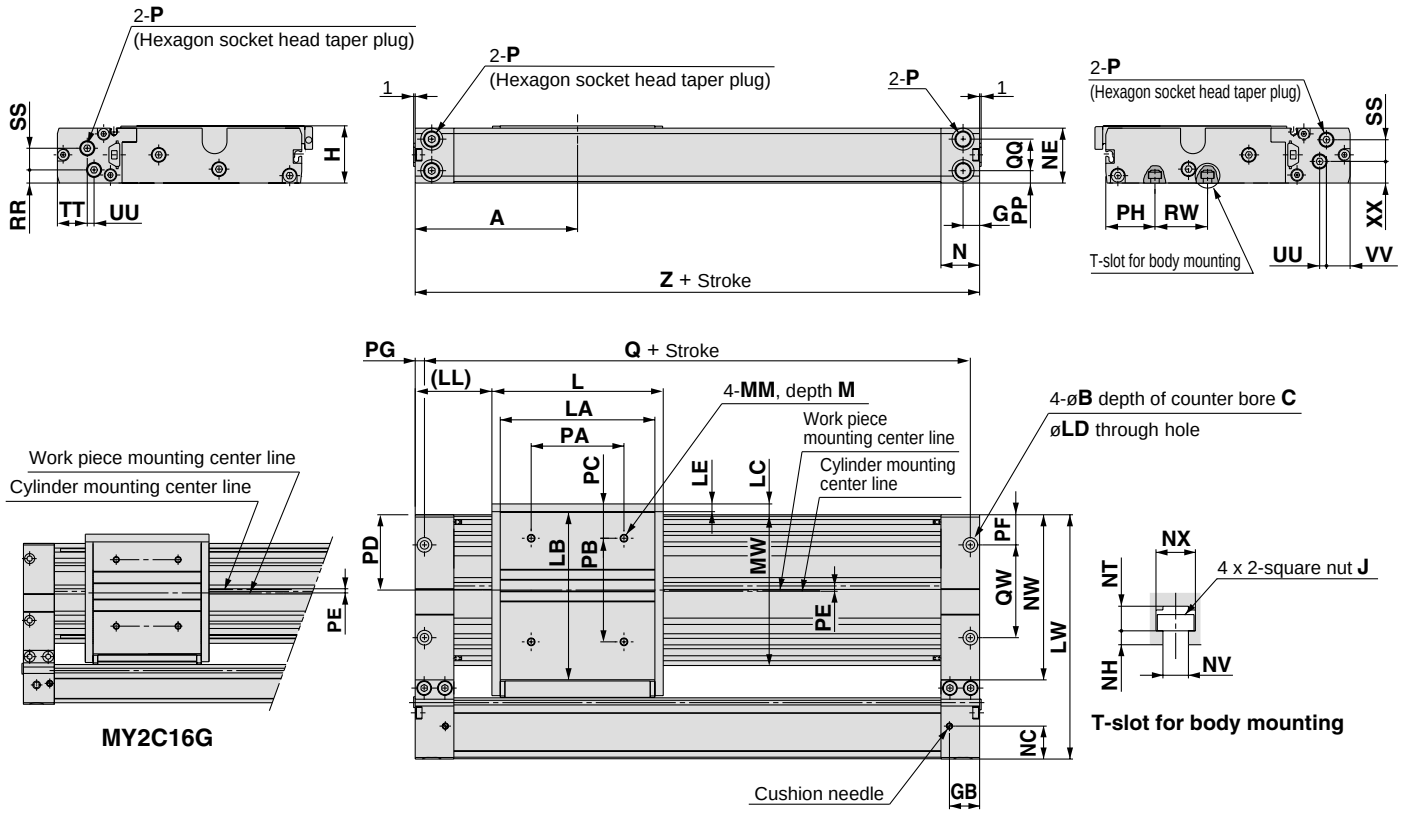
| No. | Description | Material | Note |
|---|---|---|---|
| 28 | **Cam follower cap** | Aluminium alloy | Hard anodized |
| 29 | **Magnet** | Rare earth magnet | |
| 30 | **Magnet** | Rare earth magnet | |
| 31 | **Seal magnet** | Rubber magnet | |
| 32 | **Rail** | Hard steel wire material | |
| 33 | **End spacer** | Special resin | |
| 34 | **Square nut** | Carbon steel | Nickel plated |
| 35 | **Square nut** | Carbon steel | Nickel plated |
| 36 | **Spring pin** | Carbon tool steel | Black zinc chromate |
| 37 | **Parallel pin** | Stainless steel | |
| 38 | **Hexagon socket head set screw** | Chrome molybdenum steel | Black zinc chromate |
| 39 | **Hexagon socket head set screw** | Chrome molybdenum steel | Black zinc chromate |
| 40 | **Hexagon socket head set screw** | Chrome molybdenum steel | Nickel plated |
| 41 | **Hexagon socket head set screw** | Chrome molybdenum steel | Nickel plated |
| 42 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 43 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 44 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 45 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 46 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 47 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 48 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 49 | **Steel ball** | Spring steel | Nickel plated |
| 55 | **Hexagon socket head taper plug** | Carbon steel | Nickel plated (ø16: hexagon socket head plug) |
| 56 | **Hexagon socket head taper plug** | Carbon steel | Nickel plated (ø16: hexagon socket head plug) |

**Seal list**

| No. | Description | Material | Qty. | MY2C16G | MY2C25G | MY2C40G |
|---|---|---|---|---|---|---|
| 14 | **Seal belt** | Special resin | 1 | MY16-16A- Stroke | MY2H25-16A- Stroke | MY2H40-16A- Stroke |
| 15 | **Dust seal band** | Stainless steel | 1 | MY2H16-16B- Stroke | MY2H25-16B- Stroke | MY2H40-16B- Stroke |
| 22 | **Scraper** | Special resin | 2 | MYH16-15AR4900 | MYH25-15AR4901 | MYH40-15AR4902 |
| 50 | **Piston seal** | NBR | 2 | GMY16 | GMY25 | GMY40 |
| 51 | **Cushion seal** | NBR | 2 | MYB16-15-A7163 | RCS-8 | RCS-12 |
| 52 | **Tube gasket** | NBR | 2 | P12 | TMY-25 | TMY-40 |
| 53 | **O-ring** | NBR | 4 | ø6.2 x ø3 x ø1.6 | P-5 | C-9 |
| 54 | **O-ring** | NBR | 2 | ø4 x ø1.8 x ø1.1 | ø4 x ø1.8 x ø1.1 | ø7.15 x ø3.75 x ø1.7 |

# ø16, ø25, ø40

**MY2C Bore size G — Stroke**




(mm)

| Model | A | B | C | G | GB | H | L | J | LA | LB | LC | LD | LE | (LL) | LW | M | MM | MW | N | NC | NE | NH | NT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2C16G** | 80 | 6.5 | 3.3 | 8.5 | 17 | 28 | 80 | M3 | 70 | 72.4 | 6 | 3.4 | 5 | 40 | 104 | 7 | M4 | 64.6 | 20 | 14 | 27 | 2 | 3.5 |
| **MY2C25G** | 105 | 9.5 | 5.4 | 10.7 | 19.5 | 37 | 110.8 | M5 | 100 | 108.7 | 7 | 5.5 | 5 | 49.6 | 158 | 9 | M5 | 97.5 | 25 | 21.3 | 35.5 | 3 | 5.3 |
| **MY2C40G** | 165 | 14 | 8.6 | 15.5 | 31.5 | 58 | 180 | M6 | 158 | 135.3 | 7 | 9 | 5 | 75 | 214 | 13 | M6 | 121.5 | 40 | 32.4 | 56.5 | 4 | 6.5 |

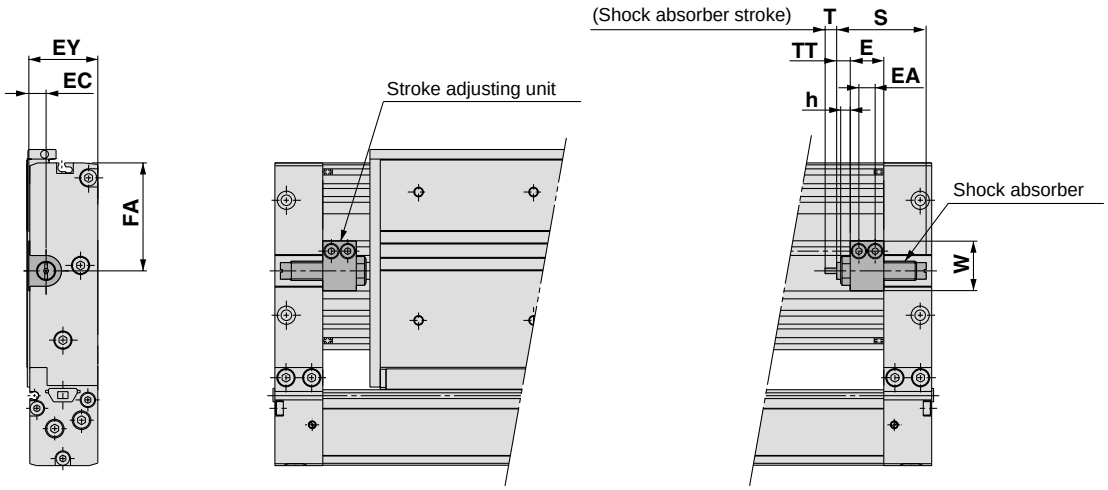
| Model | NV | NW | NX | P | PA | PB | PC | PD | PE | PF | PG | PH | PP | Q | QQ | QW | RR | RW | SS | TT | UU | VV | XX | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2C16G** | 3.4 | 69.2 | 5.8 | M5 | 40 | 43 | 16.5 | 32 | 2.2 | 9.8 | 4 | 21.3 | 5.3 | 152 | 16.4 | 40 | 5.3 | 22 | 9.7 | 12.5 | 3 | 10.5 | 12 | 160 |
| **MY2C25G** | 5.5 | 106.8 | 8.5 | $^1/_8$ | 60 | 67 | 22.2 | 48.7 | 0.8 | 19.5 | 6 | 31.8 | 8 | 198 | 20.4 | 60 | 8.5 | 34 | 14 | 19.3 | 4.4 | 15.3 | 14 | 210 |
| **MY2C40G** | 6.6 | 135.1 | 10.5 | $^1/_4$ | 100 | 77 | 29 | 60.5 | 8.5 | 40.5 | 9 | 38 | 16 | 312 | 25.5 | 57 | 11 | 45 | 21.5 | 35.4 | 2 | 29 | 23 | 330 |

"P" indicates cylinder supply ports. ∗The plug for "P" MY2C16G is a hexagon socket head plug.

## Stroke adjusting unit

### Low load shock absorber

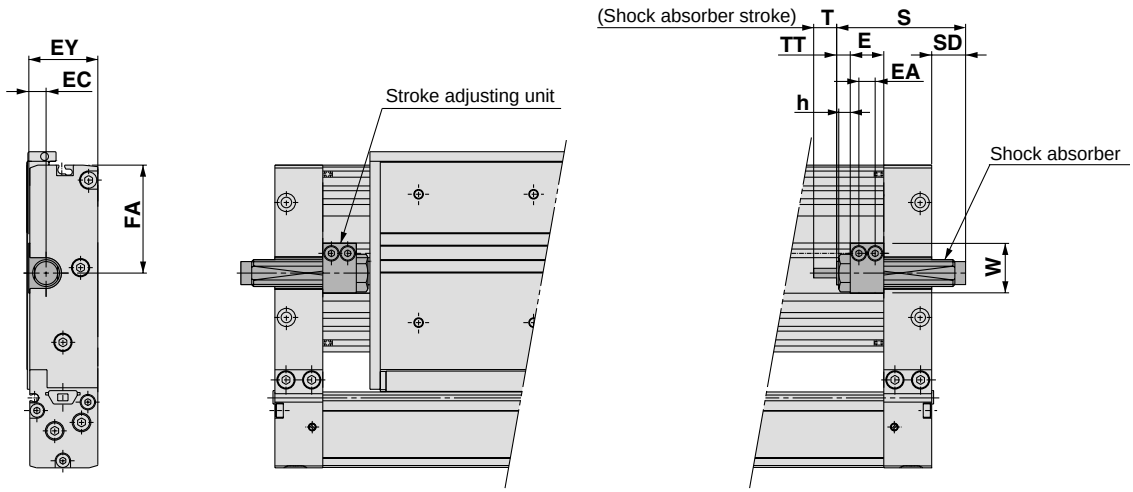
**MY2C Bore size G — Stroke L**




| Applicable cylinder | E | EA | EC | EY | FA | h | S | T | TT | W | Shock absorber model |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2C16** | 14.4 | 7 | 6 | 27 | 38.5 | 4 | 40.8 | 6 | 5.6(MAX 11.2) | 16.5 | RB0806 |
| **MY2C25** | 17.5 | 8.5 | 9 | 36 | 56.4 | 5 | 46.7 | 7 | 7.1(MAX 18.6) | 25.8 | RB1007 |
| **MY2C40** | 25 | 13 | 13.5 | 56.5 | 67.8 | 6 | 67.3 | 12 | 10 (MAX 26) | 38 | RB1412 |

### High load shock absorber

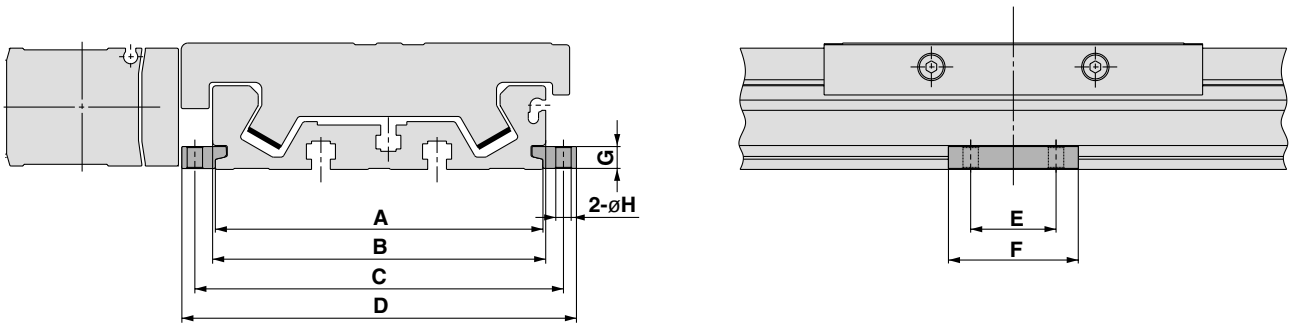
**MY2C Bore size G — Stroke H**




| Applicable cylinder | E | EA | EC | EY | FA | h | S | SD | T | TT | W | Shock absorber model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2H25** | 17.5 | 8.5 | 9 | 36 | 56.4 | 6 | 67.3 | 17.7 | 12 | 7.1 (MAX 18.6) | 25.8 | RB1412 |
| **MY2H40** | 25 | 13 | 13.5 | 56.5 | 67.8 | 6 | 73.2 | — | 15 | 10 (MAX 26) | 38 | RB2015 |

