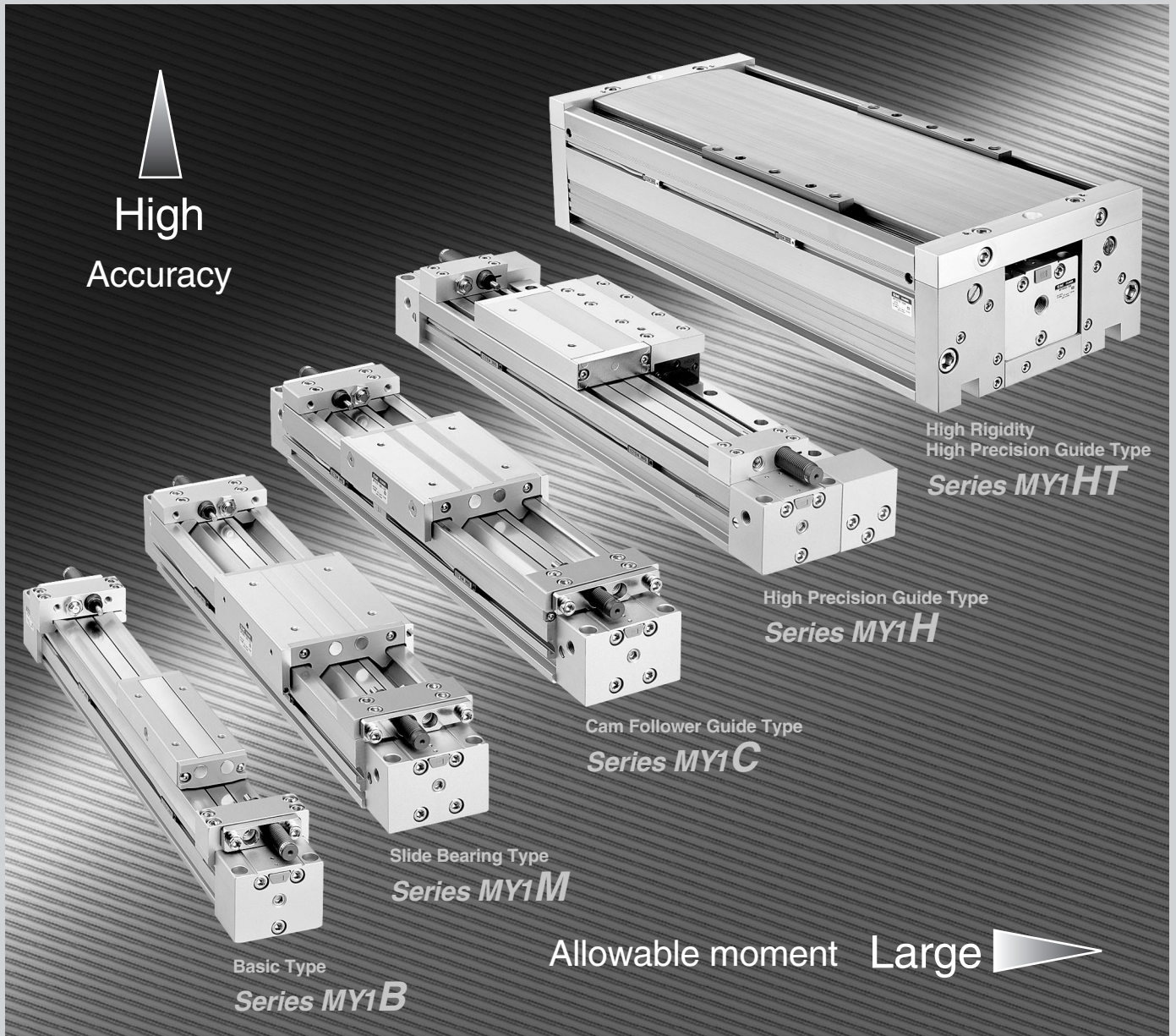


# Mechanically Jointed Rodless Cylinder *Series MY1*



**Five guide models allow a wide range of selections**

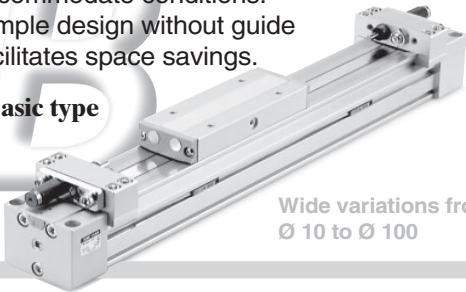
# Mechanically Jointed Rodless Cylinder Series MY1

## Basic Type

### Series MY1B

Can be combined with a variety of guides to accommodate conditions. Simple design without guide facilitates space savings.

#### Basic type



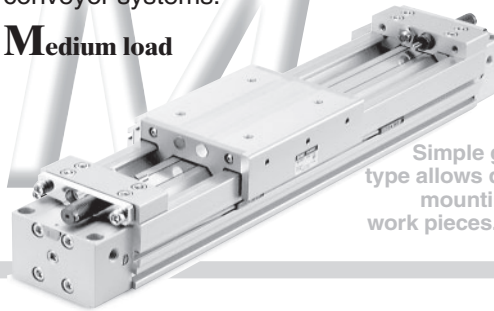
Wide variations from  $\varnothing 10$  to  $\varnothing 100$

## Slide Bearing Type

### Series MY1M

Integral guide allows use in a wide range of conveyor systems.

#### Medium load



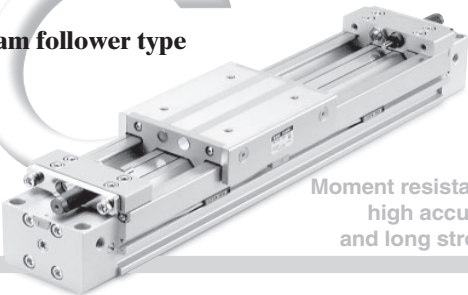
Simple guide type allows direct mounting of work pieces.

## Cam Follower Guide type

### Series MY1C

Makes smooth operation possible even with an off-set load.

#### Cam follower type



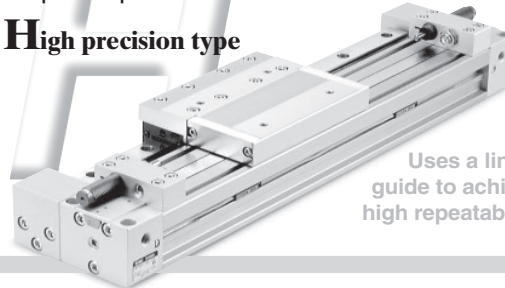
Moment resistance, high accuracy and long strokes

## High Precision Guide type

### Series MY1H

Small and medium sizes  $\varnothing 10$  to  $\varnothing 40$  are ideal for pick & place.

#### High precision type



Uses a linear guide to achieve high repeatability

## High Rigidity High Precision Guide Type

### Series MY1HT

High load, high moment and high precision. Ideal for transfer and pick & place of high load work pieces.

#### High precision Twin guide type



Higher load work pieces can be accommodated by using two linear guides.

#### Stroke availability

Strokes are selectable in 1mm units.

#### Stroke adjusting unit

Stroke Adjusting is possible on one side or on both sides.

- Adjusting bolt
- Low load shock absorber + Adjusting bolt (L unit)
- High load shock absorber + Adjusting bolt (H unit)

#### Interchangeability

The bodies and work piece mountings are interchangeable between series MY1M and MY1C.

#### Centralised piping

Piping ports are concentrated on one side.

#### Side support

Prevents cylinder tube deflection in long strokes.

## Minimum size

### Basic type MY1B



- Even when equipped with a floating bracket, the height is only 28.5 mm.

## Series variations

Series	Guide
MY1B	
MY1M	
MY1C	C
MY1H	Hi
MY1HT	HT





## Size of $\varnothing 10$ introduced to series MY1B/MY1H.

Height **27** mm

High precision guide type  
**MY1H10**

- Stroke adjusting unit can be mounted
- Centralised piping type (standard)

The stroke adjusting unit (H unit) does not protrude above the table height.

Piping type	Bore size [mm]									Air cushion	Stroke adjusting unit	Side support	Floating bracket	End lock	Order made
	10	16	20	25	32	40	50	63	80						
Basic															Intermediate strokes
Slide bearing															Long strokes
Cam follower guide															Helical insert threads
High precision guide															Dust seal band NBR lining
High rigidity high precision guide															Holder mounting bracket

Note 1)  $\varnothing 10$  is available with central piping only. Note 2)  $\varnothing 10$  is available with rubber bumper only.

**Uses two linear guides.**  
**Max. load weight 320kg ( $\varnothing 63$ )**

High rigidity/High precision guide type  
**MY1HT50, 63**

Extremely easy to maintain

- The cylinder can be replaced without disturbing the work piece
- Eyebolt mounting threads are standard for convenient installation

Using eyebolts

**End lock type introduced to series MY1H.**

Lock pin  
Allows fine stroke control

- Dimensions same as standard
- Can be locked on one side or on both sides

# Series MY1 Model Selection

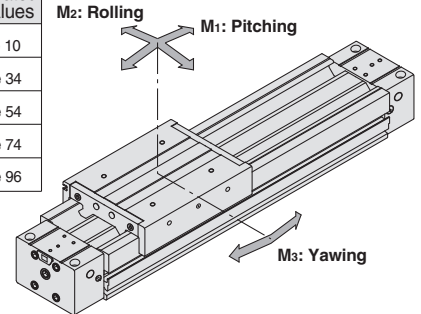
Following are the steps for selecting the most suitable Series MY1B to your application.

## Standards for Tentative Model Selection

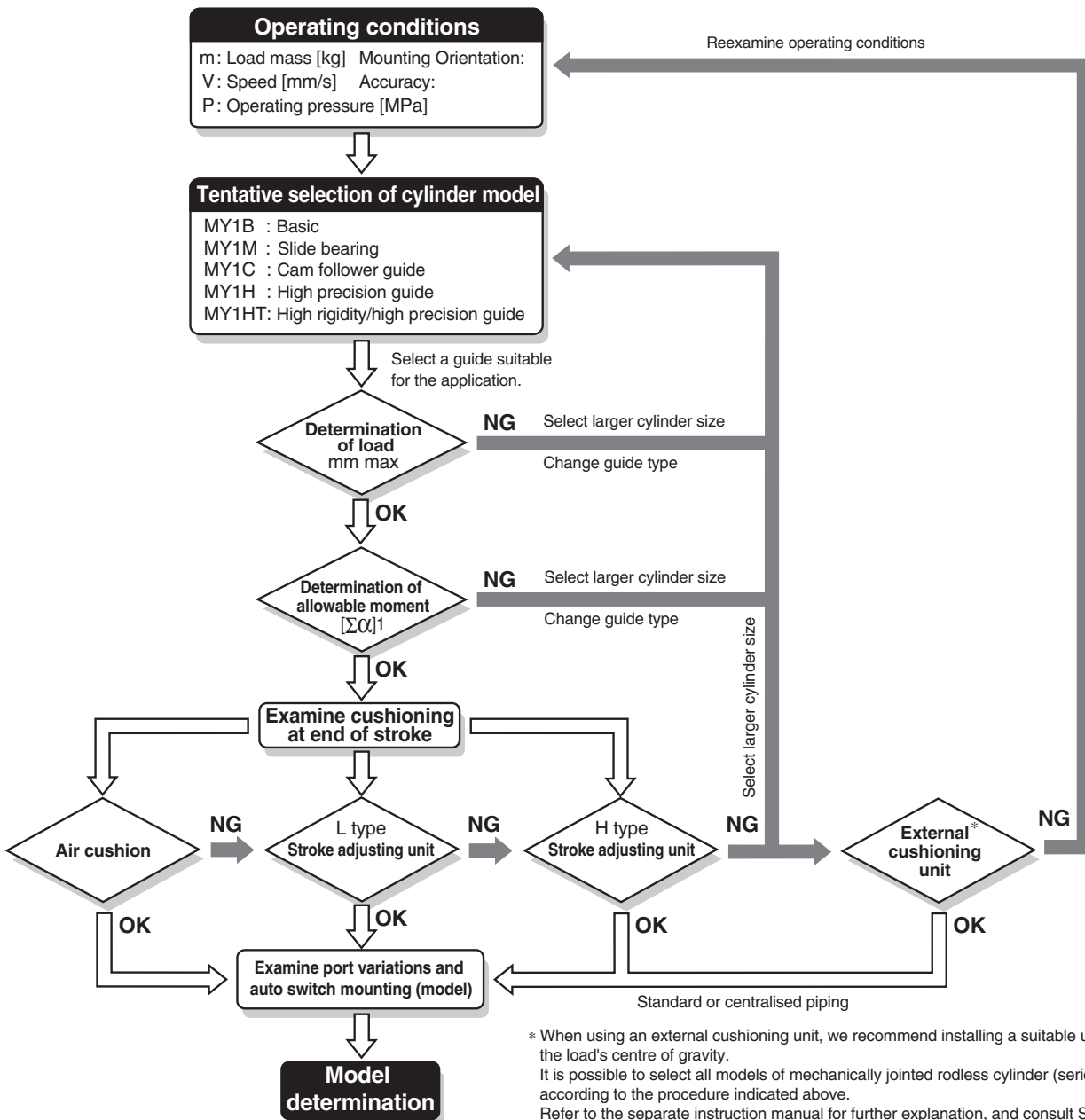
Cylinder model	Guide type	Standards for guide selection	Graphs for related allowable values
MY1B	Basic	Guaranteed accuracy not required, generally combined with separate guide	Refer to page 10
MY1M	Slide bearing	Slide table accuracy approx. 0.12 mm <small>Note 2)</small>	Refer to page 34
MY1C	Cam follower guide	Slide table accuracy approx. 0.05 mm <small>Note 2)</small>	Refer to page 54
MY1H	High precision guide	Slide table accuracy of 0.05 mm or less required <small>Note 2)</small>	Refer to page 74
MY1HT	High rigidity/high precision guide	Slide table accuracy of 0.05 mm or less required <small>Note 2)</small>	Refer to page 96

Note 1) Use as a standard when making selections regarding guide accuracy. Consult SMC when guaranteed accuracy is required for MY1C/MY1H.

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



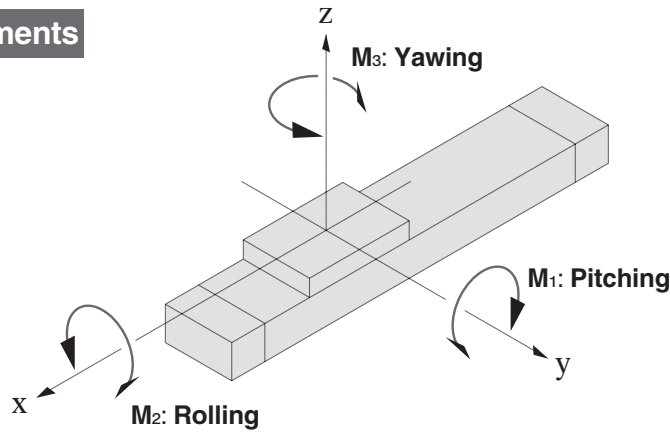
## Selection Flow Chart



**Types of Moment Applied to Rodless Cylinders**

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

**Coordinates and moments**



**Static moment**

**Horizontal mounting**

**Ceiling mounting**

**Wall mounting**

**Vertical mounting**

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 mass movable by thrust. Use 0.3 to 0.7 times the thrust (differs depending on the operating speed) as a guide for actual use.

**g: Gravitational acceleration**

**Dynamic moment**

Mounting orientation	Horizontal	Ceiling	Wall	Vertical
Dynamic load FE	$\frac{1.4}{100} \times U_a \times m_n \times g$			
Dynamic moment	$M_{1:E}$	$\frac{1}{3} \times FE \times Z$		
	$M_{2:E}$	<b>Dynamic moment <math>M_{2:E}</math> does not occur.</b>		
	$M_{3:E}$	$\frac{1}{3} \times FE \times Y$		

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

**g: Gravitational acceleration,  $U_a$ : Average speed**

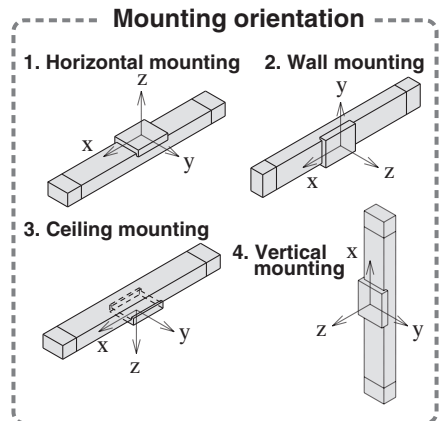
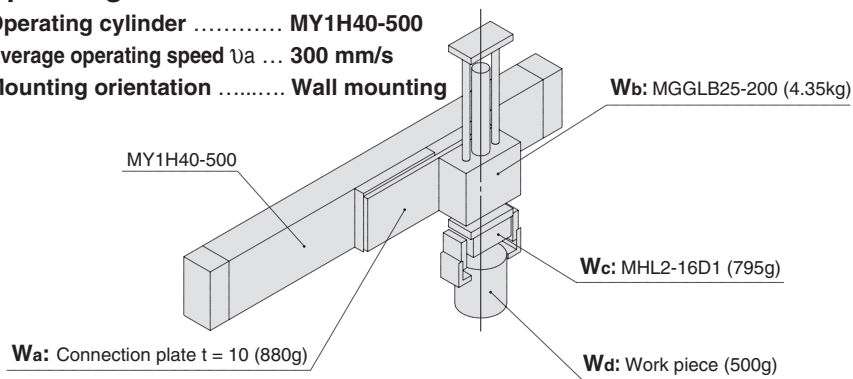
## Calculation of Guide Load Factor

### 1 Operating conditions

Operating cylinder ..... MY1H40-500

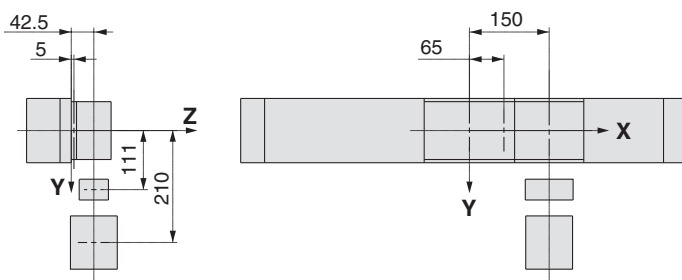
Average operating speed  $v_a$  ... 300 mm/s

Mounting orientation ..... Wall mounting



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

### 2 Load blocking



#### Work piece mass and centre of gravity

Work piece no. $W_n$	Mass $m_n$	Center of gravity		
		X-axis $X_n$	Y-axis $Y_n$	Z-axis $Z_n$
<b>Wa</b>	0.88 kg	65 mm	0 mm	5 mm
<b>Wb</b>	4.35 kg	150 mm	0 mm	42.5 mm
<b>Wc</b>	0.795 kg	150 mm	111 mm	42.5 mm
<b>Wd</b>	0.5 kg	150 mm	210 mm	42.5 mm

$n = a, b, c, d$

### 3 Calculation of composite centre of gravity

$$m_3 = \sum m_n$$

$$= 0.88 + 4.35 + 0.795 + 0.5 = \mathbf{6.525 \text{ kg}}$$

$$X = \frac{1}{m_3} \times \sum (m_n \times X_n)$$

$$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) = \mathbf{138.5 \text{ mm}}$$

$$Y = \frac{1}{m_3} \times \sum (m_n \times Y_n)$$

$$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) = \mathbf{29.6 \text{ mm}}$$

$$Z = \frac{1}{m_3} \times \sum (m_n \times Z_n)$$

$$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) = \mathbf{37.4 \text{ mm}}$$

### 4 Calculation of load factor for static load

$m_3$ : Mass

$m_3$  max (from 1 of graph MY1H/ $m_3$ ) = 50 (kg) .....

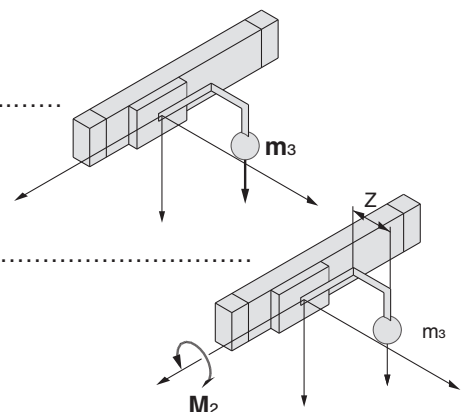
Load factor  $\alpha_1 = m_3 / m_3 \text{ max} = 6.525 / 50 = \mathbf{0.13}$

$M_2$ : Moment

$M_2$  max (from 2 of graph MY1H/ $M_2$ ) = 50 (N·m) .....

$M_2 = m_3 \times g \times Z = 6.525 \times 9.8 \times 37.4 \times 10^{-3} = 2.39 \text{ (N·m)}$

Load factor  $\alpha_2 = M_2 / M_2 \text{ max} = 2.39 / 50 = \mathbf{0.05}$

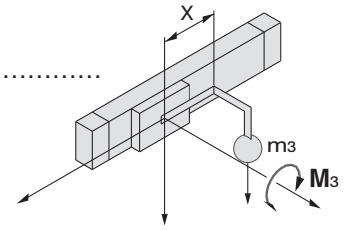


## M<sub>3</sub>: Moment

M<sub>3</sub> max (from 3 of graph MY1H/M<sub>3</sub>) = 38.7 (N·m) .....

$$M_3 = m_3 \times g \times X = 6.525 \times 9.8 \times 138.5 \times 10^{-3} = 8.86 \text{ (N·m)}$$

$$\text{Load factor } \alpha_3 = M_3 / M_{3 \text{ max}} = 8.86 / 38.7 = \mathbf{0.23}$$



## 5 Calculation of load factor for dynamic moment

### Equivalent load F<sub>E</sub> at impact

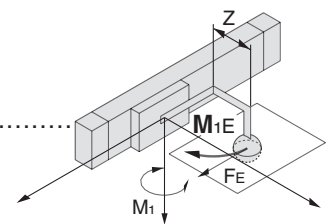
$$F_E = \frac{1.4}{100} \times v_a \times g \times m = \frac{1.4}{100} \times 300 \times 9.8 \times 6.525 = 268.6 \text{ (N)}$$

### M<sub>1E</sub>: Moment

M<sub>1E</sub> max (from 4 of graph MY1H/M<sub>1</sub> where 1.4v<sub>a</sub> = 420 mm/s) = 35.9 (N·m) .....

$$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 268.6 \times 37.4 \times 10^{-3} = 3.35 \text{ (N·m)}$$

$$\text{Load factor } \alpha_4 = M_{1E} / M_{1E \text{ max}} = 3.35 / 35.9 = \mathbf{0.09}$$

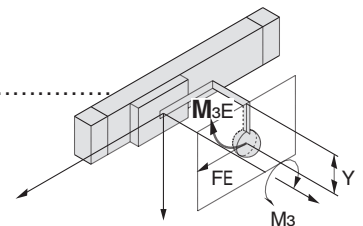


### M<sub>3E</sub>: Moment

M<sub>3E</sub> max (from 5 of graph MY1H/M<sub>3</sub> where 1.4v<sub>a</sub> = 420 mm/s) = 27.6 (N·m) .....

$$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 268.6 \times 29.6 \times 10^{-3} = 2.65 \text{ (N·m)}$$

$$\text{Load factor } \alpha_5 = M_{3E} / M_{3E \text{ max}} = 2.65 / 27.6 = \mathbf{0.10}$$



## 6 Sum and examination of guide load factors

$$\Sigma \alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = \mathbf{0.601}$$

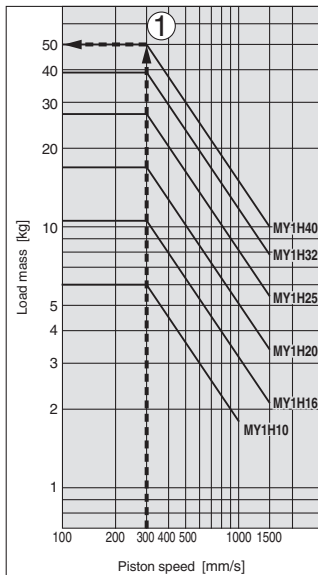
The above calculation is within the allowable value and the selected model can be used.

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".

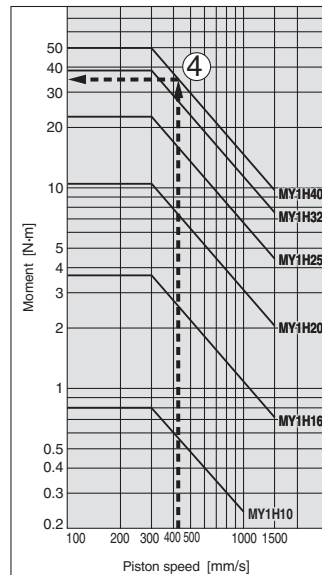
### Load mass

#### MY1H/m<sub>3</sub>

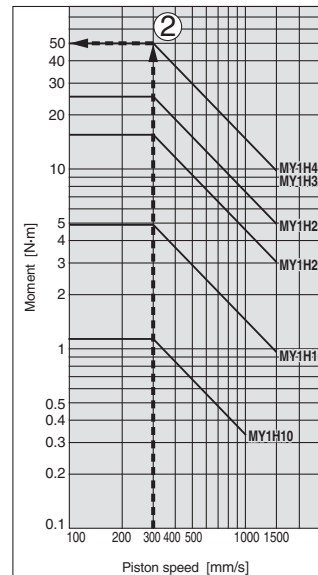


### Allowable moment

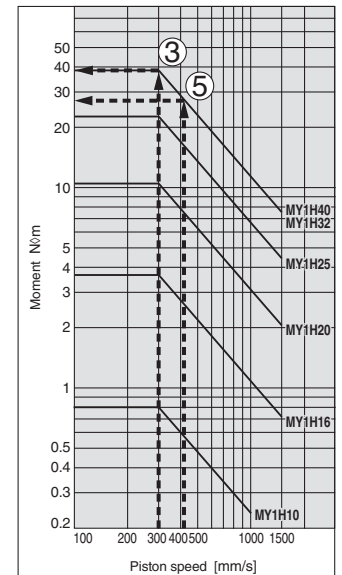
#### MY1H/M<sub>1</sub>



#### MY1H/M<sub>2</sub>



#### MY1H/M<sub>3</sub>



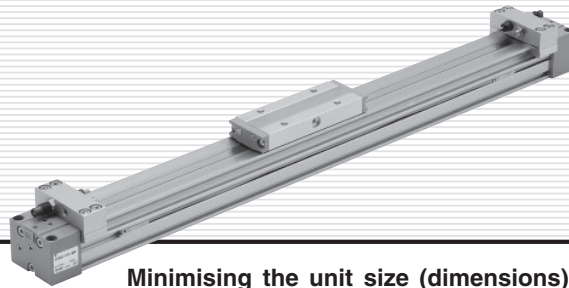




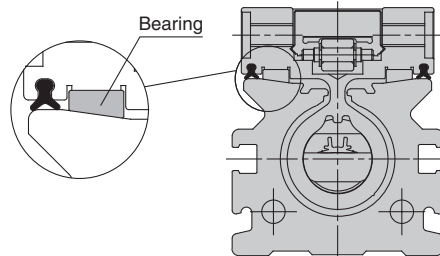
# Series MY1B

Basic Type

Ø 10, Ø 16, Ø 20, Ø 50, Ø 63, Ø 80, Ø 100



Minimising the unit size (dimensions) and combination with other guides is possible.



# Series MY1B Prior to Use

## Maximum Allowable Moment/Maximum Load Mass

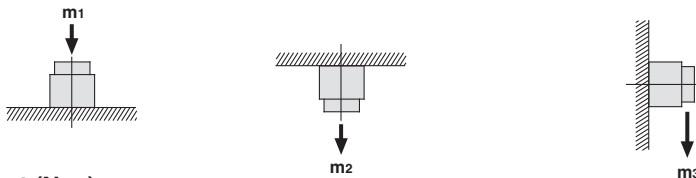
Model	Bore size [mm]	Maximum allowable moment [N·m]			Maximum load mass [kg]		
		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	m <sub>1</sub>	m <sub>2</sub>	m <sub>3</sub>
MY1B	10	0.8	0.1	0.3	5.0	1.0	0.5
	16	2.5	0.3	0.8	15	3.0	1.7
	20	5.0	0.6	1.5	21	4.2	3.0
	50	78	9.3	23	70	14	20
	63	160	19	48	83	16.6	29
	80	315	37	95	120	24	42
	100	615	73	184	150	30	60

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

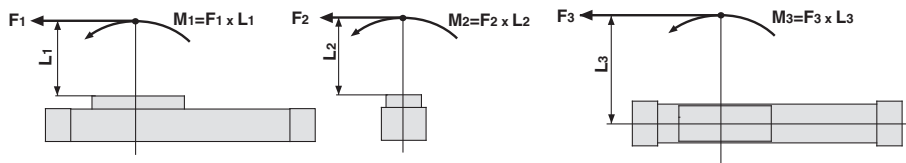
### Caution on Design

We recommend installing an external shock absorber when the cylinder is combined with another guide (connection with floating bracket, etc.) and the maximum allowable load is exceeded, or when the operating speed is 1000 to 1500 mm/s for bore sizes Ø 16, Ø 50, Ø 63, Ø 80 and Ø 100.

### Load mass (kg)



### Moment (N·m)



### <Calculation of guide load factor>

1. Maximum allowable load (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  $\bar{U}_a$  (average speed) for (1) and (2), and  $U$  (collision speed  $U = 1.4 \bar{U}_a$ ) for (3). Calculate  $m_{max}$  for (1) from the maximum allowable load graph ( $m_1, m_2, m_3$ ) and  $M_{max}$  for (2) and (3) from the maximum allowable moment graph ( $M_1, M_2, M_3$ ).

$$\text{Sum of guide load factors } \Sigma \alpha = \frac{\text{Load mass [m]}}{\text{Maximum allowable load [m}_{max}]}} + \frac{\text{Static moment [M] }^{(1)}}{\text{Allowable static moment [M}_{max}]}} + \frac{\text{Dynamic moment [M}_E] }^{(2)}}{\text{Allowable dynamic moment [M}_{Emax}]}} \leq 1$$

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 workpiece, multiple moments may occur. When this happens, the sum of the load factors ( $\Sigma \alpha$ ) is the total of all such moments.

### 2. Reference formula [Dynamic moment at impact]

Use the following formulae to calculate dynamic moment when taking stopper impact into consideration.

**m**: Load mass (kg)

**F**: Load (N)

**F<sub>E</sub>**: Load equivalent to impact (at impact with stopper) (N)

**$\bar{U}_a$** : Average speed (mm/s)

**M**: Static moment (N·m)

$U = 1.4 \bar{U}_a$  (mm/s)  $F_E = 1.4 \bar{U}_a \cdot \delta \cdot m \cdot g$  <sup>Note 4)</sup>

$\therefore M_E = \frac{1}{3} F_E \cdot L_1 = 4.57 \bar{U}_a \delta m L_1$  <sup>Note 5)</sup>

**U**: Collision speed (mm/s)

**L<sub>1</sub>**: Distance to the load's centre of gravity (m)

**M<sub>E</sub>**: Dynamic moment (N·m)

**$\delta$** : Damper coefficient

With rubber bumper = 4/100

(MY1B10, MY1H10)

With air cushion = 1/100

With shock absorber = 1/100

**g**: Gravitational acceleration (9.8 m/s<sup>2</sup>)

Note 4)  $1.4 \bar{U}_a \delta$  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.

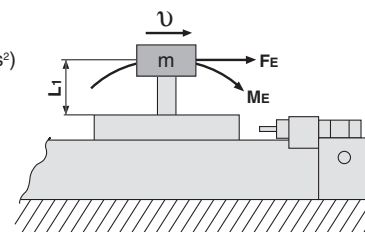
3. For detailed selection procedures, refer to pages 12 and 13.

## Maximum Allowable Moment

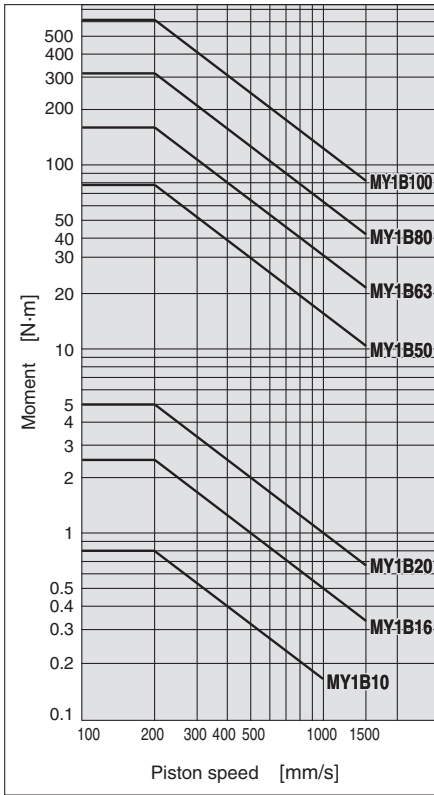
Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

## Maximum Load Mass

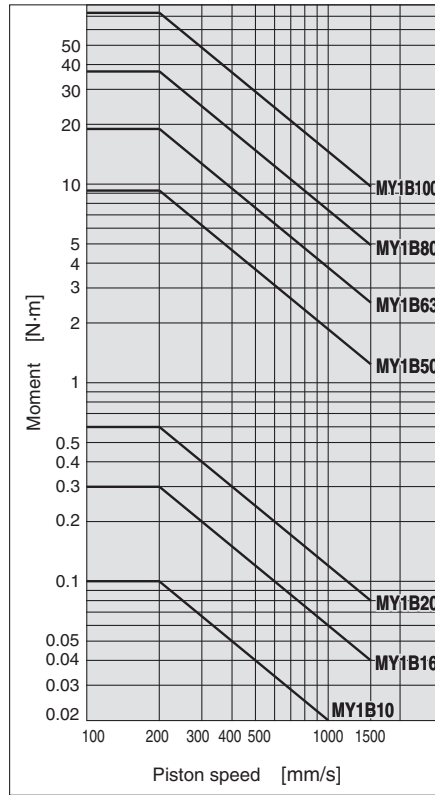
Select the load from within the range of limits shown in the graphs. Note that the maximum allowable moment value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable moment for the selected conditions.



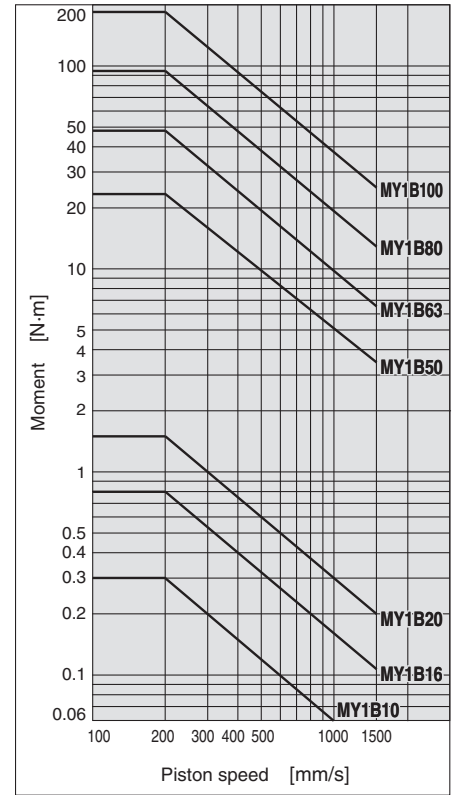
**MY1B/M<sub>1</sub>**



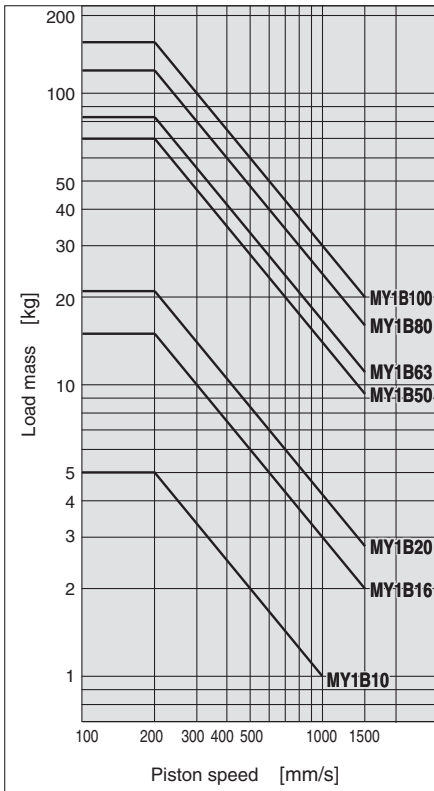
**MY1B/M<sub>2</sub>**



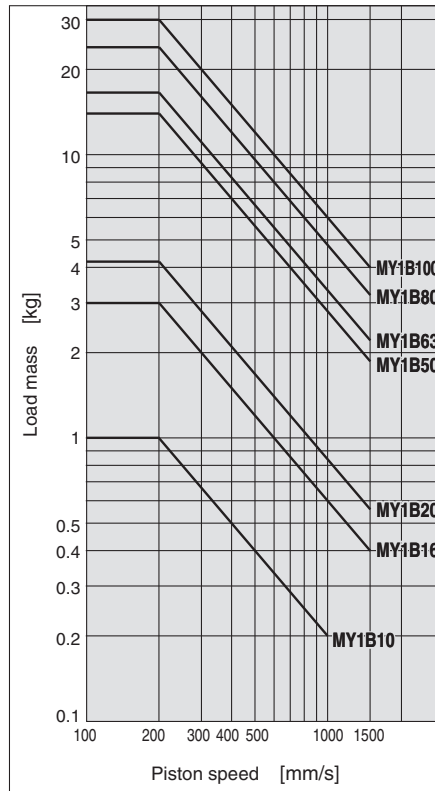
**MY1B/M<sub>3</sub>**



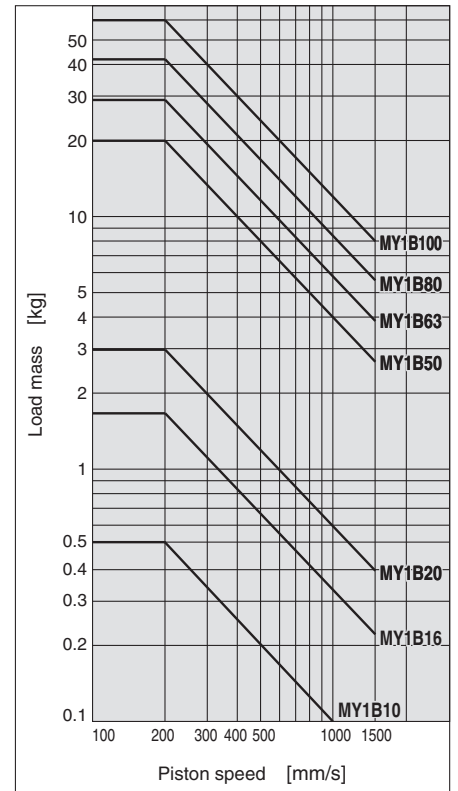
**MY1B/m<sub>1</sub>**



**MY1B/m<sub>2</sub>**



**MY1B/m<sub>3</sub>**



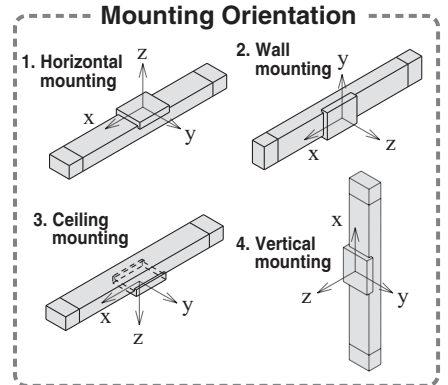
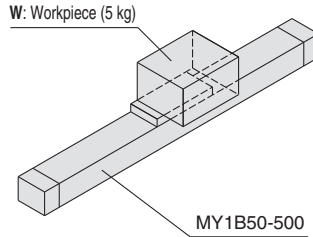
# Series MY1B Model Selection

Following are the steps for selecting the most suitable Series MY1B to your application.

## Calculation of Guide Load Factor

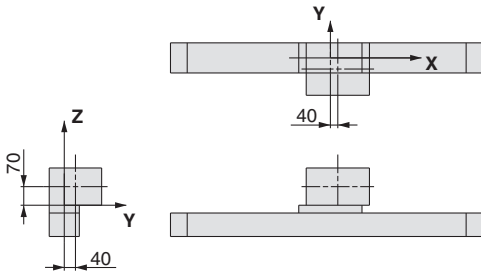
### 1. Operating Conditions

Cylinder ..... MY1B50-500  
 Average operating speed  $v_a$  .... 300 mm/s  
 Mounting orientation ..... Horizontal mounting  
 Cushion ..... Air cushion  
 ( $\delta = 1/100$ )



For actual examples of calculation for each orientation, refer to the pages above.

### 2. Load Blocking



#### Mass and Centre of Gravity for Workpiece

Workpiece no.	Mass <b>m</b>	Centre of gravity		
		X-axis	Y-axis	Z-axis
<b>W</b>	5 kg	40 mm	40 mm	70 mm

### 3. Calculation of Load Factor for Static Load

**m**<sub>1</sub>: Mass

**m**<sub>1 max</sub> (from (1) of graph MY1B/**m**<sub>1</sub>) = 47 (kg).....

Load factor  $\alpha_1 = m_1 / m_{1 \max} = 5/47 = 0.11$

**M**<sub>1</sub>: Moment

**M**<sub>1 max</sub> (from (2) of graph MY1B/**M**<sub>1</sub>) = 52 (N·m).....

**M**<sub>1</sub> = **m**<sub>1</sub> × **g** × **X** = 5 × 9.8 × 40 × 10<sup>-3</sup> = 1.96 (N·m)

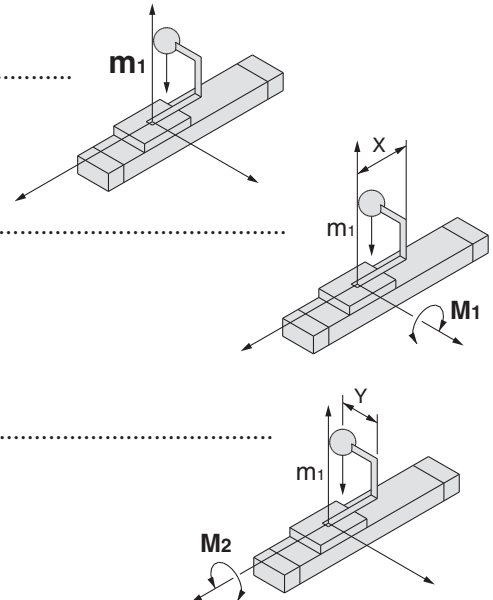
Load factor  $\alpha_2 = M_1 / M_{1 \max} = 1.96/52 = 0.04$

**M**<sub>2</sub>: Moment

**M**<sub>2 max</sub> (from (3) of graph MY1B/**M**<sub>2</sub>) = 6.2 (N·m).....

**M**<sub>3</sub> = **m**<sub>1</sub> × **g** × **Y** = 5 × 9.8 × 40 × 10<sup>-3</sup> = 1.96 (N·m)

Load factor  $\alpha_3 = M_2 / M_{2 \max} = 1.96/6.2 = 0.32$



#### 4. Calculation of Load Factor for Dynamic Moment

Equivalent load  $F_E$  at impact

$$F_E = 1.4 \cdot v_a \times \delta \times m \times g = 1.4 \times 300 \times \frac{1}{100} \times 5 \times 9.8 = 205.8 \text{ (N)}$$

$M_{1E}$ : Moment

$M_{1E \text{ max}}$  (from (4) of graph MY1B/M<sub>1</sub> where  $1.4v_a = 420 \text{ mm/s}$ ) = 37 (N·m).....

$$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 205.8 \times 70 \times 10^{-3} = 4.81 \text{ (N·m)}$$

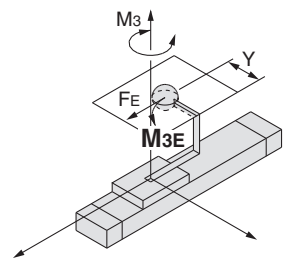
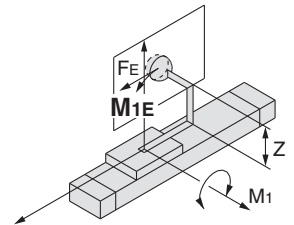
$$\text{Load factor } \alpha_4 = M_{1E} / M_{1E \text{ max}} = 4.81 / 37 = 0.13$$

$M_{3E}$ : Moment

$M_{3E \text{ max}}$  (from (5) of graph MY1B/M<sub>3</sub> where  $1.4v_a = 420 \text{ mm/s}$ ) = 11.0 (N·m).....

$$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 205.8 \times 40 \times 10^{-3} = 2.75 \text{ (N·m)}$$

$$\text{Load factor } \alpha_5 = M_{3E} / M_{3E \text{ max}} = 2.75 / 11.0 = 0.25$$



#### 5. Sum and Examination of Guide Load Factors

$$\Sigma \alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.85 \leq 1$$

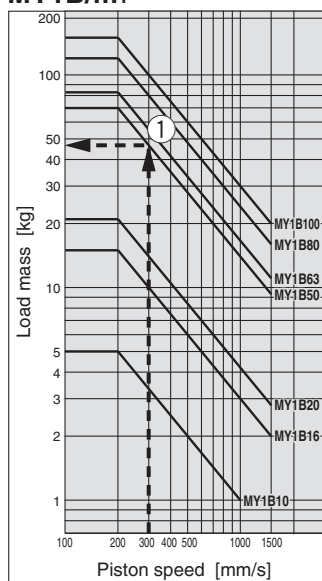
The above calculation is within the allowable value, and therefore the selected model can be used.

Select a shock absorber separately.

In an actual calculation, when the total sum of guide load factors  $\alpha$  in the formula above is more than 1, consider either decreasing the speed, increasing the bore size, or changing the product series. This calculation can be easily made using the "SMC Pneumatics CAD System".