## Side Support

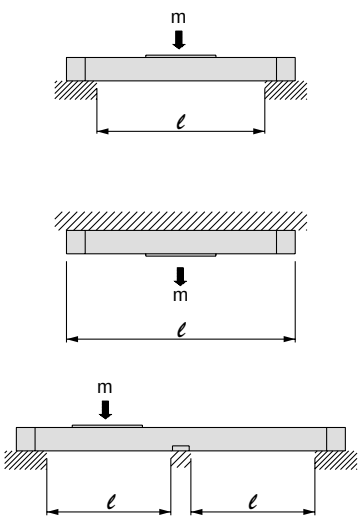
### Side support
### MYC-S□A

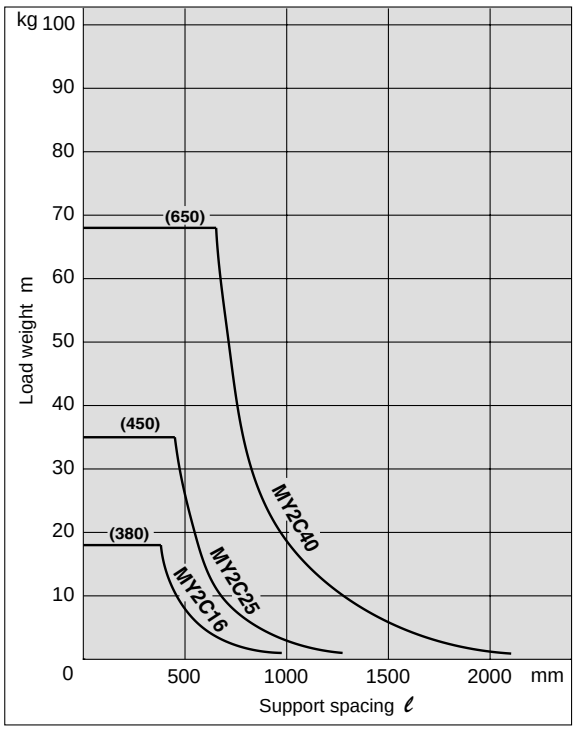



| Model | Applicable cylinder | A | B | C | D | E | F | G | øH |
|---|---|---|---|---|---|---|---|---|---|
| **MYC-S16A** | **MY2C16** | 60.6 | 64.6 | 70.6 | 77.2 | 15 | 26 | 4.9 | 3.4 |
| **MYC-S25A** | **MY2C25** | 95.9 | 97.5 | 107.9 | 115.5 | 25 | 38 | 6.4 | 4.5 |
| **MYC-S40A** | **MY2C40** | 121.5 | 121.5 | 134.5 | 145.5 | 45 | 64 | 11.7 | 6.6 |

## Guide for Using Side Supports

For long stroke operation, the cylinder tube may deflect due to its own weight and/or load weight. In such cases, install a side support at the intermediate stroke position. The spacing (ℓ) of the side support must be no more than the values shown in the graph at right.




## ⚠ Caution

①If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Make sure to level the cylinder tube when mounting the cylinder. For long stroke operation involving vibration and impact, the use of side supports is recommended even if the support spacing is within the allowable limits shown in the graph.

②Support brackets are not for mounting. They should be used only to provide support.

# Mechanical Joint Type Rodless Cylinder

# Series MY2H/2HT

## High Precision Guide Type/ø16, ø25, ø40

## How to Order

**High Precision Guide Type**

**MY2 H 16 ☐ G — 300 L ☐ — F9N ☐**

**Guide type**

| | |
|---|---|
| **H** | High precision guide with single axis |
| **HT** | High precision guide with double axis |

**Bore size**

| | |
|---|---|
| **16** | 16mm |
| **25** | 25mm |
| **40** | 40mm |

**Port thread type**

| Symbol | Type | Bore size |
|---|---|---|
| **Nil** | M threads | ø16 |
| | Rc | ø25, ø40 |
| **TN** | NPT | |
| **TF** | G | |

**Piping**

| | |
|---|---|
| **G** | Centralized piping type (standard) |

**Stroke**
Refer to the standard stroke table.

These auto switches have been changed
Contact SMC or view www.smcworld.com

F9N➡**M9N** F9NV➡**M9NV**
F9P➡**M9P** F9PV➡**M9PV**
F9B➡**M9B** F9BV➡**M9BV**

**Number of auto switches**

| | |
|---|---|
| **Nil** | 2 pcs. |
| **S** | 1 pc. |
| **n** | "n" pcs. |

**Auto switch type**

| | |
|---|---|
| **Nil** | Without auto switch |

∗Refer to the table below for auto switch model numbers.

**Stroke adjusting unit position**

| | |
|---|---|
| **Nil** | Both ends |
| **S** | One end |

∗"S" is applicable for stroke adjusting units L and H.

**Stroke adjusting unit**

| | |
|---|---|
| **Nil** | Without adjusting unit |
| **L** | With low load shock absorber |
| **H** | With high load shock absorber |
| **LH** | With one L unit and one H unit each |

**Shock absorbers for L and H units**

| Model | Unit type \ Bore size (mm) | 16 | 25 | 40 |
|---|---|---|---|---|
| **MY2H** | **L unit** | RB0806 | RB1007 | RB1412 |
| | **H unit** | RB1007 | RB1412 | RB2015 |
| **MY2HT** | **L unit** | RB1007 | RB1412 | RB2015 |
| | **H unit** | RB1412 | RB2015 | RB2725 |

## Applicable auto switches/ Refer to pages 28 through 32 for detailed auto switch specifications.

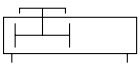
| Type | Special function | Electrical entry | Indicator light | Wiring (output) | Load voltage DC | Load voltage DC | Load voltage AC | Auto switch models: Electrical entry direction: Perpendicular | Auto switch models: Electrical entry direction: In-line | Lead wire length (m)∗: 0.5 (Nil) | Lead wire length (m)∗: 3 (L) | Lead wire length (m)∗: 5 (Z) | Applicable loads | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Reed switch** | – | Grommet | No | 2-wire | 24V | 5V 12V | 100V or less | **A90V** | **A90** | ● | ● | – | IC circuit | Relay, PLC |
| | | | Yes | | | 12V | 100V | **A93V** | **A93** | ● | ● | – | – | |
| | | | | 3-wire (NPN equiv.) | – | 5V | – | **A96V** | **A96** | ● | ● | – | IC circuit | – |
| **Solid state switch** | – | Grommet | Yes | 3-wire (NPN) | 24V | 12V | – | **F9NV** | **F9N** | ● | ● | – | – | Relay, PLC |
| | | | | 3-wire (PNP) | | | | **F9PV** | **F9P** | ● | ● | – | | |
| | | | | 2-wire | | | | **F9BV** | **F9B** | ● | ● | – | | |
| | Diagnostic indication (2-color display) | | | 3-wire (NPN) | | | | **F9NWV** | **F9NW** | ● | ● | ○ | | |
| | | | | 3-wire (PNP) | | | | **F9PWV** | **F9PW** | ● | ● | ○ | | |
| | | | | 2-wire | | | | **F9BWV** | **F9BW** | ● | ● | ○ | | |

∗Lead wire length symbols: 0.5m..... Nil (Example) F9NW
3m..... L F9NWL
5m..... Z F9NWZ

∗Solid state switches marked "○" are produced upon receipt of order.



Symbol



## Specifications

| Bore size (mm) | 16 | 25 | 40 |
|---|---|---|---|
| **Fluid** | Air | | |
| **Action** | Double acting | | |
| **Operating pressure range** | 0.1 to 0.8MPa | | |
| **Proof pressure** | 1.2MPa | | |
| **Ambient and fluid temperature** | 5 to 60°C | | |
| **Cushion** | Air cushion | | |
| **Lubrication** | Non-lube | | |
| **Stroke length tolerance** | $^{+1.8}_{0}$ | | |
| **Port size** | M5 | 1/8 | 1/4 |

## Shock Absorber Specifications

| Model | | RB 0806 | RB 1007 | RB 1412 | RB 2015 | RB 2725 |
|---|---|---|---|---|---|---|
| **Max. energy absorption (J)** | | 2.9 | 5.9 | 19.6 | 58.8 | 147 |
| **Stroke absorption (mm)** | | 6 | 7 | 12 | 15 | 25 |
| **Max. impact speed (mm/s)** | | 1500 | 1500 | 1500 | 1500 | 1500 |
| **Max. operating frequency (cycles/min)** | | 80 | 70 | 45 | 25 | 10 |
| **Spring force (N)** | **Extended** | 1.96 | 4.22 | 6.86 | 8.34 | 8.83 |
| | **Compressed** | 4.22 | 6.86 | 15.98 | 20.50 | 20.01 |
| **Operating temperature range (°C)** | | 5 to 60 | | | | |

## Stroke Adjusting Unit Specifications

| Bore size (mm) | | 16 | | 25 | | 40 | |
|---|---|---|---|---|---|---|---|
| **Unit symbol** | | L | H | L | H | L | H |
| **Shock absorber model** | **MY2H** | RB0806 | RB1007 | RB1007 | RB1412 | RB1412 | RB2015 |
| | **MY2HT** | RB1007 | RB1412 | RB1412 | RB2015 | RB2015 | RB2725 |
| **Stroke fine adjusting range (mm)** | | 0 to −5.6 | | 0 to −11.5 | | 0 to −16 | |
| **Stroke adjusting range** | | When exceeding the stroke fine adjusting range: Use the Made to Order Specifications "-X416" and "-X417". (Refer to page 35 for details.) | | | | | |

## Piston Speed

| Bore size (mm) | | 16 | 25 | 40 |
|---|---|---|---|---|
| Without stroke adjusting unit | | 100 to 1000mm/s Note 1) | | |
| Stroke adjusting unit | L unit and H unit | 100 to 1500mm/s | | |

Note 1) When exceeding the air cushion stroke ranges on page 7, the **piston speed** should be **100 to 200mm/s.**
Note 2) Use at a piston speed within the absorption capacity range. Refer to page 7.

## Standard Strokes

| Bore size (mm) | Standard stroke (mm) * | Maximum manufacturable stroke (mm) |
|---|---|---|
| **16** | 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600 | 1000 |
| **25, 40** | | 1500 |

* Strokes are manufacturable in 1mm increments, up to the maximum stroke. However, add "-XB10" to the end of the part number for non-standard strokes from 51 to 599. Also when exceeding a 600mm stroke, specify "-XB11" at the end of the model number.
Refer to the Made to Order Specifications on page 33.

**Made to Order Specifications**
Refer to pages 33 through 35 for details.

## Theoretical Output

Unit: N

| Bore size (mm) | Piston area ($mm^2$) | Operating pressure (MPa) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 |
| **16** | 200 | 40 | 60 | 80 | 100 | 120 | 140 | 160 |
| **25** | 490 | 98 | 147 | 196 | 245 | 294 | 343 | 392 |
| **40** | 1256 | 251 | 377 | 502 | 628 | 754 | 879 | 1005 |

Note) Theoretical output (N) = Pressure (MPa) x Piston area ($mm^2$)

## Weights

Unit: kg

| Model | Bore size (mm) | Basic weight | Additional weight per 50mm of stroke | Stroke adjusting unit weight (per unit) | |
|---|---|---|---|---|---|
| | | | | L unit | H unit |
| **MY2H** | **16** | 0.86 | 0.22 | 0.03 | 0.04 |
| | **25** | 2.35 | 0.42 | 0.06 | 0.09 |
| | **40** | 6.79 | 0.76 | 0.16 | 0.22 |
| **MY2HT** | **16** | 1.27 | 0.31 | 0.04 | 0.08 |
| | **25** | 3.70 | 0.61 | 0.10 | 0.18 |
| | **40** | 10.05 | 1.13 | 0.27 | 0.46 |

Calculation method Example: **MY2H25G-300L**

Basic weight ..... 2.35kg
Additional weight ..... 0.42/50mm
Weight of L unit ..... 0.06kg
Cylinder stroke ..... 300mm
2.35 + 0.42 x 300 ÷ 50 + 0.06 x 2 = Approx. 4.99kg

## Options

### Stroke adjusting unit numbers

| Model | Unit type \ Bore size (mm) | 16 | 25 | 40 |
|---|---|---|---|---|
| **MY2H** | **L unit** | MY2H-A16L | MY2H-A25L | MY2H-A40L |
| | **H unit** | MY2H-A16H | MY2H-A25H | MY2H-A40H |
| **MY2HT** | **L unit** | MY2HT-A16L | MY2HT-A25L | MY2HT-A40L |
| | **H unit** | MY2HT-A16H | MY2HT-A25H | MY2HT-A40H |

## Replacement Parts

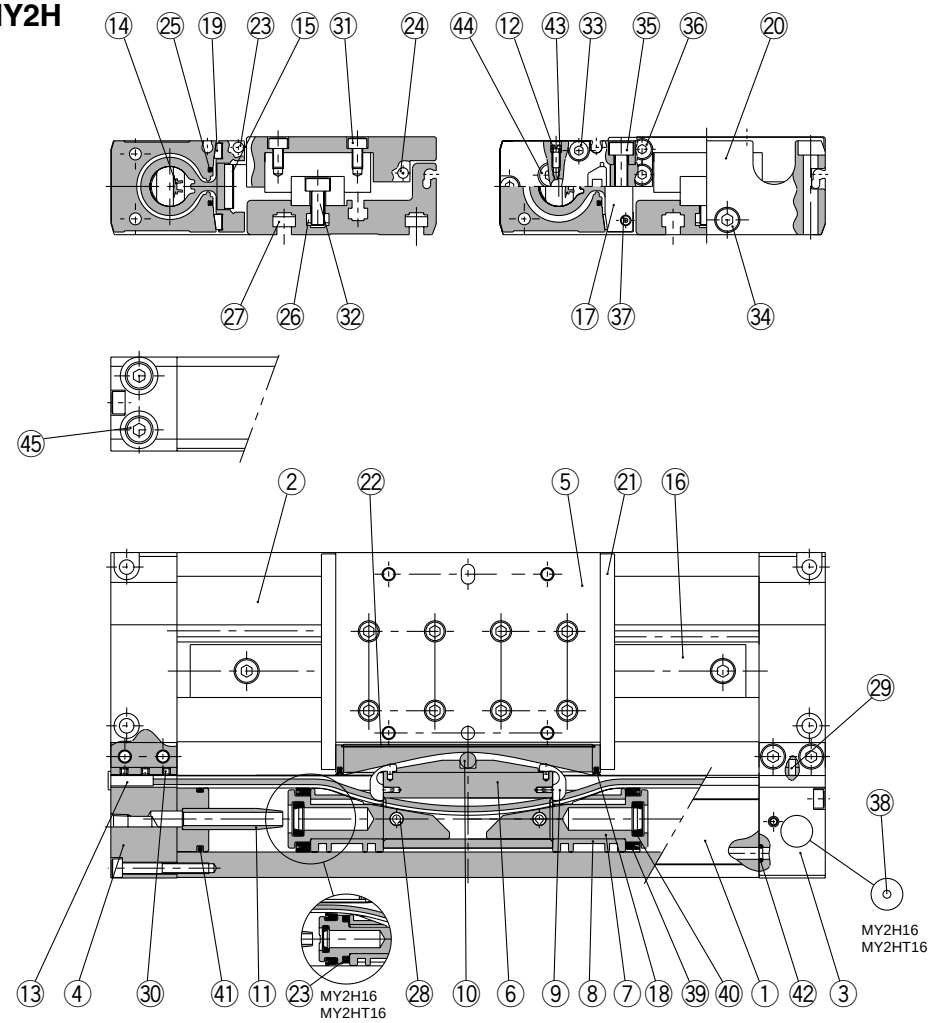
### Drive unit (cylinder) replacement part nos.

| Bore size (mm) \ Model | MY2H | MY2HT |
|---|---|---|
| **16** | MY2BH16G- Stroke | |
| **25** | MY2BH25□G- Stroke | |
| **40** | MY2BH40□G- Stroke | |

Enter a symbol for port thread type inside □.