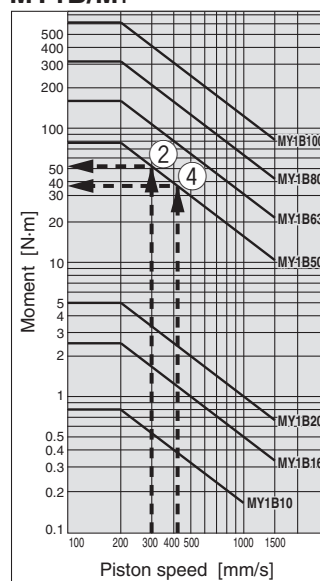
#### Load Mass

MY1B/m<sub>1</sub>

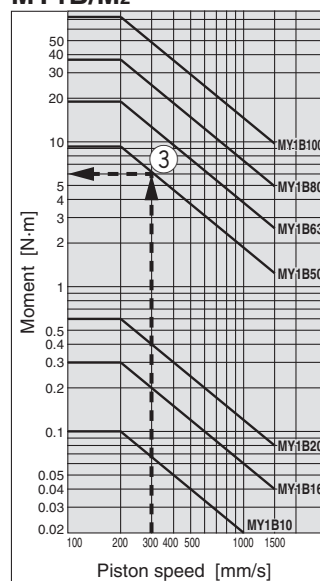


#### Allowable Moment

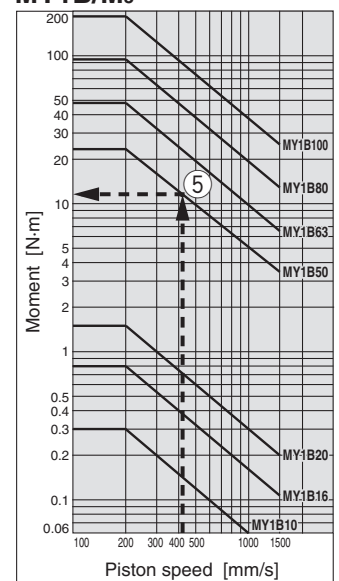
MY1B/M<sub>1</sub>



MY1B/M<sub>2</sub>



MY1B/M<sub>3</sub>





# Mechanically Jointed Rodless Cylinder Basic Type

## Series MY1B

Ø 10, Ø 16, Ø 20, Ø 50, Ø 63, Ø 80, Ø 100

For bore sizes Ø 25, Ø 32 and Ø 40, refer to the catalogue on [www.smc.eu](http://www.smc.eu).

### How to Order

Basic type

MY1B 20

300

M9BW

—

Basic type

Bore size [mm]

10	10 mm
16	16 mm
20	20 mm
50	50 mm
63	63 mm
80	80 mm
100	100 mm

Port thread type

Symbol	Type	Bore size
—	M thread	Ø 10, Ø 16, Ø 20
	Rc	
TN	NPT	Ø 50, Ø 63, Ø 80, Ø 100
TF	G	

Piping

—	Standard type
G	Centralised piping type

Note) For Ø 10, only G is available.

Cylinder stroke [mm]

Bore size [mm]	Standard stroke [ $\mu$ m]*	Maximum manufacturable stroke [mm]
10, 16	100, 200, 300, 400, 500, 600, 700	3000
20, 50, 63, 80, 100	800, 900, 1000, 1200, 1400, 1600, 1800, 2000	5000

\* The stroke can be manufactured up to the maximum stroke from 1 mm stroke in 1 mm increments. However, when the stroke is 49 mm or less, the air cushion capability lowers and multiple auto switches cannot be mounted. Pay special attention to this point. Also when exceeding a 2000 mm stroke, specify "-XB11" at the end of the model number. For details, refer to the "Made to Order Specifications"

Made to Order  
Refer to page 15 for details.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

— Without auto switch (Built-in magnet)

For Ø 10 cylinders without an auto switch, the cylinder configuration is for the reed auto switch. Contact SMC when the solid state auto switch is retrofitted.

Applicable auto switches vary depending on the bore size. Select an applicable one referring to the table below.

Stroke adjustment unit symbol

Refer to "Stroke adjustment unit" on page 15.

### Applicable Auto Switches/Refer to pages 107 to 117 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model				Lead wire length (m)					Pre-wired connector	Applicable load	
					DC	AC	Perpendicular		In-line		0.5 (—)	1 (M)	3 (L)	5 (Z)				
							Ø 10 to Ø 20	Ø 50 to Ø 100	Ø 10 to Ø 20	Ø 50 to Ø 100								
Solid state auto switch	—	—	—	3-wire (NPN)	5 V, 12 V	—	M9NV** [Y69A]	M9N** [Y59A]	●	●	○	○	○	IC circuit	Relay, PLC			
				3-wire (PNP)			M9PV** [Y7PV]	M9P** [Y7P]	●	●	○	○						
				2-wire	12 V	M9BV** [Y69B]	M9B** [Y59B]	●	●	○	○							
				3-wire (NPN)	5 V, 12 V	M9NVW** [Y7NWV]	M9NW** [Y7NW]	●	●	○	○							
	3-wire (PNP)	M9PVW** [Y7PWV]	M9PW** [Y7PW]	●		●	○	○										
	Diagnostic indication (2-colour indication)	Grommet	Yes	2-wire	12 V	M9BVW** [Y7B WV]	M9BW** [Y7BW]	●	●	○	○	○	○					
				3-wire (NPN)	5 V, 12 V	M9NAV** <sub>*1</sub> [—]	M9NA** <sub>*1</sub> [—]	○	○	●	○	○						
	Water resistant (2-colour indication)	Grommet	No	3-wire (PNP)		12 V	M9PAV** <sub>*1</sub> [—]	M9PA** <sub>*1</sub> [—]	○	○	●	○	○					
				2-wire	M9BAV** <sub>*1</sub> [—]		M9BA** <sub>*1</sub> [Y7BA]	○	○	●	○	○						
	Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	5 V	—	A96V	—	A96	Z76	●	—	●		—	—	IC circuit
2-wire					24 V			12 V	100 V	A93V* <sub>*2</sub>	—	A93	Z73	●	●	●	●	—
			No	2-wire	24 V	12 V	100 V or less	A90V	—	A90	Z80	●	—	●	—	—	IC circuit	Relay, PLC

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

\*2 1 m type lead wire is only applicable to D-A93.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWX

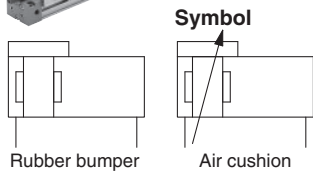
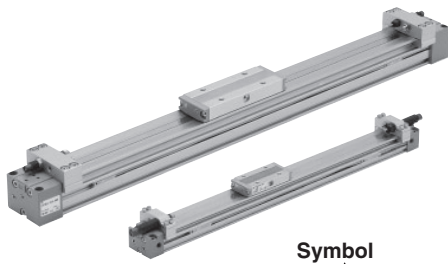
\* Solid state auto switches marked with "○" are produced upon receipt of order.  
\* Separate switch spacers (BMG2-012) are required to retrofit auto switches (M9 type) on cylinders Ø 63 to Ø 100.

\*\* D-M9□□□ type cannot be mounted on Ø 50. Select auto switches in brackets.

\* There are other applicable auto switches than listed above. For details, refer to page 115.

\* Auto switches are shipped together (not assembled).

# Mechanically Jointed Rodless Cylinder **Series MY1B**



**Made to Order: Specifications**  
(Refer to page 118 to 120 for details.)

Symbol	Specifications
-X168	Helical insert thread specifications
-XB11	Long stroke type
-XB22	Shock absorber soft type Series RJ type
-XC67	NBR rubber lining in dust seal band
20-	Cooper-free

## Specifications

Bore size [mm]	10	16	20	50	63	80	100
Fluid	Air						
Action	Double acting						
Operating pressure range	0.2 to 0.8 MPa	0.15 to 0.8 MPa		0.1 to 0.8 MPa			
Proof pressure	1.2 MPa						
Ambient and fluid temperature	5 to 60 °C						
Cushion	Rubber bumper	Air cushion					
Lubrication	Non-lube						
Stroke length tolerance	1000 or less $^{+1.8}_0$ 1001 to 3000 $^{+2.8}_0$		2700 or less $^{+1.8}_0$ , 2701 to 5000 $^{+2.8}_0$				
Piping Port size	Front/Side port	M5 x 0.8			Rc 3/8	Rc 1/2	
	Bottom port	Ø 4			Ø 10	Ø 18	

## Piston Speed

Bore size [mm]		10	16, 20, 50 to 100
Without stroke adjustment unit		100 to 500 mm/s	100 to 1000 mm/s
Stroke adjustment unit	A unit	100 to 200 mm/s	100 to 1000 mm/s <sup>(1)</sup>
	L unit and H unit	100 to 1000 mm/s	100 to 1500 mm/s <sup>(2)</sup>

Note1) Be aware that when the stroke adjustment range is increased by manipulating the adjustment bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 18, the **piston speed should be 100 to 200 mm per second.**

Note2) The piston speed is 100 to 1000 mm/s for centralised piping.

Note3) Use at a speed within the absorption capacity range. Refer to page 17.

## Stroke Adjustment Unit Specifications

Bore size [mm]		10		16	20		
Unit symbol		A	H	A	A	L	H
Configuration Shock absorber model		With adjustment bolt	RB 0805 + with adjustment bolt	With adjustment bolt	With adjustment bolt	RB 0806 + with adjustment bolt	RB 1007 + with adjustment bolt
Stroke adjustment range by intermediate fixing spacer [mm]	Without spacer	0 to -5		0 to -5.6	0 to -6		
	With short spacer	—	—	-5.6 to -11.2	-6 to -12		
	With long spacer	—	—	-11.2 to -16.8	-12 to -18		

Note) Intermediate fixing spacer is not available for Ø 10.

\* Stroke adjustment range is applicable for one side when mounted on a cylinder.

## Stroke Adjustment Unit Symbol

		Right side stroke adjustment unit										
		Without unit	A: With adjustment bolt		L: With low load shock absorber + Adjustment bolt		H: With high load shock absorber + Adjustment bolt					
			With short spacer	With long spacer	With short spacer	With long spacer	With short spacer	With long spacer	With short spacer	With long spacer		
Left side stroke adjustment unit	Without unit	—	SA	SA6	SA7	SL	SL6	SL7	SH	SH6	SH7	
	A: With adjustment bolt	AS	A	AA6	AA7	AL	AL6	AL7	AH	AH6	AH7	
		With short spacer	A6S	A6A	A6	A6A7	A6L	A6L6	A6L7	A6H	A6H6	A6H7
		With long spacer	A7S	A7A	A7A6	A7	A7L	A7L6	A7L7	A7H	A7H6	A7H7
	L: With low load shock absorber + Adjustment bolt	LS	LA	LA6	LA7	L	LL6	LL7	LH	LH6	LH7	
		With short spacer	L6S	L6A	L6A6	L6A7	L6L	L6	L6L7	L6H	L6H6	L6H7
		With long spacer	L7S	L7A	L7A6	L7A7	L7L	L7L6	L7	L7H	L7H6	L7H7
	H: With high load shock absorber + Adjustment bolt	HS	HA	HA6	HA7	HL	HL6	HL7	H	HH6	HH7	
		With short spacer	H6S	H6A	H6A6	H6A7	H6L	H6L6	H6L7	H6H	H6	H6H7
		With long spacer	H7S	H7A	H7A6	H7A7	H7L	H7L6	H7L7	H7H	H7H6	H7

\* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.

## Shock Absorbers for L and H Units

Model	Stroke adjustment unit	Bore size [mm]	
		10	20
Standard (Shock absorber/RB series)	L	—	RB0806
	H	RB0805	RB1007
Shock absorber/soft type RJ series mounted (-XB22)	L	—	RJ0806H
	H	RJ0805	RJ1007H

\* The shock absorber service life is different from that of the MY1B cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

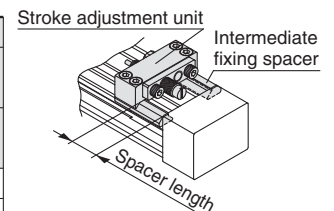
\* Mounted shock absorber soft type RJ series (-XB22) is made to order specifications.

## Shock Absorber Specifications

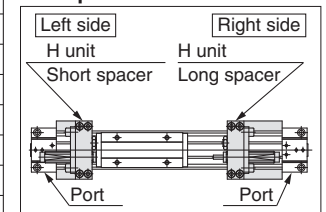
Model	RB 0805	RB 0806	RB 1007	
Max. energy absorption [J]	1.0	2.9	5.9	
Stroke absorption [mm]	5	6	7	
Max. collision speed [mm/s]	1000	1500	1500	
Max. operating frequency [cycle/min]	80	80	70	
Spring force [N]	Extended	1.96	1.96	4.22
	Retracted	3.83	4.22	6.86
Operating temperature range [°C]	5 to 60			

\* The shock absorber service life is different from that of the MY1B cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

## Stroke adjustment unit mounting diagram



## Example of H6H7 attachment



# Series MY1B

## Theoretical Output

Bore size [mm]	Piston area (mm <sup>2</sup> )	Operating pressure [MPa]							[N]
		0.2	0.3	0.4	0.5	0.6	0.7	0.8	
10	78	15	23	31	39	46	54	62	
16	200	40	60	80	100	120	140	160	
20	314	62	94	125	157	188	219	251	
50	1962	392	588	784	981	1177	1373	1569	
63	3115	623	934	1246	1557	1869	2180	2492	
80	5024	1004	1507	2009	2512	3014	3516	4019	
100	7850	1570	2355	3140	3925	4710	5495	6280	

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>)

## Weight

Bore size [mm]	Basic weight	Additional weight per each 50 mm of stroke	Weight of moving parts	Side support bracket weight (per set)	Stroke adjustment unit weight (per unit)			[kg]
					Type A and B	A unit weight	L unit weight	H unit weight
10	0.15	0.04	0.03	0.003	0.01	—	0.02	
16	0.61	0.06	0.07	0.01	0.04	—	—	
20	1.06	0.10	0.14	0.02	0.05	0.05	0.10	
50	7.78	0.44	1.40	0.04	—	—	—	
63	13.10	0.70	2.20	0.08	—	—	—	
80	20.70	1.18	4.80	0.17	—	—	—	
100	35.70	1.97	8.20	0.17	—	—	—	

Calculation: (Example) MY1B20-300A

- Basic weight .....1.06 kg
- Cylinder stroke .....300 stroke
- Additional weight .....0.10/50 stroke  
1.06 + 0.10 x 300/50 + 0.05 x 2 = 2.17 kg
- Weight of A unit .....1.76 kg

## Option

### Stroke Adjustment Unit Part No.

**MY - A 20 H2 - 6N**

Stroke adjustment unit

Intermediate fixing spacer

Stroke adjustment unit

Intermediate fixing spacer

Spacer length

Symbol	Stroke adjustment unit	Mounting position
A1	A unit	Left
A2	A unit	Right
L1	L unit	Left
L2	L unit	Right
H1	H unit	Left
H2	H unit	Right

Spacer	Without spacer
6	Short spacer
7	Long spacer

Spacer delivery style	Unit installed
N	Spacer only

Note) Stroke adjustment unit is not available for Ø 50, Ø 63, Ø 80 and Ø 100.

Note 1) Refer to page 15 for details about adjustment range.

Note 2) A and H unit only for Ø 10, A unit only for Ø 16

### Component Parts

MY-A20H2 (Without spacer)	MY-A20H2-6 (With short spacer)	MY-A20H2-7 (With long spacer)	MY-A20H2-6N (Short spacer only)	MY-A20H2-7N (Long spacer only)

### Side Support Part No.

Type	Bore size [mm]	10	16	20	50	63	80	100
Side support A		MY-S10A	MY-S16A	MY-S20A	MY-S32A	MY-S50A	MY-S63A	
Side support B		MY-S10B	MY-S16B	MY-S20B	MY-S32B	MY-S50B	MY-S63B	

For details about dimensions, etc., refer to page 28.

A set of side supports consists of a left support and a right support.

## Cushion Capacity

### Cushion Selection

#### <Rubber bumper>

Rubber bumpers are a standard feature on MY1B10.

Since the stroke absorption of rubber bumpers is short, when adjusting the stroke with an A unit, install an external shock absorber.

The load and speed range which can be absorbed by a rubber bumper is inside the rubber bumper limit line of the graph.

#### <Air cushion>

Air cushions are a standard feature on mechanically jointed rodless cylinders. (Except  $\varnothing 10$ .)

The air cushion mechanism is incorporated to prevent excessive impact of the piston at the stroke end during high speed operation. The purpose of air cushion, thus, is not 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 adjustment unit with shock absorber>

Use this unit when operating with a load or speed exceeding the air cushion limit line, or when cushioning is required 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.

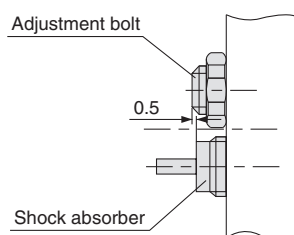
#### H unit

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

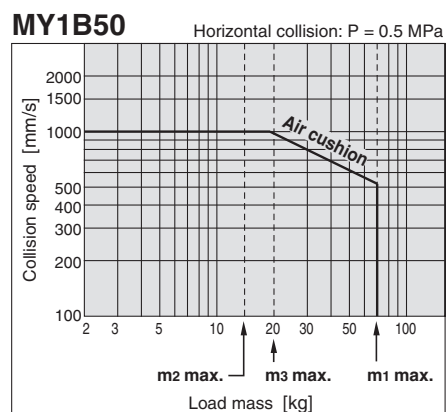
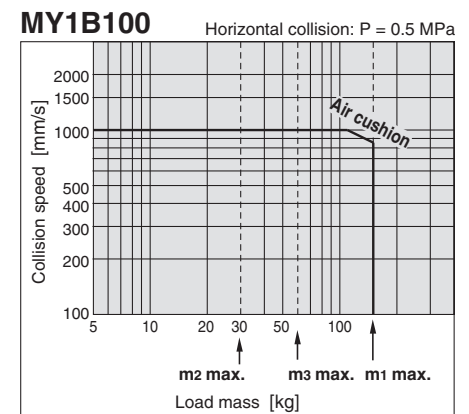
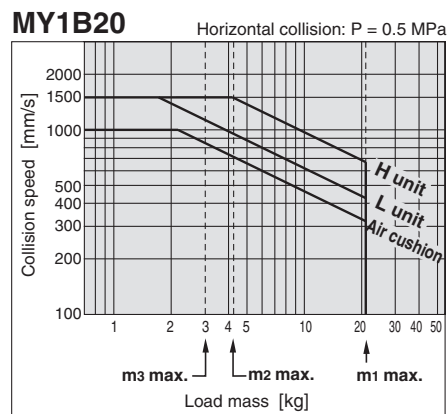
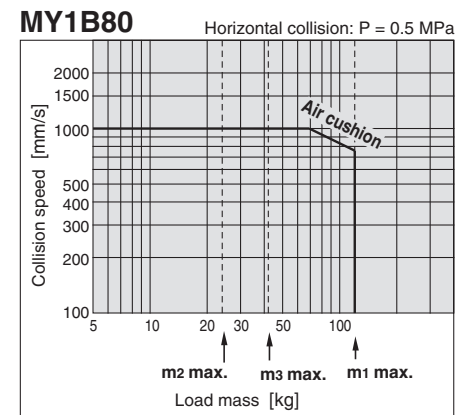
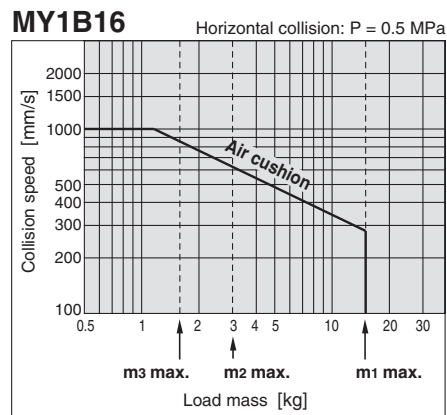
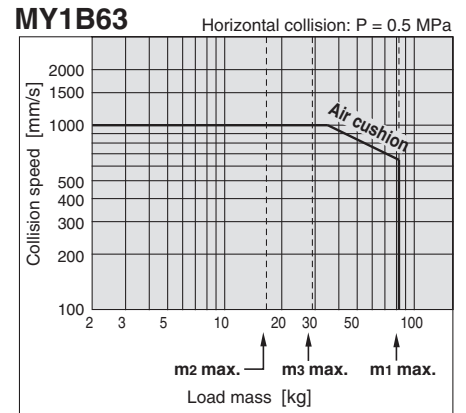
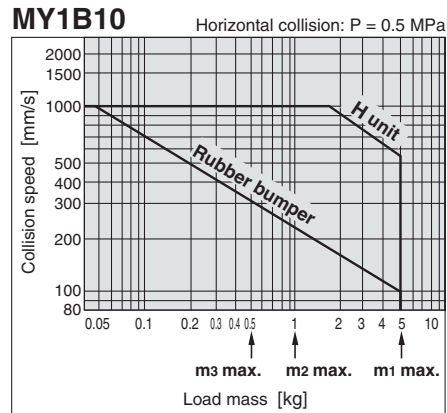
### 1. Refer to the figure below when using the adjustment bolt to perform stroke adjustment.

When the effective stroke of the shock absorber decreases as a result of stroke adjustment, the absorption capacity decreases dramatically. Secure the adjustment bolt at the position where it protrudes approximately 0.5 mm from the shock absorber.



### 2. Do not use a shock absorber together with air cushion.

### Absorption Capacity of Rubber Bumper, Air Cushion and Stroke Adjustment Units

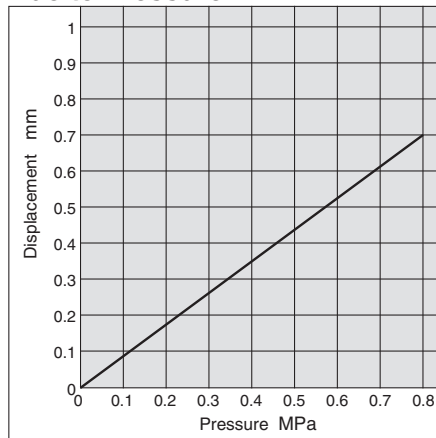


## Cushion Capacity

### Air Cushion Stroke [mm]

Bore size [mm]	Cushion stroke
16	12
20	15
50	30
63	37
80	40
100	40

### Rubber Bumper (Ø 10 only) Positive Stroke from One End Due to Pressure



### Tightening Torque for Stroke Adjustment Unit Holding Bolts [N·m]

Bore size [mm]	Unit	Tightening torque
10	A	0.4
	H	
16	A	0.7
	H	
20	A	1.8
	L	
	H	

### Tightening Torque for Stroke Adjustment Unit Lock Plate Holding Bolts [N·m]

Bore size [mm]	Unit	Tightening torque
20	H	1.2

### Calculation of Absorbed Energy for Stroke Adjustment Unit with Shock Absorber [N·m]

Type of impact	Horizontal collision	Vertical (Downward)	Vertical (Upward)
Kinetic energy $E_1$		$\frac{1}{2} m \cdot v^2$	
Thrust energy $E_2$	$F \cdot s$	$Fs + m \cdot g \cdot s$	$Fs - m \cdot g \cdot s$
Absorbed energy $E$	$E_1 + E_2$		

Symbol

$v$ : Speed of impact object (m/s)

$F$ : Cylinder thrust (N)

$s$ : Shock absorber stroke (m)

$m$ : Mass of impact object (kg)

$g$ : Gravitational acceleration (9.8 m/s<sup>2</sup>)

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

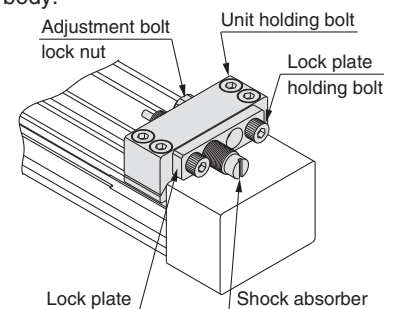
## ⚠ Precautions

### Specific product precautions

### ⚠ Caution

Use caution not to get your hands caught in the unit.

- When using a product with stroke adjustment unit, the space between the slide table (slider) and the stroke adjustment unit becomes narrow at the stroke end, causing a danger of hands getting caught. Install a protective cover to prevent direct contact with the human body.



#### <Fastening of unit>

The unit can be secured by evenly tightening the four unit holding bolts.

### ⚠ Caution

Do not operate with the stroke adjustment unit fixed in an intermediate position.

When the stroke adjustment unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the time of an impact. In such cases, as a stroke adjustment unit with the spacer for intermediate securing is available, it is recommended to use it.

(Except Ø 10)

For other lengths, please consult with SMC (Refer to "Tightening Torque for Stroke Adjustment Unit Holding Bolts".)

#### <Stroke adjustment with adjustment bolt>

Loosen the adjustment bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Retighten the lock nut.

#### <Stroke adjustment with shock absorber>

Loosen the two lock plate holding bolts, turn the shock absorber and adjust the stroke. Then, uniformly tighten the lock plate holding bolts to secure the shock absorber.

Take care not to over-tighten the holding bolts. (Except Ø 10 and Ø 20 L unit.) (Refer to "Tightening Torque for Stroke Adjustment Unit Lock Plate Holding Bolts".)

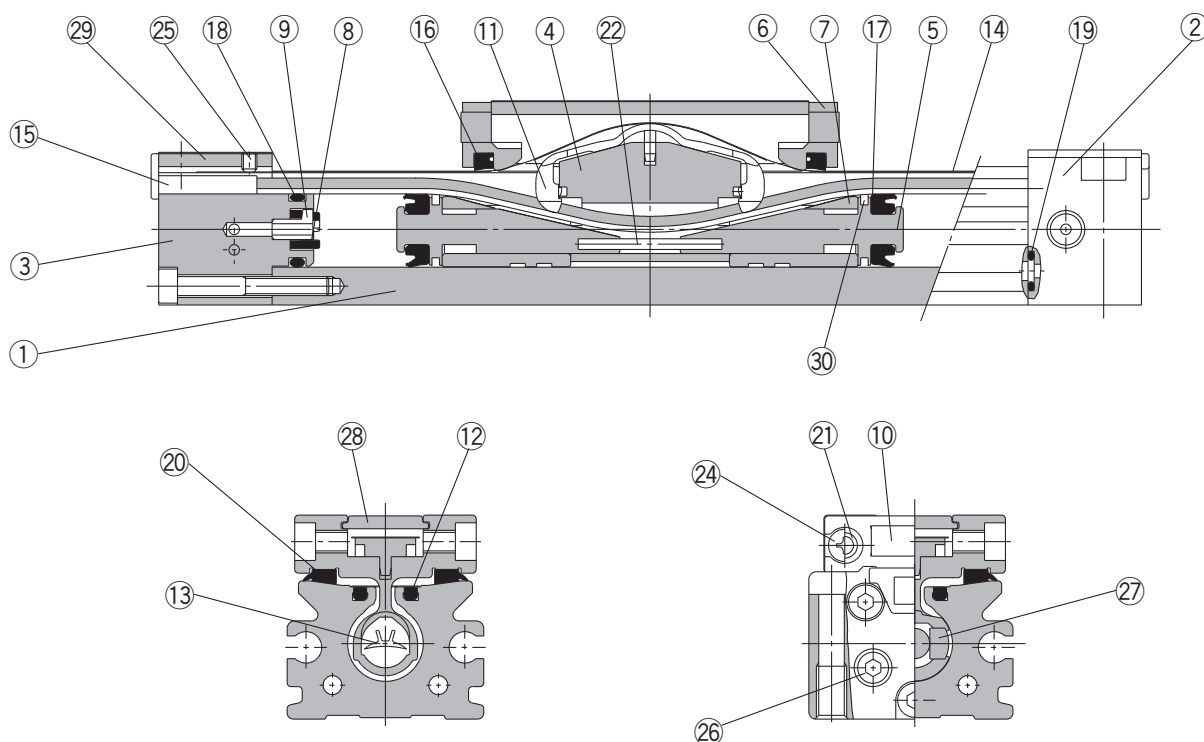
Note)

Although the lock plate may slightly bend due to tightening of the lock plate holding bolt, this does not affect the shock absorber and locking function.



**Construction: Ø 10**

**Centralised piping type: MY1B10G**



**Component Parts**

No.	Description	Material	Note
1	Cylinder tube	Aluminium alloy	Hard anodised
2	Head cover WR	Aluminium alloy	Painted
3	Head cover WL	Aluminium alloy	Painted
4	Piston yoke	Aluminium alloy	Hard anodised
5	Piston	Aluminium alloy	Chromated
6	End Cover	Special resin	
7	Wear ring	Special resin	
8	Bumper	Polyurethane rubber	
9	Holder	Stainless steel	
10	Stopper	Carbon steel	Nickel plated
11	Belt separator	Special resin	
12	Seal magnet	Rubber magnet	

No.	Description	Material	Note
15	Belt clamp	Special resin	
20	Bearing	Special resin	
21	Spacer	Chromium molybdenum steel	Nickel plated
22	Spring pin	Stainless steel	
23	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
24	Round binding head crew	Carbon steel	Nickel plated
25	Slotted set screw	Carbon steel	Black zinc chromated
26	Hexagon socket head plug	Carbon steel	Nickel plated
27	Magnet	—	
28	Top plate	Stainless steel	
29	Head plate	Stainless steel	
30	Felt	Felt	

**Replacement Part: Seal Kit**

No.	Description	Qty.	MY1B10
13	Seal belt	1	MY10-16A-Stroke
14	Dust seal band	1	MY10-16B-Stroke
16	Scraper	2	MY1B10-PS
17	Piston seal	2	
18	Tube gasket	2	
19	O-ring	4	

\* Seal kit includes 16, 17, 18 and 19.

Seal kit includes a grease pack (10 g).

When 13 and 14 are shipped independently, a grease pack is included. (10 g per 1000 strokes)

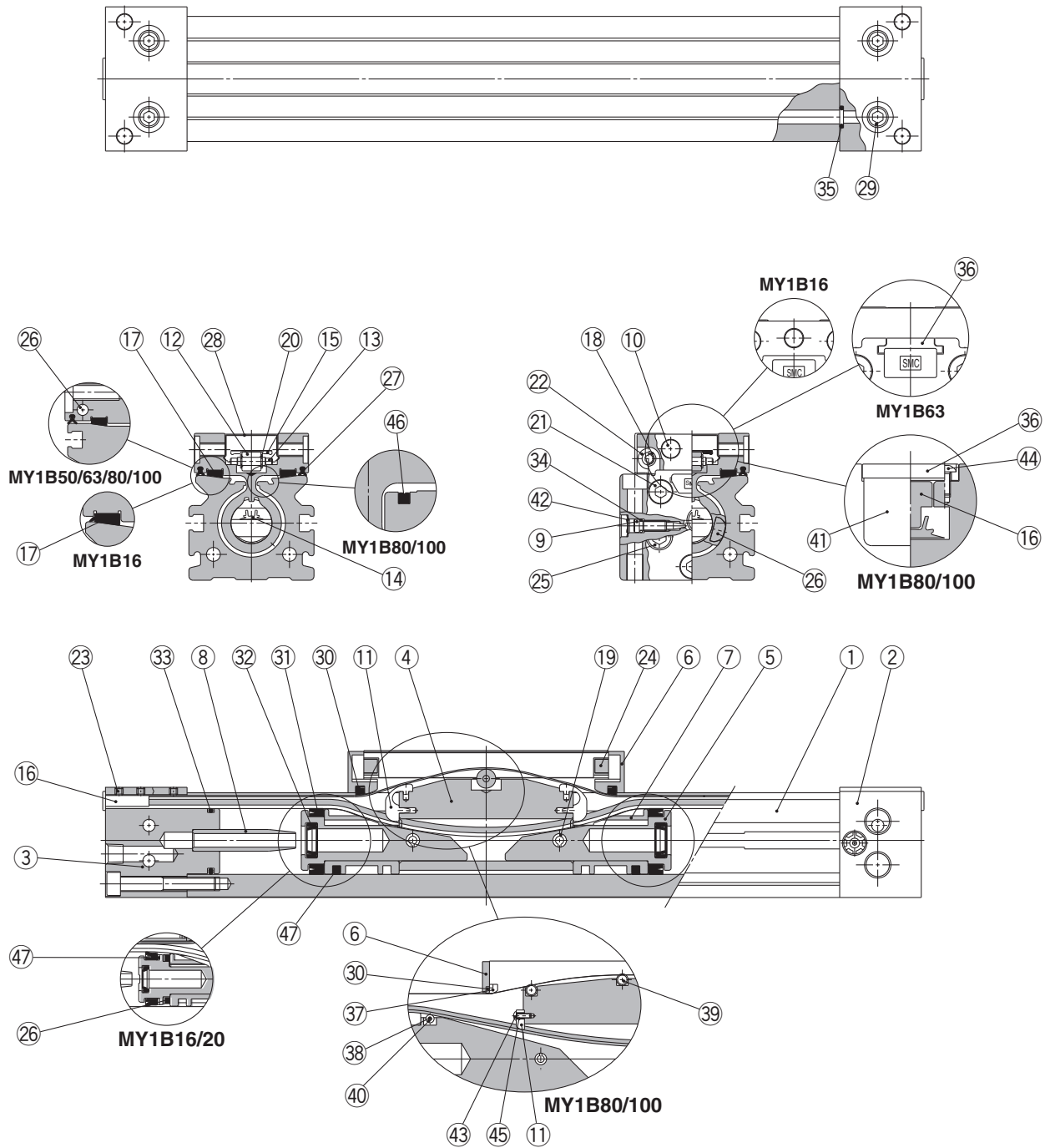
Order with the following part number when only the grease pack is needed.

**Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)**

# Series MY1B

Construction: Ø 16, Ø 20, Ø 50 to Ø 100

MY1B16, 20, 50 to 100



## MY1B16, 20, 50 to 100

### Component Parts

No.	Description	Material	Note
1	Cylinder tube	alloy	Hard anodised
2	Head cover WR	Aluminium alloy	Painted
3	Head cover WL	Aluminium alloy	Painted
4	Piston yoke	Aluminium alloy	Anodised
5	Piston	Aluminium alloy	Chromated
6	End cover	Special resin	
		Carbon steel	Nickel plated (Ø 80, Ø 100)
7	Wear ring	Special resin	
8	Cushion ring	Aluminium alloy	Anodised
9	Cushion needle	Rolled steel	Nickel plated
10	Stopper	Carbon steel	Nickel plated
11	Belt separator	Special resin	
12	Guide roller	Special resin	(Ø 16, Ø 20, Ø 50, Ø 63)
13	Guide roller shaft	Stainless steel	(Ø 16, Ø 20, Ø 50, Ø 63)
16	Belt clamp	Special resin	
		Aluminium alloy	Chromated (Ø 80, Ø 100)
17	Bearing	Special resin	
18	Spacer	Stainless steel	(Ø 16, Ø 20, Ø 50, Ø 63)
19	Spring pin	Carbon tool steel	
20	Type E retaining ring	Cold rolled special steel strip	(Ø 50, Ø 63)
21	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
22	Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated
23	Hexagon socket head set screw	Chromium molybdenum steel	Black zinc chromated/ Nickel plated
24	Double round parallel key	Carbon steel	(Ø 16, Ø 20)
25	Hexagon socket head taper plug	Carbon steel	Nickel plated

No.	Description	Material	Note
26	Magnet	—	
28	Top cover	Stainless steel	
29	Hexagon socket head taper plug	Carbon steel	Nickel plated
36	Head plate	Aluminium alloy	Painted (Ø 63 to Ø 100)
37	Backup plate	Special resin	(Ø 80, Ø 100)
38	Guide roller B	Special resin	(Ø 80, Ø 100)
39	Guide roller A	Stainless steel	(Ø 80, Ø 100)
40	Guide roller shaft B	Stainless steel	(Ø 80, Ø 100)
41	Side cover	Aluminium alloy	Hard anodised (Ø 80, Ø 100)
42	Type CR retaining ring	Spring steel	
43	Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated (Ø 80, Ø 100)
44	Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated (Ø 80, Ø 100)
45	Spacer B	Stainless steel	(Ø 80, Ø 100)
46	Seal magnet	Rubber magnet	(Ø 80, Ø 100)
47	Lub-retainer	Special resin	(Ø 16, Ø 20, Ø 50, Ø 63)

### Replacement Part: Seal Kit

No.	Description	Qty.	MY1B16	MY1B20
14	Seal belt	1	MY16-16C- <u>Stroke</u>	MY20-16C- <u>Stroke</u>
15	Dust seal band	1	MY16-16B- <u>Stroke</u>	MY20-16B- <u>Stroke</u>
27	Side scraper	2	—	MYB20-15CA7164B
34	O-ring	2	KA00309	KA00309
			(Ø 4 x Ø 1.8 x Ø 1.1)	(Ø 4 x Ø 1.8 x Ø 1.1)
30	Scraper	2	MY1B16-PS	MY1B20-PS
31	Piston seal	2		
32	Cushion seal	2		
33	Tube gasket	2		
35	O-ring	4		

No.	Description	Qty.	MY1B50	MY1B63	MY1B80	MY1B100
14	Seal belt	1	MY50-16C- <u>Stroke</u>	MY63-16A- <u>Stroke</u>	MY80-16A- <u>Stroke</u>	MY100-16A- <u>Stroke</u>
15	Dust seal band	1	MY50-16B- <u>Stroke</u>	MY63-16B- <u>Stroke</u>	MY80-16B- <u>Stroke</u>	MY100-16B- <u>Stroke</u>
27	Side scraper	2	MYB50-15CA7165B	MYB63-15CA7166B	MYB80-15CK2470B	MYB100-15CK2471B
34	O-ring	2	KA00402	KA00777	KA00050	KA00050
			(Ø 8.3 x Ø 4.5 x Ø 1.9)	—	—	—
30	Scraper	2	MY1B50-PS	MY1B63-PS	MY1B80-PS	MY1B100-PS
31	Piston seal	2				
32	Cushion seal	2				
33	Tube gasket	2				
35	O-ring	4				

\* Seal kit includes 30, 31, 32, 33 and 35. Order the seal kit based on each bore size.

\* Seal kit includes a grease pack (10 g).

When 14 and 15 are shipped independently, a grease pack is included. (10 g per 1000 strokes)

Order with the following part number when only the grease pack is needed.

**Grease pack part number:** GR-S-010 (10 g), GR-S-020 (20 g)

Note) Two kinds of dust seal bands are available for the MY1B16, 20, 50, 63. Since the part number varies depending on the treatment of the hexagon socket head set screw 23, please check a proper dust seal band carefully.

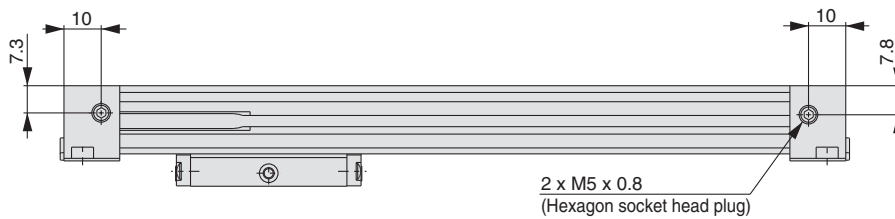
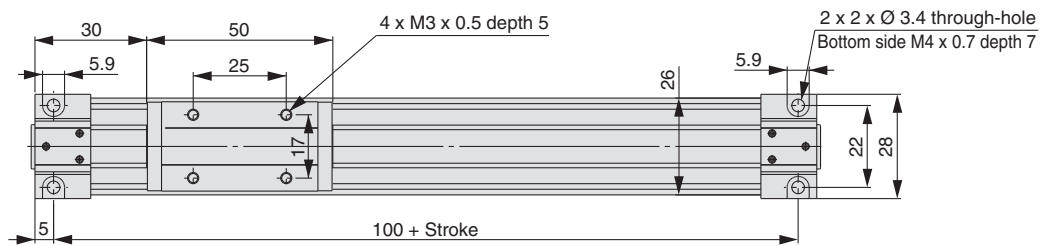
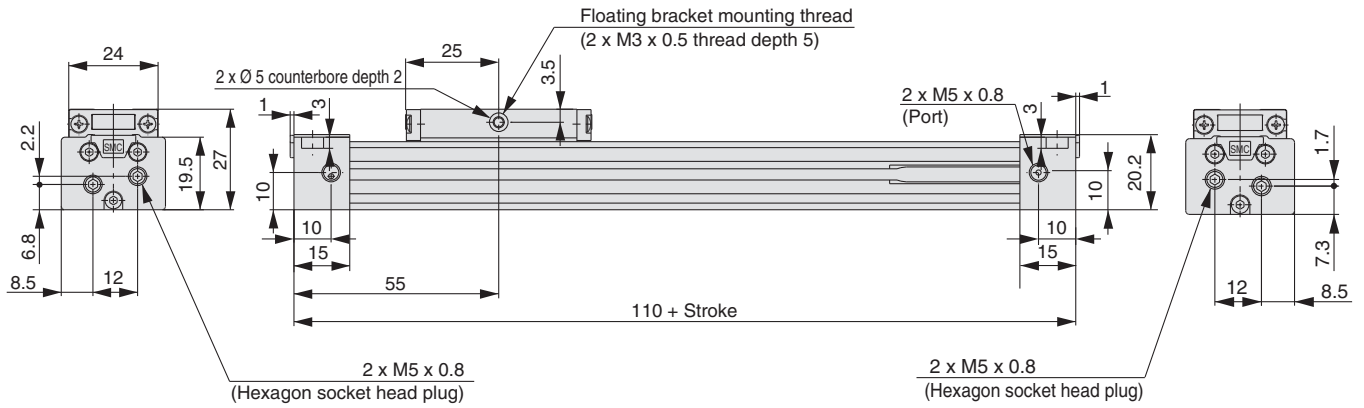
A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

# Series MY1B

## Centralised Piping Type $\varnothing 10$

Refer to page 122 regarding centralised piping port variations.

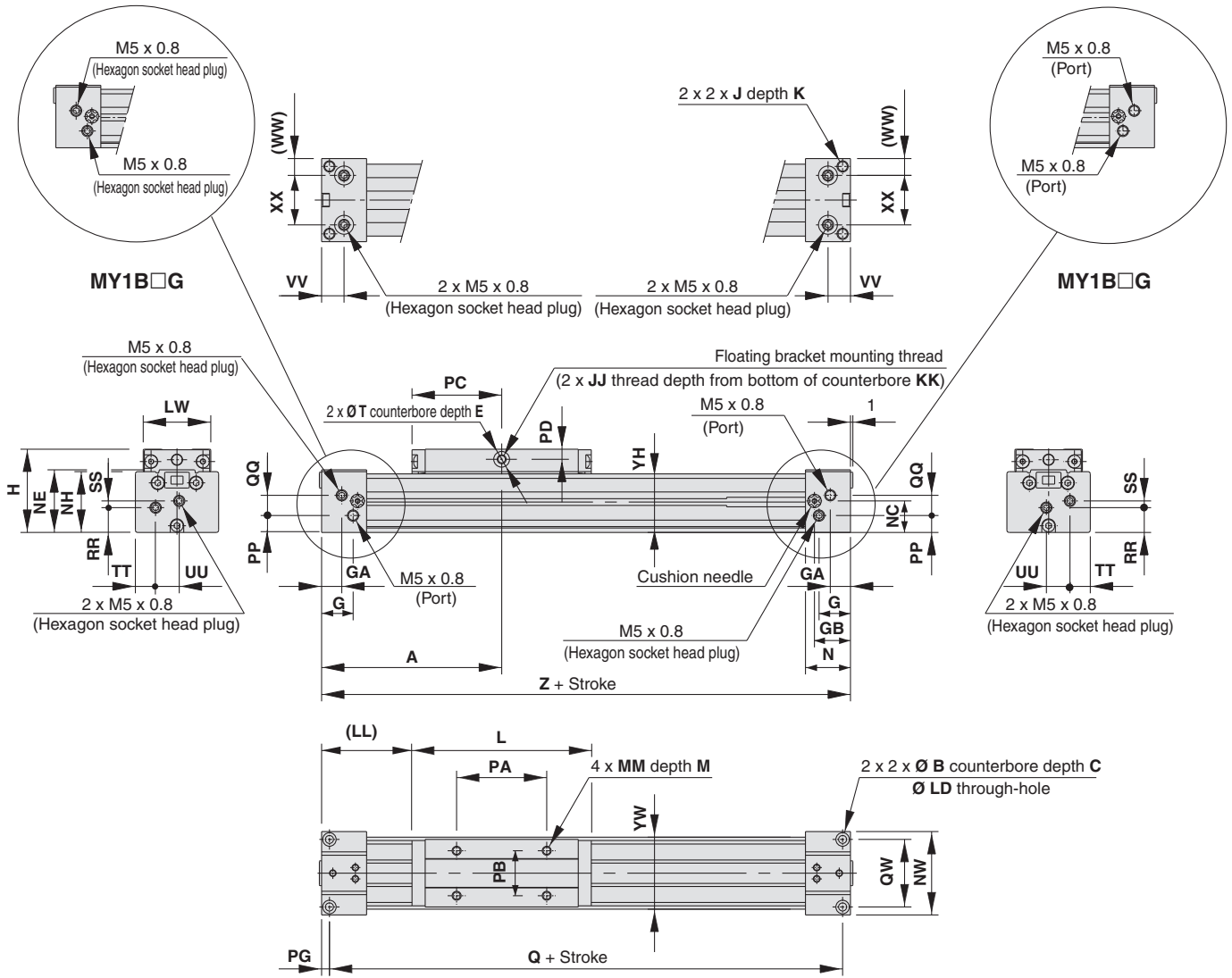
### MY1B10G — Stroke



Standard Type/Centralised Piping Type  $\varnothing 16, \varnothing 20$

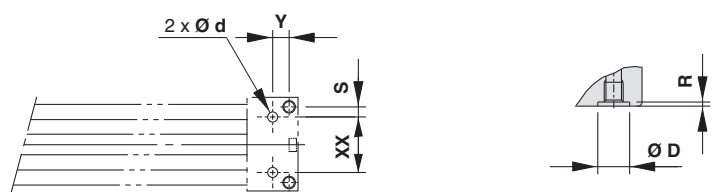
Refer to page 122 regarding centralised piping port variations.

MY1B16□/20□ — Stroke



Model	A	B	C	E	G	GA	GB	H	J	JJ	K	KK	L	LD	LL	LW	M	MM	N	NC	NE
MY1B16□	80	6	3.5	2	14	9	16	37	M5 x 0.8	M4 x 0.7	10	6.5	80	3.5	40	30	6	M4 x 0.7	20	14	27.8
MY1B20□	100	7.5	4.5	2	12.5	12.5	20.5	46	M6 x 1	M4 x 0.7	12	10	100	4.5	50	37	8	M5 x 0.8	25	17.5	34

Model	NH	NW	PA	PB	PC	PD	PG	PP	Q	QQ	QW	RR	SS	T	TT	UU	VV	WW	XX	YH	YW	Z
MY1B16□	27	37	40	20	40	4.5	3.5	7.5	153	9	30	11	3	7	9	10.5	10	7.5	22	26	32	160
MY1B20□	33.5	45	50	25	50	5	4.5	11.5	191	11	36	14.5	5	8	10.5	12	12.5	10.5	24	32.5	40	200



Bottom ported (Applicable O-ring)

Hole Size for Centralised Piping on the Bottom

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1B16□	22	6.5	4	4	8.4	1.1	C6
MY1B20□	24	8	6	4	8.4	1.1	

(Machine the mounting side to the dimensions below.)

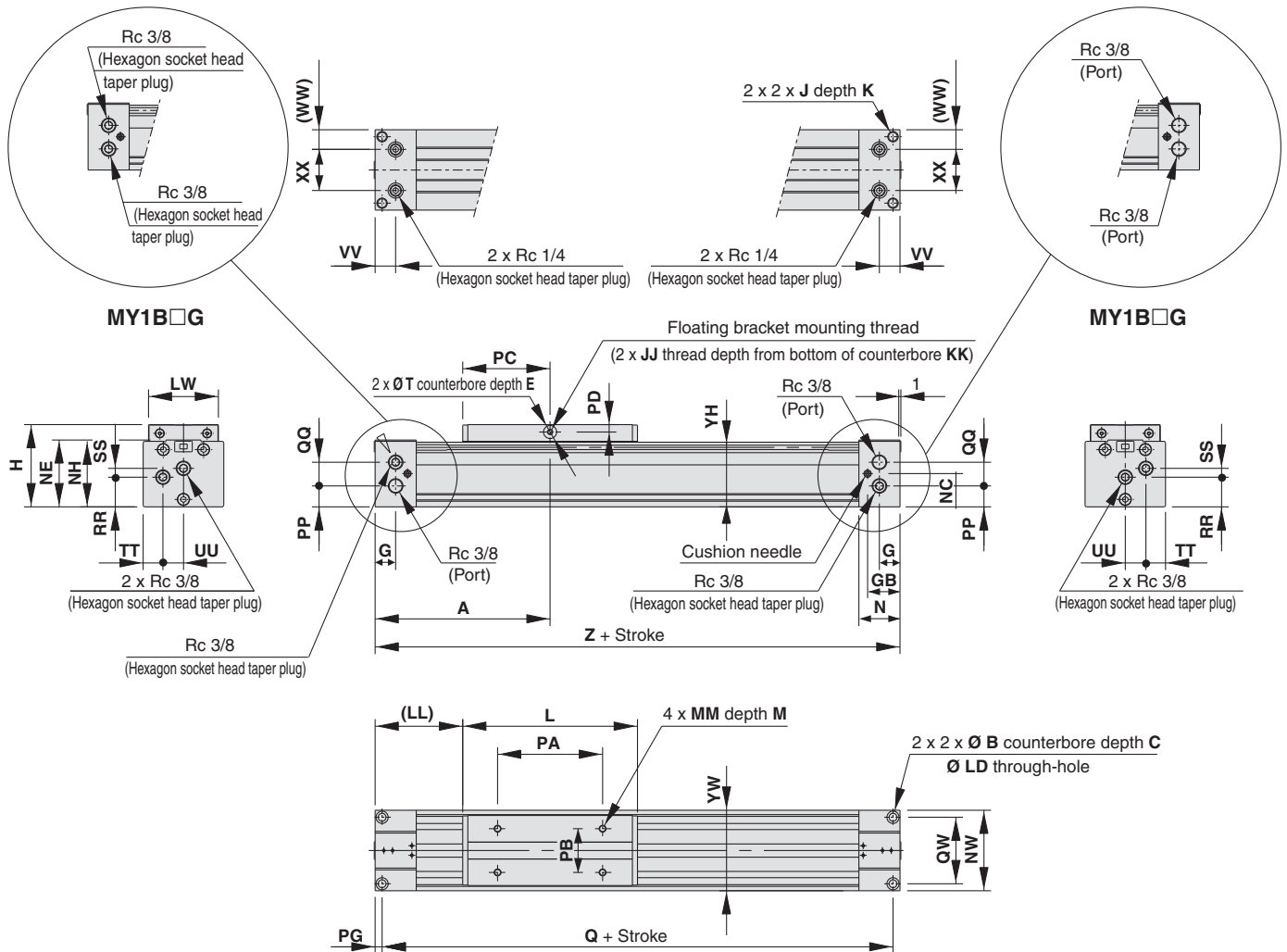


# Series MY1B

## Standard Type/Centralised Piping Type Ø 50, Ø 63

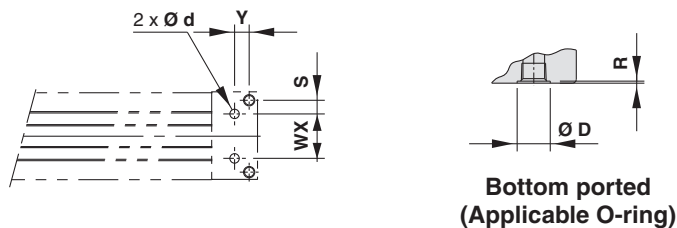
Refer to page 122 regarding centralised piping port variations.

### MY1B50□/63□ — Stroke



Model	A	B	C	E	G	GB	H	J	JJ	K	KK	L	LD	LL	LW	M	MM	N	NC	NE
MY1B50□	200	14	8.5	3	23.5	37	94	M12 x 1.75	M6 x 1	25	17	200	9	100	80	14	M8 x 1.25	47	38	76.5
MY1B63□	230	17	10.5	3	25	39	116	M14 x 2	M8 x 1.25	28	24	230	11	115	96	16	M8 x 1.25	50	51	100

Model	NH	NW	PA	PB	PC	PD	PG	PP	Q	QQ	QW	RR	SS	T	TT	UU	VV	WW	XX	YH	YW	Z
MY1B50□	75	92	120	50	100	8.5	8	24	384	27	76	34	10	15	22.5	23.5	23.5	22.5	47	74	92	400
MY1B63□	95	112	140	60	115	9.5	10	37.5	440	29.5	92	45.5	13.5	16	27	29	25	28	56	94	112	460



### Hole Size for Centralised Piping on the Bottom

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1B50□	47	15.5	14.5	10	17.5	1.1	C15
MY1B63□	56	15	18	10	17.5	1.1	

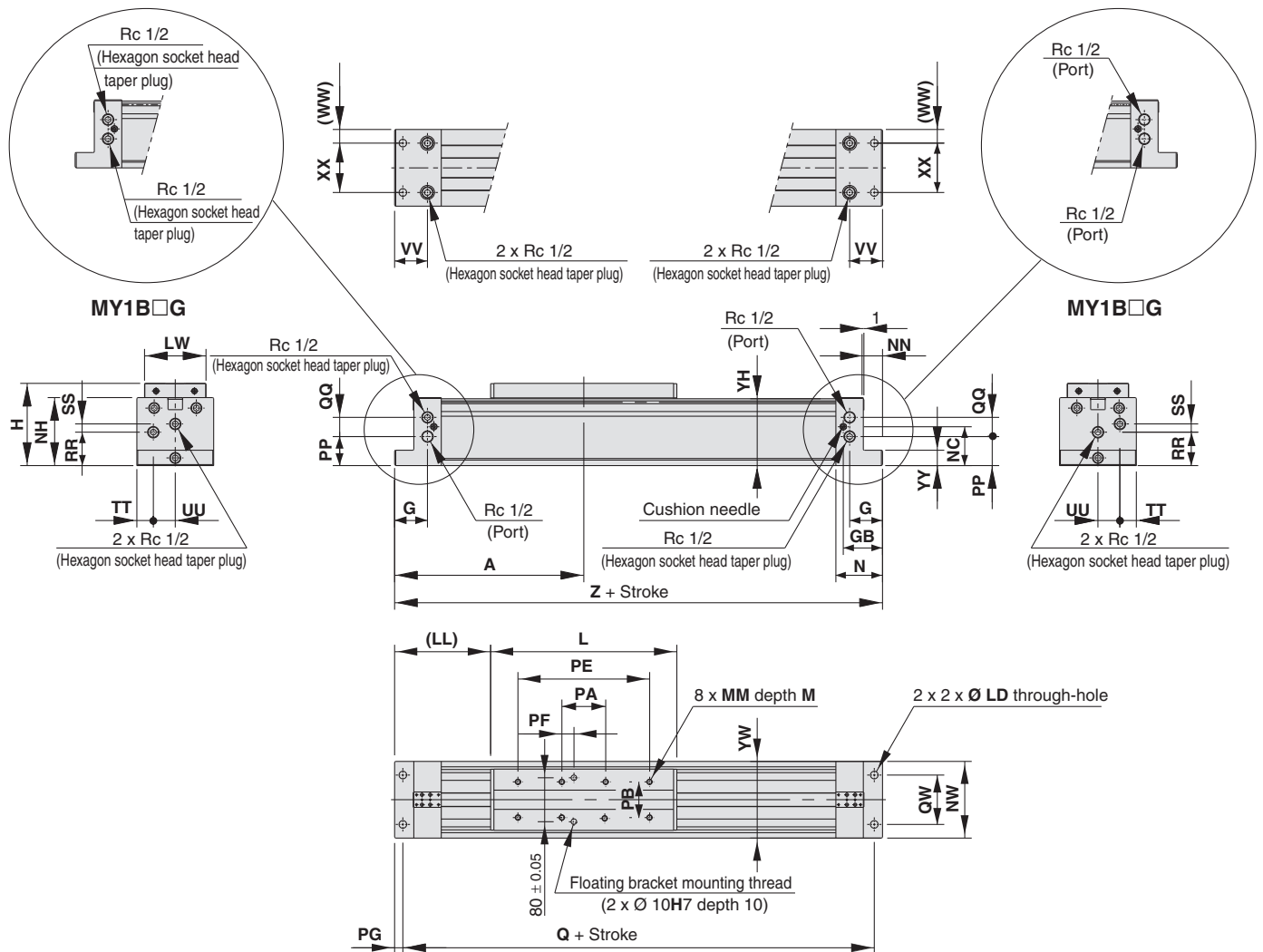
(Machine the mounting side to the dimensions below.)

# Mechanically Jointed Rodless Cylinder Basic Type **Series MY1B**

## Standard Type/Centralised Piping Type $\varnothing 80, \varnothing 100$

Refer to page 122 regarding centralised piping port variations.

### MY1B80□/100□ — Stroke

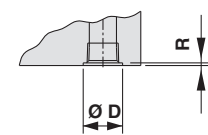
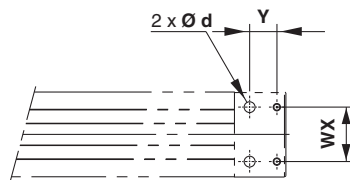


[mm]

Model	A	G	GB	H	L	LD	LL	LW	M	MM	N	NC	NH	NN	NW	PA	PB	PE
MY1B 80□	345	60	71.5	150	340	14	175	112	20	M10 x 1.5	85	71	124	35	140	80	65	240
MY1B100□	400	70	79.5	190	400	18	200	140	25	M12 x 1.75	95	85	157	45	176	120	85	280

[mm]

Model	PF	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	WW	XX	YH	YW	YY	Z
MY1B 80□	22	15	53	660	35	90	61	15	30	40	60	25	90	122	140	28	690
MY1B100□	42	20	69	760	38	120	75	20	40	48	70	28	120	155	176	35	800



**Bottom ported**  
(Applicable O-ring)

### Hole Size for Centralised Piping on the Bottom

Model	WX	Y	d	D	R	Applicable O-ring
MY1B 80□	90	45	18	26	1.8	P22
MY1B100□	120	50	18	26	1.8	

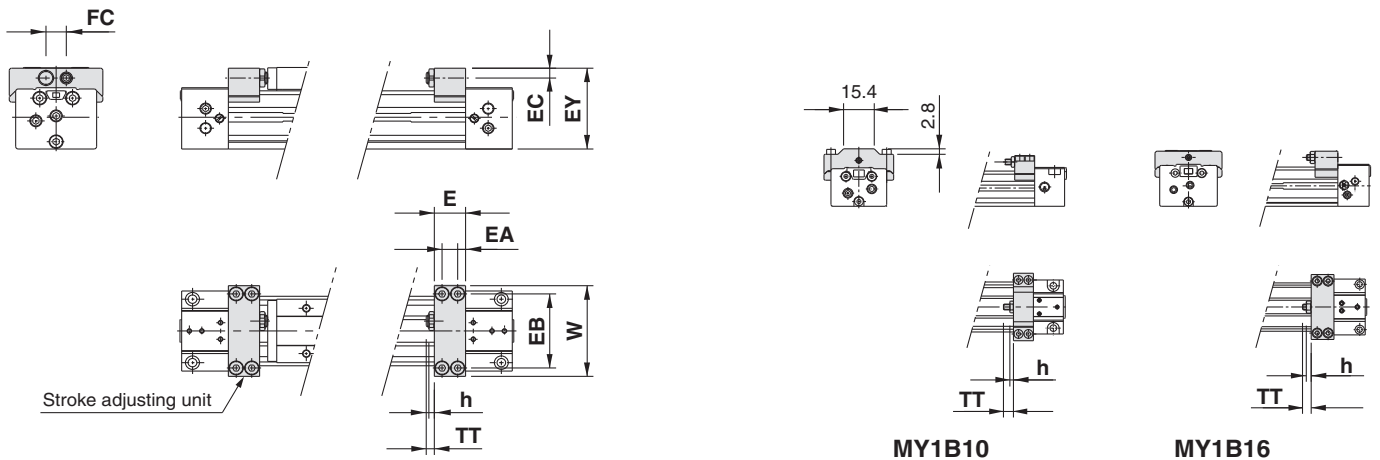
(Machine the mounting side to the dimensions below.)

# Series MY1B

## Stroke Adjustment Unit

With adjustment bolt

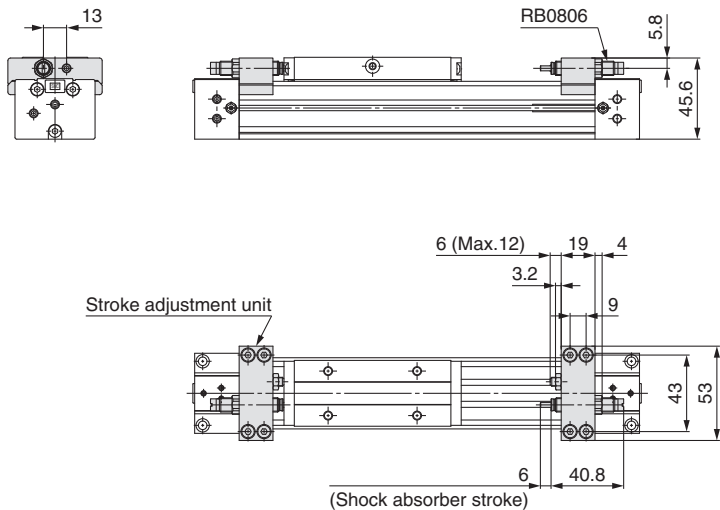
MY1B  Bore size  —  Stroke  A



Applicable bore size	E	EA	EB	EC	EY	FC	h	TT	W
MY1B10	10	5	28	3.3	26.3	—	1.8	5 (Max. 10)	35
MY1B16	14.6	7	34.4	4.2	36.5	—	2.4	5.4 (Max. 11)	43
MY1B20	19	9	43	5.8	45.6	13	3.2	6 (Max. 12)	53

With low load shock absorber + Adjustment bolt

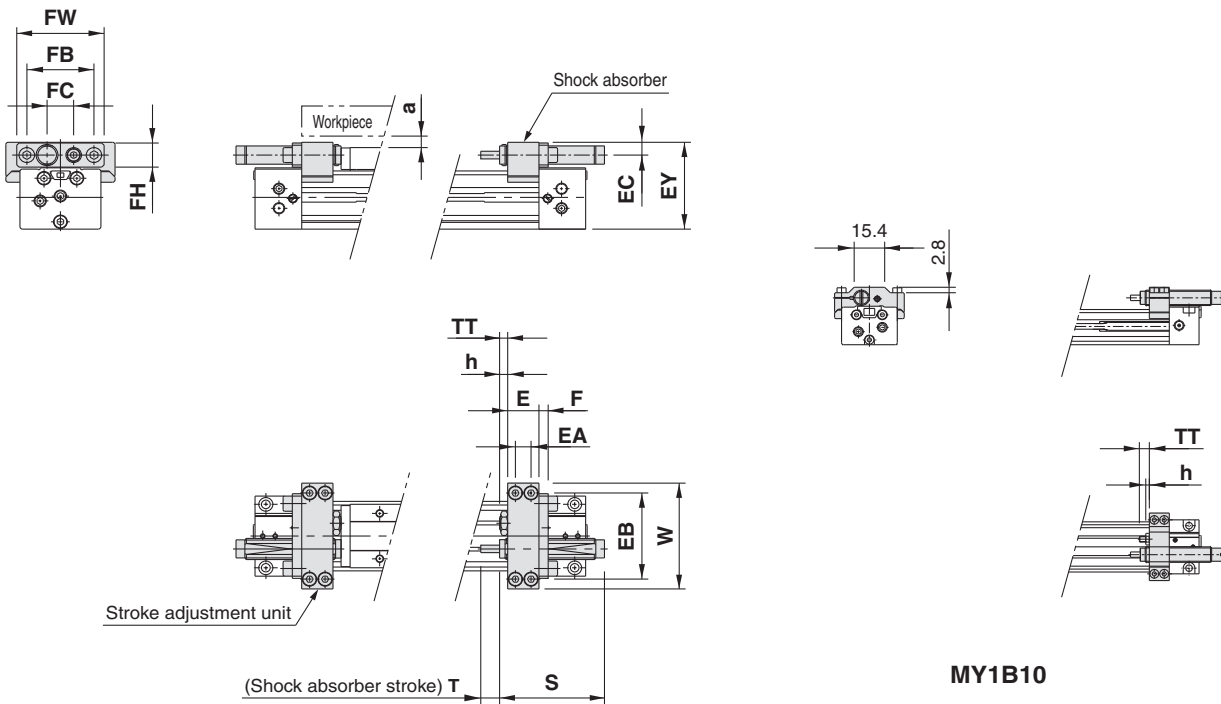
MY1B20  —  Stroke  L



## Stroke Adjustment Unit

With high load shock absorber + Adjustment bolt

MY1B Bore size □ — Stroke H



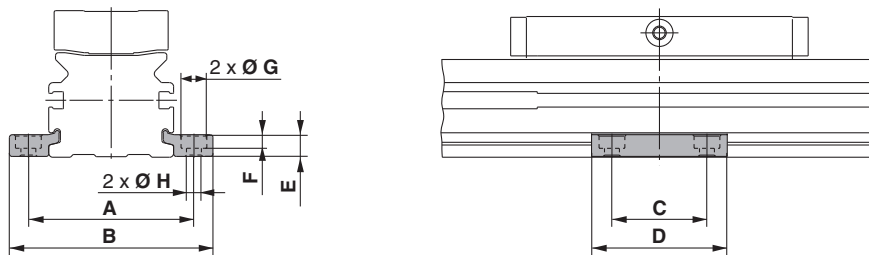
\* Since the dimension EY of H unit is greater than the table top height (dimension H), when a workpiece is loaded that is larger than the full length (dimension L) of the slide table allow a clearance of size "a" or larger at the workpiece side.

Applicable bore size	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model	a
<b>MY1B10</b>	10	5	28	5.5	29.8	—	—	8	—	—	1.8	40.8	5	5 (Max. 10)	35	RB0805	3.5
<b>MY1B20</b>	20	10	49	6.5	47.5	6	33	13	12	46	3.5	46.7	7	5 (Max. 11)	60	RB1007	2.5

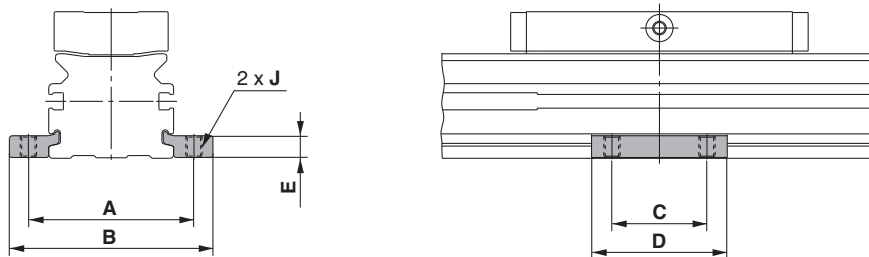
# Series MY1B

## Side Support

### Side support A MY-S□A



### Side support B MY-S□B



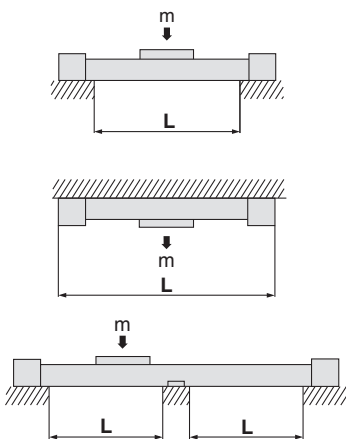
[mm]

Model	Applicable bore size	A	B	C	D	E	F	G	H	J
MY-S10 <sup>A</sup> <sub>B</sub>	MY1B 10	35	43.6	12	21	3	1.2	6.5	3.4	M4 x 0.7
MY-S16 <sup>A</sup> <sub>B</sub>	MY1B 16	43	53.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20 <sup>A</sup> <sub>B</sub>	MY1B 20	53	65.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S32 <sup>A</sup> <sub>B</sub>	MY1B 50	113	131	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S50 <sup>A</sup> <sub>B</sub>	MY1B 63	136	158	55	80	14.8	8.5	14	9	M10 x 1.5
MY-S63 <sup>A</sup> <sub>B</sub>	MY1B 80	170	200	70	100	18.3	10.5	17.5	11.5	M12 x 1.75
	MY1B100	206	236							

\* A set of side supports consists of a left support and a right support.

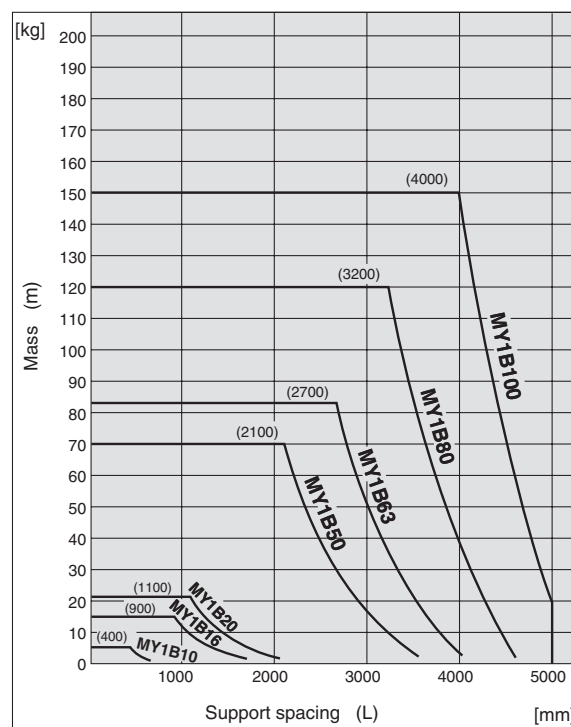
## Guide for Side Support Application

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load mass. In such a case, use a side support in the middle section. The spacing (L) of the support must be no more than the values shown in the graph on the right.



### ⚠ Caution

1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value is within the allowable limits shown in the graph.
2. Support brackets are not for mounting; use them solely for providing support.



## Floating Bracket

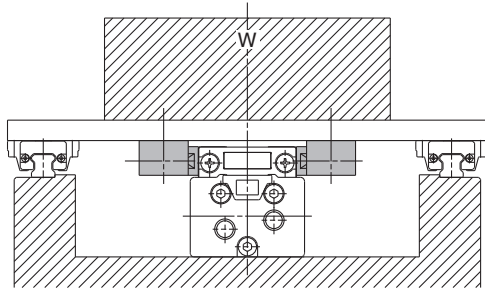
Facilitates connection to other guide systems.

Applicable bore size

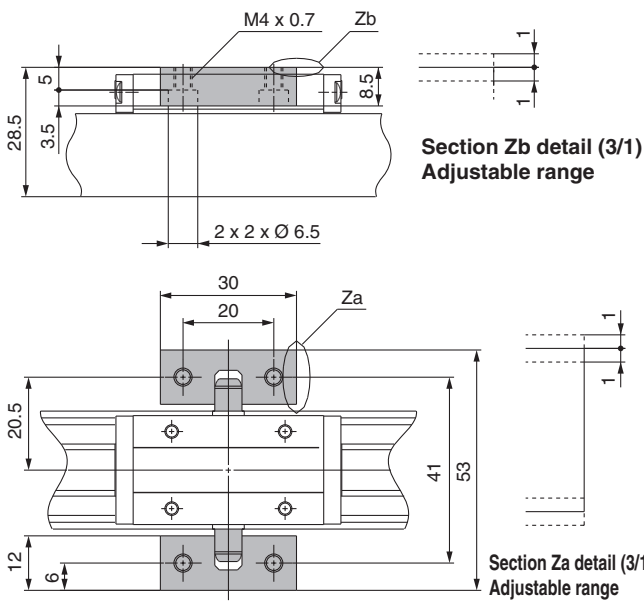
**Ø 10**

**MY-J10**

### Application Example



### Mounting Example



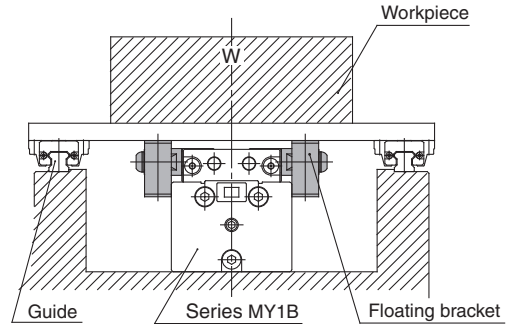
Note) A set of brackets with floating mechanism consists of a left bracket and a right bracket.

Applicable bore size

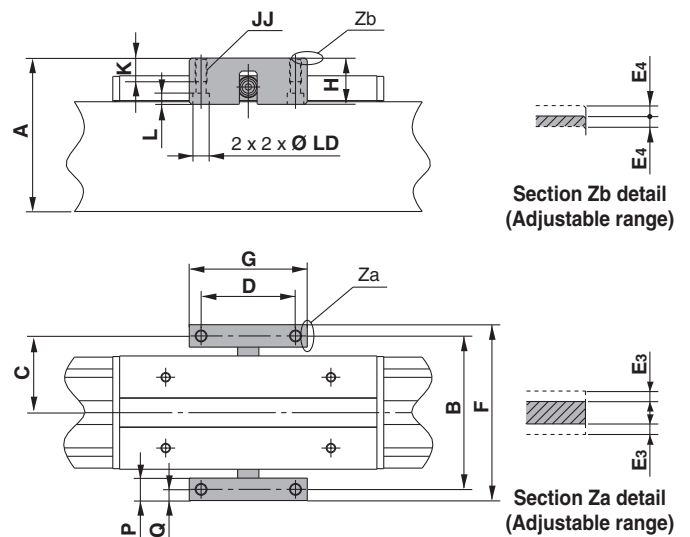
**Ø 16, Ø 20**

**MY-J16/MY-J20**

### Application Example



### Mounting Example



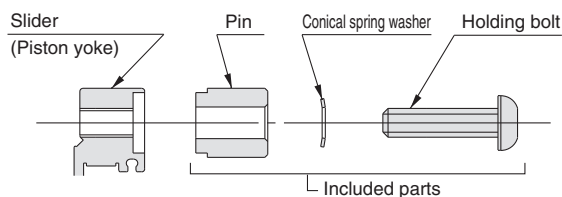
Model	Applicable bore size	A	B	C	D	F	G	H
MY-J16	MY1B16□	45	45	22.5	30	52	38	18
MY-J20	MY1B20□	55	52	26	35	59	50	21

Model	Applicable bore size	JJ	K	L	P	Q	E3	E4	LD
MY-J16	MY1B16□	M4 x 0.7	10	4	7	3.5	1	1	6
MY-J20	MY1B20□	M4 x 0.7	10	4	7	3.5	1	1	6

Note) A set of brackets with floating mechanism consists of a left bracket and a right bracket.

## Installation of Holding Bolts



## Tightening Torque for Holding Bolts (N·m)

Model	Tightening torque	Model	Tightening torque	Model	Tightening torque
MY-J10	0.6	MY-J25	3	MY-J50	5
MY-J16	1.5	MY-J32	5	MY-J63	13
MY-J20	1.5	MY-J40	5		

## MY-J10 to 63 (1 set) Component Parts

Description	Qty.
Bracket	2
Pin	2
Conical spring washer	2
Holding bolt	2



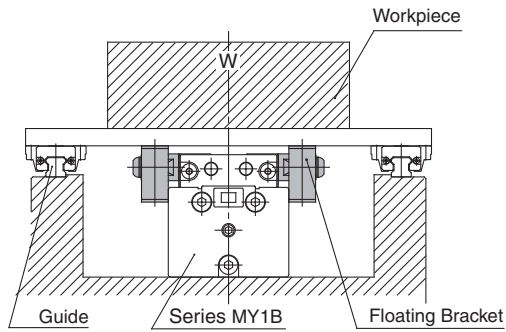
# Series MY1B

Applicable bore size

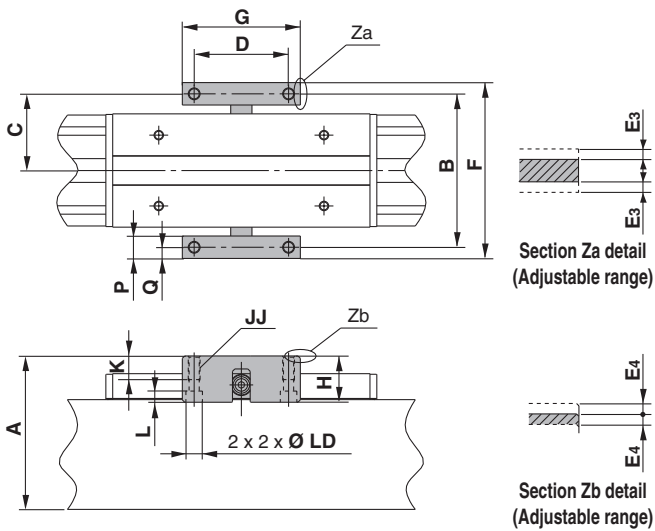
**Ø 50, Ø 63**

**MY-J50/MY-J63**

## Application Example



## Mounting Example



[mm]

Model	Applicable bore size	A	B	C	D	F	G	H	
<b>MY-J50</b>	<b>MY1B50</b> □	110	110	55	70	126	90	37	
<b>MY-J63</b>	<b>MY1B63</b> □	131	130	65	80	149	100	37	
Model	Applicable bore size	JJ	K	L	P	Q	E3	E4	LD
<b>MY-J50</b>	<b>MY1B50</b> □	M8 x 1.25	20	7.5	16	8	2.5	2.5	11
<b>MY-J63</b>	<b>MY1B63</b> □	M10 x 1.5	20	9.5	19	9.5	2.5	2.5	14

Note) A set of brackets with floating mechanism consists of a left bracket and a right bracket.

## Floating Bracket

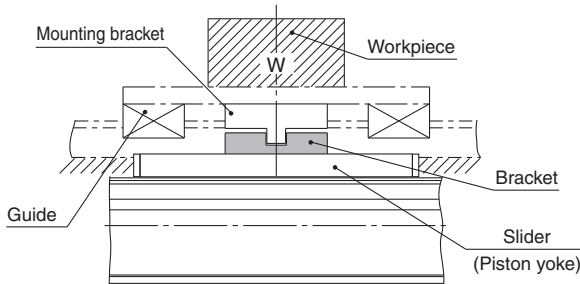
Facilitates connection to other guide systems.

Applicable bore size

**Ø 80, Ø 100**

**MY-J80/MY-J100**

### Application Example



### Floating Bracket Operating Precautions

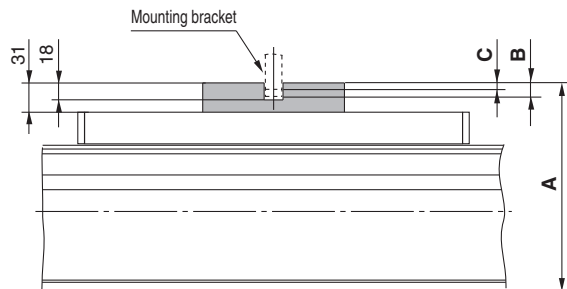
#### ⚠ Caution

When connecting to a load which has an external guide mechanism, use a discrepancy absorption mechanism.

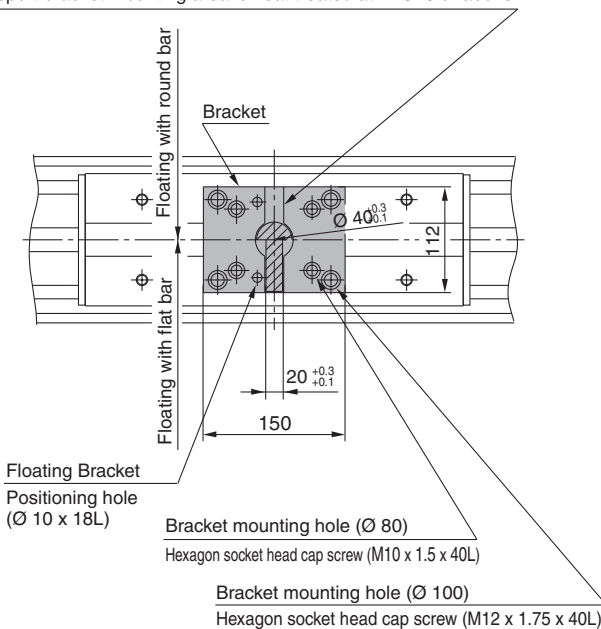
Mount the external guide mounting brackets and floating brackets in a place where the required degree of freedom for the floating Y and Z axes can be secured.

The thrust transmission area of the floating bracket must be fixed so that it does not partially contact with the body.

### Mounting Example



Support bracket mounting area is heat treated at Hrc40 or above.



Hexagon Socket Head Cap Screw Tightening Torque (N·m)

Model	Applicable bore size	A	B (max.)	C (min.)	Model	Tightening torque
MY-J 80	MY1B 80□	181	15	9	MY-J 80	25
MY-J100	MY1B100□	221	15	9	MY-J100	44

- Note) • Flat bar or round bar mounting are possible for the support bracket (slanted lines) mounted by the customer.  
 • "B" and "C" indicate the allowable mounting dimensions for the support bracket (flat bar or round bar).  
 • Consider support brackets with dimensions that allow the floating mechanism to function properly.

### MY-J80, 100 (1 set) Component Parts

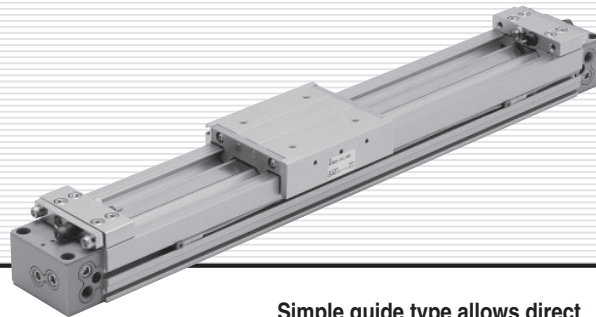
Description	Qty.
Bracket	1
Parallel pin	2
Holding bolt	4



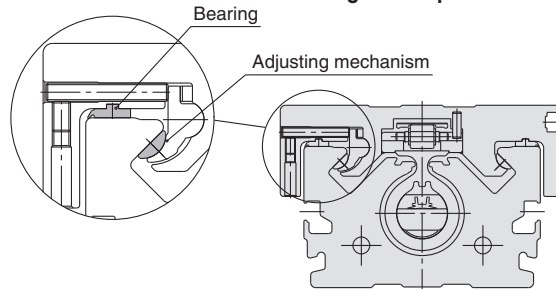
# Series MY1M

Slide Bearing Guide Type

Ø 16, Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63



Simple guide type allows direct mounting of workpieces.



# Series MY1M Prior to Use

## Maximum Allowable Moment/Maximum Load Mass

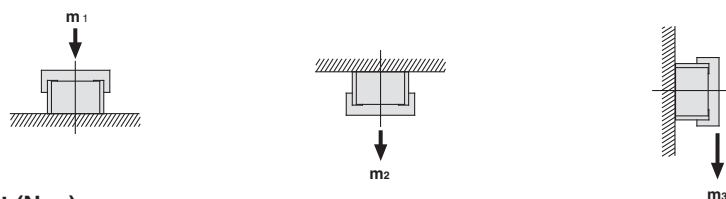
Model	Bore size [mm]	Maximum allowable moment [N·m]			Maximum load mass [kg]		
		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	m <sub>1</sub>	m <sub>2</sub>	m <sub>3</sub>
MY1M	16	6.0	3.0	1.0	18	7	2.1
	20	10	5.2	1.7	26	10.4	3
	25	15	9.0	2.4	38	15	4.5
	32	30	15	5.0	57	23	6.6
	40	59	24	8.0	84	33	10
	50	115	38	15	120	48	14
	63	140	60	19	180	72	21

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

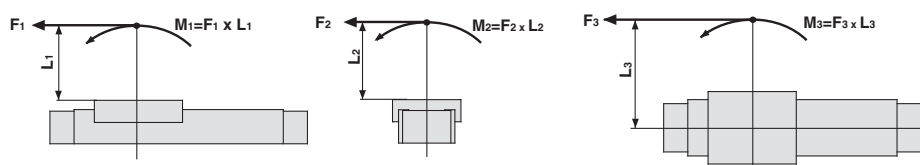
### Maximum Allowable Moment

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

### Load mass (kg)



### Moment (N·m)



### <Calculation of guide load factor>

1. Maximum allowable load (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  $\bar{v}_a$  (average speed) for (1) and (2), and  $v$  (collision speed  $v = 1.4\bar{v}_a$ ) for (3). Calculate  $m_{max}$  for (1) from the maximum allowable load graph ( $m_1, m_2, m_3$ ) and  $M_{max}$  for (2) and (3) from the maximum allowable moment graph ( $M_1, M_2, M_3$ ).

$$\text{Sum of guide load factors } \Sigma \alpha = \frac{\text{Load mass [m]}}{\text{Maximum allowable load [m}_{max}]}} + \frac{\text{Static moment [M] }^{(1)}}{\text{Allowable static moment [M}_{max}]}} + \frac{\text{Dynamic moment [ME] }^{(2)}}{\text{Allowable dynamic moment [ME}_{max}]}} \leq 1$$

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 workpiece, multiple moments may occur. When this happens, the sum of the load factors ( $\alpha$ ) is the total of all such moments.

### Maximum Load Mass

Select the load 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.

### 2. Reference formula [Dynamic moment at impact]

Use the following formulae to calculate dynamic moment when taking stopper impact into consideration.

**m**: Load mass (kg)

**F**: Load (N)

**F<sub>E</sub>**: Load equivalent to impact (at impact with stopper) (N)

**$\bar{v}_a$** : Average speed (mm/s)

**M**: Static moment (N·m)

$$v = 1.4\bar{v}_a \text{ (mm/s)} \quad F_E = 1.4\bar{v}_a \cdot \delta \cdot m \cdot g$$

$$\therefore M_E = \frac{1}{3} \cdot F_E \cdot L_1 = 4.57\bar{v}_a \delta m L_1 \text{ (N·m)}$$

**v**: Collision speed (mm/s)

**L<sub>1</sub>**: Distance to the load's centre of gravity (m)

**M<sub>E</sub>**: Dynamic moment (N·m)

**$\delta$** : Dampener coefficient At collision:  $v = 1.4\bar{v}_a$

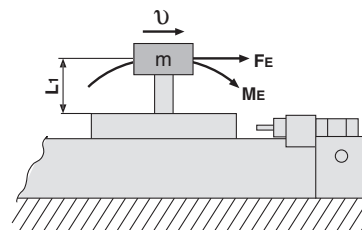
With rubber bumper = 4/100

(MY1B10, MY1H10)

With air cushion = 1/100

With shock absorber = 1/100

**g**: Gravitational acceleration (9.8 m/s<sup>2</sup>)

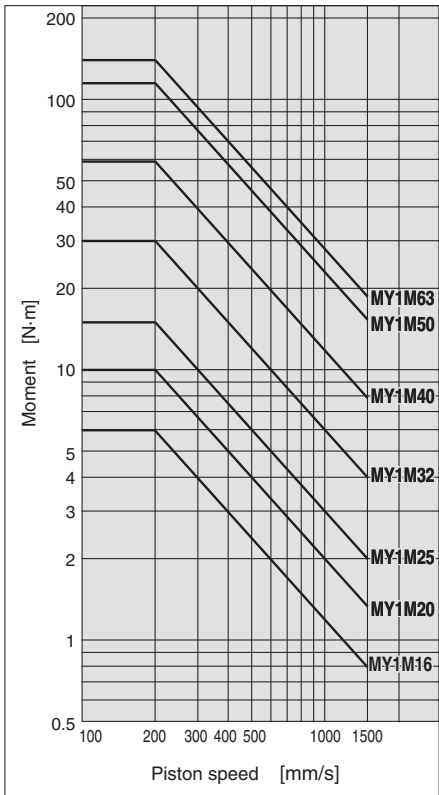


Note 4)  $1.4\bar{v}_a \delta$  is a dimensionless coefficient for calculating impact force.

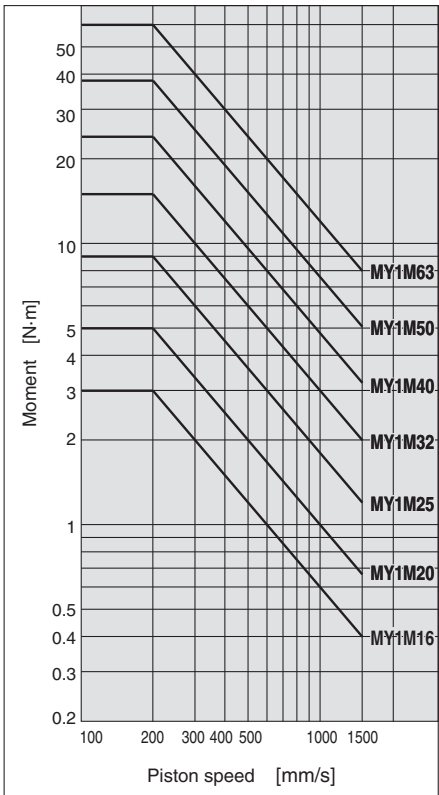
Note 5) Average load coefficient ( $= \frac{1}{3}$ ): This coefficient is for averaging the maximum load moment at the time of stopper impact according to service life calculations.