## Construction

### Single axis type/MY2H



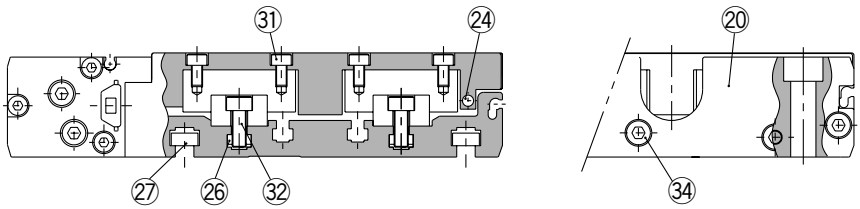

**Parts list**

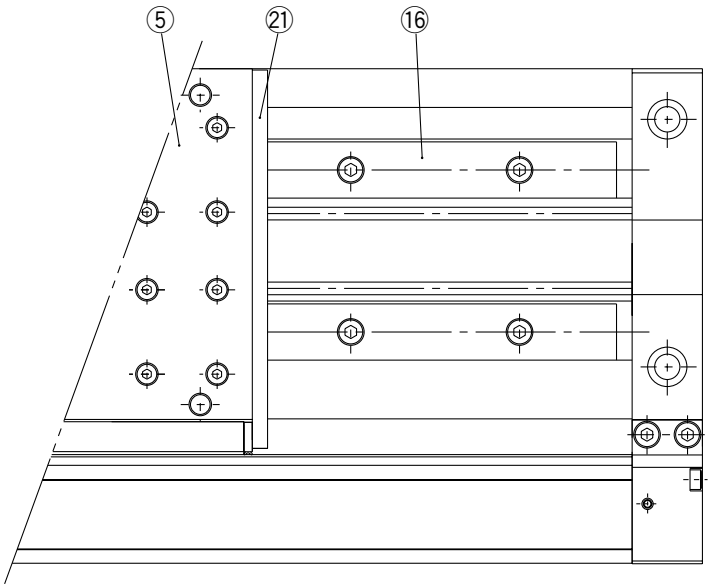
| No. | Description | Material | Note |
|---|---|---|---|
| 1 | **Cylinder tube** | Aluminum alloy | Hard anodized |
| 2 | **Body** | Aluminum alloy | Hard anodized |
| 3 | **Head cover WR** | Aluminum alloy | Hard anodized |
| 4 | **Head cover WL** | Aluminum alloy | Hard anodized |
| 5 | **Slide table** | Aluminum alloy | Hard anodized |
| 6 | **Piston yoke** | Aluminum alloy | Hard anodized |
| 7 | **Piston** | Aluminum alloy | Chromated |
| 8 | **Wear ring** | Special resin | |
| 9 | **Belt separator** | Special resin | |
| 10 | **Parallel pin** | Stainless steel | |
| 11 | **Cushion ring** | Brass | |
| 12 | **Cushion needle** | Rolled steel | Nickel plated |
| 13 | **Belt clamp** | Special resin | |
| 16 | **Guide** | — | |
| 17 | **End cover** | Aluminum alloy | Hard anodized |
| 19 | **Bearing** | Special resin | |
| 20 | **End plate** | Aluminum alloy | Hard anodized |
| 21 | **Stopper** | Carbon steel | Nickel plated after quenching |
| 22 | **Top cover** | Stainless steel | |

**Parts list**

| No. | Description | Material | Note |
|---|---|---|---|
| 23 | **Magnet** | Rare earth magnet | |
| 24 | **Magnet** | Rare earth magnet | |
| 25 | **Seal magnet** | Rubber magnet | |
| 26 | **Square nut** | Carbon steel | Nickel plated |
| 27 | **Square nut** | Carbon steel | Nickel plated |
| 28 | **Spring pin** | Carbon tool steel | Black zinc chromated |
| 29 | **Parallel pin** | Stainless steel | |
| 30 | **Hexagon socket head set screw** | Chrome molybdenum steel | Black zinc chromated |
| 31 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 32 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 33 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 34 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 35 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 36 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 37 | **Hexagon socket head button bolt** | Chrome molybdenum steel | Nickel plated |
| 38 | **Steel ball** | Spring steel | Nickel plated |
| 44 | **Hexagon socket head taper plug** | Carbon steel | Nickel plated (ø16: Hexagon socket head plug) |
| 45 | **Hexagon socket head taper plug** | Carbon steel | Nickel plated (ø16: Hexagon socket head plug) |

## Double axis type/MY2HT



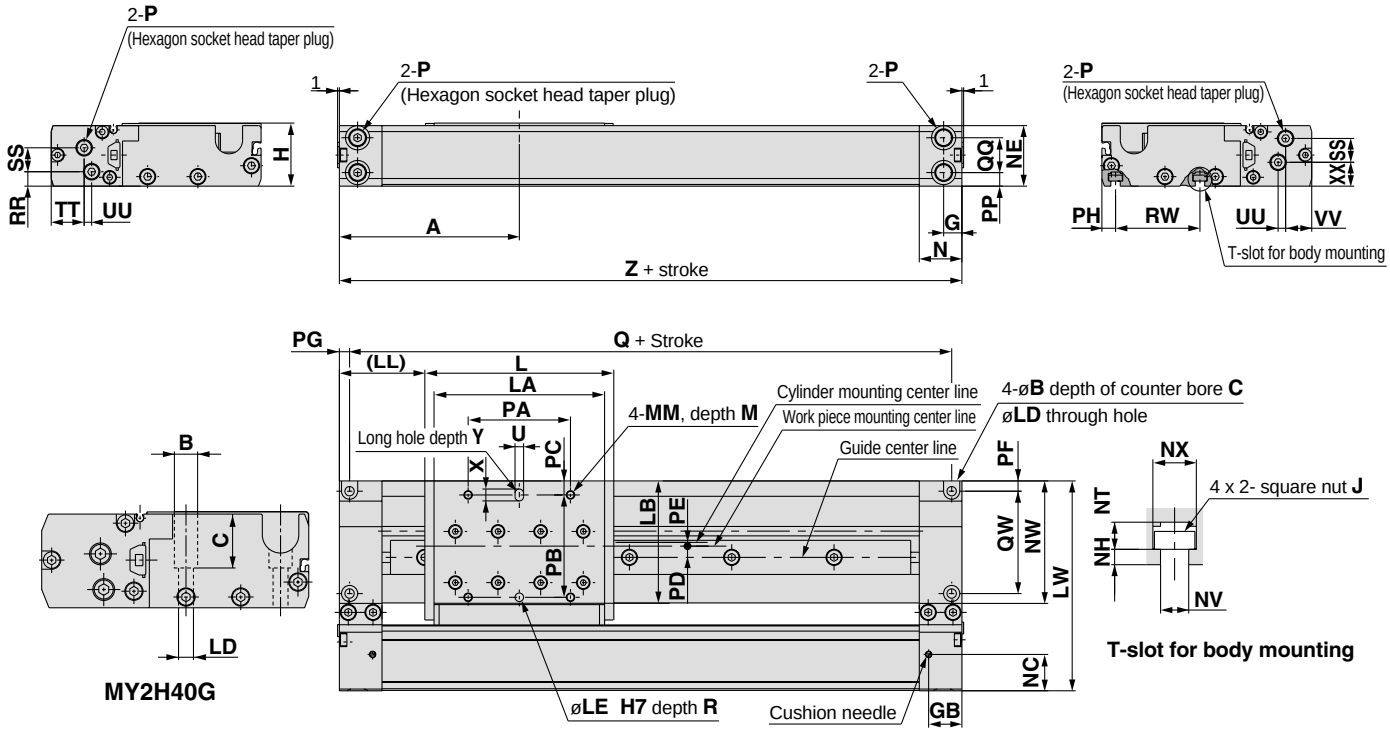




### Seal list

| No. | Description | Material | Qty. | MY2H16G/MY2HT16G | MY2H25G/MY2HT25G | MY2H40G/MY2HT40G |
|---|---|---|---|---|---|---|
| 14 | **Seal belt** | Special resin | 1 | MY16-16A-Stroke | MY2H25-16A-Stroke | MY2H40-16A-Stroke |
| 15 | **Dust seal band** | Stainless steel | 1 | MY2H16-16B-Stroke | MY2H25-16B-Stroke | MY2H40-16B-Stroke |
| 18 | **Scraper** | Special resin | 2 | MYH16-15AR4900 | MYH25-15AR4901 | MYH40-15AR4902 |
| 39 | **Piston seal** | NBR | 2 | GMY16 | GMY25 | GMY40 |
| 40 | **Cushion seal** | NBR | 2 | MYB16-15-A7163 | RCS-8 | RCS-12 |
| 41 | **Tube gasket** | NBR | 2 | P12 | TMY-25 | TMY-40 |
| 42 | **O-ring** | NBR | 4 | ø6.2 x ø3 x ø1.6 | P-5 | C-9 |
| 43 | **O-ring** | NBR | 2 | ø4 x ø1.8 x ø1.1 | ø4 x ø1.8 x ø1.1 | ø7.15 x ø3.75 x ø1.7 |

## Single Axis Type ø16, ø25, ø40

**MY2H Bore size G — Stroke**




(mm)

| Model | A | B | C | G | GB | H | L | J | LA | LB | LD | LE | (LL) | LW | M | MM | N | NC | NE | NH | NT | NV | NW | NX | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2H16G** | 80 | 6.5 | 3.3 | 8.5 | 17 | 28 | 80 | M3 | 70 | 50.4 | 3.4 | 4 | 40 | 83 | 7 | M4 | 20 | 14 | 27 | 2 | 3.5 | 3.4 | 48.2 | 5.8 | M5 |
| **MY2H25G** | 105 | 9.5 | 5.4 | 10.7 | 19.5 | 37 | 110.8 | M5 | 100 | 71.7 | 5.5 | 5 | 49.6 | 123 | 9 | M5 | 25 | 21.3 | 35.5 | 3 | 5.3 | 5.5 | 71.8 | 8.5 | $^1/_8$ |
| **MY2H40G** | 165 | 14 | 32.5 | 15.5 | 31.5 | 58 | 180 | M6 | 158 | 80.3 | 9 | 6 | 75 | 161 | 13 | M6 | 40 | 32.4 | 56.5 | 4 | 6.5 | 6.6 | 82.1 | 10.5 | $^1/_4$ |

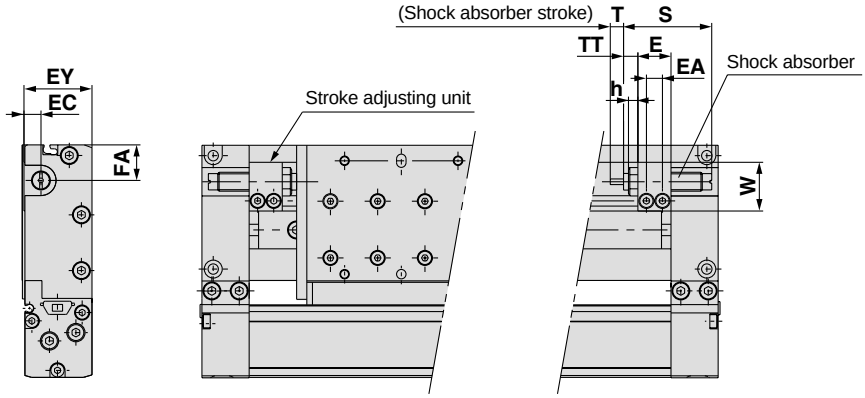
| Model | PA | PB | PC | PD | PE | PF | PG | PH | PP | Q | QQ | QW | R | RR | RW | SS | TT | U | UU | VV | X | XX | Y | Z |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2H16G** | 40 | 40 | 7.2 | 2.8 | 3.7 | 3.5 | 4 | 5.1 | 5.3 | 152 | 16.4 | 40 | 5 | 5.3 | 40 | 9.7 | 12.5 | 4 | 3 | 10.5 | 6 | 12 | 5 | 160 |
| **MY2H25G** | 60 | 60 | 8.2 | 6.6 | 2.7 | 5.5 | 6 | 7.5 | 8 | 198 | 20.4 | 60 | 5 | 8.5 | 50 | 14 | 19.3 | 5 | 4.4 | 15.3 | 7.5 | 14 | 5 | 210 |
| **MY2H40G** | 100 | 70 | 5.5 | 8.5 | 5 | 17 | 9 | 9.5 | 16 | 312 | 25.5 | 57 | 8 | 11 | 53.5 | 21.5 | 35.4 | 6 | 2 | 29 | 9 | 23 | 8 | 330 |

"P" indicates cylinder supply ports. ∗The plug for "P" MY2H16G is a hexagon socket head plug.