3. For detailed selection procedures, refer to pages 36 and 37.

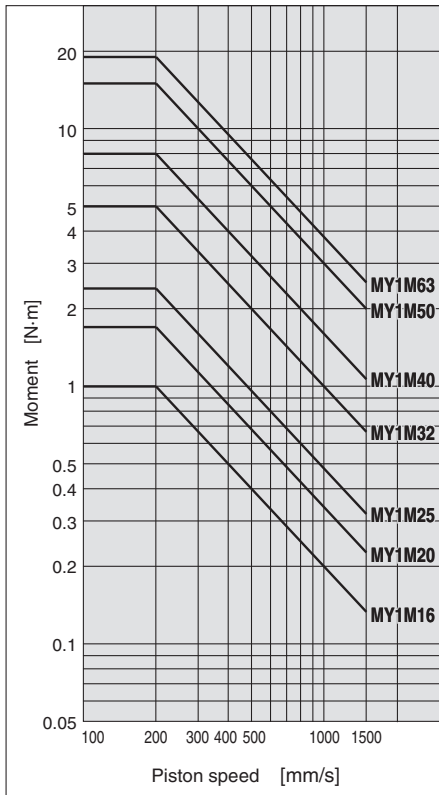
**MY1M/M<sub>1</sub>**



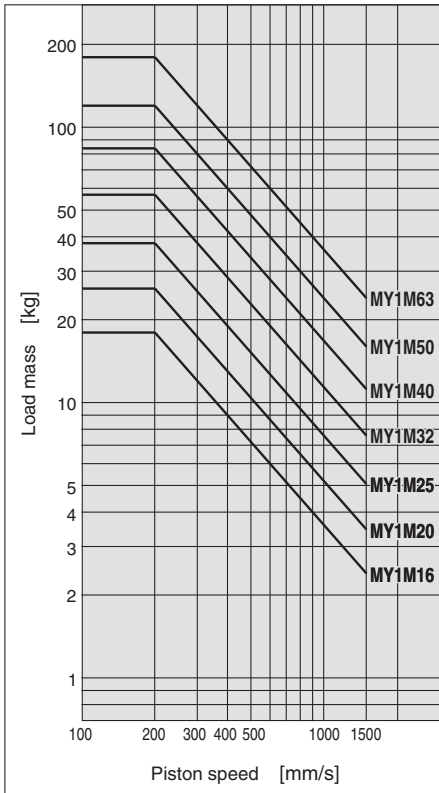
**MY1M/M<sub>2</sub>**



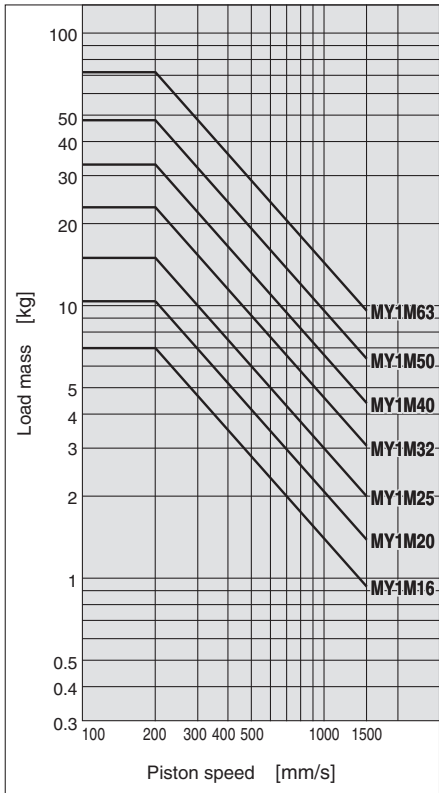
**MY1M/M<sub>3</sub>**



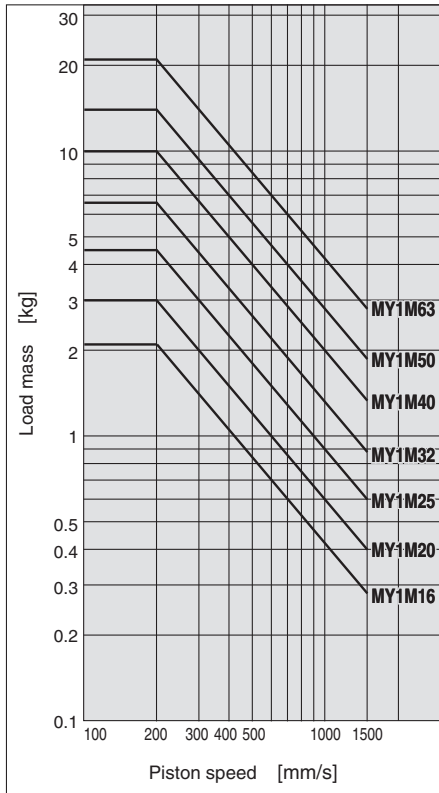
**MY1M/m<sub>1</sub>**



**MY1M/m<sub>2</sub>**



**MY1M/m<sub>3</sub>**





# Series MY1M Model Selection

Following are the steps for selecting the most suitable Series MY1M to your application.

## Calculation of Guide Load Factor

### 1. Operating Conditions

Cylinder ..... MY1M40-500

Average operating speed  $v_a$  ...200 mm/s

Mounting orientation .....Horizontal mounting

Cushion ..... Air cushion  
( $\delta = 1/100$ )

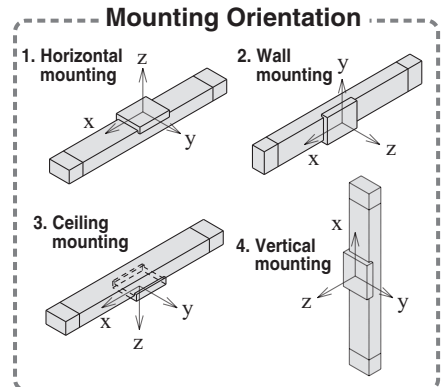
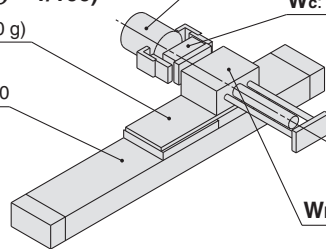
$W_a$ : Connection plate  $t = 10$  (880 g)

$W_d$ : Workpiece (500 g)

$W_c$ : MHL2-16D1 (795 g)

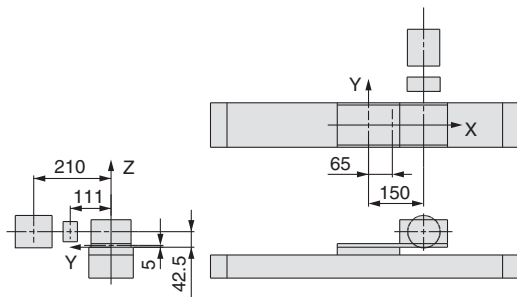
MY1M40-500

$W_b$ : MGGLB25-200 (4.35 kg)



For actual examples of calculation for each orientation, refer to the pages above.

### 2. Load Blocking



### Mass and Centre of Gravity for Each Workpiece

Workpiece no. $W_n$	Mass $m_n$	Centre of gravity		
		X-axis $X_n$	Y-axis $Y_n$	Z-axis $Z_n$
$W_a$	0.88 kg	65 mm	0 mm	5 mm
$W_b$	4.35 kg	150 mm	0 mm	42.5 mm
$W_c$	0.795 kg	150 mm	111 mm	42.5 mm
$W_d$	0.5 kg	150 mm	210 mm	42.5 mm

$n=a, b, c, d$

### 3. Composite centre of Gravity Calculation

$$m_1 = \sum m_n$$

$$= 0.88 + 4.35 + 0.795 + 0.5 = \mathbf{6.525 \text{ kg}}$$

$$X = \frac{1}{m_1} \times \sum (m_n \times X_n)$$

$$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) = \mathbf{138.5 \text{ mm}}$$

$$Y = \frac{1}{m_1} \times \sum (m_n \times Y_n)$$

$$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) = \mathbf{29.6 \text{ mm}}$$

$$Z = \frac{1}{m_1} \times \sum (m_n \times Z_n)$$

$$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) = \mathbf{37.4 \text{ mm}}$$

### 4. Calculation of load factor for static load

$m_1$ : Mass

$m_1 \text{ max}$  (from (1) of graph MY1M/ $m_1$ ) = 84 (kg).....

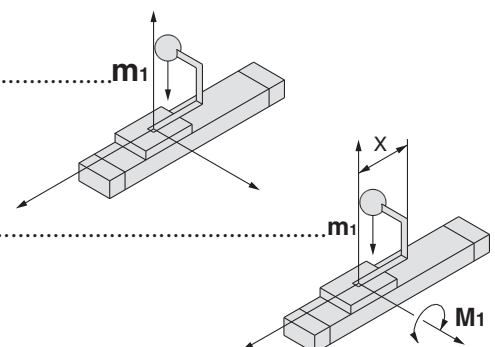
Load factor  $\alpha_1 = m_1 / m_1 \text{ max} = 6.525 / 84 = 0.08$

$M_1$ : Moment

$M_1 \text{ max}$  (from (2) of graph MY1M/ $M_1$ ) = 59 (N·m).....

$M_1 = m_1 \times g \times X = 6.525 \times 9.8 \times 138.5 \times 10^{-3} = 8.86 \text{ (N·m)}$

Load factor  $\alpha_2 = M_1 / M_1 \text{ max} = 8.86 / 59 = 0.15$

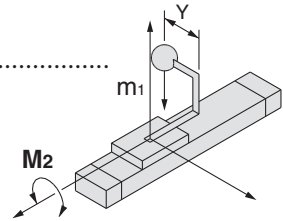


$M_2$  : Moment

$M_2 \text{ max}$  (from (3) of graph MY1M/ $M_2$ ) = 24 (N·m).....

$M_3 = m_1 \times g \times Y = 6.525 \times 9.8 \times 29.6 \times 10^{-3} = 1.89 \text{ (N·m)}$

Load factor  $\alpha_3 = M_2/M_2 \text{ max} = 1.89/24 = 0.08$



**5. Calculation of Load Factor for Dynamic Moment**

Equivalent load  $F_E$  at impact

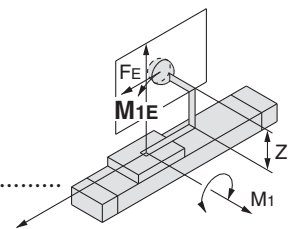
$F_E = 1.4v_a \times \delta \times m \times g = 1.4 \times 200 \times \frac{1}{100} \times 6.525 \times 9.8 = 179.1 \text{ (N)}$

$M_{1E}$  : Moment

$M_{1E} \text{ max}$  (from (4) of graph MY1M/ $M_1$  where  $1.4v_a = 280 \text{ mm/s}$ ) = 42.1 (N·m).....

$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 179.1 \times 37.4 \times 10^{-3} = 2.23 \text{ (N·m)}$

Load factor  $\alpha_4 = M_{1E}/M_{1E} \text{ max} = 2.23/42.1 = 0.05$

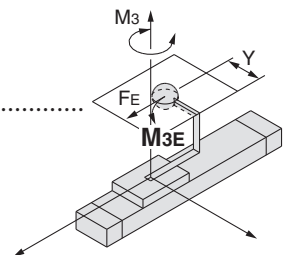


$M_{3E}$ : Moment

$M_{3E} \text{ max}$  (from (5) of graph MY1M/ $M_3$  where  $1.4v_a = 280 \text{ mm/s}$ ) = 5.7 (N·m).....

$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 179.1 \times 29.6 \times 10^{-3} = 1.77 \text{ (N·m)}$

Load factor  $\alpha_5 = M_{3E}/M_{3E} \text{ max} = 1.77/5.7 = 0.31$



**6. Sum and Examination of Guide Load Factors**

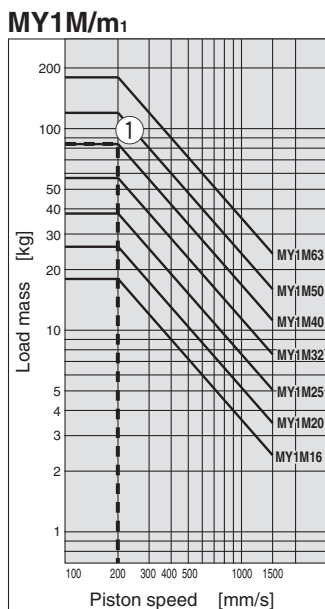
$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.67 \leq 1$

The above calculation is within the allowable value, and therefore the selected model can be used.

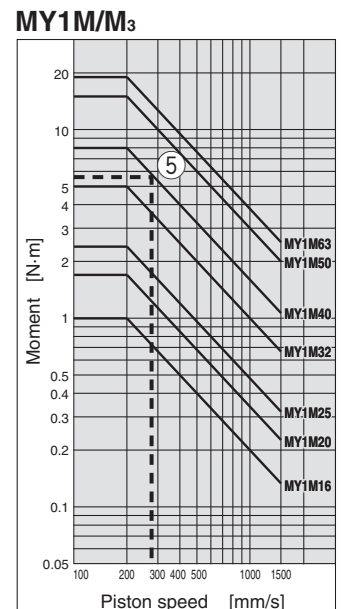
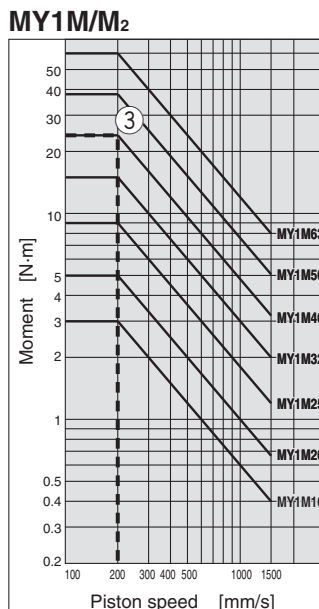
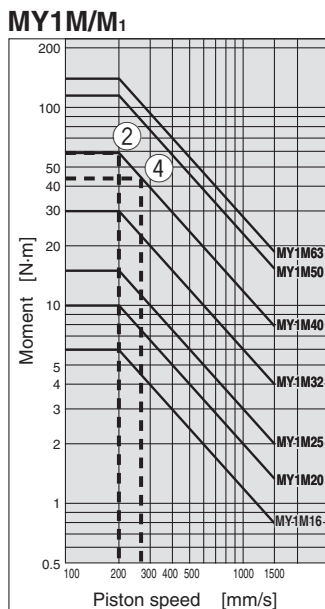
Select a shock absorber separately.

In an actual calculation, when the total sum of guide load factors  $\alpha$  in the formula above is more than 1, consider either decreasing the speed, increasing the bore size, or changing the product series. This calculation can be easily made using the “SMC Pneumatics CAD System”.

**Load Mass**



**Allowable Moment**



# Mechanically Jointed Rodless Cylinder Slide Bearing Guide Type

## Series MY1M

Ø 16, Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63

### How to Order

Slide bearing guide type

**MY1M 20** **G** - **300 L** - **M9BW** - **S**

Slide bearing guide type

Bore size

16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm

Port thread type

Symbol	Type	Bore size
—	M thread	Ø 16, Ø 20
	Rc	Ø 25, Ø 32,
TN	NPT	Ø 40, Ø 50,
TF	G	Ø 63

Piping

—	Standard type
G	Centralised piping type

Cylinder stroke [mm]

Bore size [mm]	Standard stroke [ $\mu\text{m}$ ]*	Maximum manufacturable stroke [mm]
16	100, 200, 300, 400, 500, 600, 700	3000
20, 25, 32 40, 50, 63	800, 900, 1000, 1200, 1400, 1600 1800, 2000	5000

\* The stroke can be manufactured up to the maximum stroke from 1 mm stroke in 1 mm increments. However, when the stroke is 49 mm or less, the air cushion capability lowers and multiple auto switches cannot be mounted. Pay special attention to this point. Also when exceeding a 2000 mm stroke, specify “-XB11” at the end of the model number. For details, refer to the “Made to Order Specifications”

Made to Order  
Refer to page 39  
for details.

Number of auto switches

—	2 pcs.
S	1 pc.
n	“n” pcs.

Auto switch

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

Applicable auto switches vary depending on the bore size. Select an applicable one referring to the table below.

Stroke adjustment unit symbol

Refer to “Stroke adjustment unit” on page 39.

### Applicable Auto Switches/Refer to pages 107 to 117 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model				Lead wire length (m)				Pre-wired connector	Applicable load			
					DC	AC	Perpendicular		In-line		0.5 (—)	1 (M)	3 (L)	5 (Z)					
							Ø 16, Ø 20	Ø 25 to Ø 63	Ø 16, Ø 20	Ø 25 to Ø 63									
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC			
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○					
				2-wire				M9BV	M9B	●	●	●	○	○			—		
				3-wire (NPN)				M9NWW	M9NW	●	●	●	○	○			IC circuit		
	Diagnostic indication (2-colour indication)			3-wire (PNP)	M9PWW	M9PW	●	●	●	○	○	—							
				2-wire	M9BWW	M9BW	●	●	●	○	○	—							
	Water resistant (2-colour indication)			3-wire (NPN)	M9NAV**	M9NA**	○	○	●	○	○	IC circuit							
				3-wire (PNP)	M9PAV**	M9PA**	○	○	●	○	○	—							
				2-wire	M9BAV**	M9BA**	○	○	●	○	○	—							
				2-wire	M9BAV**	M9BA**	○	○	●	○	○	—							
Reed auto switch	—	Grommet	No	3-wire (NPN equivalent)	—	5 V	—	A96V	—	A96	Z76	●	—	●	—	—	IC circuit	—	
				2-wire	24 V	12 V	100 V	A93V	—	A93	Z73	●	—	●	●	—	—	—	Relay, PLC
							100 V or less	A90V	—	A90	Z80	●	—	●	—	—	—	—	—

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

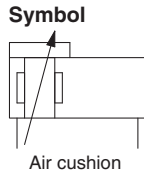
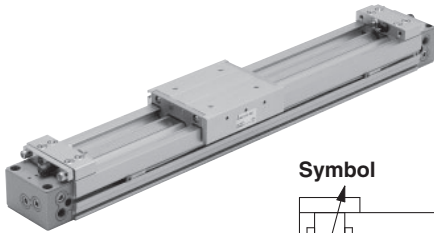
\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWX

\* Solid state auto switches marked with “O” are produced upon receipt of order.  
\* Separate switch spacers (BMG2-012) are required to retrofit auto switches (M9 type) on cylinders Ø 25 to Ø 63.

\* There are other applicable auto switches than listed above. For details, refer to page 117.

\* Auto switches are shipped together (not assembled). (Refer to pages 115 to 117 for the details of auto switch mounting.)

# Mechanically Jointed Rodless Cylinder Slide Bearing Guide Type **Series MY1M**



## Specifications

Bore size [mm]	16	20	25	32	40	50	63
Fluid	Air						
Action	Double acting						
Operating pressure range	0.2 to 0.8 MPa			0.15 to 0.8 MPa			
Proof pressure	1.2 MPa						
Ambient and fluid temperature	5 to 60 °C						
Cushion	Air cushion						
Lubrication	Non-lube						
Stroke length tolerance	1000 or less $^{+1.8}_0$ 1001 to 3000 $^{+2.8}_0$		2700 or less $^{+1.8}_0$ , 2701 to 5000 $^{+2.8}_0$				
Piping port size	Front/Side port	M5 x 0.8			Rc 1/8	Rc 1/4	Rc 3/8
	Bottom port	Ø 4			Ø 6	Ø 8	Ø 10



**Made to Order: Specifications**  
(Refer to page 118 to 120 for details.)

Symbol	Specifications
-X168	Helical insert thread specifications
-XB11	Long stroke type
-XB22	Shock absorber soft type Series RJ type
-XC67	NBR rubber lining in dust seal band
20-	Cooper-free

## Piston Speed

Bore size [mm]		16 to 63
Without stroke adjustment unit		100 to 1000 mm/s
Stroke adjustment unit	A unit	100 to 1000 mm/s <sup>(1)</sup>
	L unit and H unit	100 to 1500 mm/s <sup>(2)</sup>

Note 1) Be aware that when the stroke adjustment range is increased by manipulating the adjustment bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 34, the piston speed should be 100 to 200 mm per second.

Note 2) The piston speed is 100 to 1000 mm/s for centralised piping.

Note 3) Use at a speed within the absorption capacity range. Refer to page 42.

## Stroke Adjustment Unit Specifications

Bore size [mm]		16			20			25			32			40			50			63		
Unit symbol		A	L	H	A	L	H	A	L	H	A	L	H	A	L	H	A	L	H			
Configuration Shock absorber model	Without spacer	With adjustment bolt	RB 0806 + with adjustment bolt	With adjustment bolt	RB 0806 + with adjustment bolt	RB 1007 + with adjustment bolt	With adjustment bolt	RB 1007 + with adjustment bolt	RB 1412 + with adjustment bolt	With adjustment bolt	RB 1412 + with adjustment bolt	RB 2015 + with adjustment bolt	With adjustment bolt	RB 1412 + with adjustment bolt	RB 2015 + with adjustment bolt	With adjustment bolt	RB 2015 + with adjustment bolt	RB 2725 + with adjustment bolt	With adjustment bolt	RB 2015 + with adjustment bolt	RB 2725 + with adjustment bolt	
	With short spacer	0 to -5.6	0 to -6	0 to -11.5	0 to -12	0 to -16	0 to -20	0 to -25														
	With long spacer	-5.6 to -11.2	-6 to -12	-11.5 to -23	-12 to -24	-16 to -32	-20 to -40	-25 to -50														
Stroke adjustment range by intermediate fixing spacer [mm]	Without spacer	0 to -5.6	0 to -6	0 to -11.5	0 to -12	0 to -16	0 to -20	0 to -25														
	With short spacer	-5.6 to -11.2	-6 to -12	-11.5 to -23	-12 to -24	-16 to -32	-20 to -40	-25 to -50														
	With long spacer	-11.2 to -16.8	-12 to -18	-23 to -34.5	-24 to -36	-32 to -48	-40 to -60	-50 to -75														

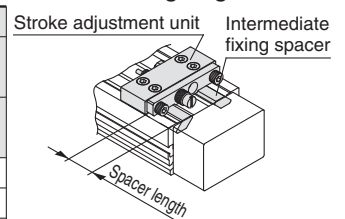
\* Stroke adjustment range is applicable for one side when mounted on a cylinder.

## Stroke Adjustment Unit Symbol

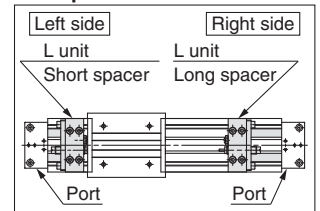
		Right side stroke adjustment unit										
		Without unit	A: With adjustment bolt		L: With low load shock absorber + Adjustment bolt		H: With high load shock absorber + Adjustment bolt					
			With short spacer	With long spacer	With short spacer	With long spacer	With short spacer	With long spacer	With short spacer	With long spacer		
Left side stroke adjustment unit	Without unit	—	SA	SA6	SA7	SL	SL6	SL7	SH	SH6	SH7	
	A: With adjustment bolt	AS	A	AA6	AA7	AL	AL6	AL7	AH	AH6	AH7	
		With short spacer	A6S	A6A	A6	A6A7	A6L	A6L6	A6L7	A6H	A6H6	A6H7
		With long spacer	A7S	A7A	A7A6	A7	A7L	A7L6	A7L7	A7H	A7H6	A7H7
	L: With low load shock absorber + Adjustment bolt	LS	LA	LA6	LA7	L	LL6	LL7	LH	LH6	LH7	
		With short spacer	L6S	L6A	L6A6	L6A7	L6L	L6	L6L7	L6H	L6H6	L6H7
		With long spacer	L7S	L7A	L7A6	L7A7	L7L	L7L6	L7	L7H	L7H6	L7H7
	H: With high load shock absorber + Adjustment bolt	HS	HA	HA6	HA7	HL	HL6	HL7	H	HH6	HH7	
		With short spacer	H6S	H6A	H6A6	H6A7	H6L	H6L6	H6L7	H6H	H6	H6H7
		With long spacer	H7S	H7A	H7A6	H7A7	H7L	H7L6	H7L7	H7H	H7H6	H7

\* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.

## Stroke adjustment unit mounting diagram



## Example of L6L7 attachment



## Shock Absorbers for L and H Units

Type	Stroke adjustment unit	Bore size [mm]					
		16	20	25	32	40	50
Standard (Shock absorber/RB series)	L	RB0806	RB1007	RB1412	RB2015		
	H	—	RB1007	RB1412	RB2725		
Shock absorber/soft type RJ series mounted (-XB22)	L	RJ0806H	RJ1007H	RJ1412H		—	—
	H	—	RJ1007H	RJ1412H	—	—	—

\* The shock absorber service life is different from that of the MY1M cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

\* Mounted shock absorber soft type RJ series (-XB22) is made to order specifications.

## 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. collision speed [mm/s]	1500					
Max. operating frequency [cycle/min]	80	70	45	25	10	
Spring force [N]	Extended	1.96	4.22	6.86	8.34	8.83
	Retracted	4.22	6.86	15.98	20.50	20.01
Operating temperature range [°C]	5 to 60					

\* The shock absorber service life is different from that of the MY1M cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

# Series MY1M

## Theoretical Output

Bore size [mm]	Piston area [mm <sup>2</sup> ]	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
20	314	62	94	125	157	188	219	251
25	490	98	147	196	245	294	343	392
32	804	161	241	322	402	483	563	643
40	1256	251	377	502	628	754	879	1005
50	1962	392	588	784	981	1177	1373	1569
63	3115	623	934	1246	1557	1869	2180	2492

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>)

## Weight

Bore size [mm]	Basic weight	Additional weight per each 50 mm of stroke	Weight of moving parts	Side support bracket weight (per set)	Stroke adjustment unit weight (per unit)		
				Type A and B	A unit weight	L unit weight	H unit weight
16	0.67	0.12	0.19	0.01	0.03	0.04	—
20	1.11	0.16	0.28	0.02	0.04	0.05	0.08
25	1.64	0.24	0.39	0.02	0.07	0.11	0.18
32	3.27	0.38	0.81	0.04	0.14	0.23	0.39
40	5.88	0.56	1.41	0.08	0.25	0.34	0.48
50	10.06	0.77	2.51	0.08	0.36	0.51	0.81
63	16.57	1.11	3.99	0.17	0.68	0.83	1.08

Calculation: (Example) MY1M25-300A

- Basic weight ..... 1.64 kg
- Cylinder stroke ..... 300 stroke
- Additional weight ..... 0.24/50 stroke  
1.64 + 0.24 x 300/50 + 0.07 x 2 ≒ 3.22 kg
- Weight of A unit ..... 0.07 kg

## Option

### Stroke Adjustment Unit Part No.

**MYM-A 25 L2-6N**

Stroke adjustment unit

Intermediate fixing spacer

Stroke adjustment unit

Intermediate fixing spacer

**Bore size**

16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm

**Unit no.**

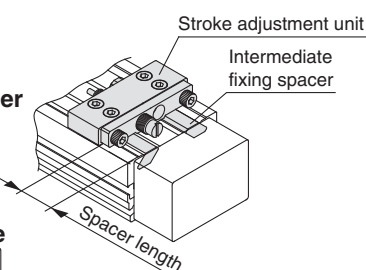
Symbol	Stroke adjustment unit	Mounting position
A1	A unit	Left
A2		Right
L1	L unit	Left
L2		Right
H1	H unit	Left
H2		Right

**Spacer delivery style**

—	Unit installed
N	Spacer only

**Intermediate fixing spacer**

—	Without spacer
6	Short spacer
7	Long spacer



Stroke adjustment unit

Intermediate fixing spacer

Spacer length

\* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.

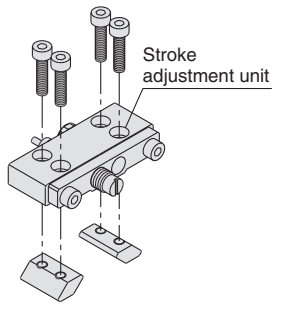
\* Spacers are shipped for a set of two.

Note 1) Refer to page 39 for details about adjustment range.

Note 2) A and L unit only for Ø 16

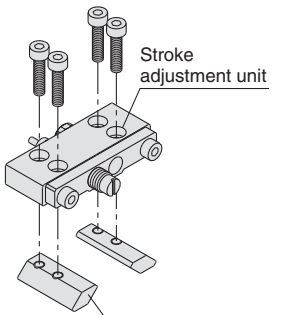
### Component Parts

**MYM-A25L2 (Without spacer)**



Stroke adjustment unit

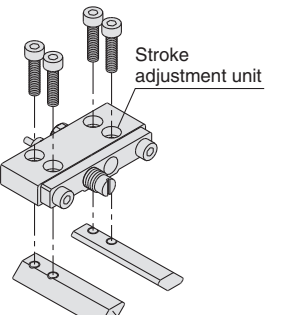
**MYM-A25L2-6 (With short spacer)**



Stroke adjustment unit

Short spacer

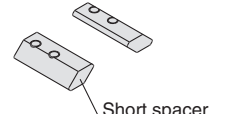
**MYM-A25L2-7 (With long spacer)**



Stroke adjustment unit

Long spacer

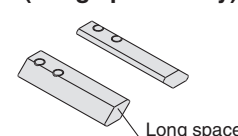
**MYM-A25L2-6N (Short spacer only)**



Short spacer

---

**MYM-A25L2-7N (Long spacer only)**



Long spacer

### Side Support Part No.

Type \ Bore size [mm]	16	20	25	32	40	50	63
Side support A	MY-S16A	MY-S20A	MY-S25A	MY-S32A	MY-S40A	MY-S50A	MY-S63A
Side support B	MY-S16B	MY-S20B	MY-S25B	MY-S32B	MY-S40B	MY-S50B	MY-S63B

For details about dimensions, etc., refer to page 51.  
A set of side supports consists of a left support and a right support.





# Series MY1M

## Cushion Capacity

### Cushion Selection

#### <Air cushion>

Air cushions are a standard feature on mechanically jointed rodless cylinders. The air cushion mechanism is incorporated to prevent excessive impact of the piston at the stroke end during high speed operation. The purpose of air cushion, thus, is not 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 adjustment unit with shock absorber>

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

#### <L unit>

Use this unit when the cylinder stroke is 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 or below the L unit limit line.

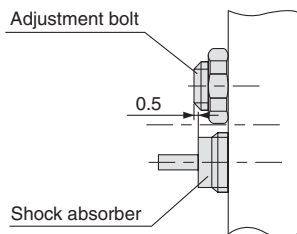
#### <H unit>

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

1. Refer to the figure below when using the adjustment bolt to perform stroke adjustment.

When the effective stroke of the shock absorber decreases as a result of stroke adjustment, the absorption capacity decreases dramatically. Secure the adjustment bolt at the position where it protrudes approximately 0.5 mm from the shock absorber.

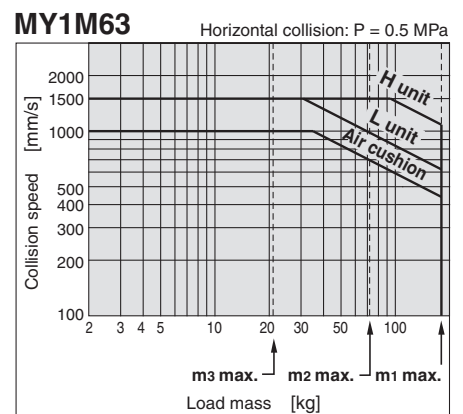
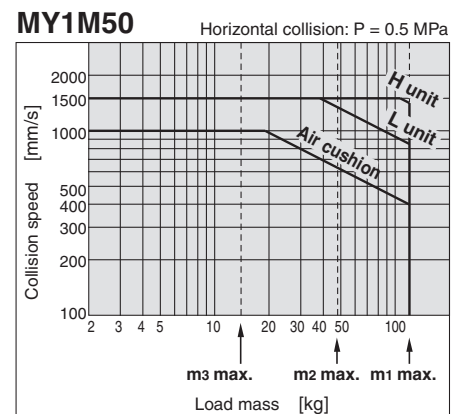
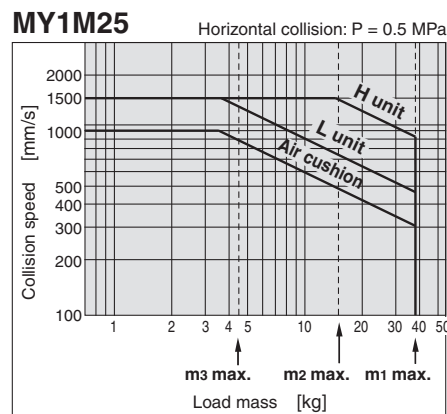
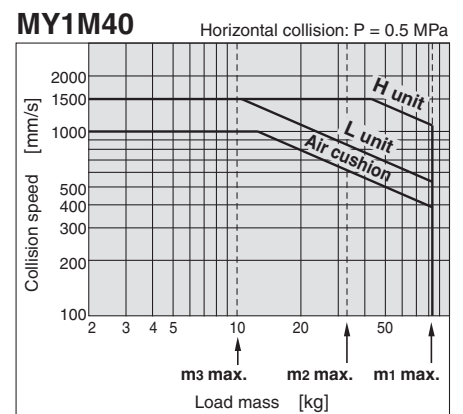
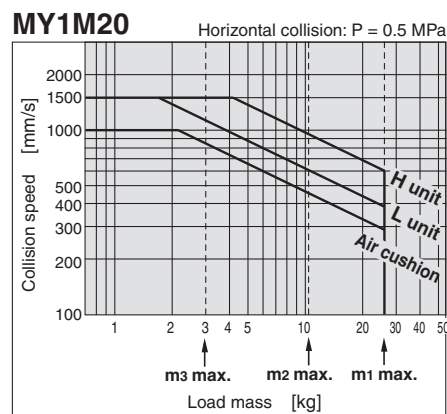
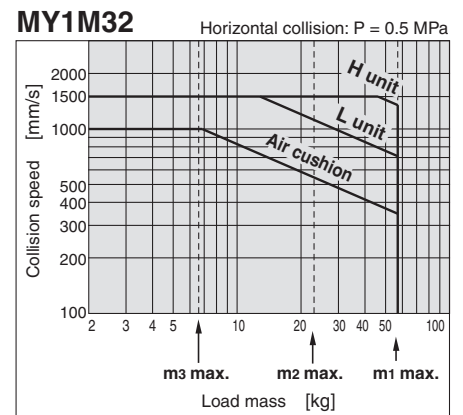
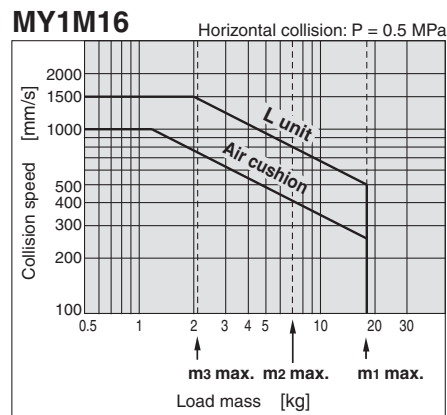


2. Do not use a shock absorber together with air cushion.

### Air Cushion Stroke [mm]

Bore size [mm]	Cushion stroke
16	12
20	15
25	15
32	19
40	24
50	30
63	37

### Absorption Capacity of Air Cushion and Stroke Adjustment Units



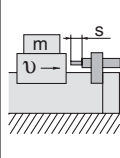
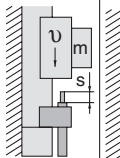
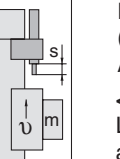
**Tightening Torque for Stroke Adjusting Unit Holding Bolts** [N·m]

Bore size [mm]	Unit	Tightening torque
16	A	0.7
	L	
20	A	1.8
	L	
	H	
25	A	3.5
	L	
	H	
32	A	5.8
	L	
	H	
40	A	13.8
	L	
	H	
50	A	13.8
	L	
	H	
63	A	27.5
	L	
	H	

**Tightening Torque for Stroke Adjustment Unit Lock Plate Holding Bolts** [N·m]

Bore size [mm]	Unit	Tightening torque
25	L	1.2
	H	3.3
32	L	3.3
	H	10
40	L	3.3
	H	10

**Calculation of Absorbed Energy for Stroke Adjusting Unit with Shock Absorber** [N·m]

Type of impact	Horizontal collision	Vertical (Downward)	Vertical (Upward)
			
Kinetic energy E <sub>1</sub>	$\frac{1}{2} m \cdot v^2$		
Thrust energy E <sub>2</sub>	F·s	F·s + m·g·s	F·s - m·g·s
Absorbed energy E	E <sub>1</sub> + E <sub>2</sub>		

Symbol

- v: Speed of impact object (m/s)
- F: Cylinder thrust (N)
- s: Shock absorber stroke (m)
- m: Mass of impact object (kg)
- g: Gravitational acceleration (9.8 m/s<sup>2</sup>)

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

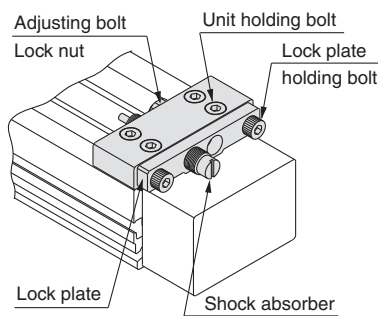
**⚠ Precautions**

**Specific product precautions**

**⚠ Caution**

Use caution not to get your hands caught in the unit.

- When using a product with stroke adjustment unit, the space between the slide table (slider) and the stroke adjustment unit becomes narrow at the stroke end, causing a danger of hands getting caught. Install a protective cover to prevent direct contact with the human body.



**<Fastening of unit>**

The unit can be secured by evenly tightening the four unit holding bolts.

**⚠ Caution**

**Do not operate with the stroke adjustment unit fixed in an intermediate position.**

When the stroke adjustment unit is fix in an intermediate position, slippage can occur depending on the amount of energy released at the time of an impact. In such cases, as a stroke adjustment unit with the spacer for intermediate securing is available, it is recommended to use it.

For other lengths, please consult with SMC (Refer to “Tightening Torque for Stroke Adjusting Unit Holding Bolts”).

**<Stroke adjustment with adjustment bolt>**

Loosen the adjustment bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Retighten the lock nut.

**<Stroke adjustment with shock absorber>**

Loosen the two lock plate holding bolts, turn the shock absorber and adjust the stroke. Then, uniformly tighten the lock plate holding bolts to secure the shock absorber.

Take care not to over-tighten the holding bolts. (Except Ø 16, Ø 20, Ø 50, Ø 63)

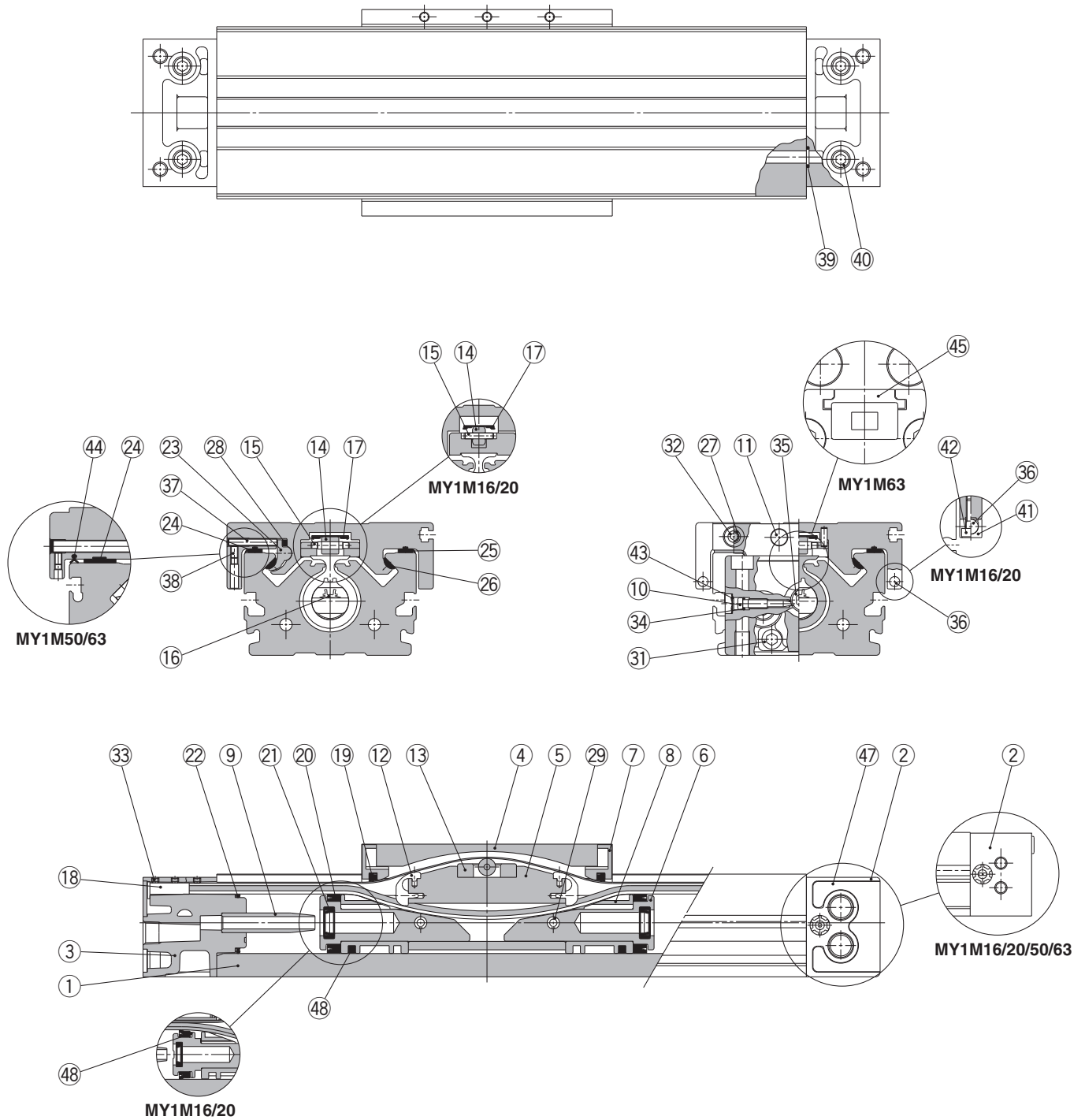
(Refer to “Tightening Torque for Stroke Adjusting Unit Lock Plate Holding Bolts”).

Note) Although the lock plate may slightly bend due to tightening of the lock plate holding bolt, this does not affect the shock absorber and locking function.

# Series MY1M

Construction: Ø 16 to Ø 63

MY1M16 to 63



## MY1M16 to 63

### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminium alloy	Hard anodised
2	Head cover WR	Aluminium alloy	Painted
3	Head cover WL	Aluminium alloy	Painted
4	Slide table	Aluminium alloy	Hard anodised
5	Piston yoke	Aluminium alloy	Chromated
6	Piston	Aluminium alloy	Chromated
7	End cover	Special resin	
8	Wear ring	Special resin	
9	Cushion ring	Aluminium alloy	Anodised
10	Cushion needle	Rolled steel	Nickel plated
11	Stopper	Carbon steel	Nickel plated
12	Belt separator	Special resin	
13	Coupler	Sintered iron material	
14	Guide roller	Special resin	
15	Guide roller shaft	Stainless steel	
18	Belt clamp	Special resin	
23	Adjusting arm	Aluminium alloy	Chromated
24	Bearing R	Special resin	
25	Bearing L	Special resin	
26	Bearing S	Special resin	

No.	Description	Material	Note
27	Spacer	Stainless steel	
28	Backup spring	Stainless steel	
29	Spring pin	Carbon tool steel	
31	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
32	Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated
33	Hexagon socket head set screw	Chromium molybdenum steel	Black zinc chromated/Nickel plated
35	Hexagon socket head taper plug	Carbon steel	Nickel plated
36	Magnet	—	
37	Hexagon socket head set screw	Chromium molybdenum steel	Black zinc chromated
38	Hexagon socket head set screw	Chromium molybdenum steel	Black zinc chromated
40	Hexagon socket head taper plug	Carbon steel	Nickel plated
41	Magnet holder	Special resin	( $\varnothing$ 16, $\varnothing$ 20)
42	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
43	Type CR retaining ring	Spring steel	
45	Head plate	Aluminium alloy	Hard anodised ( $\varnothing$ 63)
47	Port cover	Special resin	( $\varnothing$ 25 to $\varnothing$ 40)
48	Lub-retainer	Special resin	

### Replacement Part: Seal Kit

No.	Description	Qty.	MY1M16	MY1M20	MY1M25	MY1M32	MY1M40	MY1M50	MY1M63
16	Seal belt	1	MY16-16C-Stroke	MY20-16C-Stroke	MY25-16C-Stroke	MY32-16C-Stroke	MY40-16C-Stroke	MY50-16C-Stroke	MY63-16A-Stroke
17	Dust seal band	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
34	O-ring	2	KA00309 ( $\varnothing$ 4 x $\varnothing$ 1.8 x $\varnothing$ 1.1)	KA00311 ( $\varnothing$ 5.1 x $\varnothing$ 3 x $\varnothing$ 1.05)	KA00311 ( $\varnothing$ 5.1 x $\varnothing$ 3 x $\varnothing$ 1.05)	KA00320 ( $\varnothing$ 7.15 x $\varnothing$ 3.75 x $\varnothing$ 1.7)	KA00402 ( $\varnothing$ 8.3 x $\varnothing$ 4.5 x $\varnothing$ 1.9)	KA00777	KA00777
44	Side scraper	2	—	—	—	—	—	MYM50-15CK0502B	MYM63-15CK0503B
19	Scraper	2							
20	Piston seal	2							
21	Cushion seal	2	MY1M16-PS	MY1M20-PS	MY1M25-PS	MY1M32-PS	MY1M40-PS	MY1M50-PS	MY1M63-PS
22	Tube gasket	2							
39	O-ring	4							

\* Seal kit includes 19, 20, 21, 22 and 39. Order the seal kit based on each bore size.

\* Seal kit includes a grease pack (10 g).

When 16 and 17 are shipped independently, a grease pack is included. (10 g per 1000 strokes)

Order with the following part number when only the grease pack is needed.

**Grease pack part number: GR-S-010** (10 g), **GR-S-020** (20 g)

Note) Two kinds of dust seal bands are available. Verify the type to use, since the part number varies depending on the treatment of the hexagon socket head set screw 33.