## Stroke adjusting unit

### Low load shock absorber

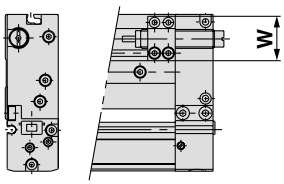
**MY2H Bore size G — Stroke L**



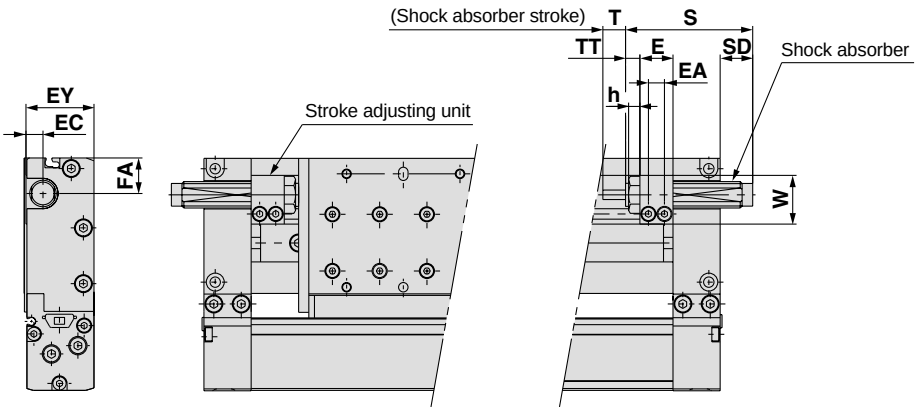

| Applicable cylinder | E | EA | EC | EY | FA | h | S | T | TT | W | Shock absorber model |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2H16** | 14.4 | 7 | 6 | 27 | 12.5 | 4 | 40.8 | 6 | 5.6 (MAX. 11.2) | 16.5 | RB0806 |
| **MY2H25** | 17.5 | 8.5 | 9 | 36 | 19.3 | 5 | 46.7 | 7 | 7.1 (MAX. 18.6) | 25.8 | RB1007 |
| **MY2H40** | 25 | 13 | 13 | 57 | 17 | 6 | 67.3 | 12 | 10 (MAX. 26) | 38 | RB1412 |

### High load shock absorber

**MY2H Bore size G — Stroke H**



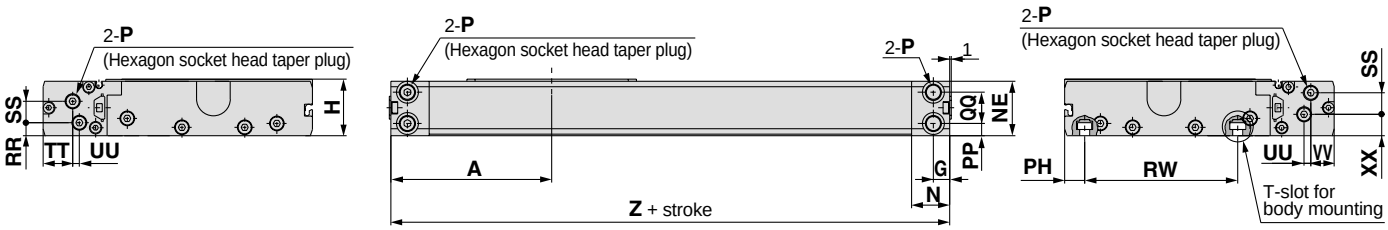

**MY2H16**

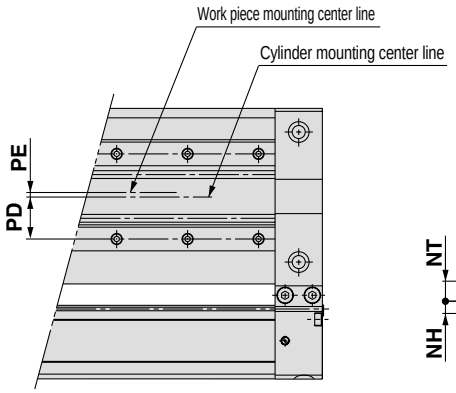



| Applicable cylinder | E | EA | EC | EY | FA | h | S | SD | T | TT | W | Shock absorber model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2H16** | 14.4 | 7 | 6 | 27 | 12.5 | — | 46.7 | 6.7 | 7 | 5.6 (MAX. 12) | 23.5 | RB1007 |
| **MY2H25** | 17.5 | 8.5 | 9 | 36 | 19.3 | 6 | 67.3 | 17.7 | 12 | 7.1 (MAX. 18.6) | 25.8 | RB1412 |
| **MY2H40** | 25 | 13 | 13 | 57 | 17 | 6 | 73.2 | — | 15 | 10 (MAX. 6) | 38 | RB2015 |

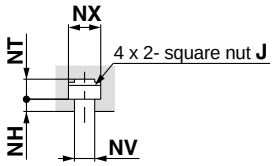
## Double axis type ø16, ø25, ø40

### MY2HT Bore size G—Stroke

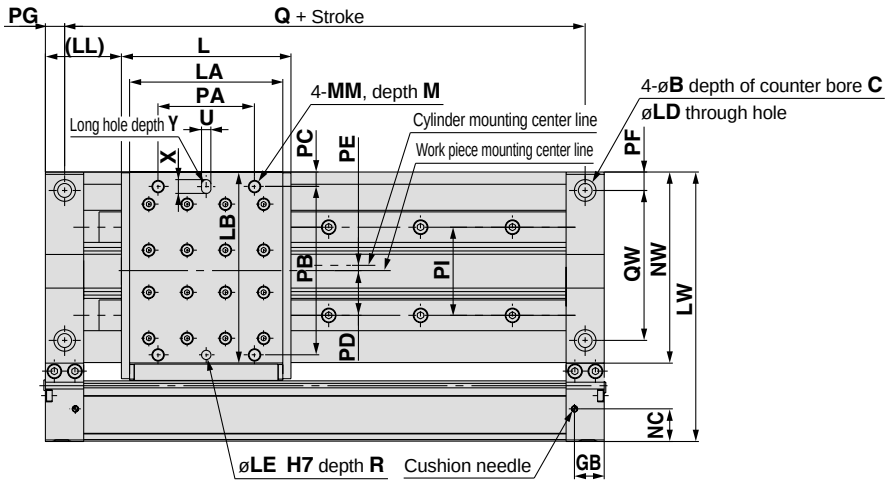



MY2HT40G




T-slot for body mounting




| Model | A | B | C | G | GB | H | L | J | LA | LB | LD | LE | (LL) | LW | M | MM | N | NC | NE | NH | NT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2HT16G** | 80 | 9.5 | 5.4 | 8.5 | 17 | 28 | 80 | M4 | 70 | 87.4 | 5.5 | 5 | 40 | 120 | 9 | M5 | 20 | 14 | 27 | 3 | 4.7 |
| **MY2HT25G** | 105 | 14 | 8.6 | 10.7 | 19.5 | 37 | 110.8 | M6 | 100 | 124.7 | 9 | 6 | 49.6 | 176 | 12 | M8 | 25 | 21.3 | 35.5 | 4 | 6.5 |
| **MY2HT40G** | 165 | 17.5 | 10.8 | 15.5 | 31.5 | 58 | 180 | M8 | 158 | 148.3 | 11 | 8 | 75 | 229 | 16 | M10 | 40 | 32.4 | 56.5 | 5 | 9 |

| Model | NV | NW | NX | P | PA | PB | PC | PD | PE | PF | PG | PH | PI | PP | Q | QQ | QW | R | RR | RW | SS | TT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2HT16G** | 4.5 | 85.2 | 7.3 | M5 | 44 | 80 | 4 | 23 | 1 | 10 | 10 | 10.2 | 41 | 5.3 | 140 | 16.4 | 66 | 5 | 5.3 | 69 | 9.7 | 12.5 |
| **MY2HT25G** | 6.6 | 124.8 | 10.5 | $^1/_8$ | 63 | 110 | 9.4 | 29.2 | 3.4 | 12 | 12.5 | 13 | 57.6 | 8 | 185 | 20.4 | 98 | 8 | 8.5 | 100 | 14 | 19.3 |
| **MY2HT40G** | 9 | 150.1 | 14 | $^1/_4$ | 113 | 132 | 8.5 | 36 | 0.5 | 20 | 20 | 18.5 | 72 | 16 | 290 | 25.5 | 110 | 12 | 11 | 116 | 21.5 | 35.4 |

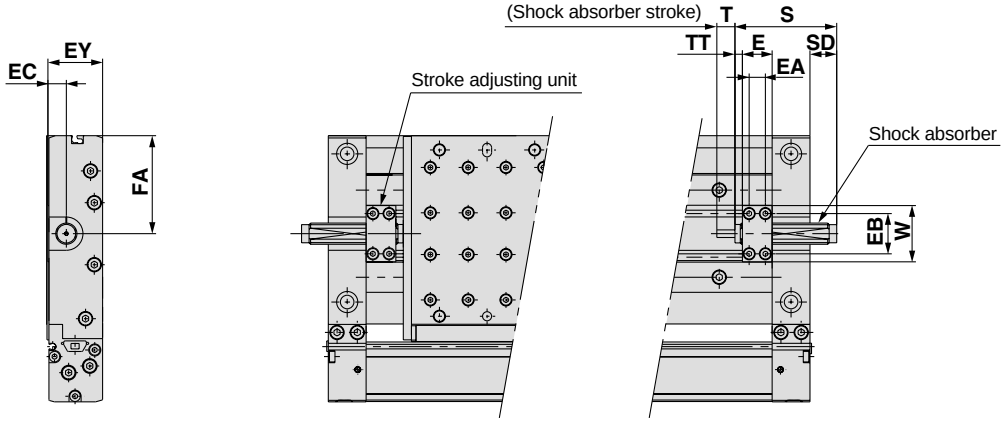
| Model | U | UU | VV | X | XX | Y | Z |
|---|---|---|---|---|---|---|---|
| **MY2HT16G** | 5 | 3 | 10.5 | 7 | 12 | 5 | 160 |
| **MY2HT25G** | 6 | 4.4 | 15.3 | 9 | 14 | 8 | 210 |
| **MY2HT40G** | 8 | 2 | 29 | 12 | 23 | 12 | 330 |

"P" indicates cylinder supply ports. ∗The plug for "P" MY2HT16G is a hexagon socket head plug.

## Stroke adjusting unit

### Low load shock absorber

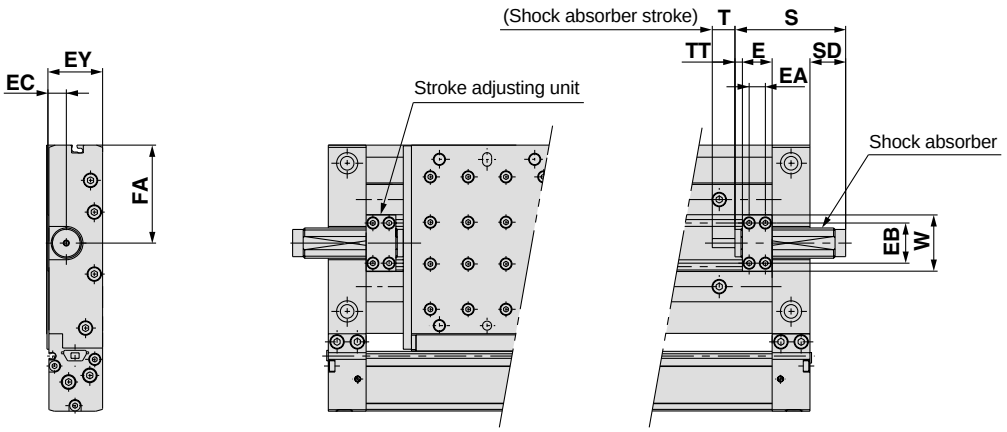
**MY2HT Bore size G — Stroke L**




| Applicable cylinder | E | EA | EB | EC | EY | FA | S | SD | T | TT | W | Shock absorber model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2HT16** | 14.4 | 7 | 21 | 8 | 27 | 46.5 | 46.7 | 6.7 | 7 | 5.6 (MAX. 11.2) | 28.6 | RB1007 |
| **MY2HT25** | 19.7 | 10.7 | 26.6 | 16.2 | 36.2 | 64.8 | 67.3 | 17.7 | 12 | 4.9 (MAX. 16.4) | 37.2 | RB1412 |
| **MY2HT40** | 29.1 | 15.1 | 37 | 17.2 | 57 | 74.5 | 73.2 | — | 15 | 5.9 (MAX. 21.9) | 51.6 | RB2015 |

### High load shock absorber

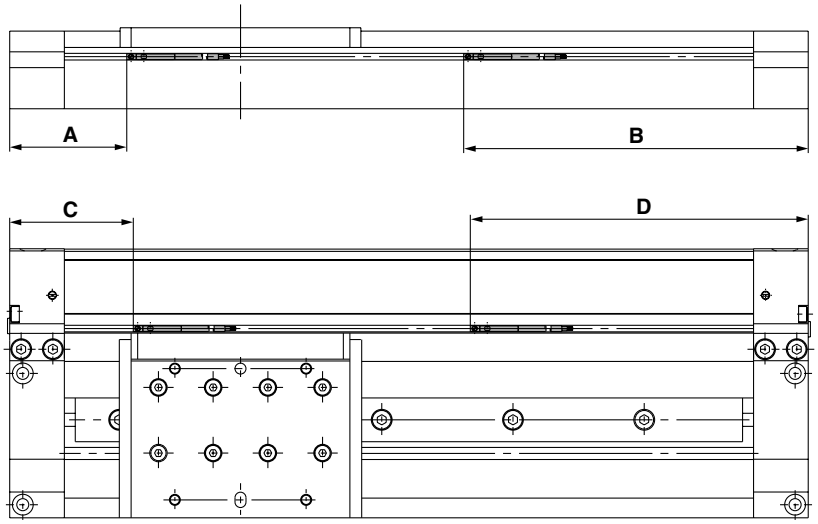
**MY2HT Bore size G — Stroke H**




| Applicable cylinder | E | EA | EB | EC | EY | FA | S | SD | T | TT | W | Shock absorber model |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MY2HT16** | 14.4 | 7 | 21 | 8 | 27 | 46.5 | 67.3 | 27.3 | 12 | 5.6 (MAX. 11.2) | 28.6 | RB1412 |
| **MY2HT25** | 19.7 | 10.7 | 26.6 | 11.2 | 36.2 | 64.8 | 73.2 | 23.6 | 15 | 4.9 (MAX. 16.4) | 37.2 | RB2015 |
| **MY2HT40** | 29.1 | 15.1 | 37 | 17.2 | 57 | 74.5 | 99 | 24 | 25 | 5.9 (MAX. 21.9) | 51.6 | RB2725 |

## Auto Switches
## Proper Mounting Positions for Stroke End Detection

Note) The operating range is a standard including hysteresis, and is not guaranteed. There may be large variations depending on the surrounding environment (variations on the order of ±30%).




**D-A9, D-A9□V** (mm)

| Bore size | A | B | Operating range |
|---|---|---|---|
| **16** | 54 | 106 | 11 |
| **25** | 54 | 156 | |
| **32** | 85 | 245 | |

(mm)

| Bore size | C | D | Operating range |
|---|---|---|---|
| **16** | 27 | 133 | 6.5 |
| **25** | 57 | 153 | 11 |
| **32** | 90.2 | 239.8 | |

**D-F9, D-F9□V** (mm)

| Bore size | A | B | Operating range |
|---|---|---|---|
| **16** | 58 | 102 | 8.5 |
| **25** | 58 | 152 | |
| **40** | 89 | 241 | |

(mm)

| Bore size | C | D | Operating range |
|---|---|---|---|
| **16** | 31 | 129 | 4 |
| **25** | 61 | 149 | 8.5 |
| **32** | 94.2 | 235.8 | |

**D-F9□W, D-F9□WV** (mm)

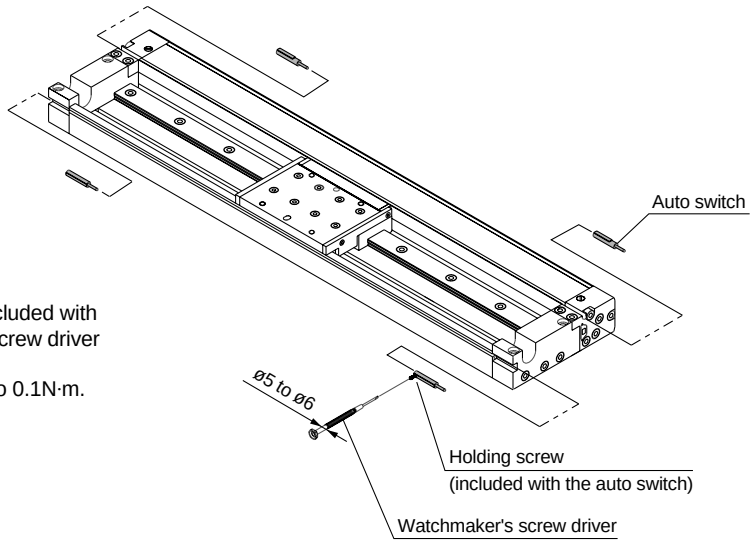
| Bore size | A | B | Operating range |
|---|---|---|---|
| **16** | 57 | 103 | 8.5 |
| **25** | 57 | 153 | |
| **40** | 88 | 242 | |

(mm)

| Bore size | C | D | Operating range |
|---|---|---|---|
| **16** | 30 | 130 | 4 |
| **25** | 60 | 150 | 8.5 |
| **32** | 93.2 | 236.8 | |

## Auto Switch Mounting

**When mounting an auto switch, insert it into the cylinder's switch groove from the direction shown in the drawing to the right. After placing it in the mounting position, use a flat head watchmakers screw driver to tighten the mounting screw which is included.**




Note) When tightening the holding screw (included with the auto switch), use a watchmakers screw driver with a handle 5 to 6mm in diameter.
The tightening torque should be 0.05 to 0.1N·m.

# Series MY2
# Auto Switch Specifications

## Auto Switch Common Specifications

| Type | Reed switch | Solid state switch |
|---|---|---|
| **Leakage current** | None | 3-wire: 100μA or less, 2-wire: 0.8mA or less |
| **Operating time** | 1.2ms | 1ms or less |
| **Impact resistance** | 300m/s² | 1000m/s² |
| **Insulation resistance** | 50MΩ or more at 500VDC (between lead wire and case) | |
| **Withstand voltage** | 1500VAC for 1 min. (between lead wire and case) | 1000VAC for 1 min. (between lead wire and case) |
| **Ambient temperature** | −10 to 60°C | |
| **Enclosure** | IEC529 standard IP67, JISC0920 watertight construction | |

## Lead Wire Length

**Lead wire length indication**

**(Example) D-F9P L**

**Lead wire length**

| | |
|---|---|
| **Nil** | 0.5m |
| **L** | 3m |
| **Z** | 5m |

Note 1) Lead wire length Z: 5m applicable auto switches
Solid state: All types are produced upon receipt of order (standard availability).
Note 2) For solid state switches with flexible lead wire specification, add "-61" at the end of the lead wire length.

**(Example) D-F9PL-61**

**Flexible specification**

## Contact Protection Boxes/CD-P11, CD-P12

### <Applicable switches>

D-A9/A9□V
The above auto switches do not have internal contact protection circuits.

**1. The operating load is an induction load.**
**2. The length of wiring to the load is 5m or more.**
**3. The load voltage is 100 or 200VAC.**

**Use a contact protection box in any of the above situations.**
The life of the contacts may otherwise be reduced. (They may stay ON all the time.)

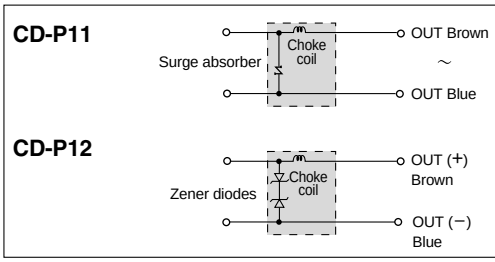
### Specifications

| Part number | CD-P11 | | CD-P12 |
|---|---|---|---|
| **Load voltage** | 100VAC | 200VAC | 24VDC |
| **Maximum load current** | 25mA | 12.5mA | 50mA |

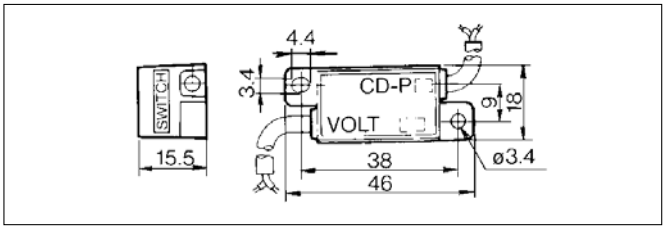
∗ Lead wire length —— Switch connection side 0.5m
Load connection side 0.5m



### Internal circuits




### Dimensions



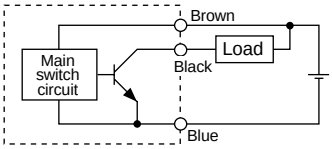

### Connection

To connect a switch to a contact protection box, connect the lead wire from the side of the contact protection box marked SWITCH to the lead wire coming out of the switch. Furthermore, the switch unit should be kept as close as possible to the contact protection box, with a lead wire length of no more than 1 meter between them.

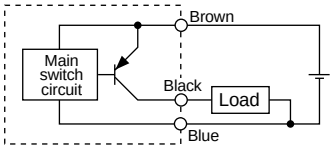
# *Series MY2*
# Auto Switch Connections and Examples

## Basic Wiring

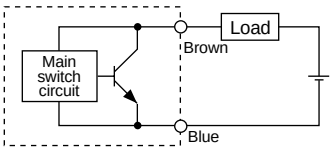
**Solid state 3-wire, NPN**



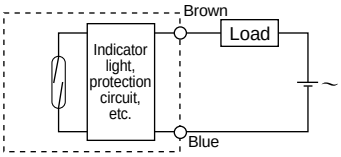

**Solid state 3-wire, PNP**



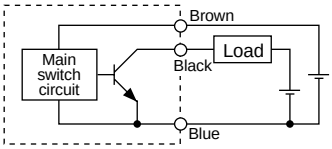

**2-wire <Solid state>**

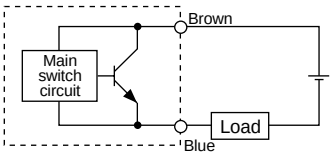


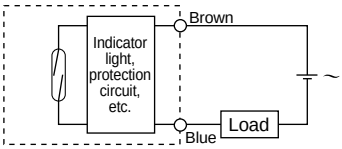

**2-wire <Reed switch>**




(Power supplies for switch and load are separate.)



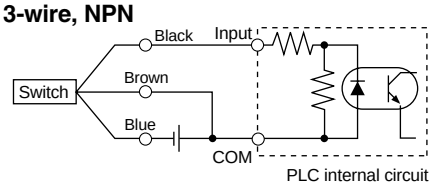



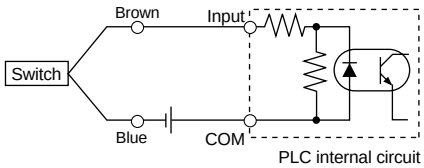

## Examples of Connection to PLC

**Sink input specifications**

**3-wire, NPN**

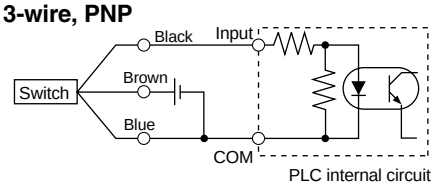



**2-wire**

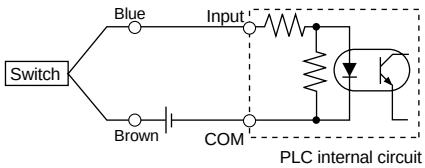



**Source input specifications**

**3-wire, PNP**




**2-wire**

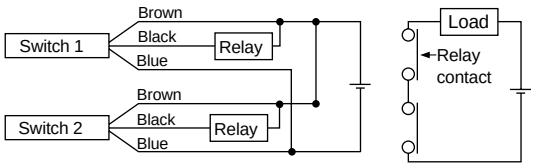



Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

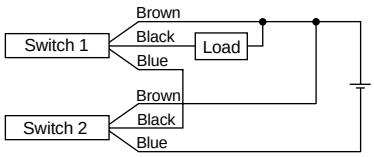
## Connection Examples for AND (Series) and OR (Parallel)

**3-wire**

**AND connection for NPN output (using relays)**

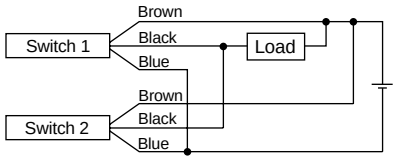



**AND connection for NPN output (performed with switches only)**

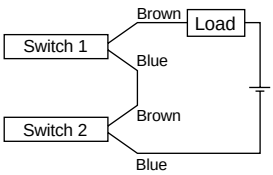



The indicator lights will light up when both switches are turned ON.

**OR connection for NPN output**




**2-wire with 2 switch AND connection**




When two switches are connected in series, a load may malfunction because the load voltage will decline when in the ON state.
The indicator lights will light up if both of the switches are in the ON state.

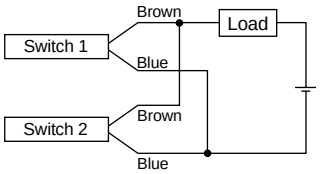
Load voltage at ON = $\frac{\text{Power supply voltage}}{} - \frac{\text{Residual voltage}}{}$ x 2 pcs.

= 24V − 4V x 2 pcs.

= 16V

Example: Power supply is 24VDC
Internal voltage drop in switch is 4V

**2-wire with 2 switch OR connection**




<Solid state>
When two switches are connected in parallel, malfunction may occur because the load voltage will increase when in the OFF state.

Load voltage at OFF = $\frac{\text{Leakage current}}{}$ x 2 pcs. x $\frac{\text{Load impedance}}{}$

= 1mA x 2 pcs. x 3kΩ

= 6V

Example: Load impedance is 3kΩ
Leakage current from switch is 1mA

<Reed switch>
Because there is no current leakage, the load voltage will not increase when turned OFF. However, depending on the number of switches in the ON state, the indicator lights may sometimes dim or not light up, because of dispersion and reduction of the current flowing to the switches.

# Solid State Switches/Direct Mount Type
# D-F9N(V), D-F9P(V), D-F9B(V)

**Grommet**



## ⚠Caution

**Operation instructions**

Be sure to use the fixing screws attached to the auto switch body to secure the switch. If screws beyond the specifications are used, the switch will be damaged.

## Auto Switch Specifications

| D-F9□, D-F9□V (with indicator light) | | | | | | |
|---|---|---|---|---|---|---|
| Auto switch part no. | D-F9N | D-F9NV | D-F9P | D-F9PV | D-F9B | D-F9BV |
| Electrical entry direction | In-line | Perpendicular | In-line | Perpendicular | In-line | Perpendicular |
| Wiring type | 3-wire | | | | 2-wire | |
| Output type | NPN | | PNP | | — | |
| Applicable load | IC circuit, Relay, PLC | | | | 24VDC relay, PLC | |
| Power supply voltage | 5, 12, 24VDC (4.5 to 28V) | | | | — | |
| Current consumption | 10mA or less | | | | — | |
| Load voltage | 28VDC or less | | — | | 24VDC (10 to 28VDC) | |
| Load current | 40mA or less | | 80mA or less | | 5 to 40mA | |
| Internal voltage drop | 1.5V or less (0.8V or less at 10mA load current) | | 0.8V or less | | 4V or less | |
| Leakage voltage | 100μA or less at 24VDC | | | | 0.8mA or less | |
| Indicator light | Red LED lights when ON | | | | | |

• Lead wire — Oil proof heavy duty vinyl cord, ø2.7, 3 cores (brown, black, blue), 0.15mm², 2 cores (brown, blue), 0.18mm², 0.5m

Note 1) Refer to page 28 for solid state switch common specifications.

Note 2) Refer to page 28 for lead wire length.