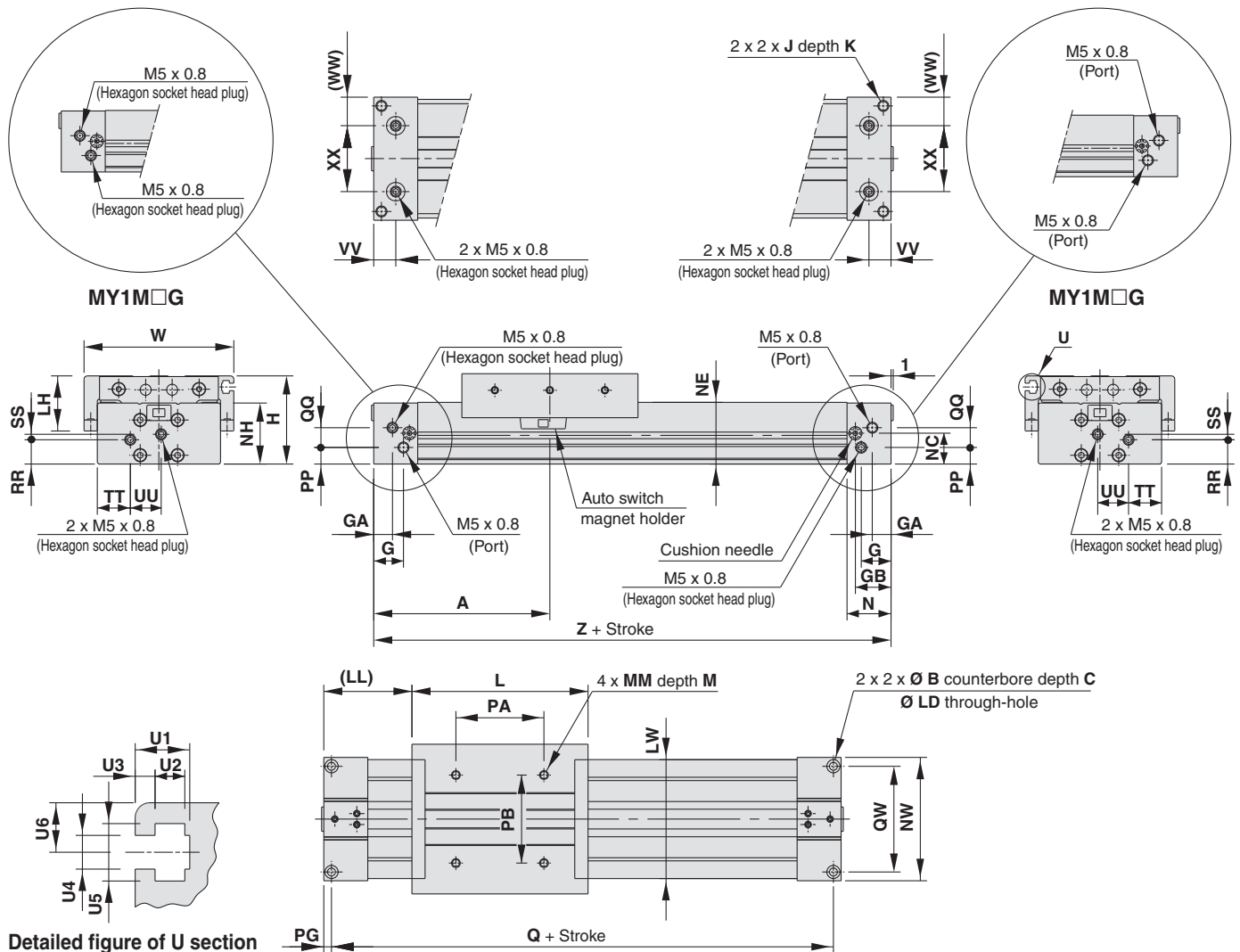
A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

# Series MY1M

## Standard Type/Centralised Piping Type $\varnothing 16, \varnothing 20$

Refer to page 122 regarding centralised piping port variations.

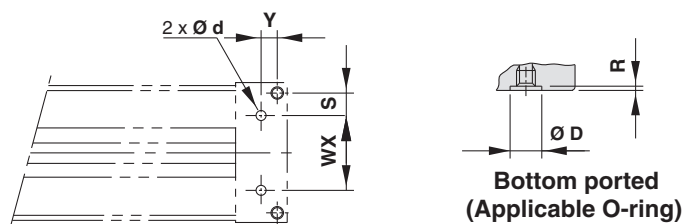
### MY1M16□/20□ — Stroke



Model	A	B	C	G	GA	GB	H	J	K	L	LD	LH	LL	LW	M	MM	N	NC	NE	NH	NW	PA
MY1M16□	80	6	3.5	13.5	8.5	16.2	40	M5 x 0.8	10	80	3.6	22.5	40	54	6	M4 x 0.7	20	14	28	27.7	56	40
MY1M20□	100	7.5	4.5	12.5	12.5	20	46	M6 x 1	12	100	4.8	23	50	58	7.5	M5 x 0.8	25	17	34	33.7	60	50

Model	PB	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	W	WW	XX	Z
MY1M16□	40	3.5	7.5	153	9	48	11	2.5	15	14	10	68	13	30	160
MY1M20□	40	4.5	11.5	191	10	45	14.5	5	18	12	12.5	72	14	32	200

Model	U1	U2	U3	U4	U5	U6
MY1M16□	5.5	3	2	3.4	5.8	5
MY1M20□	5.5	3	2	3.4	5.8	5.5



### Hole Size for Centralised Piping on the Bottom

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1M16□	30	6.5	9	4	8.4	1.1	C6
MY1M20□	32	8	6.5	4	8.4	1.1	

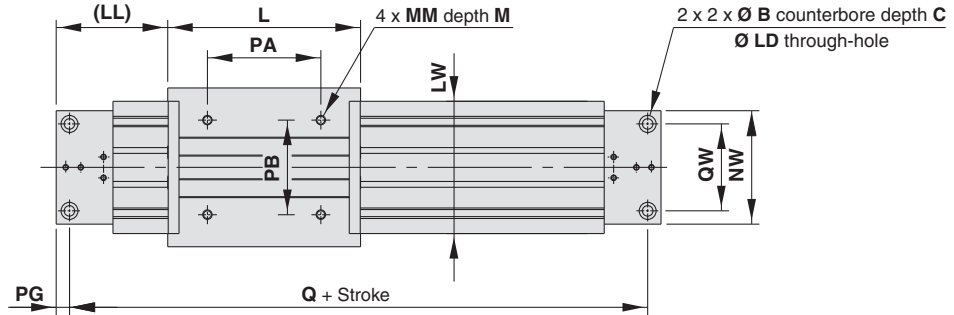
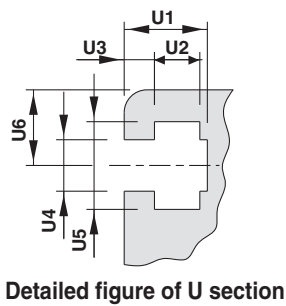
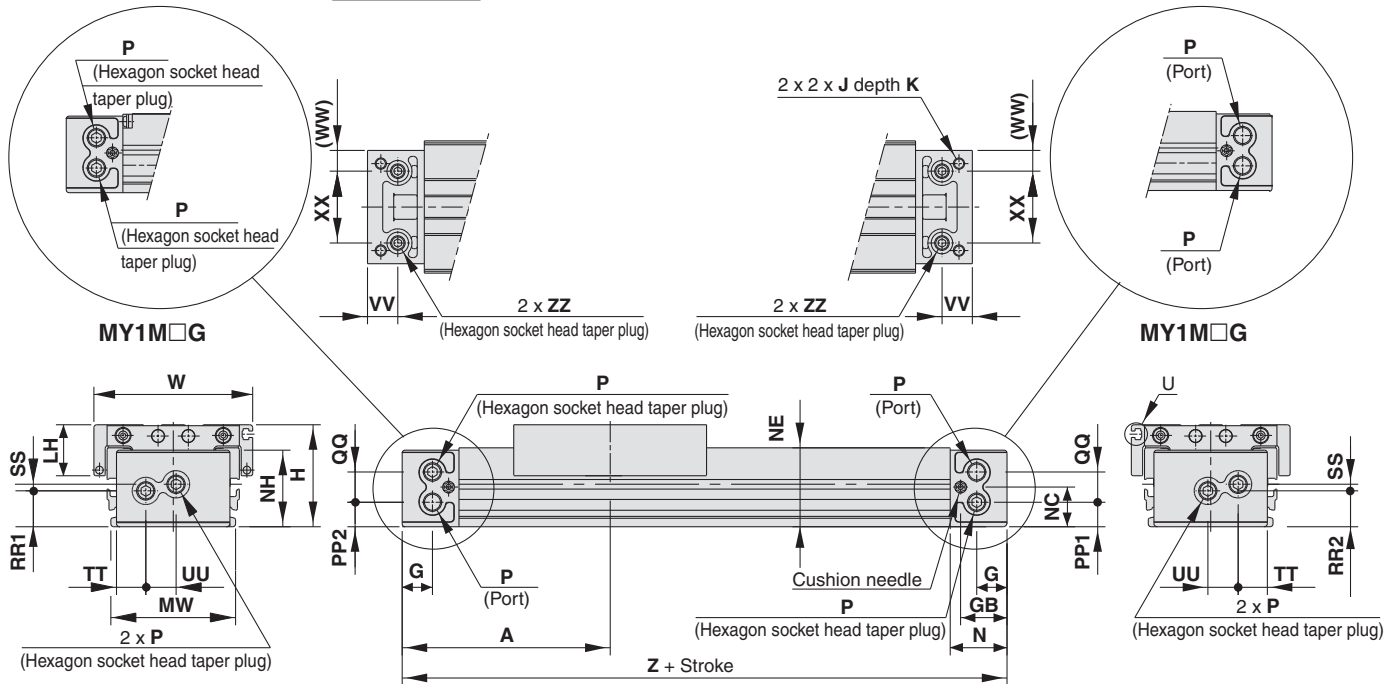
(Machine the mounting side to the dimensions below.)

# Mechanically Jointed Rodless Cylinder Slide Bearing Guide Type **Series MY1M**

## Standard Type/Centralised Piping Type $\varnothing 25, \varnothing 32, \varnothing 40$

Refer to page 122 regarding centralised piping port variations.

### MY1M25□/32□/40□ — Stroke

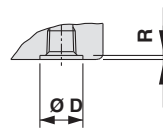
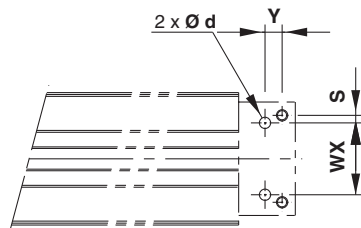


Model	A	B	C	G	GB	H	J	K	L	LD	LH	LL	LW	M	MM	MW	N	NC	NE	NH	NW	P	PA
MY1M25□	110	9	5.5	17	24.5	54	M6 x 1	9.5	102	5.6	27	59	70	10	M5 x 0.8	66	30	21	41.8	40.5	60	Rc1/8	60
MY1M32□	140	11	6.5	19	30	68	M8 x 1.25	16	132	6.8	35	74	88	13	M6 x 1	80	37	26	52.3	50	74	Rc1/8	80
MY1M40□	170	14	8.5	23	36.5	84	M10 x 1.5	15	162	8.6	38	89	104	13	M6 x 1	96	45	32	65.3	63.5	94	Rc1/4	100

"P" indicates cylinder supply ports.

### Detailed Dimensions of U Section

Model	PB	PG	PP1	PP2	Q	QQ	QW	RR1	RR2	SS	TT	UU	VV	W	WW	XX	Z	ZZ
MY1M25□	50	7	12.7	12.7	206	15.5	46	18.9	17.9	4.1	15.5	16	16	84	11	38	220	Rc 1/16
MY1M32□	60	8	15.5	18.5	264	16	60	22	24	4	21	16	19	102	13	48	280	Rc 1/16
MY1M40□	80	9	17.5	20	322	26	72	25.5	29	9	26	21	23	118	20	54	340	Rc 1/8



Bottom ported (ZZ)  
(Applicable O-ring)

### Hole Size for Centralised Piping on the Bottom

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1M25□	38	9	4	6	11.4	1.1	C9
MY1M32□	48	11	6	6	11.4	1.1	
MY1M40□	54	14	9	8	13.4	1.1	

(Machine the mounting side to the dimensions below.)

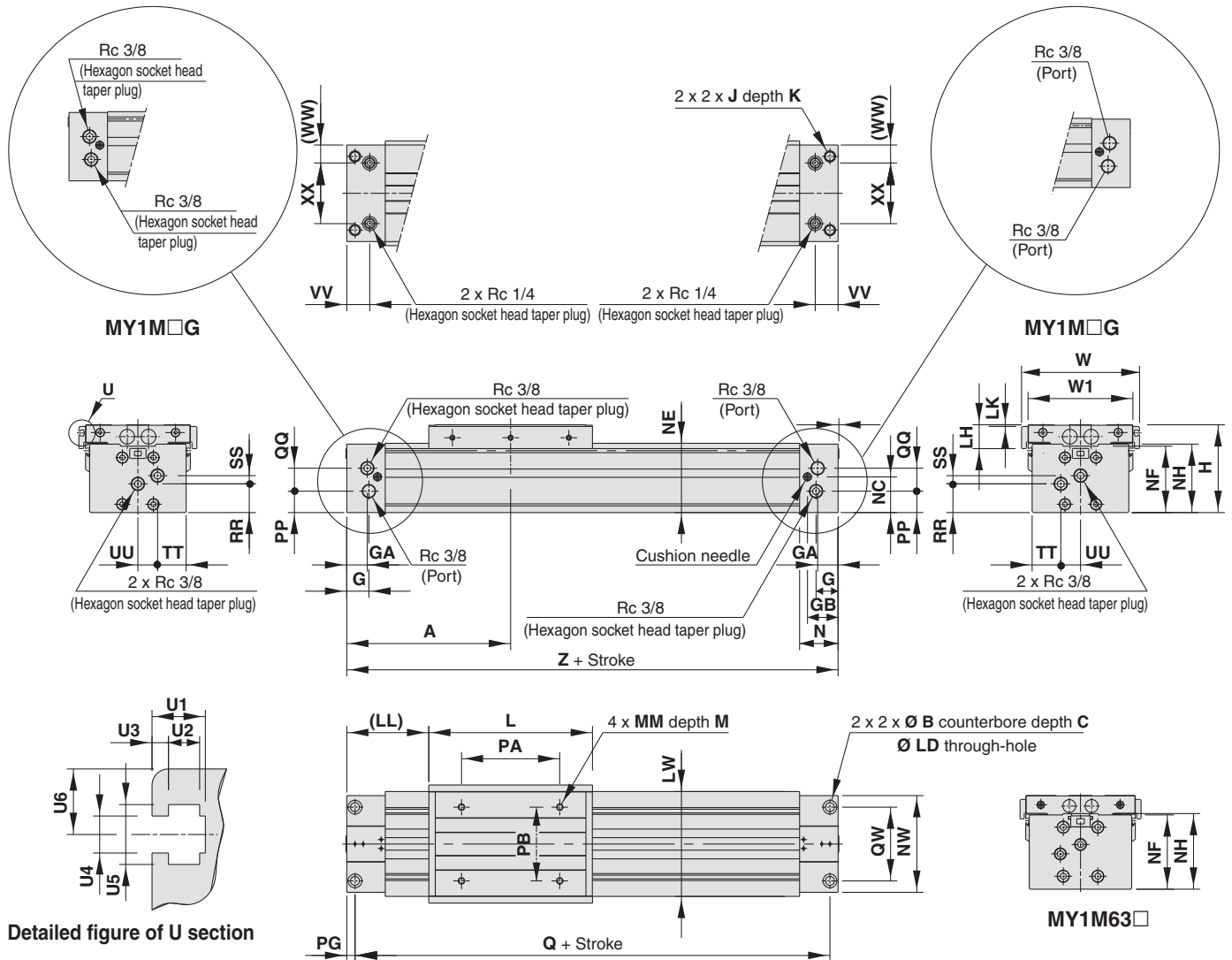


# Series MY1M

## Standard Type/Centralised Piping Type $\varnothing 50, \varnothing 63$

Refer to page 122 regarding centralised piping port variations.

### MY1M50□/60□ — Stroke



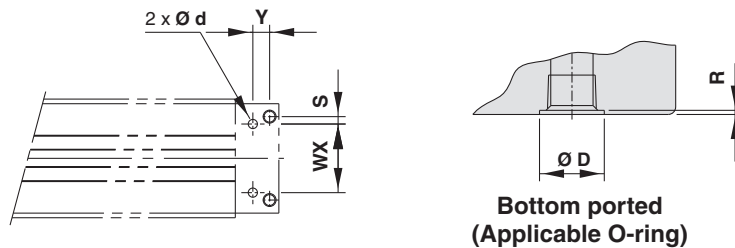
Detailed figure of U section

Model	A	B	C	G	GA	GB	H	J	K	L	LD	LH	LK	LL	LW	M	MM	N	NC	NE	NF	NH	NW	PA
MY1M50□	200	17	10.5	27	25	37.5	107	M14 x 2	28	200	11	29	2	100	128	15	M8 x 1.25	47	43.5	84.5	81	83.5	118	120
MY1M63□	230	19	12.5	29.5	27.5	39.5	130	M16 x 2	32	230	13.5	32.5	5.5	115	152	16	M10 x 1.5	50	56	104	103	105	142	140

Model	PB	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	W	W1	WW	XX	Z
MY1M50□	90	10	26	380	28	90	35	10	35	24	28	144	128	22	74	400
MY1M63□	110	12	42	436	30	110	49	13	43	28	30	168	152	25	92	460

### Detailed Dimensions of U Section

Model	U1	U2	U3	U4	U5	U6
MY1M50□	6.5	3.8	2	4.5	7.3	8
MY1M63□	8.5	5	2.5	5.5	8.4	8



### Hole Size for Centralised Piping on the Bottom

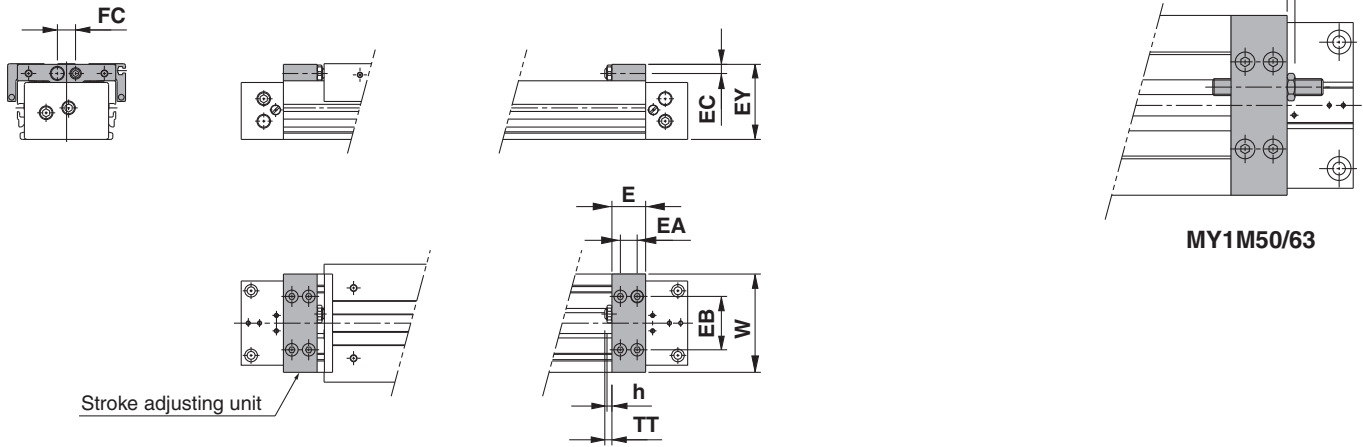
Model	WX	Y	S	d	D	R	Applicable O-ring
MY1M50□	74	18	8	10	17.5	1.1	C15
MY1M63□	92	18	9	10	17.5	1.1	

(Machine the mounting side to the dimensions below.)

### Stroke Adjustment Unit

With adjustment bolt

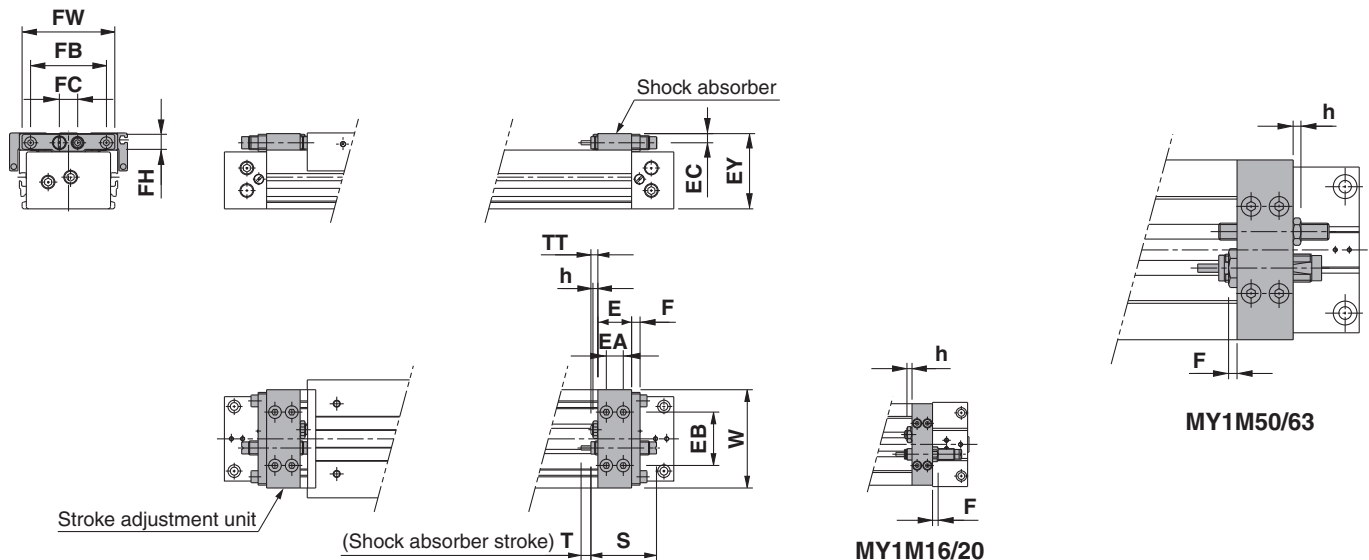
MY1M  —  A



Applicable bore size	E	EA	EB	EC	EY	FC	h	TT	W
MY1M16	14.6	7	30	5.8	39.5	14	3.6	5.4 (Max. 11)	58
MY1M20	20	10	32	5.8	45.5	14	3.6	5 (Max. 11)	58
MY1M25	24	12	38	6.5	53.5	13	3.5	5 (Max. 16.5)	70
MY1M32	29	14	50	8.5	67	17	4.5	8 (Max. 20)	88
MY1M40	35	17	57	10	83	17	4.5	9 (Max. 25)	104
MY1M50	40	20	66	14	106	26	5.5	13 (Max. 33)	128
MY1M63	52	26	77	14	129	31	5.5	13 (Max. 38)	152

With low load shock absorber + Adjustment bolt

MY1M  —  L



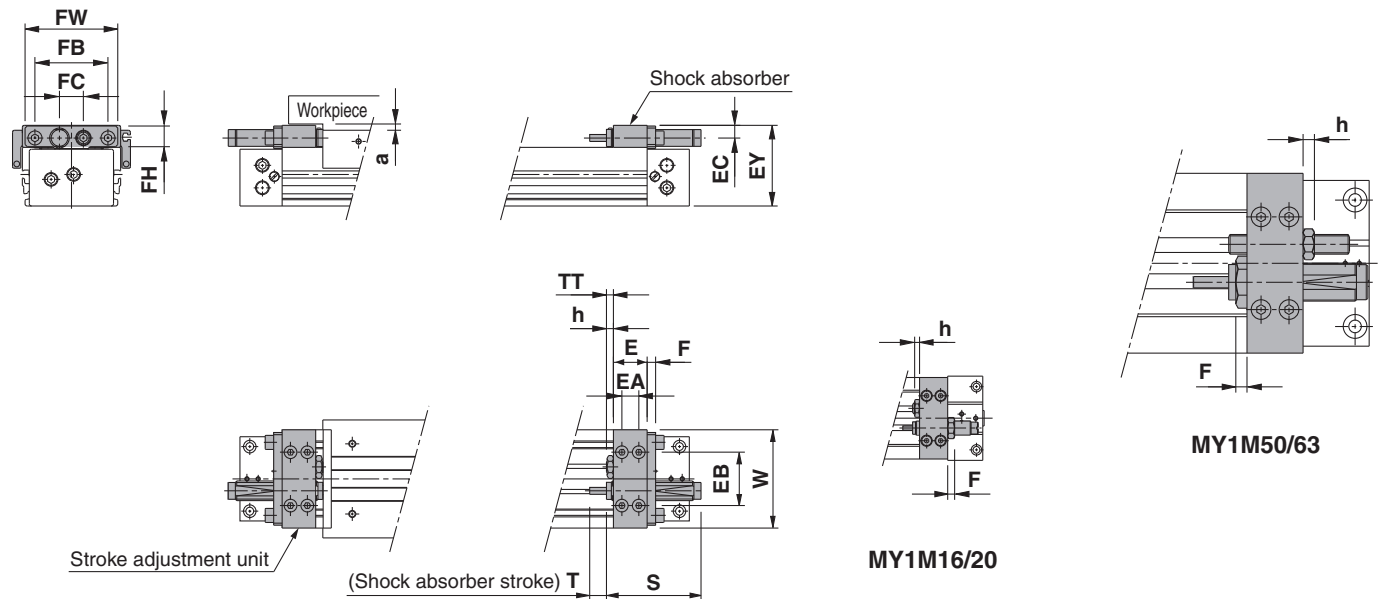
Applicable size	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model
MY1M16	14.6	7	30	5.8	39.5	4	—	14	—	—	3.6	40.8	6	5.4 (Max. 11)	58	RB0806
MY1M20	20	10	32	5.8	45.5	4	—	14	—	—	3.6	40.8	6	5 (Max. 11)	58	RB0806
MY1M25	24	12	38	6.5	53.5	6	54	13	13	66	3.5	46.7	7	5 (Max. 16.5)	70	RB1007
MY1M32	29	14	50	8.5	67	6	67	17	16	80	4.5	67.3	12	8 (Max. 20)	88	RB1412
MY1M40	35	17	57	10	83	6	78	17	17.5	91	4.5	67.3	12	9 (Max. 25)	104	RB1412
MY1M50	40	20	66	14	106	6	—	26	—	—	5.5	73.2	15	13 (Max. 33)	128	RB2015
MY1M63	52	26	77	14	129	6	—	31	—	—	5.5	73.2	15	13 (Max. 38)	152	RB2015

# Series MY1M

## Stroke Adjustment Unit

With high load shock absorber + Adjustment bolt

MY1M Bore size □ — Stroke H

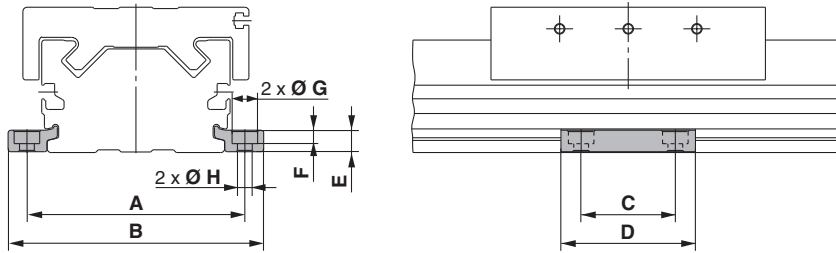


\* Since dimension EY of the H type unit is greater than the table top height (dimension H), when mounting a workpiece that exceeds the overall length (dimension L) of the slide table, allow a clearance of dimension "a" or larger on the workpiece side.

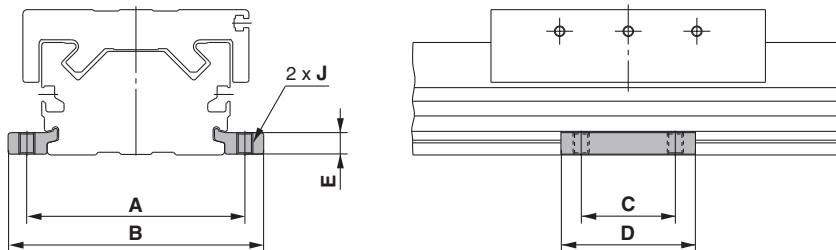
Applicable bore size	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model	a
MY1M20	20	10	32	7.7	50	5	—	14	—	—	3.5	46.7	7	5 (Max. 11)	58	RB1007	5
MY1M25	24	12	38	9	57.5	6	52	17	16	66	4.5	67.3	12	5 (Max. 16.5)	70	RB1412	4.5
MY1M32	29	14	50	11.5	73	8	67	22	22	82	5.5	73.2	15	8 (Max. 20)	88	RB2015	6
MY1M40	35	17	57	12	87	8	78	22	22	95	5.5	73.2	15	9 (Max. 25)	104	RB2015	4
MY1M50	40	20	66	18.5	115	8	—	30	—	—	11	99	25	13 (Max. 33)	128	RB2725	9
MY1M63	52	26	77	19	138.5	8	—	35	—	—	11	99	25	13 (Max. 38)	152	RB2725	9.5

## Side Support

### Side support A MY-S□A



### Side support B MY-S□B

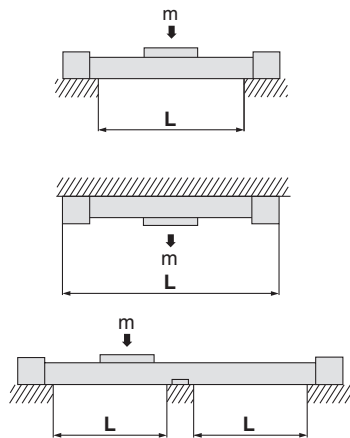


Model	Applicable bore size	A	B	C	D	E	F	G	H	J
MY-S16 <sup>A</sup> <sub>B</sub>	MY1M16	61	71.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20 <sup>A</sup> <sub>B</sub>	MY1M20	67	79.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S25 <sup>A</sup> <sub>B</sub>	MY1M25	81	95	35	50	8	5	9.5	5.5	M6 x 1
MY-S32 <sup>A</sup> <sub>B</sub>	MY1M32	100	118	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S40 <sup>A</sup> <sub>B</sub>	MY1M40	120	142	55	80	14.8	8.5	14	9	M10 x 1.5
	MY1M50	142	164							
MY-S63 <sup>A</sup> <sub>B</sub>	MY1M63	172	202	70	100	18.3	10.5	17.5	11.5	M12 x 1.75

\* A set of side supports consists of a left support and a right support.

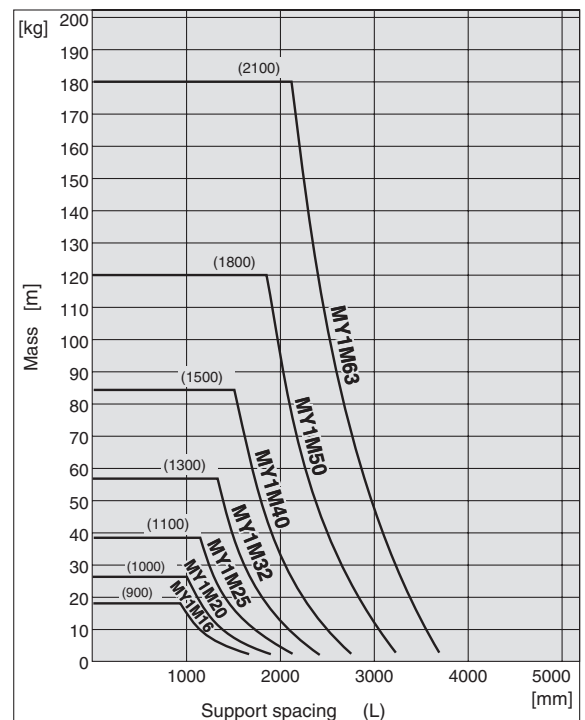
## Guide for Side Support Application

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load mass. In such a case, use a side support in the middle section. The spacing (L) of the support must be no more than the values shown in the graph on the right.



### ⚠ Caution

1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value is within the allowable limits shown in the graph.
2. Support brackets are not for mounting; use them solely for providing support.

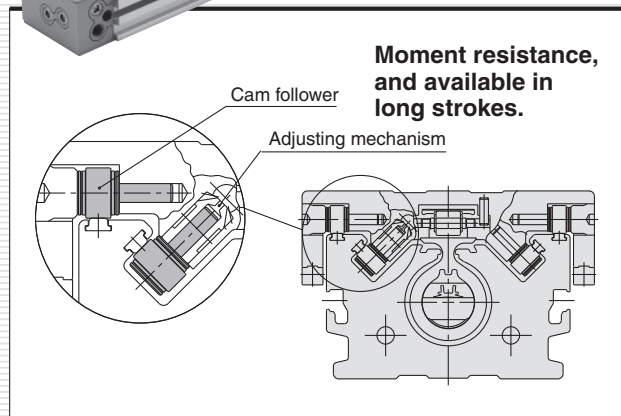
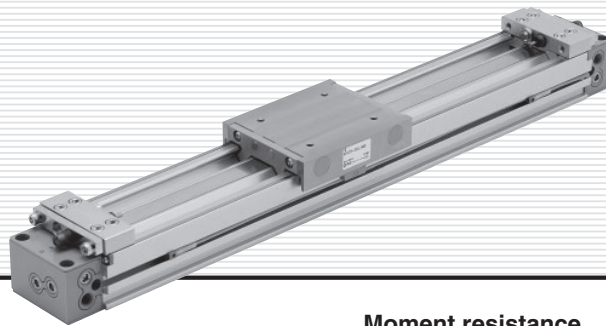




# Series MY1C

Cam Follower Guide Type

Ø 16, Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63



# Series MY1C Prior to Use

## Maximum Allowable Moment/Maximum Load Mass

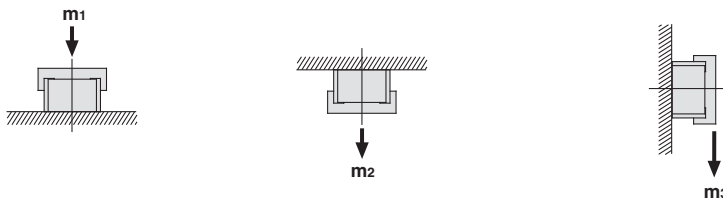
Model	Bore size [mm]	Maximum allowable moment [N·m]			Maximum load mass [kg]		
		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	m <sub>1</sub>	m <sub>2</sub>	m <sub>3</sub>
MY1C	16	6.0	3.0	2.0	18	7	2.1
	20	10	5.0	3.0	25	10	3
	25	15	8.5	5.0	35	14	4.2
	32	30	14	10	49	21	6
	40	60	23	20	68	30	8.2
	50	115	35	35	93	42	11.5
	63	150	50	50	130	60	16

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

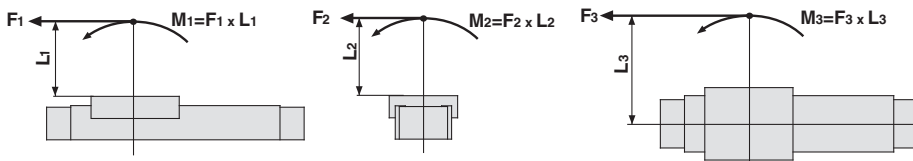
### Maximum Allowable Moment

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

### Load mass (kg)



### Moment (N·m)



### <Calculation of guide load factor>

1. Maximum allowable load (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  $\bar{v}_a$  (average speed) for (1) and (2), and  $v$  (collision speed  $v = 1.4\bar{v}_a$ ) for (3). Calculate  $m_{max}$  for (1) from the maximum allowable load graph ( $m_1, m_2, m_3$ ) and  $M_{max}$  for (2) and (3) from the maximum allowable moment graph ( $M_1, M_2, M_3$ ).

$$\text{Sum of guide load factors } \Sigma\alpha = \frac{\text{Load mass [m]}}{\text{Maximum allowable load [m}_{max}\text{]}} + \frac{\text{Static moment [M]}^{(1)}}{\text{Allowable static moment [M}_{max}\text{]}} + \frac{\text{Dynamic moment [ME]}^{(2)}}{\text{Allowable dynamic moment [ME}_{max}\text{]}} \leq 1$$

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 workpiece, multiple moments may occur. When this happens, the sum of the load factors ( $\Sigma\alpha$ ) is the total of all such moments.

### 2. Reference formula [Dynamic moment at impact]

Use the following formulae to calculate dynamic moment when taking stopper impact into consideration.

- m:** Load mass (kg)
- F:** Load (N)
- F<sub>E</sub>:** Load equivalent to impact (at impact with stopper) (N)
- $\bar{v}_a$ :** Average speed (mm/s)
- M:** Static moment (N·m)
- $v$ :** Collision speed (mm/s)
- L<sub>1</sub>:** Distance to the load's centre of gravity (m)
- M<sub>E</sub>:** Dynamic moment (N·m)
- $\delta$ :** Damper coefficient      At collision:  $v = 1.4\bar{v}_a$
- With rubber bumper = 4/100
- (MY1B10, MY1H10)
- With air cushion = 1/100
- With shock absorber = 1/100
- g:** Gravitational acceleration (9.8 m/s<sup>2</sup>)

$$v = 1.4\bar{v}_a \text{ (mm/s)} \quad F_E = 1.4\bar{v}_a \cdot \delta \cdot m \cdot g \quad (\text{Note 4})$$

$$\therefore M_E = \frac{1}{3} \cdot F_E \cdot L_1 = 4.57\bar{v}_a \delta m L_1 \text{ (N·m)} \quad (\text{Note 5})$$

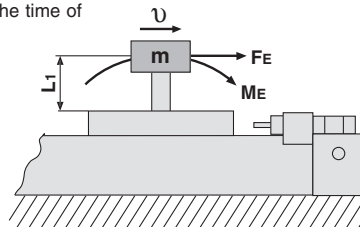
Note 4)  $1.4\bar{v}_a\delta$  is a dimensionless coefficient for calculating impact force.

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. For detailed selection procedures, refer to pages 56 and 57.

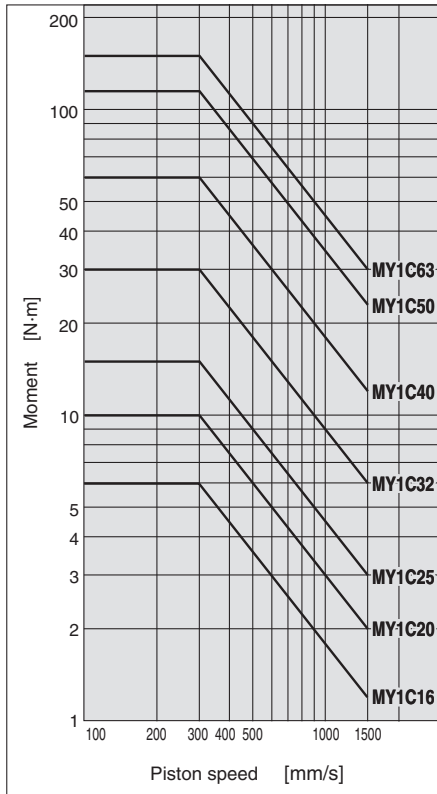
### Maximum Load Mass

Select the load 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.

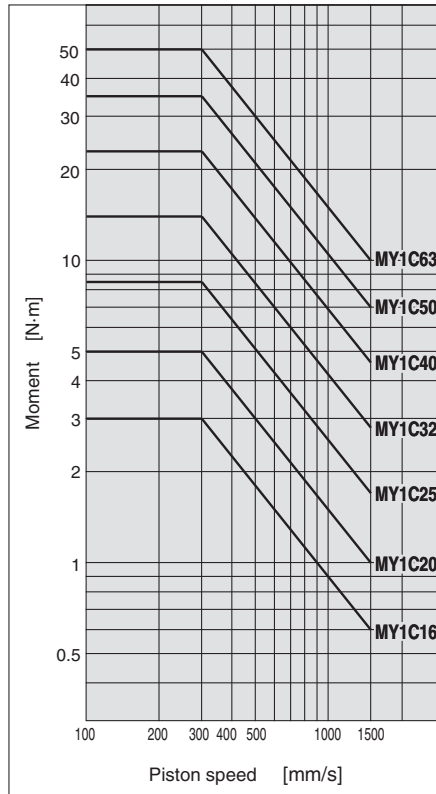




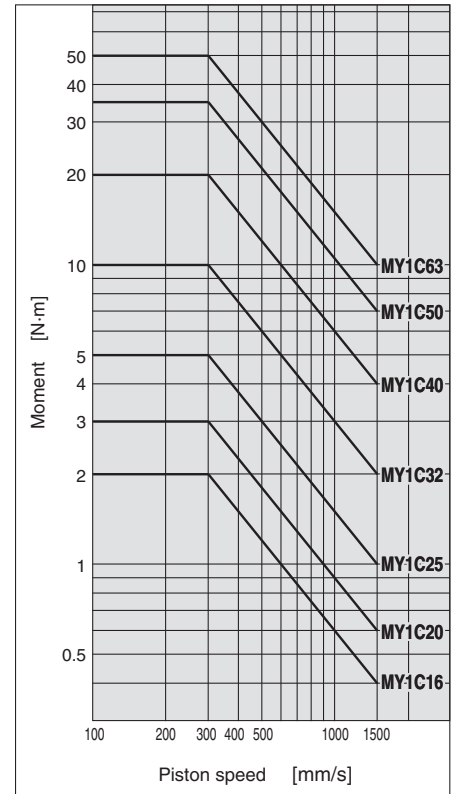
**MY1C/M<sub>1</sub>**



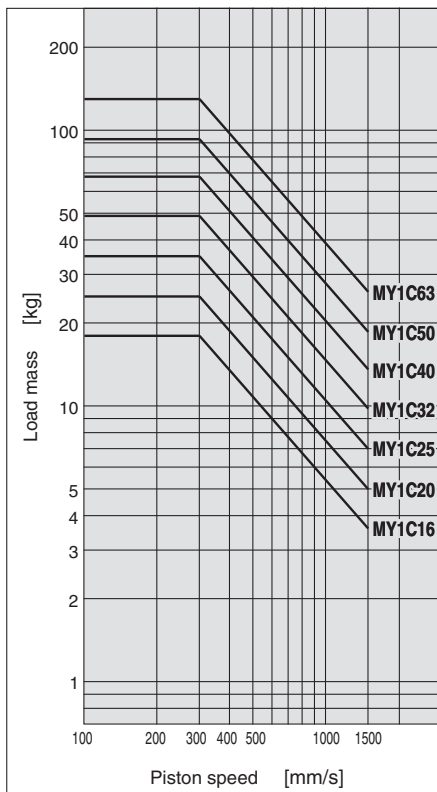
**MY1C/M<sub>2</sub>**



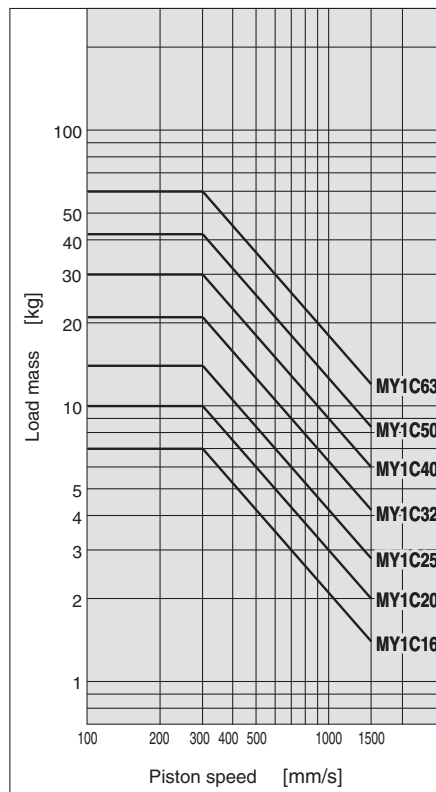
**MY1C/M<sub>3</sub>**



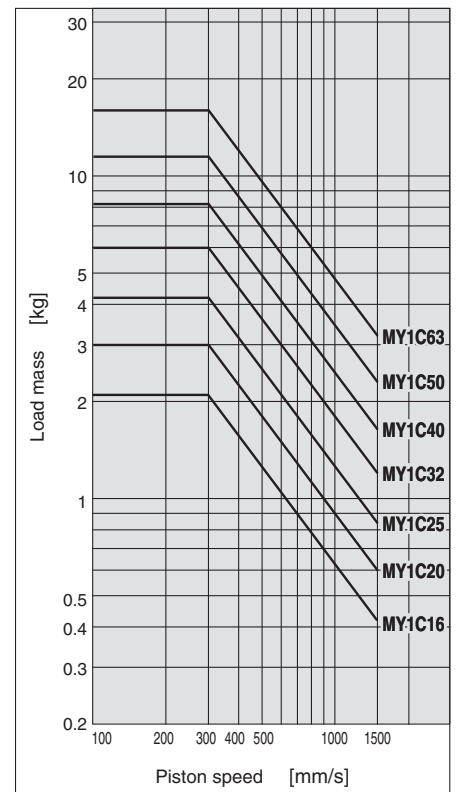
**MY1C/m<sub>1</sub>**



**MY1C/m<sub>2</sub>**



**MY1C/m<sub>3</sub>**



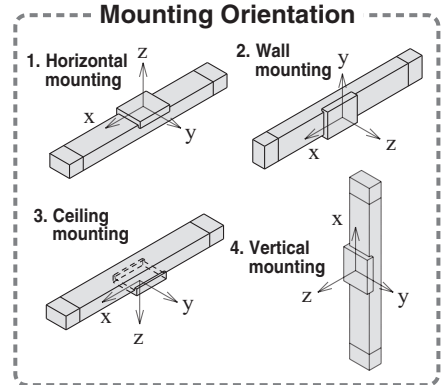
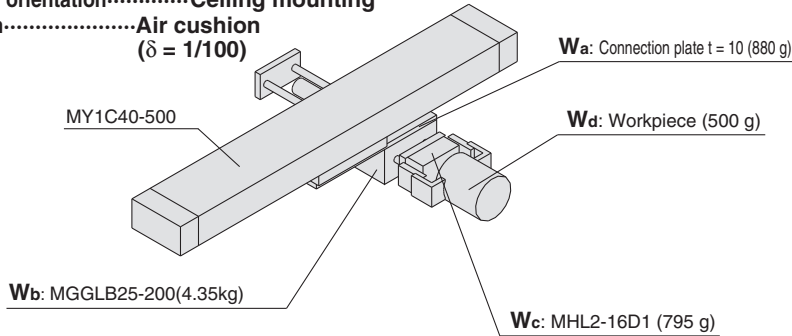
# Series MY1C Model Selection

Following are the steps for selecting the most suitable Series MY1C to your application.