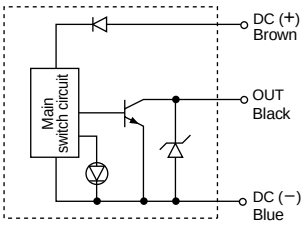
## Auto Switch Weights

Unit: g

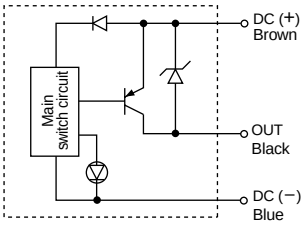
| Model | | D-F9N(V) | D-F9P(V) | D-F9B(V) |
|---|---|---|---|---|
| Lead wire length (m) | 0.5 | 7 | 7 | 6 |
| | 3 | 37 | 37 | 31 |
| | 5 | 61 | 61 | 51 |

## Auto Switch Internal Circuits

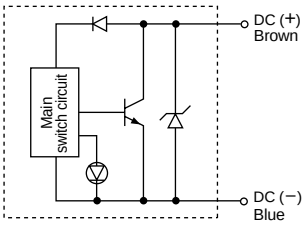
**D-F9N, F9NV**




**D-F9P, F9PV**

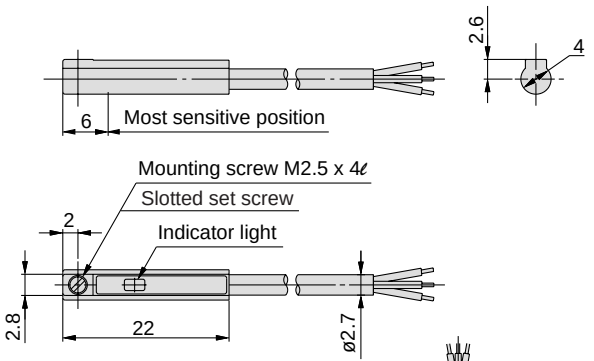



**D-F9B, F9BV**

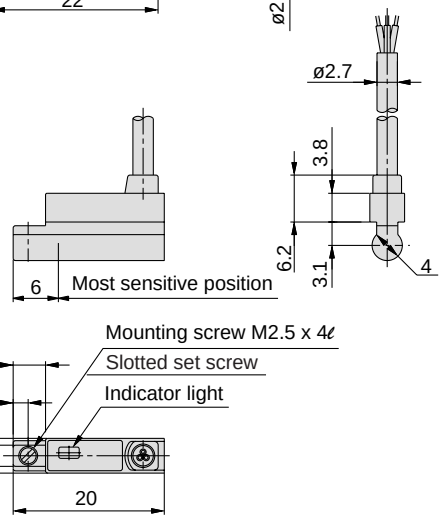



## Auto Switch Dimensions

**D-F9□**




**D-F9□V**



# Solid State Switches/Direct Mount Type
# D-F9N(V), D-F9P(V), D-F9B(V)

**Grommet**



## ⚠Caution

**Operation instructions**

Be sure to use the fixing screws attached to the auto switch body to secure the switch. If screws beyond the specifications are used, the switch will be damaged.

## Auto Switch Specifications

| D-F9□, D-F9□V (with indicator light) | | | | | | |
|---|---|---|---|---|---|---|
| Auto switch part no. | D-F9N | D-F9NV | D-F9P | D-F9PV | D-F9B | D-F9BV |
| Electrical entry direction | In-line | Perpendicular | In-line | Perpendicular | In-line | Perpendicular |
| Wiring type | 3-wire | | | | 2-wire | |
| Output type | NPN | | PNP | | — | |
| Applicable load | IC circuit, Relay, PLC | | | | 24VDC relay, PLC | |
| Power supply voltage | 5, 12, 24VDC (4.5 to 28V) | | | | — | |
| Current consumption | 10mA or less | | | | — | |
| Load voltage | 28VDC or less | | — | | 24VDC (10 to 28VDC) | |
| Load current | 40mA or less | | 80mA or less | | 5 to 40mA | |
| Internal voltage drop | 1.5V or less (0.8V or less at 10mA load current) | | 0.8V or less | | 4V or less | |
| Leakage voltage | 100μA or less at 24VDC | | | | 0.8mA or less | |
| Indicator light | Red LED lights when ON | | | | | |

- Lead wire — Oil proof heavy duty vinyl cord, ø2.7, 3 cores (brown, black, blue), 0.15mm², 2 cores (brown, blue), 0.18mm², 0.5m

Note 1) Refer to page 28 for solid state switch common specifications.
Note 2) Refer to page 28 for lead wire length.

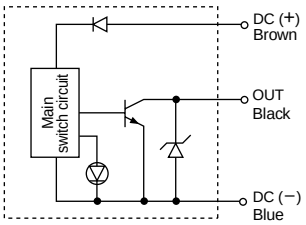
## Auto Switch Weights

Unit: g

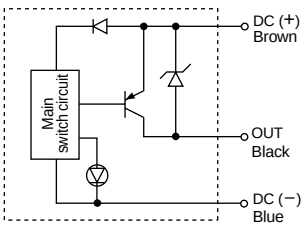
| Model | | D-F9N(V) | D-F9P(V) | D-F9B(V) |
|---|---|---|---|---|
| Lead wire length (m) | 0.5 | 7 | 7 | 6 |
| | 3 | 37 | 37 | 31 |
| | 5 | 61 | 61 | 51 |

## Auto Switch Internal Circuits

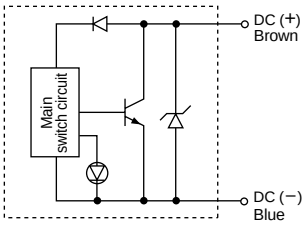
**D-F9N, F9NV**




**D-F9P, F9PV**

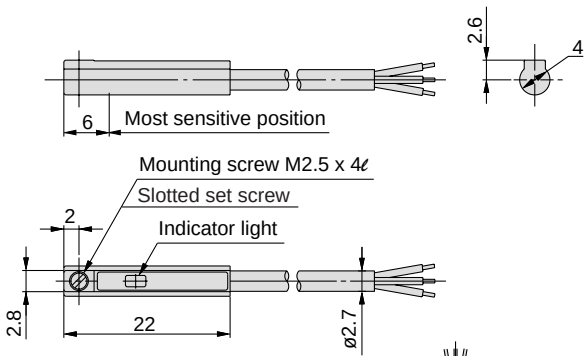



**D-F9B, F9BV**

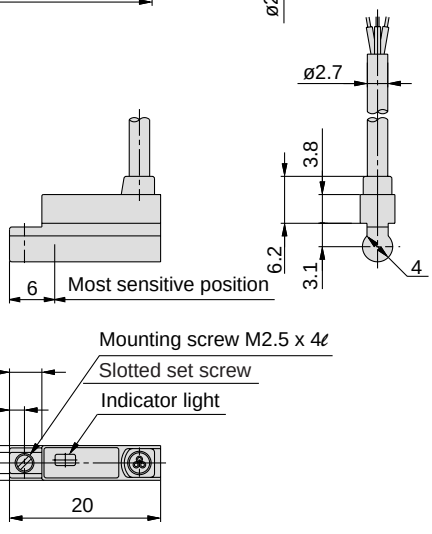



## Auto Switch Dimensions

**D-F9□**




**D-F9□V**






SMC

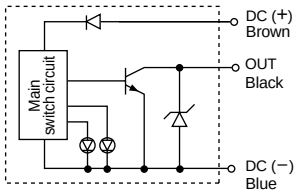
# 2-Color Display
# Solid State Switches/Direct Mount Type
# D-F9NW(V), D-F9PW(V), D-F9BW(V)

**Grommet**

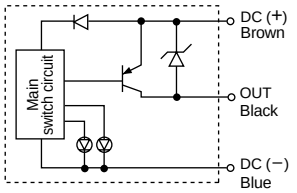


## Auto Switch Internal Circuits

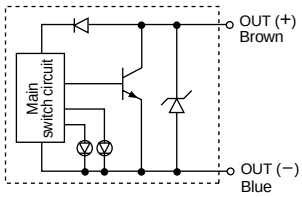
### D-F9NW, F9NWV



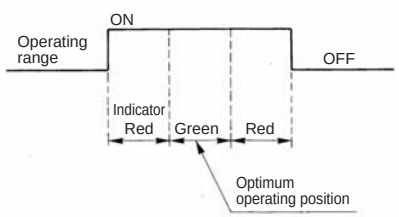

### D-F9PW, F9PWV




### D-F9BW, F9BWV




### Indicator light/Display method




## Auto Switch Specifications

| D-F9□W, D-F9□WV (with indicator light) | | | | | | |
|---|---|---|---|---|---|---|
| Auto switch part no. | D-F9NW | D-F9NWV | D-F9PW | D-F9PWV | D-F9BW | D-F9BWV |
| Electrical entry direction | In-linel | Perpendicular | In-linel | Perpendicular | In-linel | Perpendicular |
| Wiring type | 3-wire | | | | 2-wire | |
| Output type | NPN | | PNP | | — | |
| Applicable load | IC circuit, Relay, PLC | | | | 24VDC relay, PLC | |
| Power supply voltage | 5, 12, 24VDC (4.5 to 28V) | | | | — | |
| Current consumption | 10mA or less | | | | — | |
| Load voltage | 28VDC or less | | — | | 24VDC (10 to 28VDC) | |
| Load current | 40mA or less | | 80mA or less | | 5 to 40mA | |
| Internal voltage drop | 1.5V or less (0.8V or less at 10mA load current) | | 0.8V or less | | 4V or less | |
| Leakage voltage | 100μA or less at 24VDC | | | | 0.8mA or less | |
| Indicator light | Actuated position .....Red LED light up<br>Optimum operating position ....Green LED light up | | | | | |

O Lead wire — Oil proof heavy duty vinyl cord, ø2.7, 3 cores (brown, black, blue), 0.15mm², 2 cores (brown, blue), 0.18mm², 0.5m

Note 1) Refer to page 28 for solid state switch common specifications.

Note 2) Refer to page 28 for lead wire length.

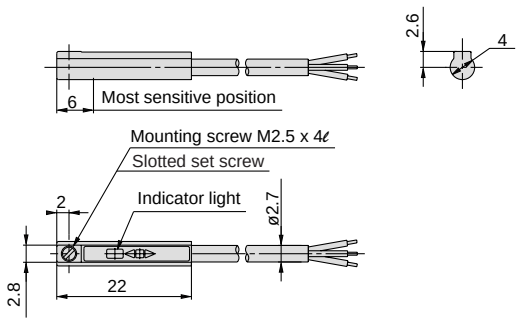
## Auto Switch Weights

Unit: g

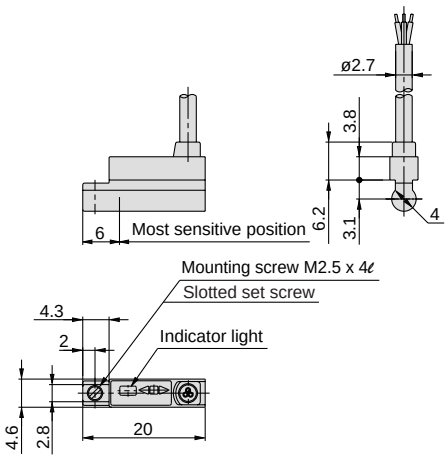
| Model | | D-F9NW(V) | D-F9PW(V) | D-F9BW(V) |
|---|---|---|---|---|
| Lead wire length (m) | 0.5 | 7 | 7 | 7 |
| | 3 | 34 | 34 | 32 |
| | 5 | 56 | 56 | 52 |

## Auto Switch Dimensions

### D-F9□W




### D-F9□WV



# *Series MY2*
# Made to Order Specifications

Contact SMC for detailed dimensions, specifications and lead times.

**Order made application list**

| | | Intermediate stroke XB10 | Long stroke XB11 | Helical insert threads X168 | Holder mounting bracket X416/X417 | Copper-free 20- |
|---|---|---|---|---|---|---|
| MY2C | Cam follower guide Type | Standardized | ● | ● | ● | ● |
| MY2H | High precision guide type (Single axis) | ● | ● | ● | ● | ● |
| MY2HT | High precision guide type (Double axis) | ● | ● | ● | ● | ● |

## 1 Intermediate Stroke -XB10

Intermediate strokes are available within the standard stroke range. The stroke can be set in 1mm increments.

■**Stroke range: 51 to 599mm**

MY2 □ Bore size – Stroke – Auto switch – Symbol – XB10

● Series/Bore size

| | | 16 | 25 | 40 |
|---|---|---|---|---|
| H | High precision guide type (Single axis) | ● | ● | ● |
| HT | High precision guide type (Double axis) | ● | ● | ● |

**Example) MY2H40G-599L-A93-XB10**

## 2 Long Stroke -XB11

Available with long strokes exceeding the standard strokes. The stroke can be set in 1mm increments.

■**Stroke range: 2001 to 5000mm (2001 to 3000mm for ø16)**

MY2 □ Bore size – Stroke – Auto switch – Symbol – XB11

● Series/Bore size

| | | 16 | 25 | 40 |
|---|---|---|---|---|
| C | Cam follower guide type | ● | ● | ● |

**Example) MY2C40G-4999L-A93-XB11**

■**Stroke range: 601 to 1500mm (601 to 1000mm for ø16)**

MY2 □ Bore size – Stroke – Auto switch – Symbol – XB11

● Series/Bore size

| | | 16 | 25 | 40 |
|---|---|---|---|---|
| H | High precision guide type (Single axis) | ● | ● | ● |
| HT | High precision guide type (Double axis) | ● | ● | ● |

**Example) MY2H40G-999L-A93-XB11**

## 3 Helical Insert Thread Specification -X168

The mounting threads of the slider are changed to helical insert threads. The thread size is the same as standard.

MY2 □ Bore size – Stroke – Auto switch – Symbol – X168

● Series/Bore size

| | | 16 | 25 | 40 |
|---|---|---|---|---|
| C | Cam follower guide Type | ● | ● | ● |
| H | High precision guide type (Single axis) | ● | ● | ● |
| HT | High precision guide type (Double axis) | ● | ● | ● |

**Example) MY2H40G-300L-A93-X168**

## 4 Copper-free Specifications 20-

For copper-free applications

20 – MY2 □ Bore size – Stroke – Auto switch – Symbol

● Series/Bore size

| | | 16 | 25 | 40 |
|---|---|---|---|---|
| C | Cam follower guide Type | ● | ● | ● |
| H | High precision guide type (Single axis) | ● | ● | ● |
| HT | High precision guide type (Double axis) | ● | ● | ● |

## 5 Holder Mounting Bracket ..... ①, ② -X416, X417

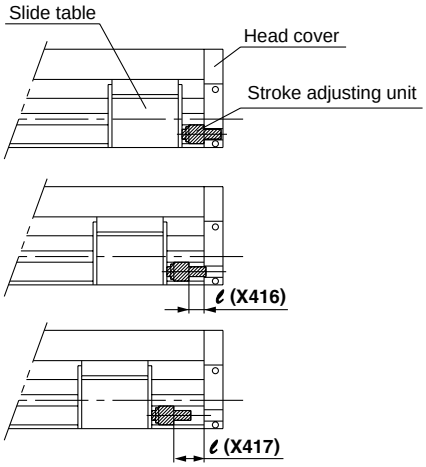
**Holder mounting brackets are used to fasten the stroke adjusting unit at an intermediate stroke position.**

**Holder mounting bracket ①.....-X416 Holder mounting bracket ②..... -X417**

### Fine stroke adjustment range

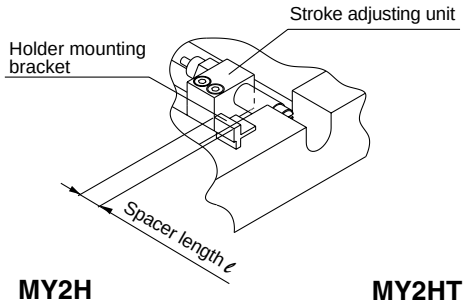
(Treated as a special order when exceeding the adjustment ranges shown below.) Unit: mm

| Bore size (mm) | -X416 (one side) | | -X417 (one side) | |
|---|---|---|---|---|
| | Spacer length ℓ | Adjustment range | Spacer length ℓ | Adjustment range |
| **16** | 5.6 | −5.6 to −11.2 | 11.2 | −11.2 to −16.8 |
| **25** | 11.5 | −11.5 to −23 | 23 | −23 to −34.5 |
| **40** | 16 | −16 to −32 | 32 | −32 to −48 |

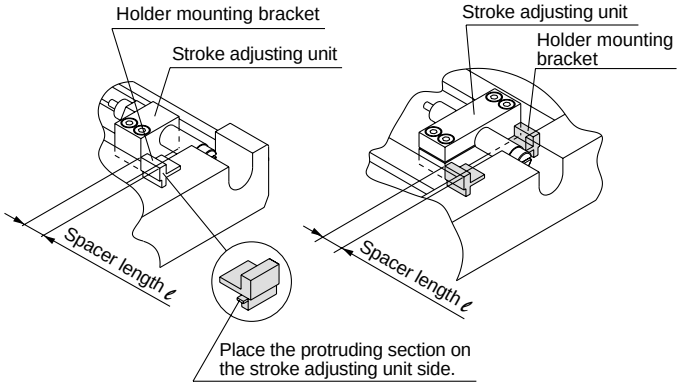



### Holder Mounting Bracket Illustration

**MY2C**




**MY2H** **MY2HT**




**MY2 □ Bore size − 300 L − X416 □**

**Combination symbol**
Refer to the table below for applicable symbols.

**Holder mounting bracket**
Refer to the table below for applicable symbols.

**Stroke adjusting unit**
Refer to the table below for applicable symbols.

**Stroke**
Note) Indicates the stroke prior to mounting the stroke adjusting unit.

**Series/Bore size**

| | | 16 | 25 | 40 |
|---|---|---|---|---|
| **C** | Cam follower guide type | ● | ● | ● |
| **H** | High precision guide type (Single axis) | ● | ● | ● |
| **HT** | High precision guide type (Double axis) | ● | ● | ● |

| Stroke adjusting unit | Holder mounting bracket | Suffix | Mounting pcs. X416 | Mounting pcs. X417 | Combination description |
|---|---|---|---|---|---|
| **L, H, LS, HS** | **X416** | **Nil** | 1 | – | X416 on one side |
| **L, H** | | **W** | 2 | – | X416 on both sides (one on each side) |
| | | **Z** | 1 | 1 | X416 on one side, X417 on the other side |
| **LH** | | **L** | 1 | – | X416 on L unit side |
| **LH** | | **H** | 1 | – | X416 on H unit side |
| **LH** | | **LZ** | 1 | 1 | X416 on L unit side, X417 on the other side |
| **LH** | | **HZ** | 1 | 1 | X416 on H unit side, X417 on the other side |
| **L, H, LS, HS** | **X417** | **Nil** | – | 1 | X417 on one side |
| **L, H** | | **W** | – | 2 | X417 on both sides (one on each side) |
| **LH** | | **L** | – | 1 | X417 on L unit side |
| **LH** | | **H** | – | 1 | X417 on H unit side |

Note) For LS and HS, the stroke adjusting unit is mounted on one side only.

# Made to Order Specifications

Order Made

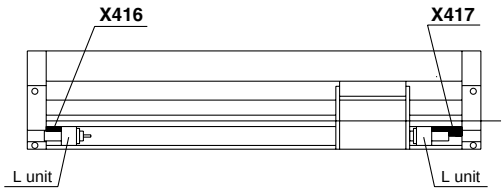
Contact SMC for detailed dimensions, specifications and lead times.

## 5 Holder Mounting Bracket ..... ①, ② -X416, X417

### Example

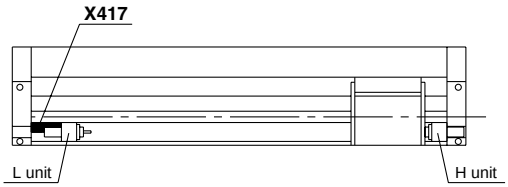
• L units with one each of X416 and X417

**MY2H25G-300L-X416Z**




• L and H units, where X417 is mounted on L unit only and nothing on H unit

**MY2H25G-300LH-X417L**




**How to order single pieces of stroke adjusting unit and holder mounting bracket**

**MY2H-A16L**
**MY2HT-A16L** – **X417** □

**Combination symbol**

| | |
|---|---|
| **Nil** | Stroke adjusting unit + Holder mounting bracket |
| **N** | Holder mounting bracket only |

**Holder mounting bracket**

| | |
|---|---|
| **X416** | Holder mounting bracket 1 |
| **X417** | Holder mounting bracket 2 |

**Stroke adjusting unit model**

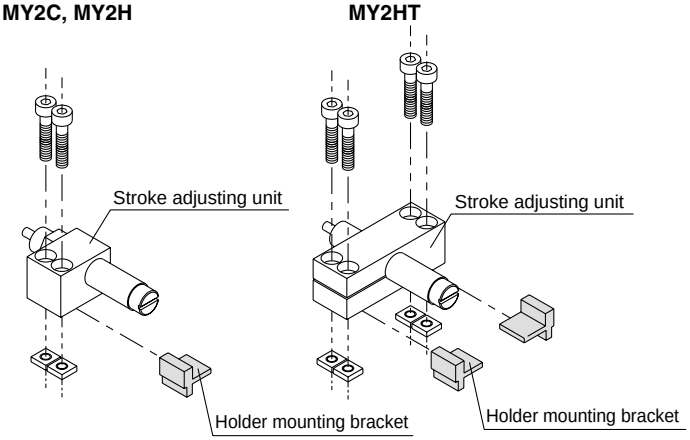
Note) Refer to "Options" table on pages 13 and 20.

### Example

• **Stroke adjusting unit with holder mounting bracket**
**MY2H-A25L-X416** (L unit for MY2H25 and X416 bracket)

• **Holder mounting bracket only**
**MY2H-A25L-X416N** (MY2H25 and X416 bracket for L unit)

**MY2C, MY2H** **MY2HT**




Note) For MY2H, the parts are packed together when shipped.

# *Series MY2*
# Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of **"Caution", "Warning"** or **"Danger"**. To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

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

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

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

Note 1) ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

## ⚠ Warning

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

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

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

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

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

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

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

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

# *Series MY2*
# Actuator Precautions 1
**Be sure to read before handling.**

## Design

### ⚠Warning

**1. There is a danger of sudden action by air cylinders if sliding parts of machinery are twisted, etc., and changes in forces occur.**

In such cases, human injury may occur; e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be designed to avoid such dangers.

**2. Install a protective cover when there is a risk of human injury.**

If a driven object and moving parts of a cylinder pose a danger of human injury, design the structure to avoid contact with the human body.

**3. Securely tighten all mounting parts and connecting parts so that they will not become loose.**

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

**4. A deceleration circuit or shock absorber , etc., may be required.**

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb the impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the impact. In this case, the rigidity of the machinery should also be examined.

**5. Consider a possible drop in circuit pressure due to a power outage, etc.**

When a cylinder is used in a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage, etc. Therefore, safety equipment should be installed to prevent damage to machinery and/or human injury. Suspension mechanisms and lifting devices also require consideration for drop prevention.

**6. Consider a possible loss of power source.**

Measures should be taken to protect against human injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity or hydraulics, etc.

**7. Design circuitry to prevent sudden lurching of driven objects.**

When a cylinder is driven by an exhaust center type directional control valve or when starting up after residual pressure is exhausted from the circuit, etc., the piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching, because there is a danger of human injury and/or damage to equipment when this occurs.

**8. Consider emergency stops.**

Design so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device under abnormal conditions, a power outage or a manual emergency stop.

**9. Consider the action when operation is restarted after an emergency stop or abnormal stop.**

Design the machinery so that human injury or equipment damage will not occur upon restart of operation. When the cylinder has to be reset at the starting position, install safe manual control equipment.

## Selection

### ⚠Warning

**1. Confirm the specifications.**

The products advertised in this catalog are designed according to use in industrial compressed air systems. If the products are used in conditions where pressure, temperature, etc., are out of specification, damage and/or malfunction may be caused. Do not use in these conditions. (Refer to specifications.)

Consult SMC if you use a fluid other than compressed air.

**2. Intermediate stops**

When intermediate stopping of a cylinder piston is performed with a 3 position closed center type directional control valve, it is difficult to achieve stopping positions as accurate and minute as with hydraulic pressure due to the compressibility of air.

Furthermore, since valves and cylinders, etc., are not guaranteed for zero air leakage, and it is not possible to hold a stopped position, do not use for this purpose. In case it is necessary to hold a stopped position, select equipment and design circuits to prevent movement.

### ⚠Caution

**1. Operate within the limits of the maximum usable stroke.**

Refer to the air cylinder model selection procedure for the maximum usable stroke.

**2. Operate the piston within a range such that collision damage will not occur at the stroke end.**

Operate within a range such that damage will not occur when the piston having inertial force stops by striking the cover at the stroke end. Refer to the cylinder model selection procedure for the range within which damage will not occur.

**3. Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.**

**4. Provide intermediate supports for long stroke cylinders.**

Provide intermediate supports for cylinders with long strokes to prevent bending of the tube, and deflection due to vibration and external loads, etc.

## Piping

### ⚠Caution

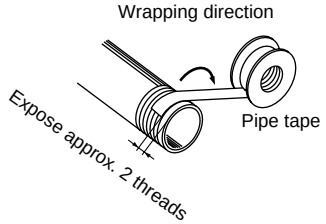
**1. Preparation before piping**

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

**2. Wrapping of pipe tape**

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping.

Also, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



# *Series MY2*
# Actuator Precautions 2
**Be sure to read before handling.**

## Mounting

## ⚠Caution

### 1. Do not apply strong impacts or excessive moment to the slide table (slider).

The slide table (slider) is supported by precision bearings. Therefore, do not apply strong impacts or excessive moment, etc., when mounting work pieces.

### 2. Align carefully when connecting to a load having an external guide mechanism.

Mechanically jointed rodless cylinders can be used with a direct load within the allowable range for each type of guide, but careful alignment is necessary when connecting to a load having an external guide mechanism.

As the stroke becomes longer, variations in the center axis become larger. Consider using a connection method (floating mechanism) that is able to absorb these variations.

### 3. Do not scratch or gouge the cylinder tube by striking or grasping it with other objects.

Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause malfunction.

### 4. Do not use until you can verify that equipment can operate properly.

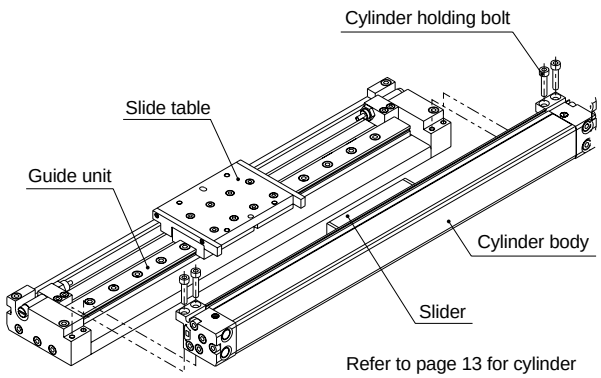
Verify correct mounting by suitable function and leakage tests after compressed air and power are connected following mounting, maintenance or conversions.

### 5. Instruction manual

The product should be mounted and operated after thoroughly reading the manual and understanding its contents.
Keep the instruction manual where it can be referred to as needed.

### 6. Attaching and detaching the cylinder body

To remove the cylinder, remove the four cylinder holding bolts and take the cylinder off the guide unit. To install the cylinder, insert its slider into the slide table on the guide unit, and equally tighten the four holding bolts. Tighten the holding bolts securely, because if they become loose, this can cause damage or malfunction, etc.



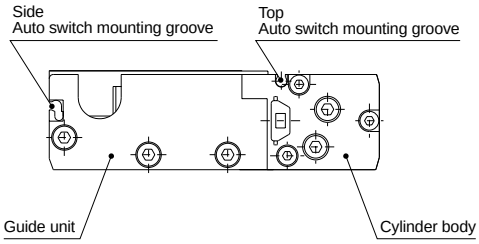

Refer to page 13 for cylinder replacement part numbers.

### 7. Auto switch mounting

The series MY2 can be equipped with auto switches on the top of the cylinder body and on the side of the guide unit, but use caution in the following cases.

**<Mounting auto switches on top of the cylinder body>**

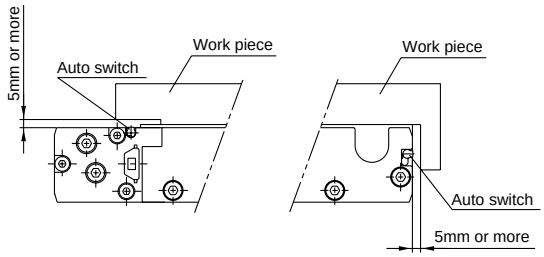
Depending on the mounting method and shape of the work piece, note that the lead wires from an auto switch with perpendicular lead wire entry may interfere with the work piece.
In this case, ensure clearance for the work piece to avoid interference.




### 8. Work piece mounting

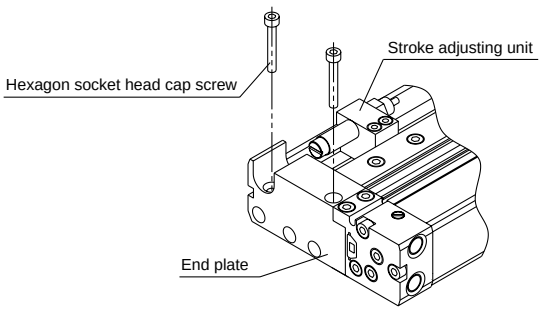
When mounting a magnetic work piece, keep a clearance of 5mm or more between the auto switch and the work piece.

Otherwise the magnetic force inside the cylinder may be taken away, resulting in malfunction of the auto switch.




### 9. Body mounting

When mounting a MT2H40G with stroke adjustment unit from the top, move the stroke adjustment unit and secure the body with the end plate mounting holes. After mounting, return the stroke adjustment unit to the stroke end and secure it again.



# Series MY2
# Actuator Precautions 3
**Be sure to read before handling.**

## Handling

### ⚠Caution

**1. Do not inadvertently move the setting of the guide adjustment unit.**

The guide is already adjusted at the factory, and readjustment is not necessary under normal operating conditions. Therefore, do not inadvertently move the setting of the guide adjustment unit.