## Calculation of Guide Load Factor

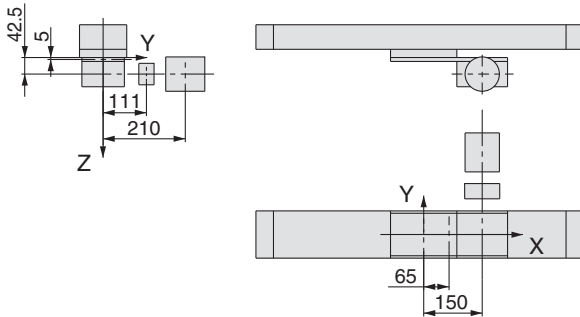
### 1. Operating Conditions

Cylinder..... MY1C40-500  
Average operating speed  $v_a$  ... 300 mm/s  
Mounting orientation..... Ceiling mounting  
Cushion..... Air cushion  
( $\delta = 1/100$ )



For actual examples of calculation for each orientation, refer to the pages above.

### 2. Load Blocking



### Mass and Centre of Gravity for Each Workpiece

Workpiece no. $W_n$	Mass $m_n$	Centre of gravity		
		X-axis $X_n$	Y-axis $Y_n$	Z-axis $Z_n$
<b>Wa</b>	0.88 kg	65 mm	0 mm	5 mm
<b>Wb</b>	4.35 kg	150 mm	0 mm	42.5 mm
<b>Wc</b>	0.795 kg	150 mm	111 mm	42.5 mm
<b>Wd</b>	0.5 kg	150 mm	210 mm	42.5 mm

$n=a, b, c, d$

### 3. Composite Centre of Gravity Calculation

$$m_2 = \sum m_n$$

$$= 0.88 + 4.35 + 0.795 + 0.5 = \mathbf{6.525 \text{ kg}}$$

$$X = \frac{1}{m_2} \times \sum (m_n \times x_n)$$

$$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) = \mathbf{138.5 \text{ mm}}$$

$$Y = \frac{1}{m_2} \times \sum (m_n \times y_n)$$

$$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) = \mathbf{29.6 \text{ mm}}$$

$$Z = \frac{1}{m_2} \times \sum (m_n \times z_n)$$

$$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) = \mathbf{37.4 \text{ mm}}$$

### 4. Calculation of Load Factor for Static Load

$m_2$ : Mass

$m_2 \text{ max}$  (from (1) of graph MY1C/ $m_2$ ) = 30 (kg).....

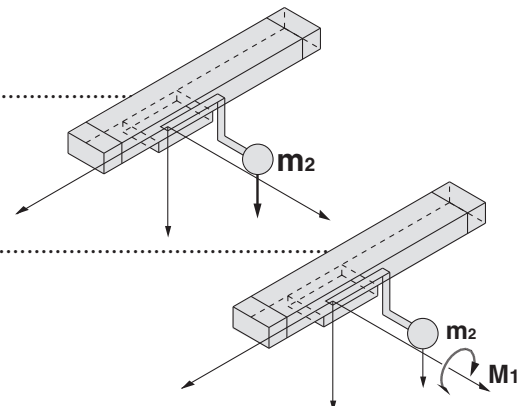
$$\text{Load factor } \alpha_1 = m_2 / m_2 \text{ max} = 6.525 / 30 = \mathbf{0.22}$$

$M_1$ : Moment

$M_1 \text{ max}$  (from (2) of graph MY1C/ $M_1$ ) = 60 (N·m).....

$$M_1 = m_2 \times g \times X = 6.525 \times 9.8 \times 138.5 \times 10^{-3} = 8.86 \text{ (N·m)}$$

$$\text{Load factor } \alpha_2 = M_1 / M_1 \text{ max} = 8.86 / 60 = \mathbf{0.15}$$

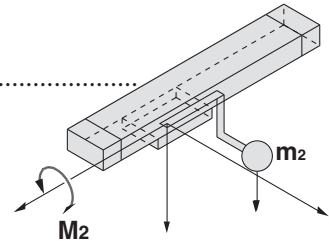


**M<sub>2</sub>**: Moment

**M<sub>2</sub> max** (from (3) of graph MY1C/M<sub>2</sub>) = 23.0 (N·m).....

**M<sub>2</sub>** = **m<sub>2</sub>** × **g** × **Y** = 6.525 × 9.8 × 29.6 × 10<sup>-3</sup> = 1.89 (N·m)

Load factor **α<sub>3</sub>** = **M<sub>2</sub>/M<sub>2</sub> max** = 1.89/23.0 = **0.08**



**5. Calculation of Load Factor for Dynamic Moment**

**Equivalent load F<sub>E</sub> at impact**

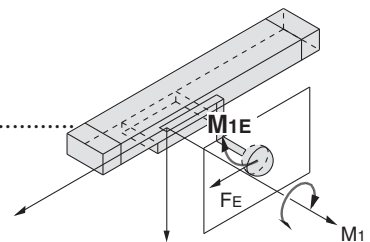
**F<sub>E</sub>** = 1.4v<sub>a</sub> × δ × m × g = 1.4 × 300 ×  $\frac{1}{100}$  × 6.525 × 9.8 = 268.6 (N)

**M<sub>1E</sub>**: Moment

**M<sub>1E</sub> max** (from (4) of graph MY1C/M<sub>1</sub> where 1.4v<sub>a</sub> = 420 mm/s) = 42.9 (N·m).....

**M<sub>1E</sub>** =  $\frac{1}{3}$  × **F<sub>E</sub>** × **Z** =  $\frac{1}{3}$  × 268.6 × 37.4 × 10<sup>-3</sup> = 3.35 (N·m)

Load factor **α<sub>4</sub>** = **M<sub>1E</sub>/M<sub>1E</sub> max** = 3.35/42.9 = **0.08**

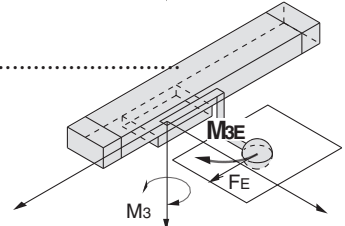


**M<sub>3E</sub>**: Moment

**M<sub>3E</sub> max** (from (5) of graph MY1C/M<sub>3</sub> where 1.4v<sub>a</sub> = 420 mm/s) = 14.3 (N·m).....

**M<sub>3E</sub>** =  $\frac{1}{3}$  × **F<sub>E</sub>** × **Y** =  $\frac{1}{3}$  × 268.6 × 29.6 × 10<sup>-3</sup> = 2.65 (N·m)

Load factor **α<sub>5</sub>** = **M<sub>3E</sub>/M<sub>3E</sub> max** = 2.65/14.3 = **0.19**



**6. Sum and Examination of Guide Load Factors**

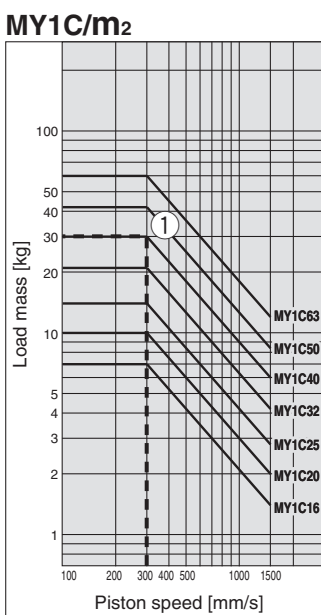
$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.72 \leq 1$

The above calculation is within the allowable value, and therefore the selected model can be used.

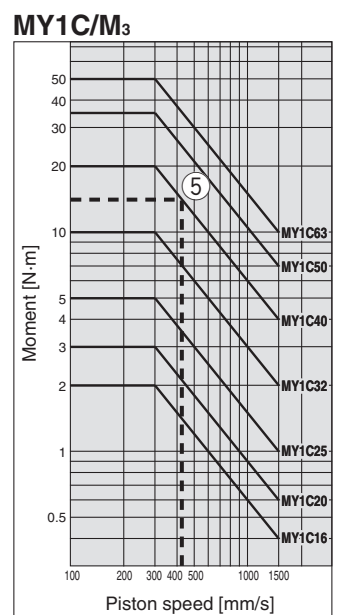
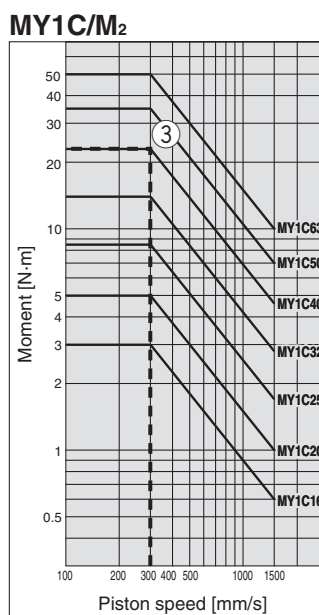
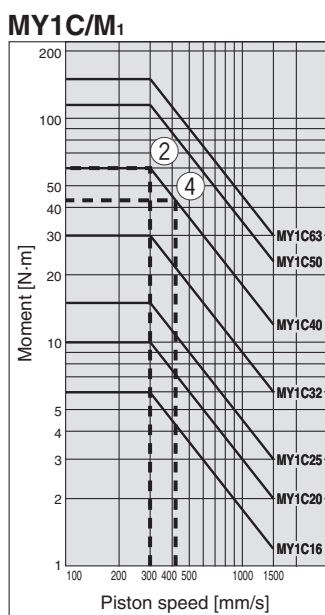
Select a shock absorber separately.

In an actual calculation, when the total sum of guide load factors α in the formula above is more than 1, consider either decreasing the speed, increasing the bore size, or changing the product series. This calculation can be easily made using the "SMC Pneumatics CAD System".

**Load Mass**



**Allowable Moment**



# Mechanically Jointed Rodless Cylinder Cam Follower Guide Type

## Series MY1C

Ø 16, Ø 20, Ø 25, Ø 32, Ø 40, Ø 50, Ø 63

### How to Order

Cam follower guide type

MY1C 25 [ ] [ ] - 300 [ ] - M9BW [ ] - [ ]

Cam follower guide type

Bore size

16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm

Port thread type

Symbol	Type	Bore size
—	M thread	Ø 16, Ø 20
	Rc	Ø 25, Ø 32,
TN	NPT	Ø 40, Ø 50,
TF	G	Ø 63

Piping

—	Standard type
G	Centralised piping type

Cylinder stroke [mm]

Bore size [mm]	Standard stroke [ $\mu$ m]*	Maximum manufacturable stroke [mm]
16	100, 200, 300, 400, 500, 600, 700	3000
20, 25, 32 40, 50, 63	800, 900, 1000, 1200, 1400, 1600 1800, 2000	5000

\* The stroke can be manufactured up to the maximum stroke from 1 mm stroke in 1 mm increments. However, when the stroke is 49 mm or less, the air cushion capability lowers and multiple auto switches cannot be mounted. Pay special attention to this point. Also when exceeding a 2000 mm stroke, specify "-XB11" at the end of the model number. For details, refer to the "Made to Order Specifications"

Made to Order  
Refer to page 59 for details.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

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

Applicable auto switches vary depending on the bore size. Select an applicable one referring to the table below.

Stroke adjustment unit symbol

Refer to "Stroke adjustment unit" on page 59.

### Applicable Auto Switches/Refer to pages 107 to 117 for further information on auto switches.

Type	Special function	Electrical entry	Indicator/light	Wiring (Output)	Load voltage		Auto switch model				Lead wire length (m)				Pre-wired connector	Applicable load			
					DC	AC	Perpendicular		In-line		0.5 (—)	1 (M)	3 (L)	5 (Z)					
							Ø 16, Ø 20	Ø 25 to Ø 63	Ø 16, Ø 20	Ø 25 to Ø 63									
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC			
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○					
				2-wire				M9BV	M9B	●	●	●	○	○			—		
				3-wire (NPN)				M9NWV	M9NW	●	●	●	○	○			IC circuit		
	Diagnostic indication (2-colour indication)			3-wire (PNP)	M9PWV	M9PW	●	●	●	○	○	—							
				2-wire	M9BWV	M9BW	○	○	●	○	○	—							
	Water resistant (2-colour indication)			3-wire (NPN)	M9NAV**	M9NA**	○	○	●	○	○	IC circuit							
				3-wire (PNP)	M9PAV**	M9PA**	○	○	●	○	○	—							
				2-wire	M9BAV**	M9BA**	○	○	●	○	○	—							
				—	—	—	—	—	—	—	—	—	—						
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	100 V or less	A96V	—	A96	Z76	●	—	●	—	—	IC circuit	—	
				2-wire				A93V	—	A93	Z73	●	—	●	●	—	—	—	Relay, PLC
								A90V	—	A90	Z80	●	—	●	—	—	—	—	IC circuit

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Consult with SMC regarding water resistant types with the above model numbers.

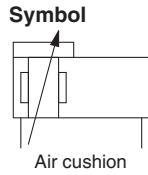
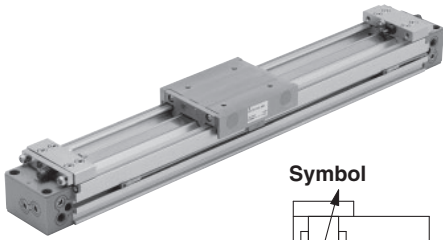
\* Lead wire length symbols: 0.5 m ..... — (Example) M9NV  
1 m ..... M (Example) M9NVM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NZ

\* Solid state auto switches marked with "○" are produced upon receipt of order.  
\* Separate switch spacers (BMG2-012) are required to retrofit auto switches (M9 type) on cylinders Ø 25 to Ø 63.

\* There are other applicable auto switches than listed above. For details, refer to page 117.

\* Auto switches are shipped together (not assembled). (Refer to pages 115 to 117 for the details of auto switch mounting.)

# Mechanically Jointed Rodless Cylinder Cam Follower Guide Type *Series MY1C*



**Made to Order: Specifications**  
(Refer to page 118 to 120 for details.)

Symbol	Specifications
-X168	Helical insert thread specifications
-XB11	Long stroke type
-XB22	Shock absorber soft type Series RJ type
-XC67	NBR rubber lining in dust seal band
-XC56	Knock pins holes
20-	Cooper-free

## Specifications

Bore size [mm]	16	20	25	32	40	50	63
Fluid	Air						
Action	Double acting						
Operating pressure range	0.15 to 0.8 MPa			0.1 to 0.8 MPa			
Proof pressure	1.2 MPa						
Ambient and fluid temperature	5 to 60 °C						
Cushion	Air cushion						
Lubrication	Non-lube						
Stroke length tolerance	1000 or less $^{+1.8}_0$ 1001 to 3000 $^{+2.8}_0$		2700 or less $^{+1.8}_0$ , 2701 to 5000 $^{+2.8}_0$				
Piping port size	Front/Side port	M5 x 0.8		Rc 1/8	Rc 1/4	Rc 3/8	
	Bottom port	Ø 4		Ø 6	Ø 8	Ø 10	

## Piston Speed

Bore size [mm]		16 to 63
Without stroke adjustment unit		100 to 1000 mm/s
Stroke adjustment unit	A unit	100 to 1000 mm/s <sup>(1)</sup>
	L unit and H unit	100 to 1500 mm/s <sup>(2)</sup>

Note 1) Be aware that when the stroke adjustment range is increased by manipulating the adjustment bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 62, the piston speed should be 100 to 200 mm per second.

Note 2) The piston speed is 100 to 1000 mm/s for centralised piping.

Note 3) Use at a speed within the absorption capacity range. Refer to page 62.

## Stroke Adjustment Unit Specifications

Bore size [mm]		16			20			25			32			40			50			63		
Unit symbol		A	L	H	A	L	H	A	L	H	A	L	H	A	L	H	A	L	H			
Configuration Shock absorber model	Without spacer	With adjustment bolt RB 0806 + with adjustment bolt	With adjustment bolt RB 0806 + with adjustment bolt	With adjustment bolt RB 1007 + with adjustment bolt	With adjustment bolt RB 1007 + with adjustment bolt	With adjustment bolt RB 1412 + with adjustment bolt	With adjustment bolt RB 1412 + with adjustment bolt	With adjustment bolt RB 2015 + with adjustment bolt	With adjustment bolt RB 1412 + with adjustment bolt	With adjustment bolt RB 2015 + with adjustment bolt	With adjustment bolt RB 1412 + with adjustment bolt	With adjustment bolt RB 2015 + with adjustment bolt	With adjustment bolt RB 2015 + with adjustment bolt	With adjustment bolt RB 2725 + with adjustment bolt	With adjustment bolt RB 2725 + with adjustment bolt	With adjustment bolt RB 2015 + with adjustment bolt	With adjustment bolt RB 2725 + with adjustment bolt	With adjustment bolt RB 2015 + with adjustment bolt	With adjustment bolt RB 2725 + with adjustment bolt			
	With short spacer	-5.6 to -11.2	-6 to -12	-11.5 to -23	-12 to -24	-16 to -32	-20 to -40	-25 to -50	-32 to -48	-40 to -60	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75			
	With long spacer	-11.2 to -16.8	-12 to -18	-23 to -34.5	-24 to -36	-32 to -48	-40 to -60	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75	-50 to -75			

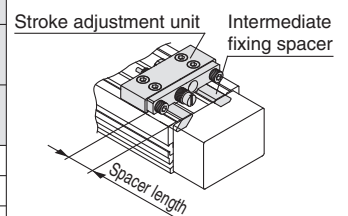
\* Stroke adjustment range is applicable for one side when mounted on a cylinder.

## Stroke Adjustment Unit Symbol

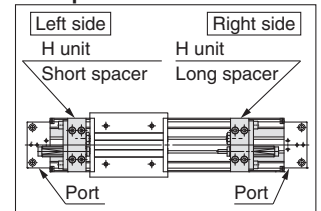
		Right side stroke adjustment unit												
		Without unit	A: With adjustment bolt		L: With low load shock absorber + Adjustment bolt		H: With high load shock absorber + Adjustment bolt		Without unit		Without unit			
Left side stroke adjustment unit	Without unit	—	SA	SA6	SA7	SL	SL6	SL7	SH	SH6	SH7	Without unit	Without unit	
	A: With adjustment bolt	AS	A	AA6	AA7	AL	AL6	AL7	AH	AH6	AH7	Without unit	Without unit	
		With short spacer	A6S	A6A	A6	A6A7	A6L	A6L6	A6L7	A6H	A6H6	A6H7	Without unit	Without unit
		With long spacer	A7S	A7A	A7A6	A7	A7L	A7L6	A7L7	A7H	A7H6	A7H7	Without unit	Without unit
	L: With low load shock absorber + Adjustment bolt	LS	LA	LA6	LA7	L	LL6	LL7	LH	LH6	LH7	Without unit	Without unit	
		With short spacer	L6S	L6A	L6A6	L6A7	L6L	L6	L6L7	L6H	L6H6	L6H7	Without unit	Without unit
		With long spacer	L7S	L7A	L7A6	L7A7	L7L	L7L6	L7	L7H	L7H6	L7H7	Without unit	Without unit
	H: With high load shock absorber + Adjustment bolt	HS	HA	HA6	HA7	HL	HL6	HL7	H	HH6	HH7	Without unit	Without unit	
		With short spacer	H6S	H6A	H6A6	H6A7	H6L	H6L6	H6L7	H6H	H6	H6H7	Without unit	Without unit
		With long spacer	H7S	H7A	H7A6	H7A7	H7L	H7L6	H7L7	H7H	H7H6	H7	Without unit	Without unit

\* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.

## Stroke adjustment unit mounting diagram



## Example of H6H7 attachment



## Shock Absorbers for L and H Units

Type	Stroke adjustment unit	Bore size [mm]						
		16	20	25	32	40	50	63
Standard (Shock absorber/RB series)	L	RB0806	RB1007	RB1412	RB2015			
	H	—	RB1007	RB1412	RB2015			RB2725
Shock absorber/soft type RJ series mounted (-XB22)	L	RJ0806H	RJ1007H	RJ1412H		—	—	—
	H	—	RJ1007H	RJ1412H	—	—	—	—

\* The shock absorber service life is different from that of the MY1C cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

\* Mounted shock absorber soft type RJ series (-XB22) is made to order specifications.

## 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. collision speed [mm/s]	1500					
Max. operating frequency [cycle/min]	80	70	45	25	10	
Spring force [N]	Extended	1.96	4.22	6.86	8.34	8.83
	Retracted	4.22	6.86	15.98	20.50	20.01
Operating temperature range [°C]	5 to 60					

\* The shock absorber service life is different from that of the MY1C cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

# Series MY1C

## Theoretical Output

Bore size [mm]	Piston area [mm <sup>2</sup> ]	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
20	314	62	94	125	157	188	219	251
25	490	98	147	196	245	294	343	392
32	804	161	241	322	402	483	563	643
40	1256	251	377	502	628	754	879	1005
50	1962	392	588	784	981	1177	1373	1569
63	3115	623	934	1246	1557	1869	2180	2492

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>)

## Weight

Bore size [mm]	Basic weight	Additional weight per each 50 mm of stroke	Weight of moving parts	Side support bracket weight (per set)	Stroke adjustment unit weight (per unit)		
					Type A and B	A unit weight	L unit weight
16	0.67	0.12	0.22	0.01	0.03	0.04	—
20	1.06	0.15	0.31	0.02	0.04	0.05	0.08
25	1.58	0.24	0.41	0.02	0.07	0.11	0.18
32	3.14	0.37	0.86	0.04	0.14	0.23	0.39
40	5.60	0.52	1.49	0.08	0.25	0.34	0.48
50	10.14	0.76	2.59	0.08	0.36	0.51	0.81
63	16.67	1.10	4.26	0.17	0.68	0.83	1.08

Calculation: (Example) MY1C25-300A

- Basic weight..... 1.58 kg
- Cylinder stroke..... 300 stroke
- Additional weight..... 0.24/50 stroke  
1.58 + 0.24 x 300/50 + 0.07 x 2 ≒ 3.16 kg
- Weight of A unit..... 0.07 kg

## Option

### Stroke Adjustment Unit Part No.

**MYM-A 25 L2 - 6N**

**Stroke adjustment unit**

**Bore size**

16	16 mm
20	20 mm
25	25 mm
32	32 mm
40	40 mm
50	50 mm
63	63 mm

**Unit no.**

Symbol	Stroke adjustment unit	Mounting position
A1	A unit	Left
A2	A unit	Right
L1	L unit	Left
L2	L unit	Right
H1	H unit	Left
H2	H unit	Right

**Intermediate fixing spacer**

—	Without spacer
6	Short spacer
7	Long spacer

**Spacer delivery style**

—	Unit installed
N	Spacer only

\* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.  
\* Spacers are shipped for a set of two.

### Component Parts

**MYM-A25L2 (Without spacer)**

**MYM-A25L2-6 (With short spacer)**

**MYM-A25L2-7 (With long spacer)**

**MYM-A25L2-6N (Short spacer only)**

**MYM-A25L2-7N (Long spacer only)**

### Side Support Part No.

Bore size [mm]	16	20	25	32	40	50	63
Side support A	MY-S16A	MY-S20A	MY-S25A	MY-S32A	MY-S40A	MY-S50A	MY-S63A
Side support B	MY-S16B	MY-S20B	MY-S25B	MY-S32B	MY-S40B	MY-S50B	MY-S63B

For details about dimensions, etc., refer to page 71.  
A set of side supports consists of a left support and a right support.





# Series MY1C

## Cushion Capacity

### Cushion Selection

#### <Air cushion>

Air cushions are a standard feature on mechanically jointed rodless cylinders.

The air cushion mechanism is incorporated to prevent excessive impact of the piston at the stroke end during high speed operation. The purpose of air cushion, thus, is not 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 adjustment 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 the cylinder stroke is 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 or below the L unit limit line.

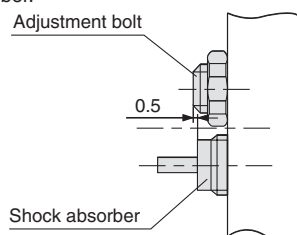
#### H unit

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

1. Refer to the figure below when using the adjustment bolt to perform stroke adjustment.

When the effective stroke of the shock absorber decreases as a result of stroke adjustment, the absorption capacity decreases dramatically. Secure the adjustment bolt at the position where it protrudes approximately 0.5 mm from the shock absorber.



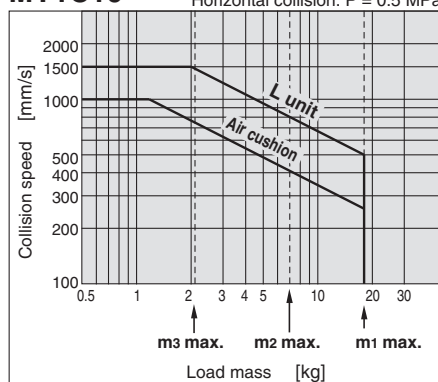
2. Do not use a shock absorber together with air cushion.

### Air Cushion Stroke [mm]

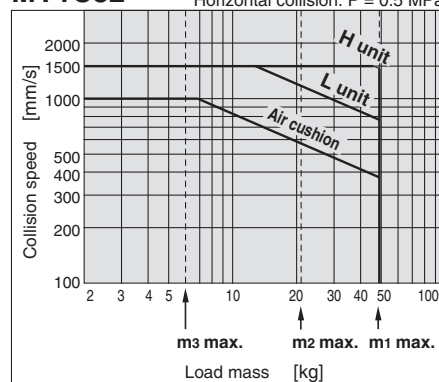
Bore size [mm]	Cushion stroke [mm]
16	12
20	15
25	15
32	19
40	24
50	30
63	37

### Absorption Capacity of Air Cushion and Stroke Adjustment Units

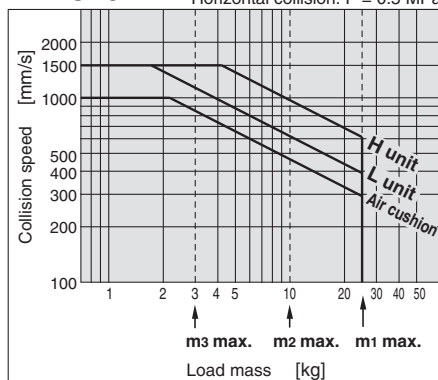
MY1C16 Horizontal collision: P = 0.5 MPa



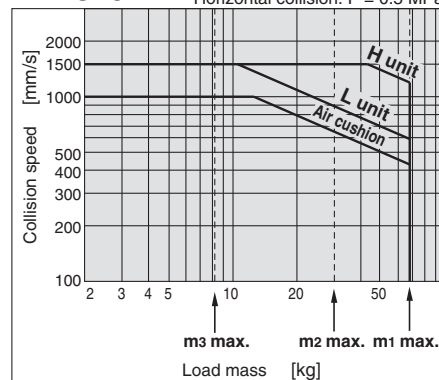
MY1C32 Horizontal collision: P = 0.5 MPa



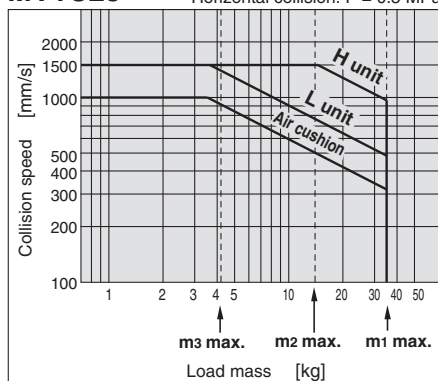
MY1C20 Horizontal collision: P = 0.5 MPa



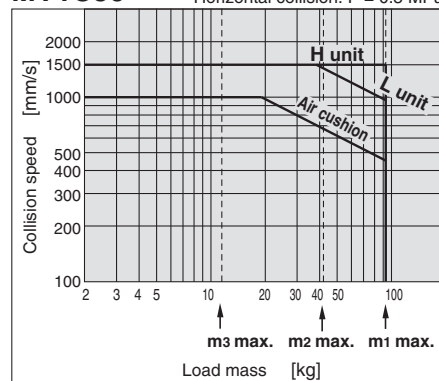
MY1C40 Horizontal collision: P = 0.5 MPa



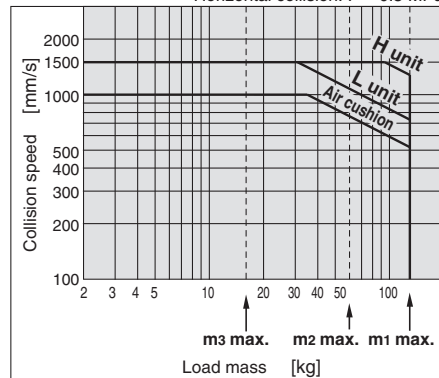
MY1C25 Horizontal collision: P = 0.5 MPa



MY1C50 Horizontal collision: P = 0.5 MPa



MY1C63 Horizontal collision: P = 0.5 MPa



**Tightening Torque for Stroke Adjustment Unit Holding Bolts** [N·m]

Bore size [mm]	Unit	Tightening torque
16	A	0.7
	L	
20	A	1.8
	L	
	H	
25	A	3.5
	L	
	H	
32	A	5.8
	L	
	H	
40	A	13.8
	L	
	H	
50	A	13.8
	L	
	H	
63	A	27.5
	L	
	H	

**Tightening Torque for Stroke Adjustment Unit Lock Plate Holding Bolts** [N·m]

Bore size [mm]	Unit	Tightening torque
25	L	1.2
	H	3.3
32	L	3.3
	H	10
40	L	3.3
	H	10

**Calculation of Absorbed Energy for Stroke Adjustment Unit with Shock Absorber** [N·m]

Type of impact	Horizontal collision	Vertical (Downward)	Vertical (Upward)
Kinetic energy $E_1$	$\frac{1}{2} m \cdot v^2$		
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 $E$	$E_1 + E_2$		

Symbol

$v$ : Speed of impact object (m/s)

$F$ : Cylinder thrust (N)

$s$ : Shock absorber stroke (m)

$m$ : Mass of impact object (kg)

$g$ : Gravitational acceleration (9.8 m/s<sup>2</sup>)

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

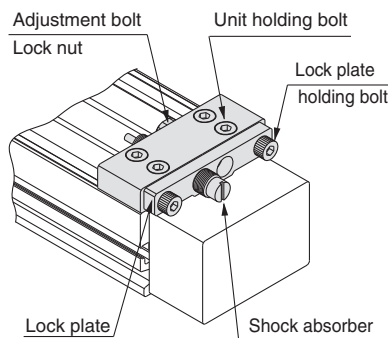
**⚠ Precautions**

**Specific products precautions**

**⚠ Caution**

Use caution not to get your hands caught in the unit.

- When using a product with stroke adjustment unit, the space between the slide table (slider) and the stroke adjusting unit becomes narrow at the stroke end, causing a danger of hands getting caught. Install a protective cover to prevent direct contact with the human body.



**<Fastening of unit>**

The unit can be secured by evenly tightening the four unit holding bolts.

**⚠ Caution**

Do not operate with the stroke adjustment unit fixed in an intermediate position.

When the stroke adjusting unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the time of an impact. In such cases, as a stroke adjustment unit with the spacer for intermediate securing is available, it is recommended to use it.

For other lengths, please consult with SMC (Refer to "Tightening Torque for Stroke Adjustment Unit Holding Bolts".)

**<Stroke adjustment with adjusting bolt>**

Loosen the adjusting bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Retighten the lock nut.

**<Stroke adjustment with shock absorber>**

Loosen the two lock plate holding bolts, turn the shock absorber and adjust the stroke. Then, uniformly tighten the lock plate holding bolts to secure the shock absorber.

Take care not to over-tighten the holding bolts. (Except  $\varnothing 16$ ,  $\varnothing 20$ ,  $\varnothing 50$ ,  $\varnothing 63$ )

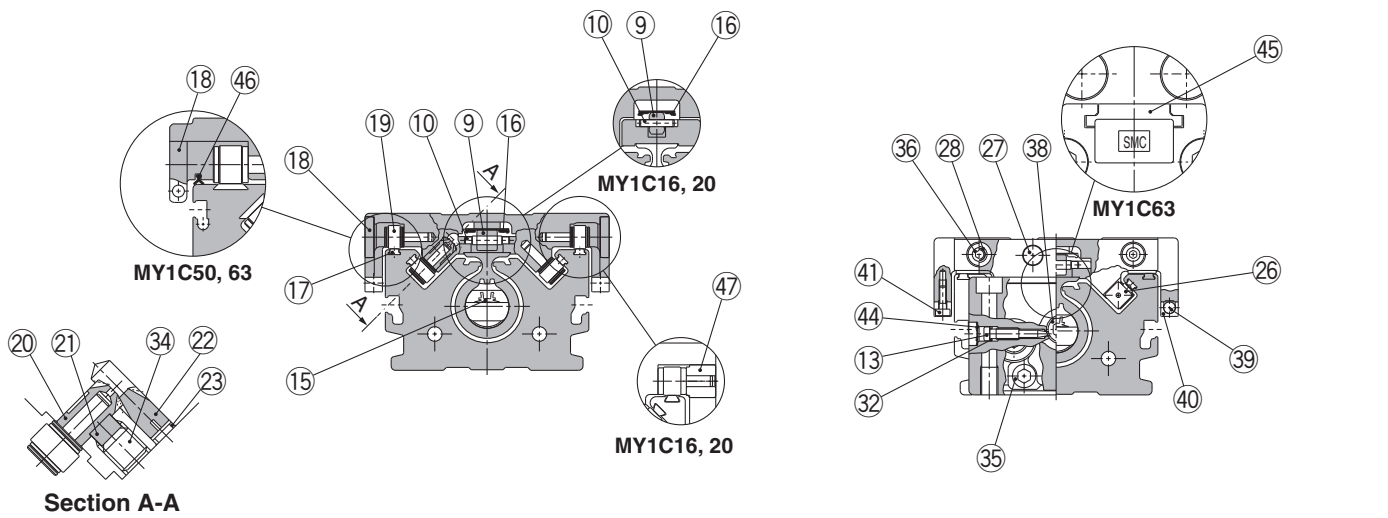
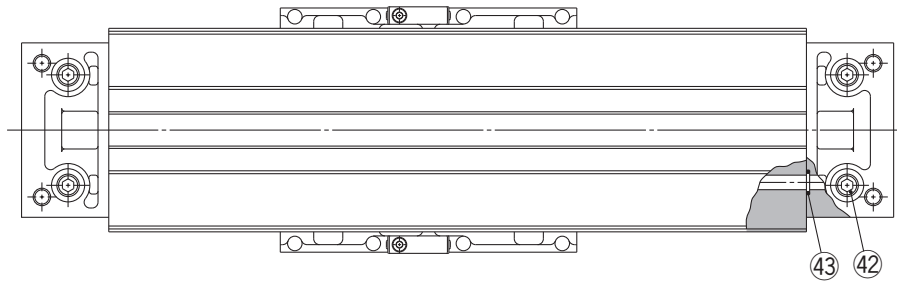
(Refer to "Tightening Torque for Stroke Adjusting Unit Lock Plate Holding Bolts".)

Note) Although the lock plate may slightly bend due to tightening of the lock plate holding bolt, this does not affect the shock absorber and locking function.

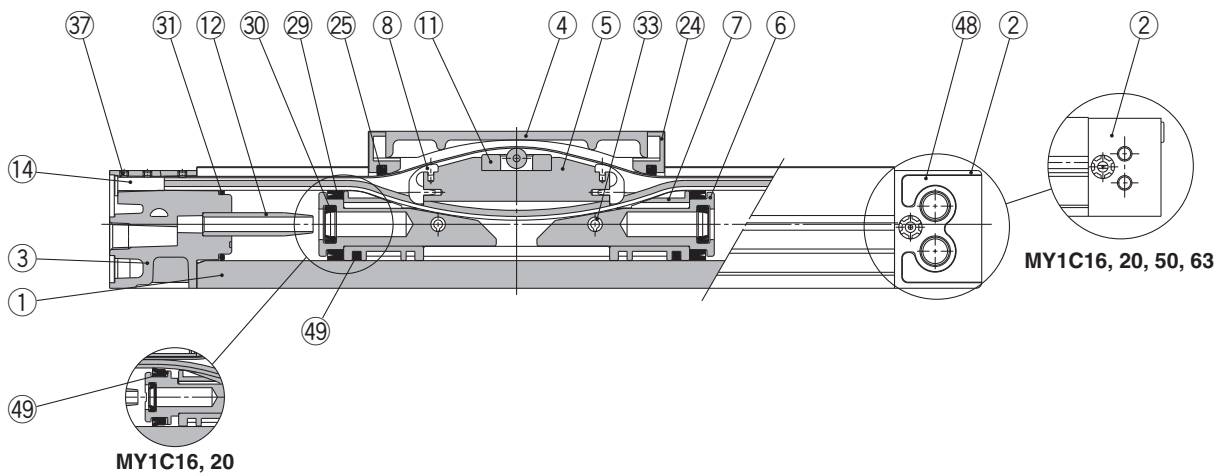
# Series MY1C

Construction: Ø 16 to Ø 63

MY1C16 to 63



Section A-A



## MY1C16 to 63

### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminium alloy	Hard anodised
2	Head cover WR	Aluminium alloy	Painted
3	Head cover WL	Aluminium alloy	Painted
4	Slide table	Aluminium alloy	Electroless nickel plated
5	Piston yoke	Aluminium alloy	Chromated
6	Piston	Aluminium alloy	Chromated
7	Wear ring	Special resin	
8	Belt separator	Special resin	
9	Guide roller	Special resin	
10	Guide roller shaft	Stainless steel	
11	Coupler	Sintered iron material	
12	Cushion ring	Aluminium alloy	Anodised
13	Cushion needle	Rolled steel	Nickel plated
14	Belt clamp	Special resin	
17	Rail	Hard steel wire	
18	Cam follower cap	Special resin	( $\varnothing$ 25 to $\varnothing$ 40)
19	Cam follower	—	
20	Eccentric gear	Stainless steel	
21	Gear bracket	Stainless steel	
22	Adjustment gear	Stainless steel	
23	Retaining ring	Stainless steel	

No.	Description	Material	Note
24	End Cover	Special resin	
26	Backup plate	Special resin	
27	Stopper	Carbon steel	Nickel plated
28	Spacer	Stainless steel	
33	Spring pin	Carbon tool steel	
34	Hexagon socket head set screw	Chromium molybdenum steel	Black zinc chromated
35	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
36	Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated
37	Hexagon socket head set screw	Chromium molybdenum steel	Black zinc chromated/Nickel plated
38	Hexagon socket head taper plug	Carbon steel	Nickel plated
39	Magnet		
40	Magnet holder	Special resin	
41	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
42	Hexagon socket head taper plug	Carbon steel	Nickel plated
44	Type CR retaining ring	Spring steel	
45	Head plate	Aluminium alloy	Hard anodised ( $\varnothing$ 63)
46	Side scraper	Special resin	( $\varnothing$ 50 to $\varnothing$ 63)
47	Bushing	Aluminium alloy	( $\varnothing$ 16 to $\varnothing$ 20)
48	Port cover	Special resin	( $\varnothing$ 25 to $\varnothing$ 40)
49	Lub-retainer	Special resin	

### Replacement Part: Seal Kit

No.	Description	Qty.	MY1C16	MY1C20	MY1C25	MY1C32	MY1C40	MY1C50	MY1C63
15	Seal belt	1	MY16-16C-Stroke	MY20-16C-Stroke	MY25-16C-Stroke	MY32-16C-Stroke	MY40-16C-Stroke	MY50-16C-Stroke	MY63-16A-Stroke
16	Dust seal band	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
32	O-ring	2	KA00309 ( $\varnothing$ 4 x $\varnothing$ 1.8 x $\varnothing$ 1.1)	KA00311 ( $\varnothing$ 5.1 x $\varnothing$ 3 x $\varnothing$ 1.05)	KA00311 ( $\varnothing$ 5.1 x $\varnothing$ 3 x $\varnothing$ 1.05)	KA00320 ( $\varnothing$ 7.15 x $\varnothing$ 3.75 x $\varnothing$ 1.7)	KA00402 ( $\varnothing$ 8.3 x $\varnothing$ 4.5 x $\varnothing$ 1.9)	—	—
46	Side scraper	2	—	—	—	—	—	MYM50-15CK0502B	MYM63-15CK0503B
25	Scraper	2	MY1M16-PS	MY1M20-PS	MY1M25-PS	MY1M32-PS	MY1M40-PS	MY1M50-PS	MY1M63-PS
29	Piston seal	2							
30	Cushion seal	2							
31	Tube gasket	2							
43	O-ring	4							

\* Seal kit includes 25, 29, 30, 31 and 43. Order the seal kit based on each bore size.

\* Seal kit includes a grease pack (10 g).

When 15 and 16 are shipped independently, a grease pack is included. (10 g per 1000 strokes)

Order with the following part number when only the grease pack is needed.

**Grease pack part number: GR-S-010** (10 g), **GR-S-020** (20 g)

Note) Two kinds of dust seal bands are available. Verify the type to use, since the part number varies depending on the treatment of the hexagon socket head set screw 37.

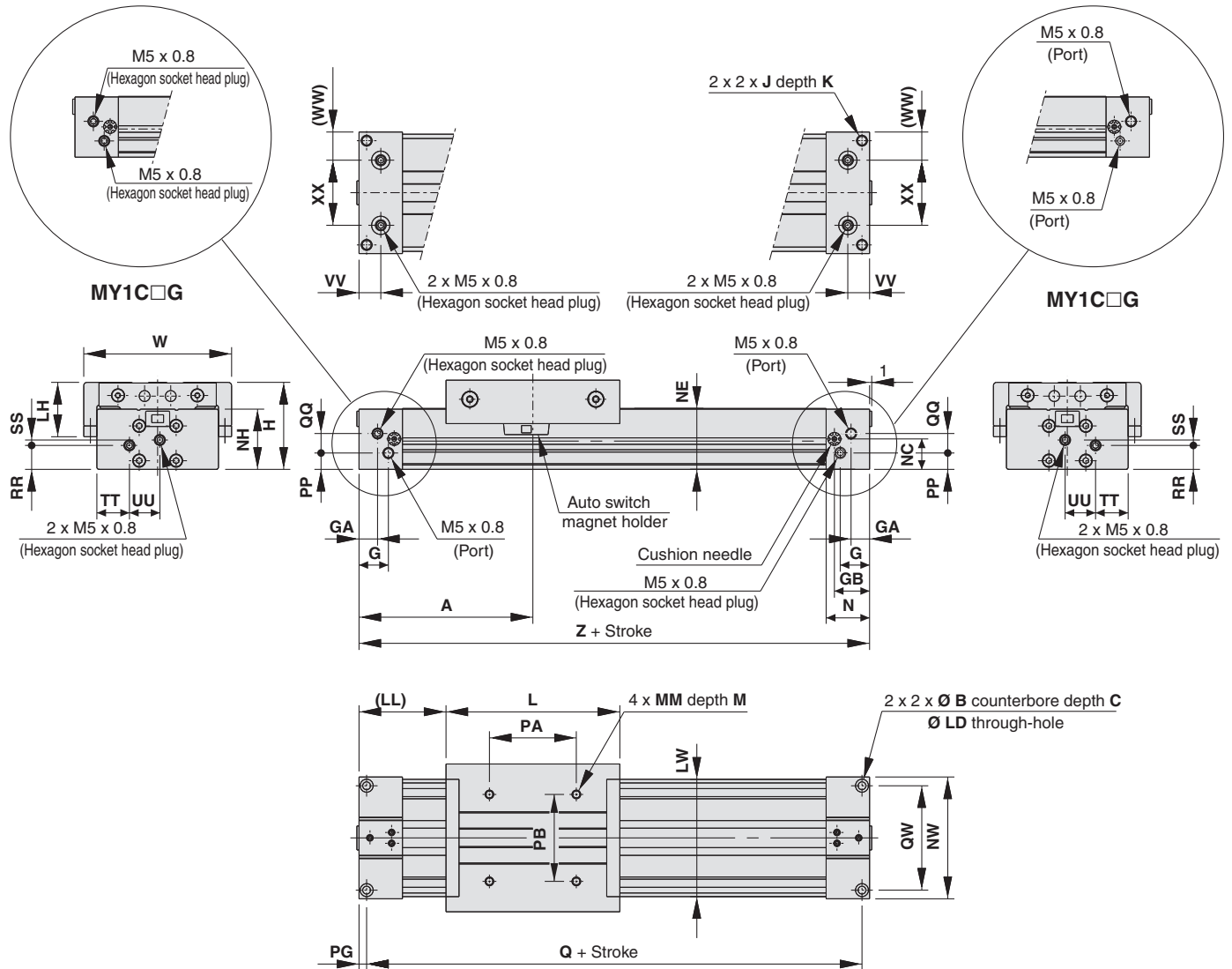
A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

# Series MY1C

## Standard Type/Centralised Piping Type $\varnothing 16, \varnothing 20$

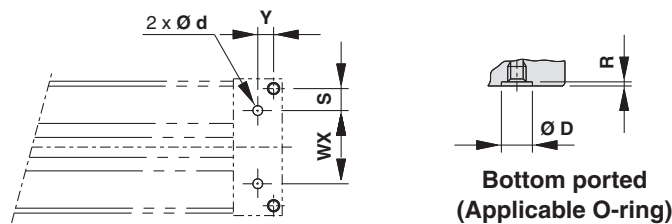
Refer to page 122 regarding centralised piping port variations.