**2. Do not perform operation that results in negative pressure inside the cylinder.**

Under operating conditions which create negative pressure inside the cylinder due to external forces or inertial forces, note that air leakage may occur due to separation of the seal belt.

**3. Be careful that hands are not caught in the mechanism.**

When equipped with the stroke adjustment unit, there is a danger of getting hands caught at the stroke end where the space between the slide table and the stroke adjustment unit is reduced. Provide a protective cover to prevent direct contact with the human body.

**4. Do not secure the stroke adjusting unit in an intermediate position.**

When the stroke adjustment unit is secured at an intermediate position, slippage may occur depending on the amount of energy at the time of impact. In this case, the use of order made specifications –X416 or –X417 is recommended, because a holder mounting bracket for adjustment is provided.
Consult SMC regarding other desired lengths.

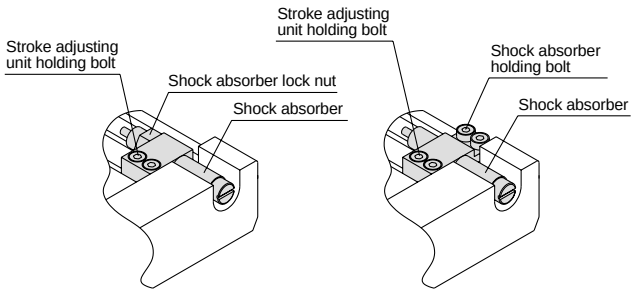
**<Securing the unit body>**

The unit body is secured by equally tightening the two stroke adjusting unit holding bolts. (See drawings below.)

**<Shock absorber stroke adjustment>**

**— MY2C, MY2H —**

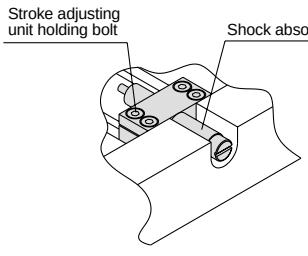
Loosen the shock absorber lock nut (shock absorber holding bolts for MY2H16, H unit), and adjust the stroke by rotating the shock absorber. After the adjustment, tighten the lock nut (holding bolts) to secure the shock absorber.




For MY2H16, H unit

**— For MY2HT —**

Loosen the two stroke adjusting unit holding bolts on the cylinder side, and adjust the stroke by rotating the shock absorber. After the adjustment, tighten the holding bolts uniformly to secure the shock absorber.




For MY2HT

Stroke adjusting unit holding bolt tightening torque N·m

| Bore size mm | Tightening torque |
|---|---|
| 16 | 0.6 |
| 25 | 1.5 |
| 40 | 5.0 |

## Cushion

### ⚠Caution

**1. Readjust with the cushion needle.**

The cushion is adjusted before shipment from the factory, but the cushion needle located on the cover should be readjusted before operation according to the load and operating speed, etc. Turning the cushion needle clockwise closes the restriction and increases the strength of the cushion.

**2. Do not operate with the cushion needle completely closed.**

This can cause damage to seals.

## Lubrication

### ⚠Caution

**1. Lubrication of non-lube type cylinder**

The cylinder is lubricated at the factory and can be used without any further lubrication.

However, in the event that it will be lubricated, use class 1 turbine oil (without additives) ISO VG32.

Stopping lubrication later may lead to malfunction due to the loss of the original lubricant. Therefore, lubrication must be continued once it has been started.

## Air Supply

### ⚠Warning

**1. Use clean air.**

Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as it can cause damage or malfunction.

### ⚠Caution

**1. Install air filters.**

Install air filters at the upstream side of valves. The filtration degree should be 5µm or finer.

**2. Install an after-cooler, air dryer or water separator, etc.**

Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after-cooler, air dryer or water separator, etc.

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

At temperatures of 5°C or less, take measures to prevent freezing, since moisture in circuits can be frozen and this may cause damage to seals and lead to malfunction.

Refer to SMC's "Best Pneumatics vol.4" catalog for further details on compressed air quality.

# *Series MY2*
# Actuator Precautions 4
**Be sure to read before handling.**

## Operating Environment

## ⚠Warning

**1. Do not use in environments where there is a danger of corrosion.**

Refer to the construction drawings regarding cylinder materials.

**2. Avoid use in environments where a cylinder will come in contact with coolants, cutting oil, water, adhesive matter, or dust, etc. Also avoid operation with compressed air that contains drainage or foreign matter, etc.**

- Foreign matter or liquids on the cylinder's interior or exterior can wash out the lubricating grease, which can lead to deterioration and damage of dust seal band and seal materials, causing a danger of malfunction.

  When operating in locations with exposure to water and oil, or in dusty locations, provide protection such as a cover to prevent direct contact with the cylinder, or mount so that the dust seal band surface faces downward, and operate with clean compressed air.

## Maintenance

## ⚠Warning

**1. Maintenance should be performed according to the procedure indicated in the instruction manual.**

If handled improperly, malfunction and damage of machinery or equipment may occur.

**2. Removal of equipment, and supply/exhaust of compressed air.**

When equipment is removed, first check measures to prevent dropping of driven objects and run-away of equipment, etc. Then cut off the supply pressure and electric power, and exhaust all compressed air from the system.
When machinery is restarted, proceed with caution after confirming measures to prevent cylinder lurching.

## ⚠Caution

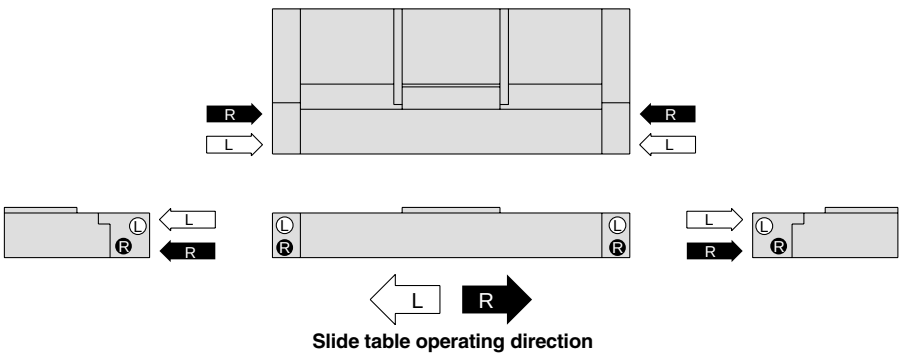
**1. Drain flushing**

Remove drainage from air filters regularly.

## ⚠Caution

### Centralized Piping Port Variations

- Head cover ports can be freely selected to best suit different situations.

| Applicable cylinder | Port variations |
|---|---|
| **MY2C16/25/40**<br>**MY2H16/25/40**<br>**MY2HT16/25/40** |  **Slide table operating direction** |

# Series MY2
# Auto Switch Precautions 1
**Be sure to read before handling.**

## Design and Selection

## ⚠Warning

### 1. Confirm the specifications.

Read the specifications carefully and use this product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications of current load, voltage, temperature or impact.

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

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

### 3. Pay attention to the length of time that a switch is ON at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

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

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

**<Reed switch>**

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

1) Use a contact protection box when the wire length is 5m or longer.

**<Solid state switch>**

2) Although wire length does not affect switch function, use wiring 100m or shorter.

### 5. Take precautions for the internal voltage drop of the switch.

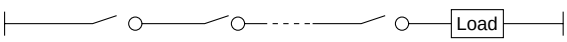
**<Reed switch>**

1) Switches with an indicator light (Except D-A96, A96V)

- If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)

  [The voltage drop will be "n" times larger when "n" auto switches are connected.]

  Even though an auto switch operates normally, the load may not operate.




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

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Model A90, A90V).

**<Solid state switch>**

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

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

### 6. Pay attention to leakage current.

**<Solid state switch>**

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

Operating current of load (OFF condition) > Leakage current

If the criteria given in the above formula are not met, it will not reset correctly (stays ON). Use a 3-wire switch if this specification will not be satisfied.

Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

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

**<Reed switch>**

If driving a load such as a relay that generates a surge voltage, use a contact protection box.

**<Solid state switch>**

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

### 8. Cautions for use in an interlock circuit

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

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

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

# Series MY2
# Auto Switch Precautions 2
**Be sure to read before handling.**

## Mounting and Adjustment

## ⚠Warning

### 1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/s$^2$ or more for reed switches and 1000m/s$^2$ or more for solid state switches) while handling.

Although the body of the switch may not be damaged, the inside of the switch could be damaged and cause a malfunction.

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

Never carry a cylinder by its lead wires. This may not only cause broken lead wires, but it may cause internal elements of the switch to be damaged by the stress.

### 3. Mount switches using the proper tightening torque.

When a switch is tightened beyond the range of tightening torque, the mounting screws or switch may be damaged. On the other hand, tightening below the range of tightening torque may allow the switch to slip out of position.

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

Adjust the mounting position of an auto switch so that the piston stops at the center of the operating range (the range in which a switch is ON). (The mounting positions shown in the catalog indicate the optimum positions at stroke end.) If mounted at the end of the operating range (around the borderline of ON and OFF), operation may be unstable.

## Wiring

## ⚠Warning

### 1. Avoid repeatedly bending or stretching lead wires.

Broken lead wires will result from repeatedly applying bending stress or stretching force to the lead wires.

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

**<2-wire type>**

If the power is turned ON when an auto switch is not connected to a load, the switch will be instantly damaged because of excess current.

### 3. Confirm proper insulation of wiring.

Be certain that there is no faulty wiring insulation (contact with other circuits, ground fault, improper insulation between terminals, etc.). Damage may occur due to excess current flow into a switch.

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

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

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

## Wiring

**<Reed switch>**

If the power is turned ON with a load in a short circuit condition, the switch will be instantly damaged because of excess current flow into the switch.

**<Solid state switch>**

Model J51 and all models of PNP output type switches do not have built-in short circuit protection circuits. If loads are short circuited, the switches will be instantly damaged, as in the case of reed switches.

Take special care to avoid reverse wiring with the brown [red] power supply line and the black [white] output line on 3-wire type switches.

### 6. Avoid incorrect wiring.

**<Reed switch>**

A 24VDC switch with indicator light has polarity. The brown [red] lead wire or terminal no. 1 is (+), and the blue [black] lead wire or terminal no. 2 is (–).

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

   Also note that a current greater than that specified will damage a light emitting diode and it will no longer operate.

   Applicable models: D-A93, A93V

**<Solid state switch>**

1) If connections are reversed on a 2-wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will be in a normally ON state. However, note that the switch will be damaged if reversed connections are made while the load is in a short circuited condition.
2) If connections are reversed (power supply line + and power supply line –) on a 3-wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue [black] wire and the power supply line (–) is connected to the black [white] wire, the switch will be damaged.

### ∗ Lead wire colour changes

Lead wire colors of SMC switches have been changed in order to meet NECA Standard 0402 for production beginning September, 1996 and thereafter. Please refer to the tables provided.
Special care should be taken regarding wire polarity during the time that the old colours still coexist with the new colours.

**2-wire**

| | Old | New |
|---|---|---|
| Output (+) | Red | Brown |
| Output (–) | Black | Blue |

**3-wire**

| | Old | New |
|---|---|---|
| Power supply | Red | Brown |
| GND | Black | Blue |
| Output | White | Black |

**Solid state with diagnostic output**

| | Old | New |
|---|---|---|
| Power supply | Red | Brown |
| GND | Black | Blue |
| Output | White | Black |
| Diagnostic output | Yellow | Orange |

**Solid state with latch type diagnostic output**

| | Old | New |
|---|---|---|
| Power supply | Red | Brown |
| GND | Black | Blue |
| Output | White | Black |
| Latch type diagnostic output | Yellow | Orange |

# *Series MY2*
# Auto Switch Precautions 3

**Be sure to read before handling.**

## Operating Environment

### ⚠Warning

**1. Never use in an atmosphere of explosive gases.**

The construction of auto switches is not intended to prevent explosion. Never use in an atmosphere with an explosive gas since this may cause a serious explosion.

**2. Do not use in an area where a magnetic field is generated.**

Auto switches will malfunction or magnets inside cylinders will become demagnetized. (Consult SMC regarding the availability of a magnetic field resistant auto switch.)

**3. Do not use in an environment where the auto switch will be continually exposed to water.**

Although switches satisfy IEC standard IP67 construction (JIS C 0920: watertight construction), do not use switches in applications where continually exposed to water splash or spray. Poor insulation or swelling of the potting resin inside switches may cause malfunction.

**4. Do not use in an environment with oil or chemicals.**

Consult SMC if auto switches will be used in an environment with coolant, cleaning solvent, various oils or chemicals. If auto switches are used under these conditions for even a short time, they may be adversely affected by improper insulation, malfunction due to swelling of the potting resin, or hardening of the lead wires.

**5. Do not use in an environment with temperature cycles.**

Consult SMC if switches are used where there are temperature cycles other than normal air temperature changes, as they may be adversely affected internally.

**6. Do not use in an environment where there is excessive impact shock.**

**<Reed switch>**

When excessive impact (300m/s$^2$ or more) is applied to a reed switch during operation, the contact will malfunction and generate or cut off a signal momentarily (1ms or less). Consult SMC regarding the need to use a solid state switch depending upon the environment.

**7. Do not use in an area where surges are generated.**

**<Solid state switch>**

When there are units (solenoid type lifter, high frequency induction furnace, motor, etc.) which generate a large amount of surge in the area around cylinders with solid state auto switches, this may cause deterioration or damage to internal circuit elements of the switch. Avoid sources of surge generation and crossed lines.

**8. Avoid accumulation of iron debris or close contact with magnetic substances.**

When a large amount of ferrous debris such as machining chips or welding spatter is accumulated, or a magnetic substance (something attracted by a magnet) is brought into close proximity with an auto switch cylinder, it may cause auto switches to malfunction due to a loss of the magnetic force inside the cylinder.

## Maintenance

### ⚠Warning

**1. Perform the following maintenance periodically in order to prevent possible danger due to unexpected auto switch malfunction.**

1) Securely tighten switch mounting screws.

If screws become loose or the mounting position is dislocated, retighten them after readjusting the mounting position.

2) Confirm that there is no damage to lead wires.

To prevent faulty insulation, replace switches or repair lead wires, etc., if damage is discovered.

3) Confirm the lighting of the green light on a 2-color display type switch.

Confirm that the green LED is on when stopped at the established position. If the red LED is on, the mounting position is not appropriate. Readjust the mounting position until the green LED lights up.

## Other

### ⚠Warning

**1. Consult SMC concerning water resistance, elasticity of lead wires and usage at welding sites, etc.**

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