### MY1C16□/20□ — Stroke



Model	A	B	C	G	GA	GB	H	J	K	L	LD	LH	LL	LW	M	MM	N	NC
MY1C16□	80	6	3.5	13.5	8.5	16.2	40	M5 x 0.8	10	80	3.6	22.5	40	54	6	M4 x 0.7	20	14
MY1C20□	100	7.5	4.5	12.5	12.5	20	46	M6 x 1	12	100	4.8	23	50	58	7.5	M5 x 0.8	25	17

Model	NE	NH	NW	PA	PB	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	W	WW	XX	Z
MY1C16□	28	27.7	56	40	40	3.5	7.5	153	9	48	11	2.5	15	14	10	68	13	30	160
MY1C20□	34	33.7	60	50	40	4.5	11.5	191	10	45	14.5	5	18	12	12.5	72	14	32	200



### Hole Sizes for Centralised Piping on the Bottom

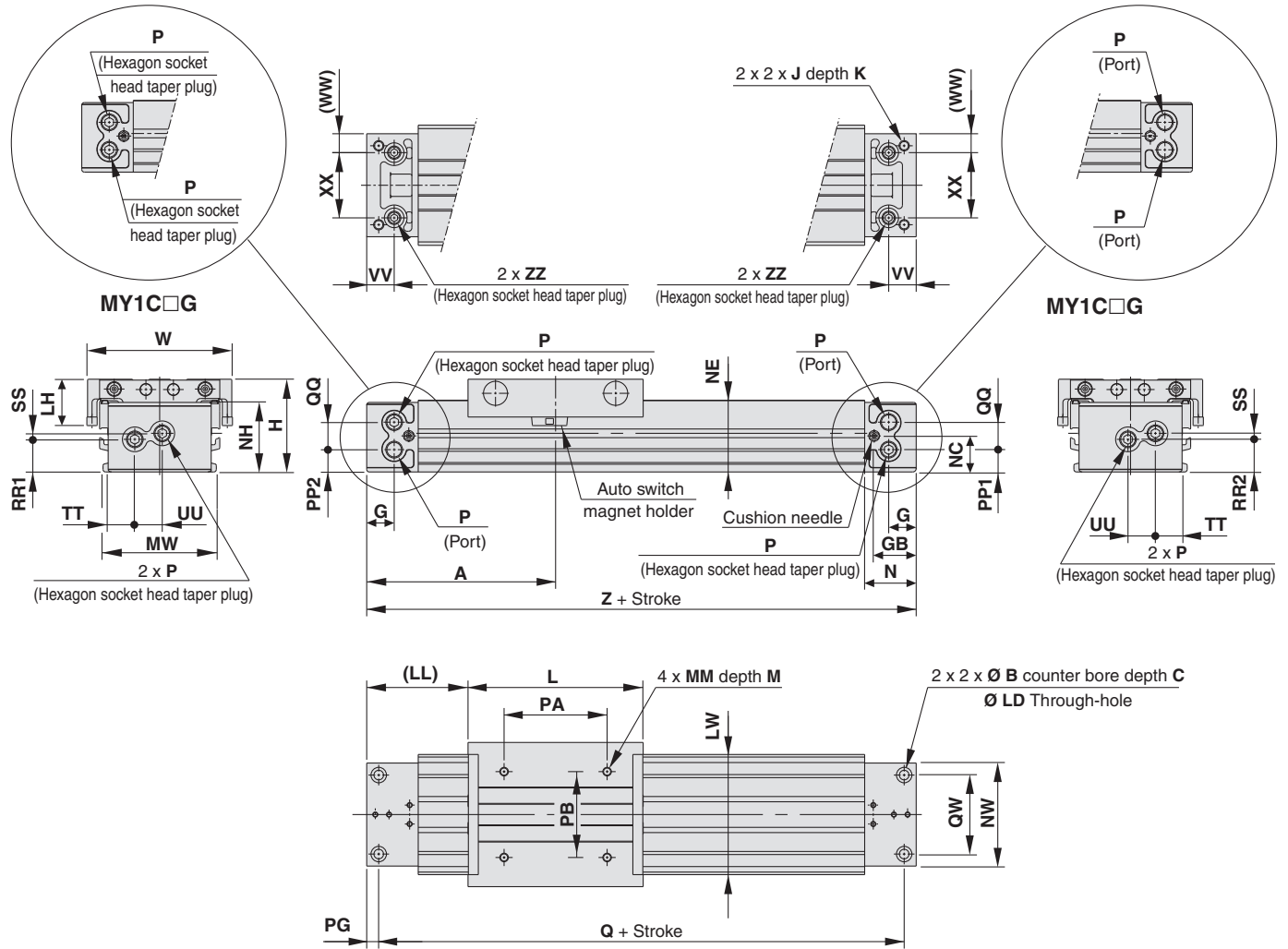
Model	WX	Y	S	d	D	R	Applicable O-ring
MY1C16□	30	6.5	9	4	8.4	1.1	C6
MY1C20□	32	8	6.5	4	8.4	1.1	

(Machine the mounting side to the dimensions below.)

# Mechanically Jointed Rodless Cylinder Cam Follower Guide Type **Series MY1C**

**Standard Type/Centralised Piping Type  $\varnothing 25$ ,  $\varnothing 32$ ,  $\varnothing 40$**  Refer to page 122 regarding centralised piping port variations.

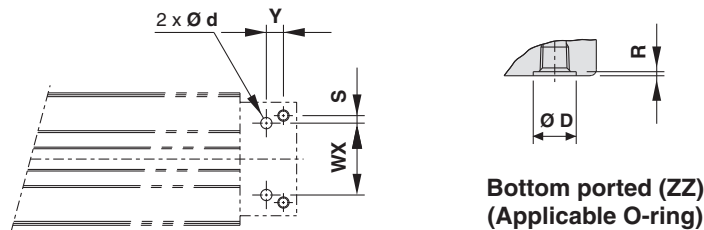
## MY1C25□/32□/40□ — Stroke



Model	A	B	C	G	GB	H	J	K	L	LD	LH	LL	LW	M	MM	MW	N	NC	NE	NH	NW	P	PA
MY1C25□	110	9	5.5	17	24.5	54	M6 x 1	9.5	102	5.6	27	59	70	10	M5 x 0.8	66	30	21	41.8	40.5	60	Rc 1/8	60
MY1C32□	140	11	6.5	19	30	68	M8 x 1.25	16	132	6.8	35	74	88	13	M6 x 1	80	37	26	52.3	50	74	Rc 1/8	80
MY1C40□	170	14	8.5	23	36.5	84	M10 x 1.5	15	162	8.6	38	89	104	13	M6 x 1	96	45	32	65.3	63.5	94	Rc 1/4	100

"P" indicates cylinder supply ports.

Model	PB	PG	PP1	PP2	Q	QQ	QW	RR1	RR2	SS	TT	UU	VV	W	WW	XX	Z	ZZ
MY1C25□	50	7	12.7	12.7	206	15.5	46	18.9	17.9	4.1	15.5	16	16	84	11	38	220	Rc 1/16
MY1C32□	60	8	15.5	18.5	264	16	60	22	24	4	21	16	19	102	13	48	280	Rc 1/16
MY1C40□	80	9	17.5	20	322	26	72	25.5	29	9	26	21	23	118	20	54	340	Rc 1/8



### Hole Size for Centralised Piping on the Bottom

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1C25□	38	9	4	6	11.4	1.1	C9
MY1C32□	48	11	6	6	11.4	1.1	
MY1C40□	54	14	9	8	13.4	1.1	

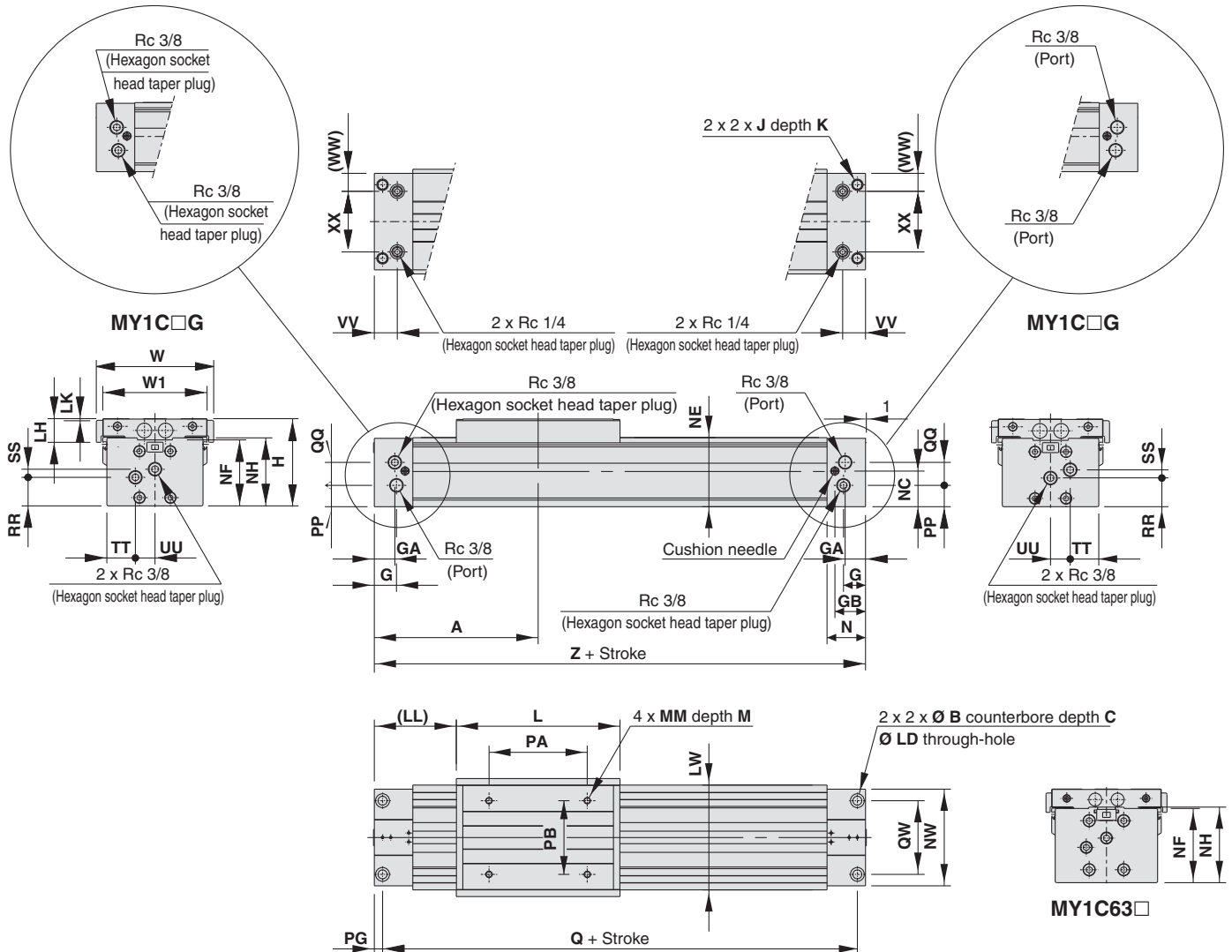
(Machine the mounting side to the dimensions below.)

# Series MY1C

## Standard Type/Centralised Piping Type $\varnothing 50, \varnothing 63$

Refer to page 122 regarding centralised piping port variations.

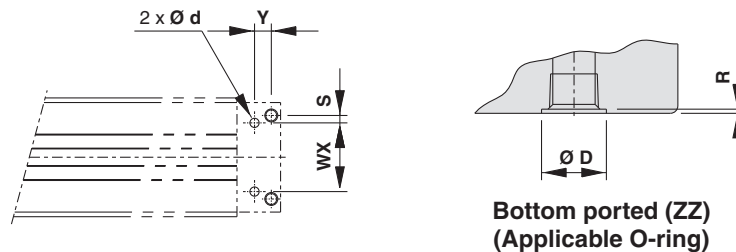
### MY1C50□/63□ — Stroke



Model	A	B	C	G	GA	GB	H	J	K	L	LD	LH	LK	LL	LW	M	MM	N	NC	NE
MY1C50□	200	17	10.5	27	25	37.5	107	M14 x 2	28	200	11	29	2	100	128	15	M8 x 1.25	47	43.5	84.5
MY1C63□	230	19	12.5	29.5	27.5	39.5	130	M16 x 2	32	230	13.5	32.5	5.5	115	152	16	M10 x 1.5	50	60	104

Model	NF	NH	NW	PA	PB	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	W	W1	WW	XX	Z
MY1C50□	81	83.5	118	120	90	10	26	380	28	90	35	10	35	24	28	144	128	22	74	400
MY1C63□	103	105	142	140	110	12	42	436	30	110	49	13	43	28	30	168	152	25	92	460

[mm]



### Hole Size for Centralised Piping on the Bottom

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1C50□	74	18	8	10	17.5	1.1	C15
MY1C63□	92	18	9	10	17.5	1.1	

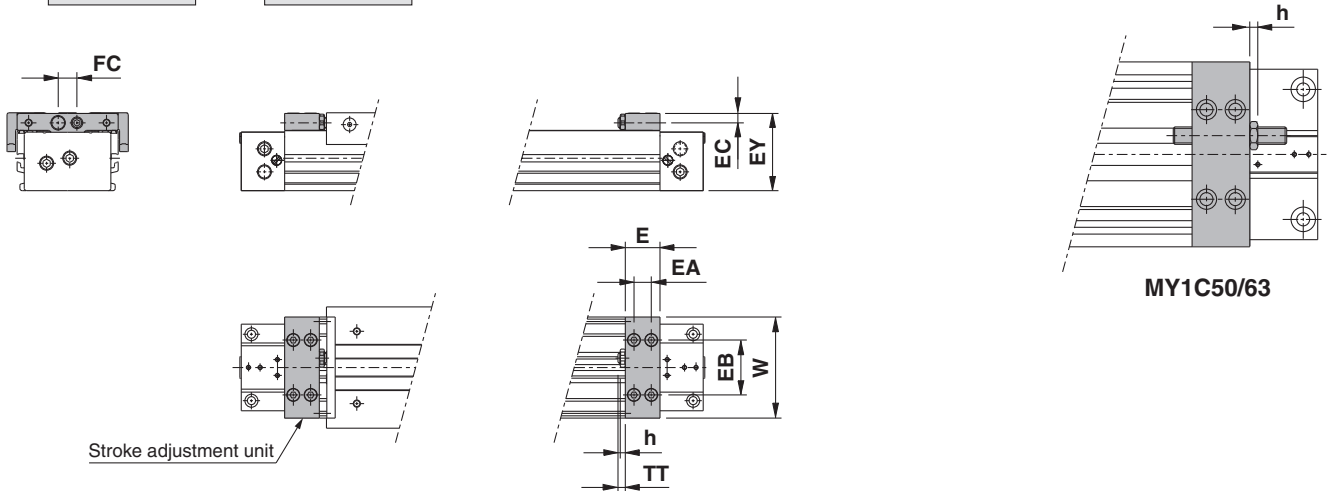
(Machine the mounting side to the dimensions above.)



### Stroke Adjustment Unit

With adjustment bolt

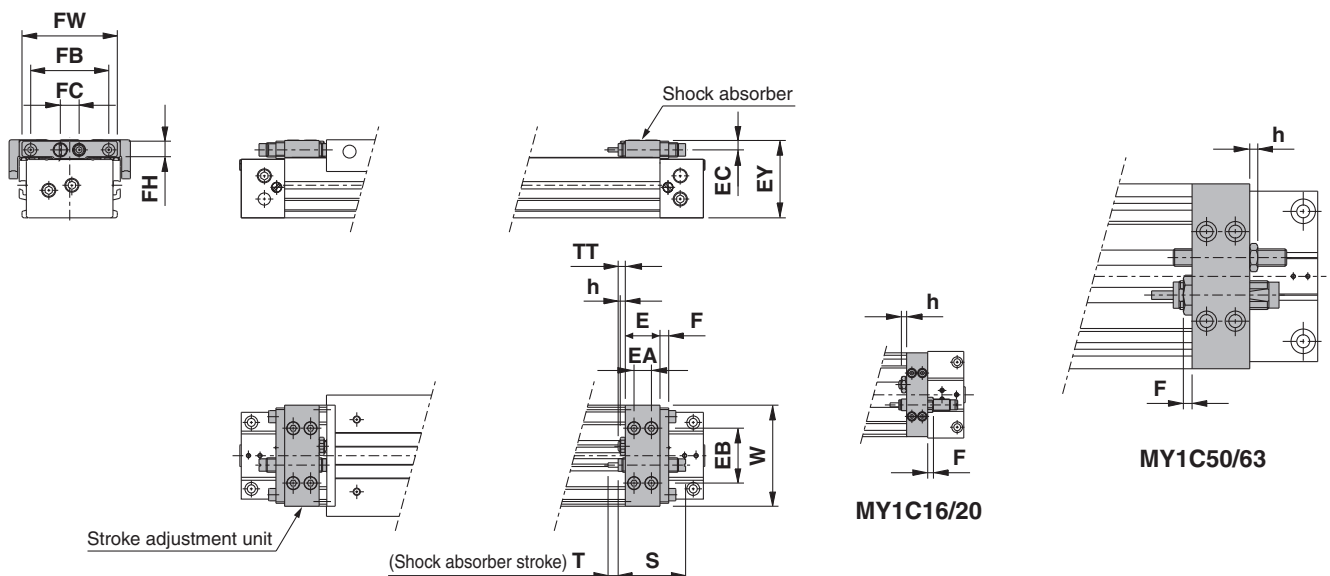
MY1C Bore size □ — Stroke A



Applicable bore size	E	EA	EB	EC	EY	FC	h	TT	W
MY1C16	14.6	7	30	5.8	39.5	14	3.6	5.4 (Max. 11)	58
MY1C20	20	10	32	5.8	45.5	14	3.6	5 (Max. 11)	58
MY1C25	24	12	38	6.5	53.5	13	3.5	5 (Max. 16.5)	70
MY1C32	29	14	50	8.5	67	17	4.5	8 (Max. 20)	88
MY1C40	35	17	57	10	83	17	4.5	9 (Max. 25)	104
MY1C50	40	20	66	14	106	26	5.5	13 (Max. 33)	128
MY1C63	52	26	77	14	129	31	5.5	13 (Max. 38)	152

With low load shock absorber + Adjustment bolt

MY1C Bore size □ — Stroke L



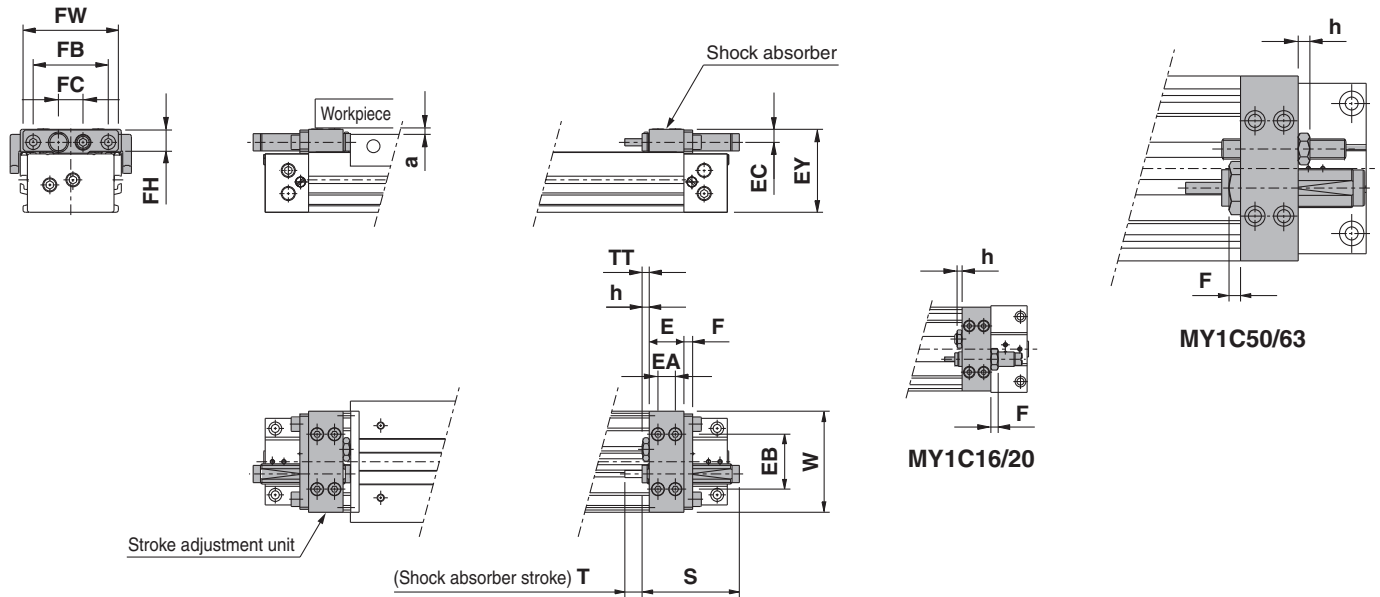
Applicable bore size	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model
MY1C16	14.6	7	30	5.8	39.5	4	—	14	—	—	3.6	40.8	6	5.4 (Max. 11)	58	RB0806
MY1C20	20	10	32	5.8	45.5	4	—	14	—	—	3.6	40.8	6	5 (Max. 11)	58	RB0806
MY1C25	24	12	38	6.5	53.5	6	54	13	13	66	3.5	46.7	7	5 (Max. 16.5)	70	RB1007
MY1C32	29	14	50	8.5	67	6	67	17	16	80	4.5	67.3	12	8 (Max. 20)	88	RB1412
MY1C40	35	17	57	10	83	6	78	17	17.5	91	4.5	67.3	12	9 (Max. 25)	104	RB1412
MY1C50	40	20	66	14	106	6	—	26	—	—	5.5	73.2	15	13 (Max. 33)	128	RB2015
MY1C63	52	26	77	14	129	6	—	31	—	—	5.5	73.2	15	13 (Max. 38)	152	RB2015

# Series MY1C

## Stroke Adjustment Unit

With high load shock absorber + Adjustment bolt

MY1C Bore size □ — Stroke H

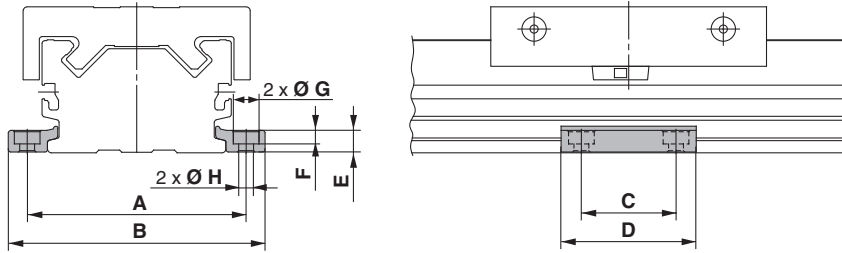


\* Since dimension EY of the H type unit is greater than the table top height (dimension H), when mounting a workpiece that exceeds the overall length (dimension L) of the slide table, allow a clearance of dimension "a" or larger on the workpiece side.

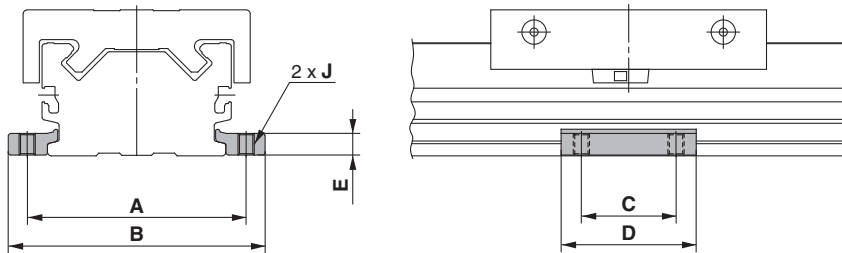
Applicable bore size	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model	a
MY1C20	20	10	32	7.7	50	5	—	14	—	—	3.5	46.7	7	5 (Max. 11)	58	RB1007	5
MY1C25	24	12	38	9	57.5	6	52	17	16	66	4.5	67.3	12	5 (Max. 16.5)	70	RB1412	4.5
MY1C32	29	14	50	11.5	73	8	67	22	22	82	5.5	73.2	15	8 (Max. 20)	88	RB2015	6
MY1C40	35	17	57	12	87	8	78	22	22	95	5.5	73.2	15	9 (Max. 25)	104	RB2015	4
MY1C50	40	20	66	18.5	115	8	—	30	—	—	11	99	25	13 (Max. 33)	128	RB2725	9
MY1C63	52	26	77	19	138.5	8	—	35	—	—	11	99	25	13 (Max. 38)	152	RB2725	9.5

## Side Support

### Side support A MY-S□A



### Side support B MY-S□B



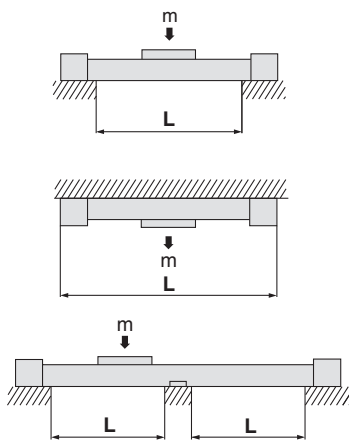
[mm]

Model	Applicable bore size	A	B	C	D	E	F	G	H	J
MY-S16 <sup>A</sup> <sub>B</sub>	MY1C16	61	71.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20 <sup>A</sup> <sub>B</sub>	MY1C20	67	79.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S25 <sup>A</sup> <sub>B</sub>	MY1C25	81	95	35	50	8	5	9.5	5.5	M6 x 1
MY-S32 <sup>A</sup> <sub>B</sub>	MY1C32	100	118	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S40 <sup>A</sup> <sub>B</sub>	MY1C40	120	142	55	80	14.8	8.5	14	9	M10 x 1.5
	MY1C50	142	164							
MY-S63 <sup>A</sup> <sub>B</sub>	MY1C63	172	202	70	100	18.3	10.5	17.5	11.5	M12 x 1.75

\* A set of side supports consists of a left support and a right support.

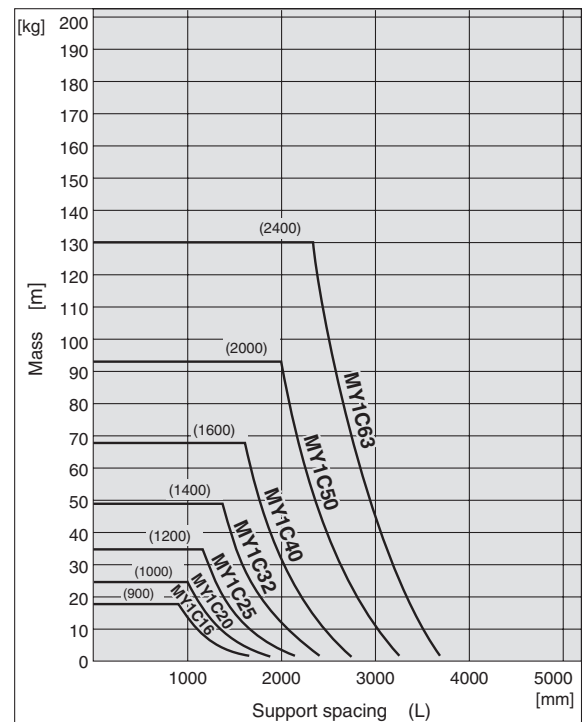
## Guide for Side Support Application

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load weight. In such a case, use a side support in the middle section. The spacing (L) of the support must be no more than the values shown in the graph on the right.



### ⚠ Caution

1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value is within the allowable limits shown in the graph.
2. Support brackets are not for mounting; use them solely for providing support.

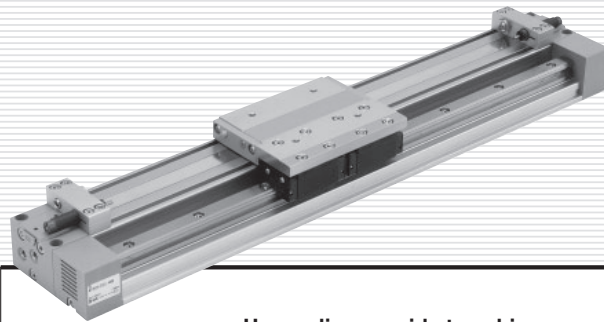




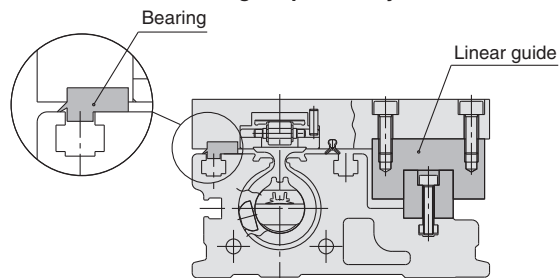
# Series MY1H

Linear Guide Type

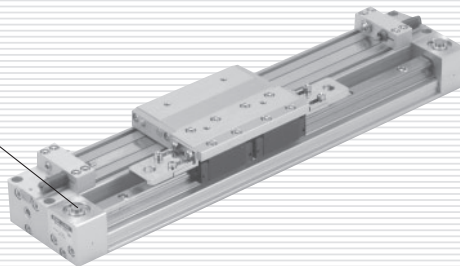
Ø 10, Ø 16, Ø 20



Uses a linear guide to achieve high repeatability



End lock type capable of holding a position at the stroke end (Except bore size Ø 10)



# Series MY1H Prior to Use

## Maximum Allowable Moment/Maximum Load Mass

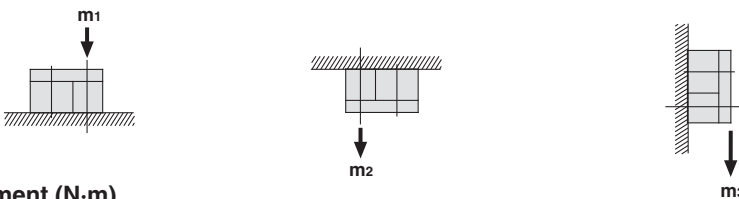
Model	Bore size [mm]	Maximum allowable moment (N·m)			Maximum load mass [kg]		
		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	m <sub>1</sub>	m <sub>2</sub>	m <sub>3</sub>
MY1H	10	0.8	1.1	0.8	6.1	6.1	6.1
	16	3.7	4.9	3.7	10.8	10.8	10.8
	20	11	16	11	17.6	17.6	17.6

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

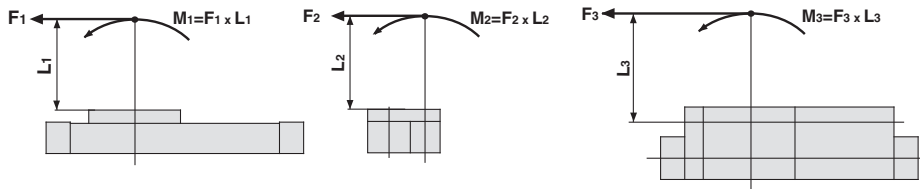
### Maximum Allowable Moment

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

### Load mass (kg)



### Moment (N·m)



### <Calculation of guide load factor>

1. Maximum allowable load (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  $v_a$  (average speed) for (1) and (2), and  $v$  (collision speed  $v = 1.4v_a$ ) for (3). Calculate  $m_{max}$  for (1) from the maximum allowable load graph ( $m_1, m_2, m_3$ ) and  $M_{max}$  for (2) and (3) from the maximum allowable moment graph ( $M_1, M_2, M_3$ ).

$$\text{Sum of guide load factors } \Sigma \alpha = \frac{\text{Load mass [m]}}{\text{Maximum allowable load [m}_{max}\text{]}} + \frac{\text{Static moment [M]}^{(1)}}{\text{Allowable static moment [M}_{max}\text{]}} + \frac{\text{Dynamic moment [M}_E\text{]}^{(2)}}{\text{Allowable dynamic moment [M}_{E,max}\text{]}} \leq 1$$

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 workpiece, multiple moments may occur. When this happens, the sum of the load factors ( $\Sigma \alpha$ ) is the total of all such moments.

### 2. Reference formula [Dynamic moment at impact]

Use the following formulae to calculate dynamic moment when taking stopper impact into consideration.

- m**: Load mass (kg)
- F**: Load (N)
- F<sub>E</sub>**: Load equivalent to impact (at impact with stopper) (N)
- v<sub>a</sub>**: Average speed (mm/s)
- M**: Static moment (N·m)
- v**: Collision speed (mm/s)
- L<sub>1</sub>**: Distance to the load's centre of gravity (m)
- M<sub>E</sub>**: Dynamic moment (N·m)
- δ**: Damper coefficient
  - With rubber bumper = 4/100 (MY1B10, MY1H10)
  - With air cushion = 1/100
  - With shock absorber = 1/100
- g**: Gravitational acceleration (9.8 m/s<sup>2</sup>)

$$v = 1.4v_a \text{ (mm/s)} \quad F_E = 1.4v_a \cdot \delta \cdot m \cdot g$$

$$\therefore M_E = \frac{1}{3} \cdot F_E \cdot L_1 = 4.57v_a \delta m L_1 \text{ (N·m)}$$

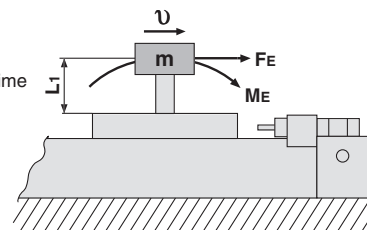
Note 4)  $1.4v_a \delta$  is a dimensionless coefficient for calculating impact force.

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.

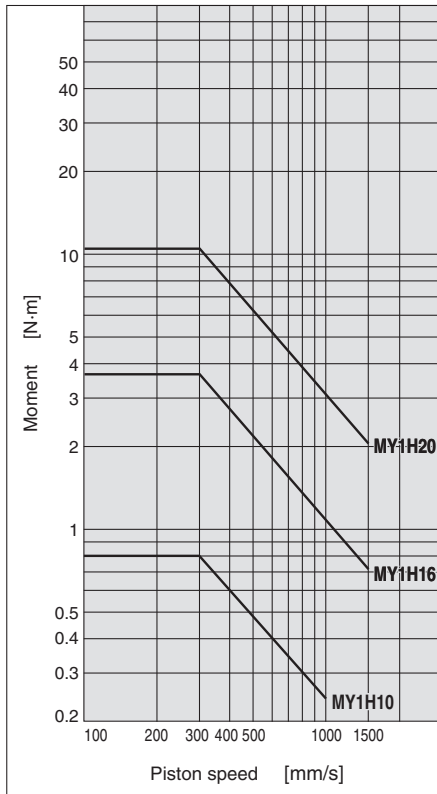
3. For detailed selection procedures, refer to pages 76 and 77.

### Maximum Load Mass

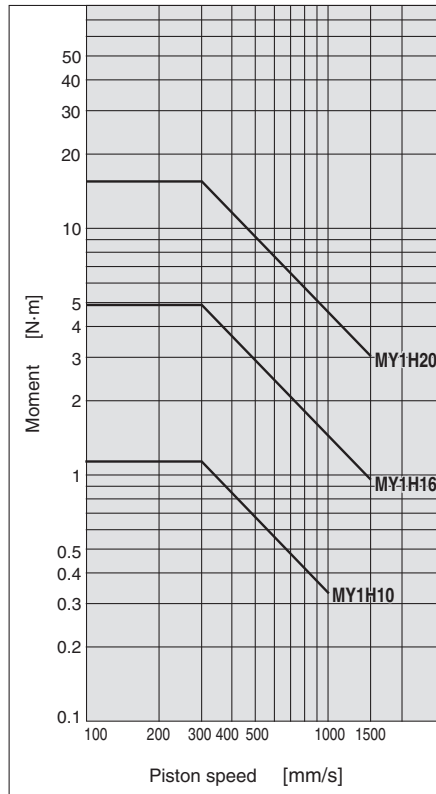
Select the load from within the range of limits shown in the graphs. Note that the maximum allowable moment value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable moment for the selected conditions.



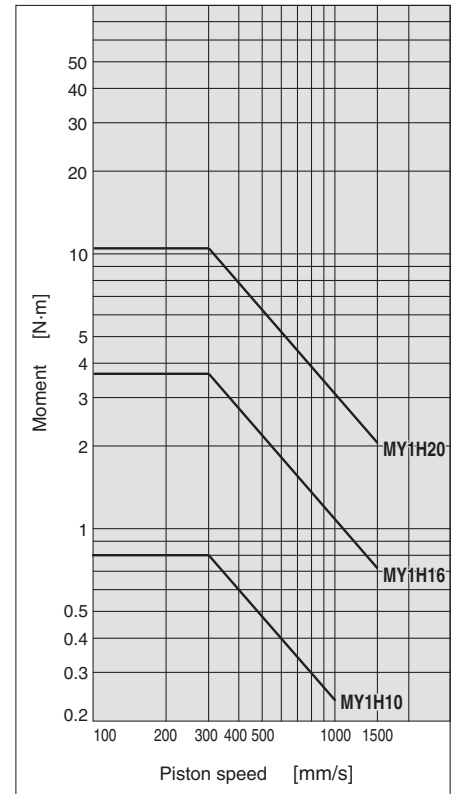
**MY1H/M<sub>1</sub>**



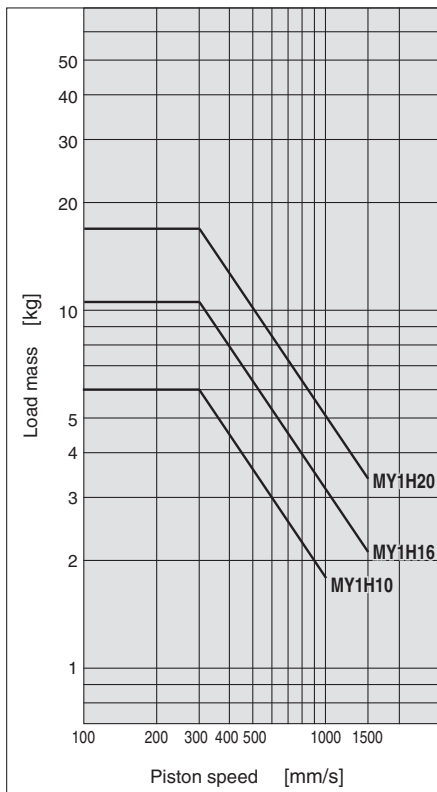
**MY1H/M<sub>2</sub>**



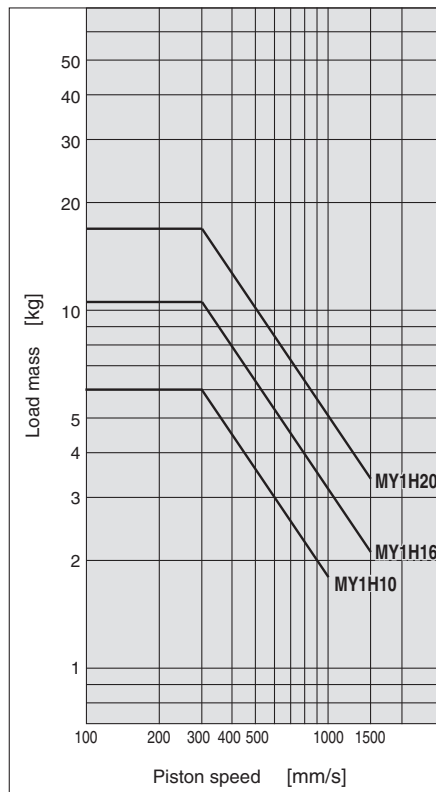
**MY1H/M<sub>3</sub>**



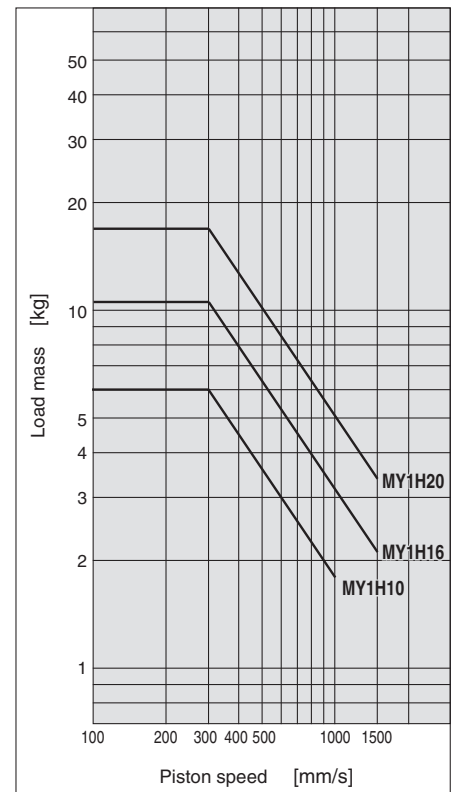
**MY1H/m<sub>1</sub>**



**MY1H/m<sub>2</sub>**



**MY1H/m<sub>3</sub>**





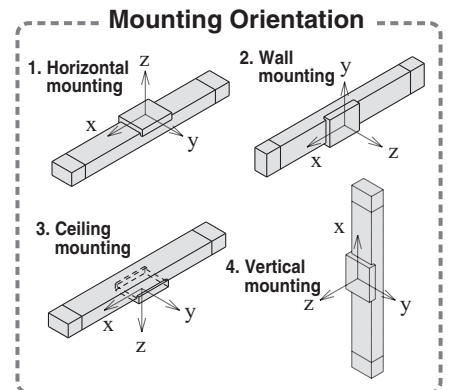
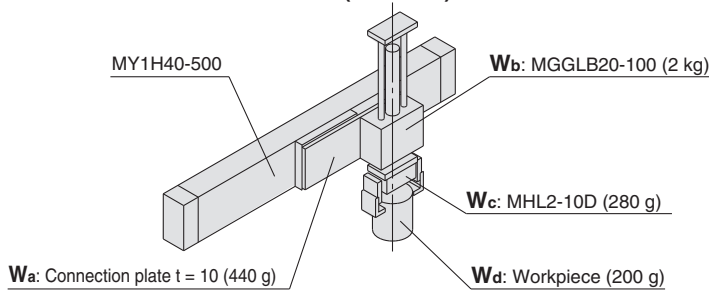
# Series MY1H Model Selection

Following are the steps for selecting the most suitable Series MY1H to your application.

## Calculation of Guide Load Factor

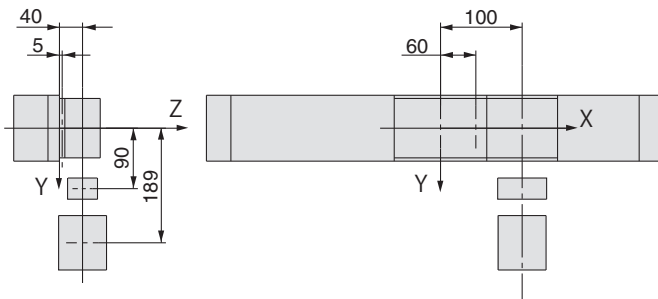
### 1. Operating Conditions

Operating cylinder ..... MY1H20-500  
 Average operating speed  $v_a$  ... 300 mm/s  
 Mounting orientation ..... Wall mounting  
 Cushion ..... Air cushion ( $\delta = 1/100$ )



For actual examples of calculation for each orientation, refer to the pages above.

### 2. Load Blocking



### Mass and Centre of Gravity for Each Workpiece

Workpiece no. $W_n$	Mass $m_n$	Centre of gravity		
		X-axis $X_n$	Y-axis $Y_n$	Z-axis $Z_n$
$W_a$	0.44 kg	60 mm	0 mm	5 mm
$W_b$	2.0 kg	100 mm	0 mm	40 mm
$W_c$	0.280 kg	100 mm	90 mm	40 mm
$W_d$	0.2 kg	100 mm	189 mm	40 mm

$n=a, b, c, d$

### 3. Composite Centre of Gravity Calculation

$$m_3 = \sum m_n$$

$$= 0.44 + 2.0 + 0.280 + 0.2 = 2.92 \text{ kg}$$

$$X = \frac{1}{m_3} \times \sum (m_n \times X_n)$$

$$= \frac{1}{2.95} (0.44 \times 60 + 2.0 \times 100 + 0.280 \times 100 + 0.2 \times 100) = 94.0 \text{ mm}$$

$$Y = \frac{1}{m_3} \times \sum (m_n \times Y_n)$$

$$= \frac{1}{2.95} (0.44 \times 0 + 2.0 \times 0 + 0.280 \times 90 + 0.2 \times 189) = 21.6 \text{ mm}$$

$$Z = \frac{1}{m_3} \times \sum (m_n \times Z_n)$$

$$= \frac{1}{2.95} (0.44 \times 5 + 2.0 \times 40 + 0.280 \times 40 + 0.2 \times 40) = 34.8 \text{ mm}$$

### 4. Calculation of Load Factor for Static Load

$m_3$ : Mass

$m_3 \text{ max}$  (from (1) of graph MY1H/ $m_3$ ) = 17.6 (kg).....

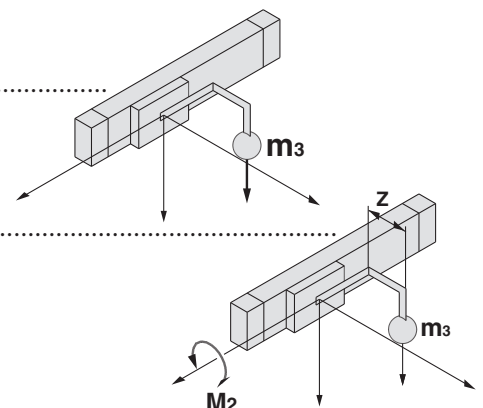
$$\text{Load factor } \alpha_1 = m_3 / m_3 \text{ max} = 2.92 / 17.6 = 0.17$$

$M_2$ : Moment

$m_2 \text{ max}$  (from (2) of graph MY1H/ $M_2$ ) = 16.0 (N·m).....

$$M_2 = m_3 \times g \times Z = 2.92 \times 9.8 \times 34.8 \times 10^{-3} = 1.00 \text{ (N·m)}$$

$$\text{Load factor } \alpha_2 = M_2 / M_2 \text{ max} = 1.00 / 16.0 = 0.07$$

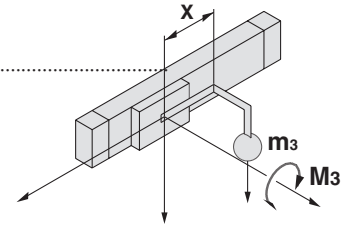


**M<sub>3</sub>**: Moment

**M<sub>3</sub> max** (from (3) of graph MY1H/M<sub>3</sub>) = 11.0 (N·m).....

$$M_3 = m_3 \times g \times X = 2.92 \times 9.8 \times 94.0 \times 10^{-3} = 2.69 \text{ (N·m)}$$

$$\text{Load factor } \alpha_3 = M_3 / M_{3 \text{ max}} = 2.69 / 11.0 = 0.25$$



**5. Calculation of Load Factor for Dynamic Moment**

**Equivalent load F<sub>E</sub> at impact**

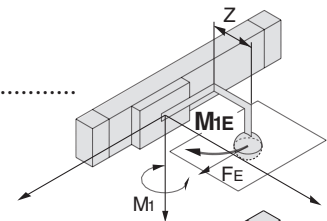
$$F_E = 1.4 \nu a \times \delta \times m \times g = 1.4 \times 300 \times \frac{1}{100} \times 2.92 \times 9.8 = 120.2 \text{ (N)}$$

**M<sub>1E</sub>**: Moment

**M<sub>1E</sub> max** (from (4) of graph MY1H/M<sub>1</sub> where 1.4νa = 420 mm/s) = 7.9 (N·m).....

$$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 120.2 \times 34.8 \times 10^{-3} = 1.40 \text{ (N·m)}$$

$$\text{Load factor } \alpha_4 = M_{1E} / M_{1E \text{ max}} = 1.40 / 7.9 = 0.18$$

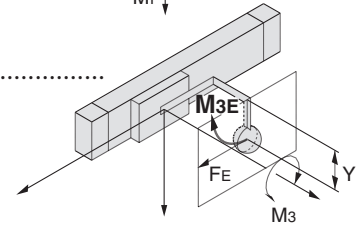


**M<sub>3E</sub>**: Moment

**M<sub>3E</sub> max** (from (5) of graph MY1H/M<sub>3</sub> where 1.4νa = 420 mm/s) = 7.9 (N·m).....

$$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 120.2 \times 21.6 \times 10^{-3} = 0.87 \text{ (N·m)}$$

$$\text{Load factor } \alpha_5 = M_{3E} / M_{3E \text{ max}} = 0.87 / 7.9 = 0.12$$



**6. Sum and Examination of Guide Load Factors**

$$\sum \alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.79 \leq 1$$

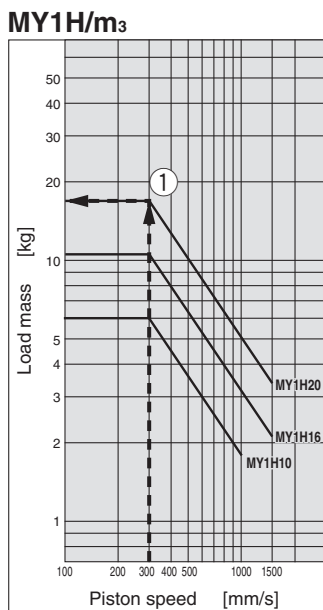
The above calculation is within the allowable value, and therefore the selected model can be used.

Select a shock absorber separately.

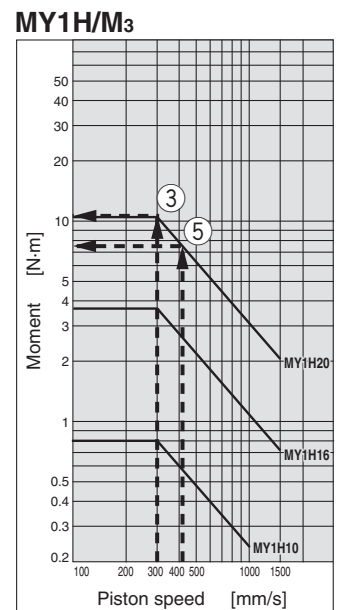
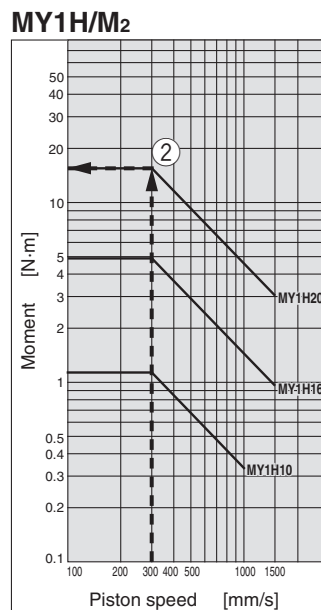
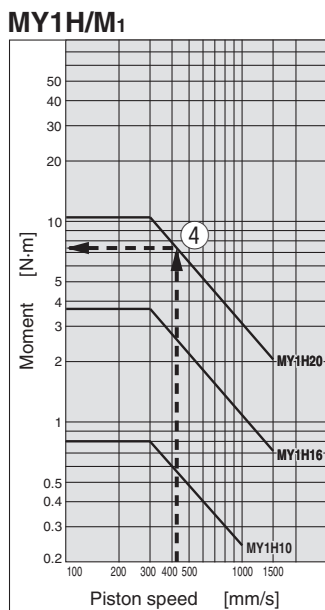
In an actual calculation, when the total sum of guide load factors  $\sum \alpha$  in the formula above is more than 1, consider either decreasing the speed, increasing the bore size, or changing the product series.

This calculation can be easily made using the “SMC Pneumatics CAD System”.

**Load Mass**



**Allowable Moment**



# Mechanically Jointed Rodless Cylinder Linear Guide Type

## Series MY1H

Ø 10, Ø 16, Ø 20

For bore sizes Ø 25, Ø 32 and Ø 40, refer to the catalogue on [www.smc.eu](http://www.smc.eu)

### How to Order

Linear guide type **MY1H** **20** - **300** - **M9BW**

Linear guide type

Bore size

10	10 mm
16	16 mm
20	20 mm

Piping

—	Standard type
G	Centralised piping type

Note) For Ø 10, only G is available.

Cylinder stroke [mm]

Bore size [mm]	Standard stroke [mm]	Intermediate stroke (-XB10)	Long stroke (-XB11)	Maximum manufacturable stroke
10	50, 100, 150 200, 250, 300 350, 400, 450 500, 550, 600	Intermediate strokes of 60 to 590 mm (10 mm increments) other than standard strokes	—	1000
16, 20		Intermediate strokes of 51 to 599 mm (1 mm increments) other than standard strokes	Strokes of 601 to 1000 mm (1 mm increments) exceeding the standard stroke	

Ordering example

\* Add "-XB10" to the end of the part number for intermediate strokes.

\* Add "-XB11" to the end of the part number for long strokes.

Made to Order  
Refer to page 79 for details.

Number of auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

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

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

For Ø 10 cylinders without an auto switch, the cylinder configuration is for the reed auto switch. Contact SMC when the solid state auto switch is retrofitted.

End lock position

—	Without end lock
E	Right end
F	Left end
W	Both ends

\* MY1H10 is not available with end lock.

\* For end lock positions, refer to page 93.

Stroke adjustment unit symbol

Refer to "Stroke adjustment unit" on page 71.

Intermediate fixing spacer is not available for end lock mounting side.

### Applicable Auto Switches/Refer to pages 107 to 117 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)					Pre-wired connector	Applicable load				
					DC	AC	Perpendicular	In-line	0.5 (—)	1 (M)	3 (L)	5 (Z)	None (N)		IC circuit	Relay, PLC			
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	○	IC circuit	Relay, PLC		
				3-wire (PNP)				M9PV	M9P	●	●	●	○	○	○				
				2-wire				M9BV	M9B	●	●	●	○	○	○			○	
	Diagnostic indication (2-colour indication)			3-wire (NPN)	24 V	5 V, 12 V	—	M9NWV	M9NW	●	●	●	○	○	○	○		IC circuit	
				3-wire (PNP)				M9PWV	M9PW	●	●	●	○	○	○	○			
				2-wire				M9BWW	M9BW	●	●	●	○	○	○	○			
	Water resistant (2-colour indication)			3-wire (NPN)	24 V	5 V, 12 V	—	M9NAV*1	M9NA*1	○	○	●	○	—	○	IC circuit			
				3-wire (PNP)				M9PAV*1	M9PA*1	○	○	●	○	—	○				
				2-wire				M9BAV*1	M9BA*1	○	○	●	○	—	○				
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—			
				2-wire				100 V	A93V*2	A93	●	●	●	●			—	—	Relay, PLC
								100 V or less	A90V	A90	●	—	●	—			—	—	

\*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

\*2 1 m type lead wire is only applicable to D-A93.

\* Lead wire length symbols: 0.5 m ..... — (Example) M9NW  
1 m ..... M (Example) M9NWM  
3 m ..... L (Example) M9NWL  
5 m ..... Z (Example) M9NWX

\* Solid state auto switches marked with "○" are produced upon receipt of order.

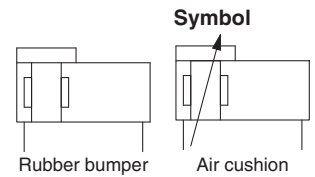
\* There are other applicable auto switches than listed above. For details, refer to page 117.

\* Auto switches are shipped together (not assembled). (Refer to pages 115 to 117 for the details of auto switch mounting.)

# Mechanically Jointed Rodless Cylinder Linear Guide Type **Series MY1H**

## Specifications

Bore size [mm]		10	16	20
Fluid		Air		
Action		Double acting		
Operating pressure range		0.2 to 0.8 MPa	0.15 to 0.8 MPa	
Proof pressure		1.2 MPa		
Ambient and fluid temperature		5 to 60 °C		
Cushion		Rubber bumper	Air cushion	
Lubrication		Non-lube		
Stroke length tolerance		+1.8 0		
Piping port size	Front/Side port	M5 x 0.8		
	Bottom port	Ø 4		



### Made to Order: Specifications (Refer to page 118 to 120 for details.)

Symbol	Specifications
-X168	Helical insert thread specifications
-XB10	Intermediate stroke type
-XB11	Long stroke type
-XB22	Shock absorber soft type Series RJ type
-XC67	NBR rubber lining in dust seal band
-XC56	Knock pins holes
20-	Cooper-free

## Lock Specifications

Bore size [mm]	16	20
Lock position	One end (Selectable), Both ends	
Holding force (Max.) (N)	110	170
Fine stroke adjustment range [mm]	0 to -5.6	0 to -6
Backlash	1 mm or less	
Manual release	Possible (Non-lock type)	

## Piston Speed

Bore size [mm]		10	16, 20
Without stroke adjustment unit		100 to 500 mm/s	100 to 1000 mm/s
Stroke adjustment unit	A unit	100 to 200 mm/s	100 to 1000 mm/s <sup>(1)</sup>
	L unit and H unit	100 to 1000 mm/s	100 to 1500 mm/s <sup>(2)</sup>

Note 1) Be aware that when the stroke adjustment range is increased by manipulating the adjustment bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 81, the piston speed should be 100 to 200 mm per second.

Note 2) The piston speed is 100 to 1000 mm/s for centralised piping.

Note 3) Use at a speed within the absorption capacity range. Refer to page 81.

## Stroke Adjustment Unit Specifications

Bore size [mm]		10	16		20		
Unit symbol		H	A	L	A	L	H
Configuration		RB 0805 + with adjustment bolt	With adjustment bolt	RB 0806 + with adjustment bolt	With adjustment bolt	RB 0806 + with adjustment bolt	RB 1007 + with adjustment bolt
Stroke adjustment range by intermediate fixing spacer [mm]	Without spacer	0 to -10	0 to -5.6		0 to -6		
	With short spacer	— *1	-5.6 to -11.2		-6 to -12		
	With long spacer	— *1	-11.2 to -16.8		-12 to -18		

\*1) For Ø 10, stroke adjustment is available. Refer to page 83 for details.

\*2) Stroke adjustment range is applicable for one side when mounted on a cylinder.

## Stroke Adjustment Unit Symbol

		Right side stroke adjustment unit										
		Without unit	A: With adjustment bolt			L: With low load shock absorber + Adjustment bolt			H: With high load shock absorber + Adjustment bolt			
Left side stroke adjustment unit	Without unit	—	SA	SA6	SA7	SL	SL6	SL7	SH	SH6	SH7	
	A: With adjustment bolt	AS	A	AA6	AA7	AL	AL6	AL7	AH	AH6	AH7	
		With short spacer	A6S	A6A	A6	A6A7	A6L	A6L6	A6L7	A6H	A6H6	A6H7
		With long spacer	A7S	A7A	A7A6	A7	A7L	A7L6	A7L7	A7H	A7H6	A7H7
	L: With low load shock absorber + Adjustment bolt	LS	LA	LA6	LA7	L	LL6	LL7	LH	LH6	LH7	
		With short spacer	L6S	L6A	L6A6	L6A7	L6L	L6	L6L7	L6H	L6H6	L6H7
		With long spacer	L7S	L7A	L7A6	L7A7	L7L	L7L6	L7	L7H	L7H6	L7H7
	H: With high load shock absorber + Adjustment bolt	HS	HA	HA6	HA7	HL	HL6	HL7	H	HH6	HH7	
		With short spacer	H6S	H6A	H6A6	H6A7	H6L	H6L6	H6L7	H6H	H6	H6H7
		With long spacer	H7S	H7A	H7A6	H7A7	H7L	H7L6	H7L7	H7H	H7H6	H7

\* Intermediate fixing spacer is not available for end lock mounting side.

\* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.

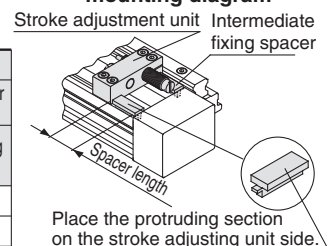
## Shock Absorbers for L and H Units

Type	Stroke adjustment unit	Bore size [mm]		
		10	16	20
Standard (Shock absorber/RB series)	L	—	RB0806	
	H	RB0805	—	RB1007
Shock absorber/soft type RJ series mounted (-XB22)	L	—	RJ0806H	
	H	RJ0805	—	RJ1007H

\* The shock absorber service life is different from that of the MY1H cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

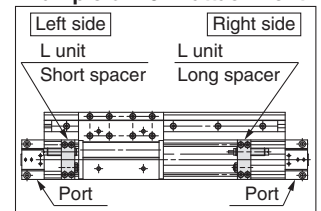
\* Mounted shock absorber soft type RJ series (-XB22) is made to order specifications.

## Stroke adjustment unit mounting diagram



Place the protruding section on the stroke adjusting unit side.

## Example of L6L7 attachment



## Shock Absorber Specifications

Model		RB 0805	RB 0806	RB 1007
Max. energy absorption [J]		1.0	2.9	5.9
Stroke absorption [mm]		5	6	7
Max. collision speed [mm/s]		1000	1500	1500
Max. operating frequency [cycle/min]		80	80	70
Spring force [N]	Extended	1.96	1.96	4.22
	Retracted	3.83	4.22	6.86
Operating temperature range [°C]		5 to 60		

\* The shock absorber service life is different from that of the MY1H cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

# Series MY1H

## Theoretical Output

Bore size [mm]	Piston area [mm <sup>2</sup> ]	Operating pressure [MPa]						
		0.2	0.3	0.4	0.5	0.6	0.7	0.8
10	78	15	23	31	39	46	54	62
16	200	40	60	80	100	120	140	160
20	314	62	94	125	157	188	219	251

Note) Theoretical output (N) = Pressure (MPa) x Piston area (mm<sup>2</sup>)

## Weight

Bore size [mm]	Basic weight	Additional weight per each 50 mm of stroke	Weight of moving parts	Side support bracket weight (per set)	Stroke adjustment unit weight (per unit)		
				Type A and B	A unit weight	L unit weight	H unit weight
10	0.26	0.08	0.05	0.003	—	—	0.02
16	0.74	0.14	0.19	0.01	0.02	0.04	—
20	1.35	0.25	0.40	0.02	0.03	0.05	0.07

Calculation: (Example) MY1H20-300A

- Basic weight ..... 1.35 kg
- Cylinder stroke ..... 300 stroke
- Additional weight ..... 0.25/50 stroke  
1.35 + 0.25 x 300/50 + 0.03 x 2 = 2.19 kg
- Weight of A unit ..... 0.03 kg

## Option

### Stroke Adjustment Unit Part No.

**MYH-A 20 H2-6N**

Stroke adjustment unit

Bore size

10	10 mm
16	16 mm
20	20 mm

Unit no.

Symbol	Stroke adjustment unit	Mounting position
A1	A unit	Left
A2		Right
L1	L unit	Left
L2		Right
H1	H unit	Left
H2		Right

Note 1) Refer to page 79 for details about adjustment range.

Note 2) H unit only for Ø 10, A and L unit only for Ø 16

Stroke adjustment unit

Intermediate fixing spacer

Spacer length

Place the protruding section on the stroke adjustment unit side.

Intermediate fixing spacer

Symbol	Without spacer
6	Short spacer
7	Long spacer

Spacer delivery style

Symbol	Unit installed
N	Spacer only

\* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.

\* Spacers are shipped for a set of two.

\* Intermediate fixing spacer is not available for Ø 10.

\* When ordering the intermediate fixing spacer for the stroke adjustment unit, the intermediate fixing spacer is shipped together.

### Component Parts

MYH-A20H2 (Without spacer)	MYH-A20H2-6 (With short spacer)	MYH-A20H2-7 (With long spacer)	MYH-A20H2-6N (Short spacer only)

\* Nuts are equipped on the cylinder body.

### Side Support Part No.

Bore size [mm]	10	16	20
Side support A	MY-S10A	MY-S16A	MY-S20A
Side support B	MY-S10B	MY-S16B	MY-S20B

For details about dimensions, etc., refer to page 94.

A set of side supports consists of a left support and a right support.

## Cushion Capacity

### Cushion Selection

#### <Rubber bumper>

Rubber bumpers are a standard feature on MY1H10.

Since the stroke absorption of rubber bumpers is short, when adjusting the stroke with an A unit, install an external shock absorber.

The load and speed range which can be absorbed by a rubber bumper is inside the rubber bumper limit line of the graph.

#### <Air cushion>

Air cushions are a standard feature on mechanically jointed rodless cylinders.

The air cushion mechanism is incorporated to prevent excessive impact of the piston at the stroke end during high speed operation. The purpose of air cushion, thus, is not 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 adjustment unit with shock absorber>

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

#### L unit

Use this unit when the cylinder stroke is 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 or below the L unit limit line.

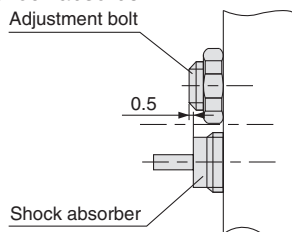
#### H unit

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

1. Refer to the figure below when using the adjustment bolt to perform stroke adjustment.

When the effective stroke of the shock absorber decreases as a result of stroke adjustment, the absorption capacity decreases dramatically. Secure the adjusting bolt at the position where it protrudes approximately 0.5 mm from the shock absorber.



2. Do not use a shock absorber together with air cushion.

### Air Cushion Stroke

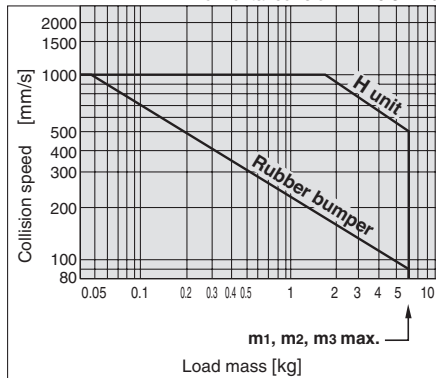
[mm]

Bore size [mm]	Cushion stroke
16	12
20	15

### Absorption Capacity of Rubber Bumper, Air cushion and Stroke Adjustment Units

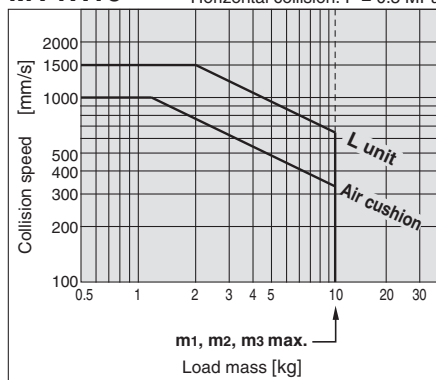
#### MY1H10

Horizontal collision: P = 0.5 MPa



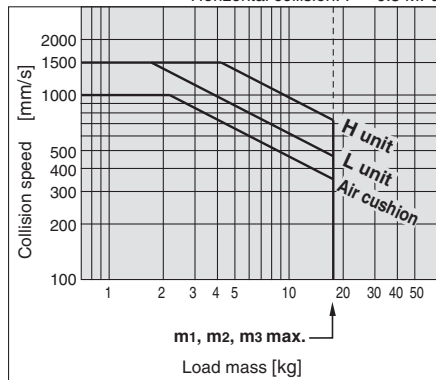
#### MY1H16

Horizontal collision: P = 0.5 MPa



#### MY1H20

Horizontal collision: P = 0.5 MPa



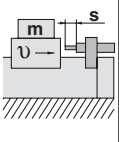
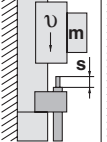
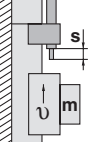
# Series MY1H

## Cushion Capacity

### Tightening Torque for Stroke Adjustment Unit Holding Bolts [N·m]

Bore size [mm]	Tightening torque
10	Refer to the adjustment procedures on page 83.
16	0.7
20	1.8

### Calculation of Absorbed Energy for Stroke Adjustment Unit with Shock Absorber [N·m]

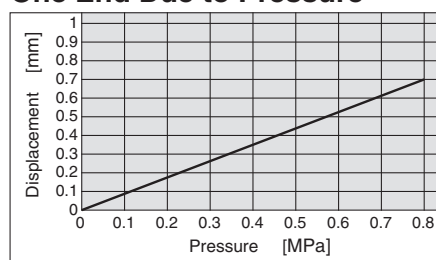
Type of impact	Horizontal collision	Vertical (Downward)	Vertical (Upward)
			
Kinetic energy $E_1$	$\frac{1}{2} m \cdot v^2$		
Thrust energy $E_2$	$F \cdot s$	$F \cdot s + m \cdot g \cdot s$	$F \cdot s - m \cdot g \cdot s$
Absorbed energy $E$	$E_1 + E_2$		

Symbol

- $v$ : Speed of impact object (m/s)
- $F$ : Cylinder thrust (N)
- $s$ : Shock absorber stroke (m)
- $m$ : Weight of impact object (kg)
- $g$ : Gravitational acceleration (9.8 m/s<sup>2</sup>)

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

### Rubber Bumper (Ø 10 only) Positive Stroke from One End Due to Pressure







## Series MY1H

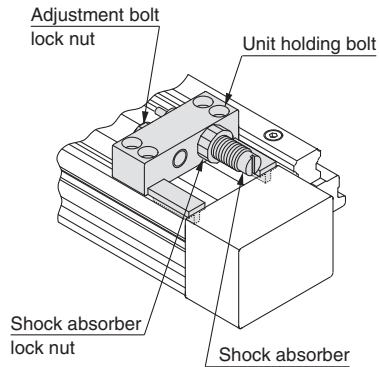
# Specific Product Precautions 1

Be sure to read before handling.

### ⚠ Caution

Use caution not to get your hands caught in the unit.

- When using a product with stroke adjustment unit, the space between the slide table (slider) and the stroke adjustment unit becomes narrow at the stroke end, causing a danger of hands getting caught. Install a protective cover to prevent direct contact with the human body.



#### <Fastening of unit>

The unit can be secured by evenly tightening the four unit holding bolts.

### ⚠ Caution

Do not operate with the stroke adjustment unit fixed in an intermediate position.

When the stroke adjustment unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the time of an impact. In such cases, as a stroke adjustment unit with the spacer for intermediate securing is available, it is recommended to use it.

(Except  $\varnothing 10$ )

For other lengths, please consult with SMC (Refer to "Tightening Torque for Stroke Adjustment Unit Holding Bolts".)

#### <Stroke adjustment with adjustment bolt>

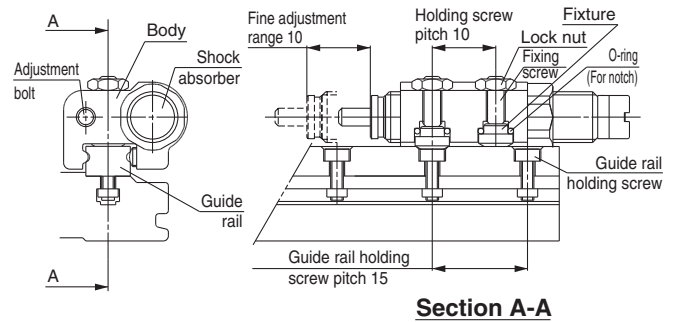
Loosen the adjustment bolt lock nut, and adjust the stroke from the head cover side using a hexagon wrench. Re-tighten the lock nut.

#### <Stroke adjustment with shock absorber>

Loosen the shock absorber lock nut, and adjust the stroke by turning the shock absorber. Then, re-tighten the lock nut.

### ⚠ Caution

To adjust the stroke adjustment unit of the MY1H10, follow the step shown below.



#### Adjusting Procedure

1. Loosen the two lock nuts, and then loosen the holding screws by turning them approximately two turns.
2. Move the body to the notch just before the desired stroke. (The notches are found in alternating increments of 5 mm and 10 mm.)
3. Tighten the holding screw to 0.3 N·m. Make sure that the tightening does not cause excessive torque. The fixture fits into the fastening hole in the guide rail to prevent slippage, which enables fastening with low torque.
4. Tighten the lock nut to 0.6 N·m.
5. Make fine adjustments with the adjustment bolt and shock absorber.





## Series MY1H

# Specific Product Precautions 2

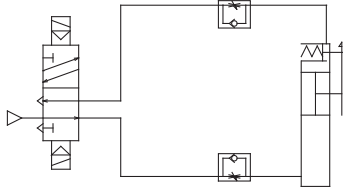
Be sure to read before handling.

### With End Locks

#### Recommended Pneumatic Circuit

#### ⚠ Caution

This is necessary for the correct locking and unlocking actions.



#### Operating Precautions

#### ⚠ Caution

##### 1. Do not use 3 position solenoid valves.

Avoid use in combination with 3 position solenoid valves (especially closed centre metal seal types). If pressure is trapped in the port on the lock mechanism side, the cylinder cannot be locked.

Furthermore, even after being locked, the lock may be released after some time due to air leaking from the solenoid valve and entering the cylinder.

##### 2. Back pressure is required when releasing the lock.

Before starting operation, be sure to control the system so that air is supplied to the side without the lock mechanism (in case of locks on both ends, the side where the slide table is not locked) as shown in the figure above. There is a possibility that the lock may not be released. (Refer to the section on releasing the lock.)

##### 3. Release the lock when mounting or adjusting the cylinder.

If mounting or other work is performed when the cylinder is locked, the lock unit may be damaged.

##### 4. Operate at 50 % or less of the theoretical output.

If the load exceeds 50 % of the theoretical output, this may cause problems such as failure of the lock to release, or damage to the lock unit.

##### 5. Do not operate multiple cylinders in synchronization.

Avoid applications in which two or more end lock cylinders are synchronised to move one workpiece, as one of the cylinder locks may not be able to release when required.

##### 6. Use a speed controller with meter-out control.

Lock cannot be released occasionally by meter-in control.

##### 7. Be sure to operate completely to the cylinder stroke end on the side with the lock.

If the cylinder piston does not reach the end of the stroke, locking and unlocking may not be possible. (Refer to the section on adjusting the end lock mechanism.)

#### Operating Pressure

#### ⚠ Caution

1. Supply air pressure of 0.15 MPa or higher to the port on the side that has the lock mechanism, as it is necessary for disengaging the lock.

#### Exhaust Speed

#### ⚠ Caution

1. Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05 MPa or less. In the cases where the piping on the lock mechanism side is long and thin, or the speed controller is separated at some distance from the cylinder port, the exhaust speed will be reduced. Take note that some time may be required for the lock to engage. In addition, clogging of a silencer mounted on the solenoid valve exhaust port can produce the same effect.

#### Relation to Cushion

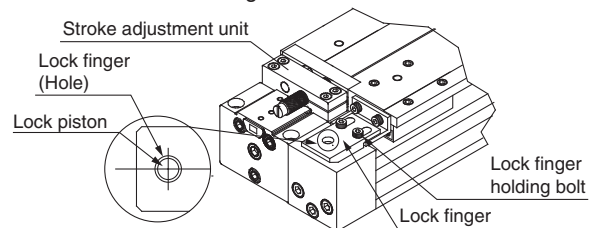
#### ⚠ Caution

1. When the air cushion on the lock mechanism side is in a fully closed or nearly closed state, there is a possibility that the slide table will not reach the stroke end, in which case locking will not occur.

#### Adjusting the End Lock Mechanism

#### ⚠ Caution

1. The end lock mechanism is adjusted at the time of shipping. Therefore, adjustment for operation at the stroke end is unnecessary.
2. Adjust the end lock mechanism after the stroke adjustment unit has been adjusted. The adjustment bolt and shock absorber of the stroke adjustment unit must be adjusted and secured first. Locking and unlocking may not occur otherwise.
3. Perform fine adjustment of the end lock mechanism as follows. Loosen the lock finger holding bolts, and then adjust by aligning the centre of the lock piston with the centre of the lock finger hole. Secure the lock finger.



#### Releasing the Lock

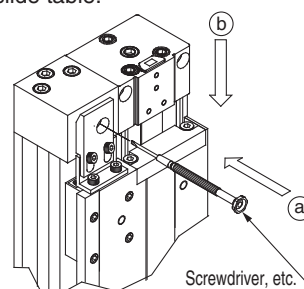
#### ⚠ Warning

1. Before releasing the lock, be sure to supply air to the side without the lock mechanism, so that there is no load applied to the lock mechanism when it is released. (Refer to the recommended pneumatic circuits.) If the lock is released when the port on the side without the lock is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged. Furthermore, sudden movement of the slide table is very dangerous.

#### Manual Release

#### ⚠ Caution

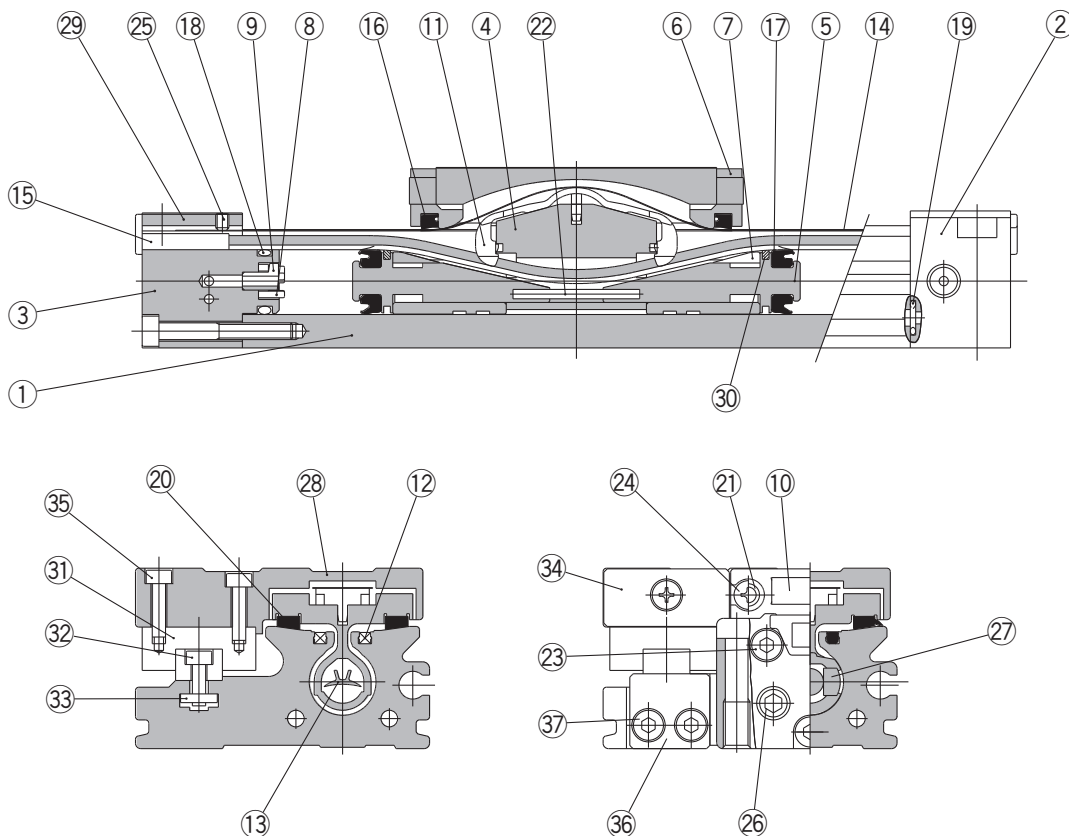
1. When manually releasing the end lock, be sure to release the pressure. If it is unlocked while the air pressure still remains, it will lead to damage a workpiece, etc. due to unexpected lurching.
2. Perform manual release of the end lock mechanism as follows. Push the lock piston down with a screwdriver, etc., and move the slide table.



Other handling precautions regarding mounting, piping, and environment are the same as the standard series.

Construction:  $\varnothing 10$

Centralised piping type



Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminium alloy	Hard anodised
2	Head cover WR	Aluminium alloy	Painted
3	Head cover WL	Aluminium alloy	Painted
4	Piston yoke	Aluminium alloy	Hard anodised
5	Piston	Aluminium alloy	Chromated
6	End cover	Special resin	
7	Wear ring	Special resin	
8	Bumper	Polyurethane rubber	
9	Holder	Stainless steel	
10	Stopper	Carbon steel	Nickel plated
11	Belt separator	Special resin	
12	Seal magnet	Rubber magnet	
15	Belt clamp	Special resin	
20	Bearing	Special resin	
21	Spacer	Chromium molybdenum steel	Nickel plated

No.	Description	Material	Note
22	Spring pin	Stainless steel	
23	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
24	Round head Phillips screw	Carbon steel	Nickel plated
25	Hexagon socket head set screw	Carbon steel	Black zinc chromated
26	Hexagon socket head plug	Carbon steel	Nickel plated
27	Magnet	—	
28	Slide table	Aluminium alloy	Hard anodised
29	Head plate	Stainless steel	
30	Felt	Felt	
31	Linear guide	—	
32	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
33	Square nut	Carbon steel	Nickel plated
34	Stopper plate	Carbon steel	Nickel plated
35	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
36	Guide stopper	Carbon steel	Nickel plated
37	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated

Replacement Part: Seal Kit

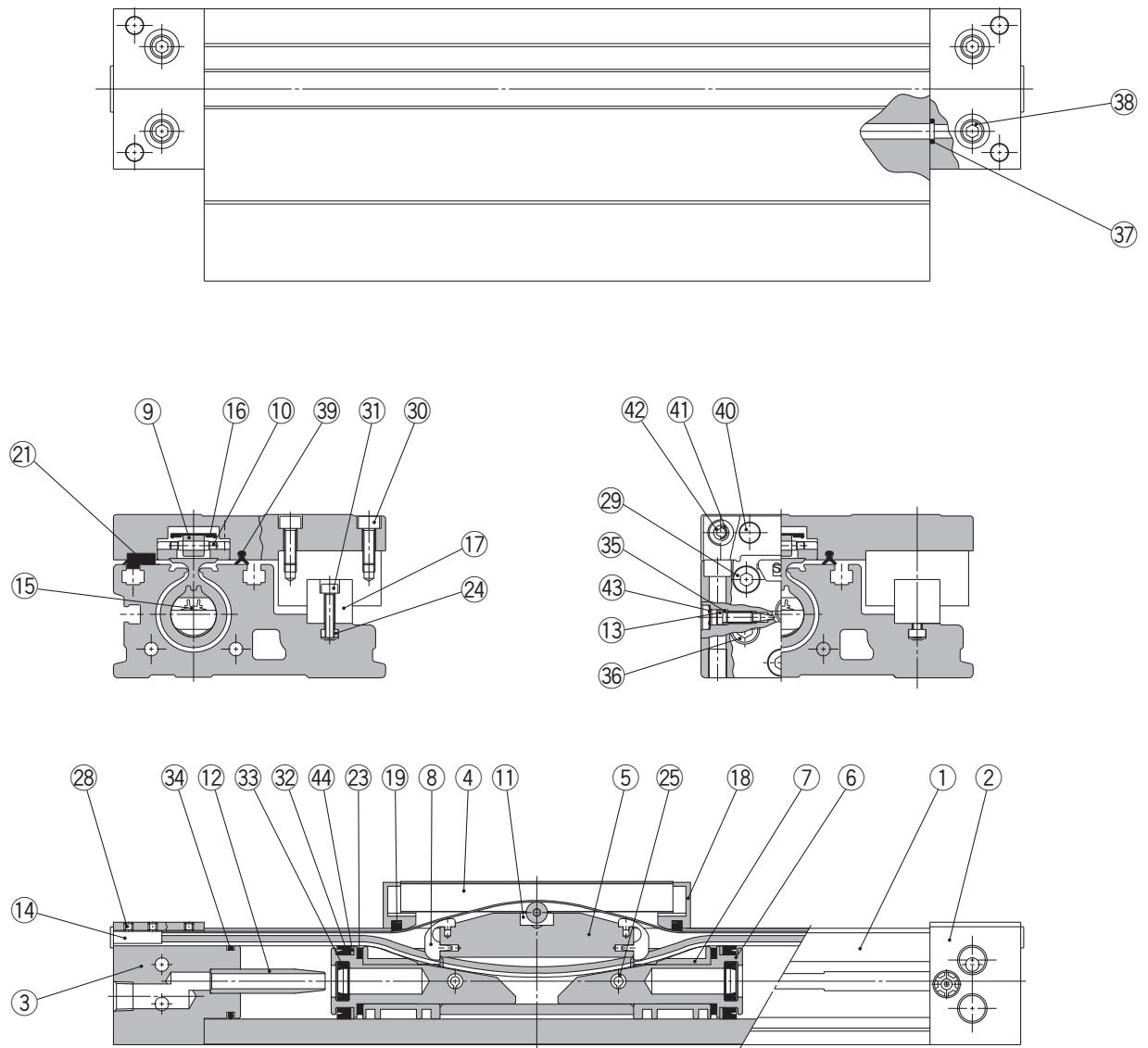
No.	Description	Qty.	MY1H10
13	Seal belt	1	MY10-16A-Stroke
14	Dust seal band	1	MY10-16B-Stroke
16	Scraper	2	MY1B10-PS
17	Piston seal	2	
18	Tube gasket	2	
19	O-ring	4	

\* Seal kit includes 16, 17, 18 and 19.  
Seal kit includes a grease pack (10 g).  
When 13 and 14 are shipped independently, a grease pack is included.  
Order with the following part number when only the grease pack is needed.  
**Grease pack part number: GR-S-010 (10 g), GR-S-020 (20 g)**

# Series MY1H

Construction:  $\varnothing 16$ ,  $\varnothing 20$

MY1H16, 20



## MY1H16, 20

### Component Parts

No.	Description	Material	Note
1	Cylinder tube	Aluminium alloy	Hard anodised
2	Head cover WR	Aluminium alloy	Painted
3	Head cover WL	Aluminium alloy	Painted
4	Slide table	Aluminium alloy	Hard anodised
5	Piston yoke	Aluminium alloy	Chromated
6	Piston	Aluminium alloy	Chromated
7	Wear ring	Special resin	
8	Belt separator	Special resin	
9	Guide roller	Special resin	
10	Guide roller shaft	Stainless steel	
11	Coupler	Sintered iron material	
12	Cushion ring	Aluminium alloy	Anodised
13	Cushion needle	Rolled steel	Nickel plated
14	Belt clamp	Special resin	
17	Guide	—	
18	End cover	Special resin	
21	Bearing	Special resin	

No.	Description	Material	Note
23	Magnet	—	
24	Square nut	Carbon steel	Nickel plated
25	Spring pin	Carbon tool steel	
28	Hexagon socket head set screw	Chromium molybdenum steel	Black zinc chromated/Nickel plated
29	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
30	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
31	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
36	Hexagon socket head taper plug	Carbon steel	Nickel plated
38	Hexagon socket head taper plug	Carbon steel	Nickel plated
40	Stopper	Carbon steel	Nickel plated
41	Spacer	Stainless steel	
42	Hexagon socket button head screw	Chromium molybdenum steel	Nickel plated
43	Type CR retaining ring	Spring steel	
44	Lub-retainer	Special resin	

### Replacement Part: Seal Kit

No.	Description	Qty.	MY1H16	MY1H20
15	Seal belt	1	MY16-16C- <u>Stroke</u>	MY20-16C- <u>Stroke</u>
16	Dust seal band	1	MY16-16B- <u>Stroke</u>	MY20-16B- <u>Stroke</u>
35	O-ring	2	KA00309 ( $\varnothing 4 \times \varnothing 1.8 \times \varnothing 1.1$ )	KA00309 ( $\varnothing 4 \times \varnothing 1.8 \times \varnothing 1.1$ )
39	Side scraper	1	MYH16-15BK2900B	MYH20-15BK2901B
19	Scraper	2	MY1H16-PS	MY1H20-PS
32	Piston seal	2		
33	Cushion seal	2		
34	Tube gasket	2		
37	O-ring	4		

\* Seal kit includes 19, 32, 33, 34 and 37. Order the seal kit based on each bore size.

\* Seal kit includes a grease pack (10 g).

When 15 and 16 are shipped independently, a grease pack (20 g) is included.

Order with the following part number when only the grease pack is needed.

**Grease pack part number: GR-S-010** (10 g), **GR-S-020** (20 g)

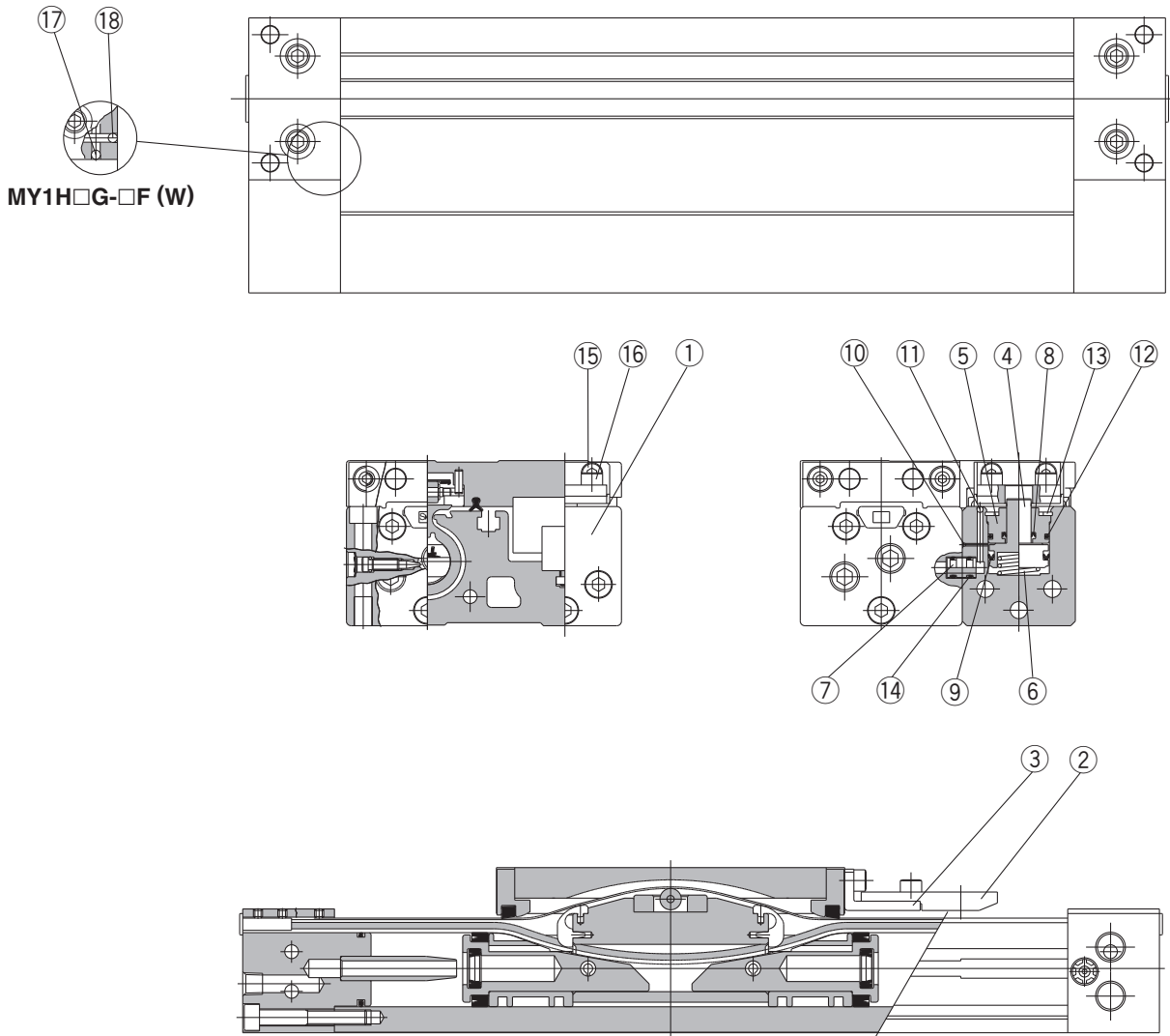
Note) Two kinds of dust seal bands are available. Verify the type to use, since the part number varies depending on the treatment of the hexagon socket head set screw 28.

A: Black zinc chromated → MY□□-16B-stroke, B: Nickel plated → MY□□-16BW-stroke

# Series MY1H

Construction: Ø 16, Ø 20

With End Lock



## Component Parts

No.	Description	Material	Note
1	Locking body	Aluminium alloy	Painted
2	Lock finger	Carbon steel	After quenching, nickel plated
3	Lock finger bracket	Rolled steel	Nickel plated
4	Lock piston	Carbon tool steel	After quenching, electroless nickel plated
5	Rod cover	Aluminium alloy	Hard anodised
6	Return spring	Spring steel	Zinc chromated
7	Bypass pipe	Aluminium alloy	Chromated
10	Steel ball	High carbon chrome bearing steel	
11	Steel ball	High carbon chrome bearing steel	
13	Round type R retaining ring	Carbon tool steel	Nickel plated
14	O-ring	NBR	
15	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
16	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
17	Steel ball	High carbon chrome bearing steel	
18	Steel ball	High carbon chrome bearing steel	

## Replacement Part: Seal Kit

No.	Description	Material	Qty.	MY1H16	MY1H20
8	Rod seal	NBR	1	KB00257	KB00257
9	Piston seal	NBR	1	KB00202	KB00202
12	O-ring	NBR	1	KA00057	KA00057

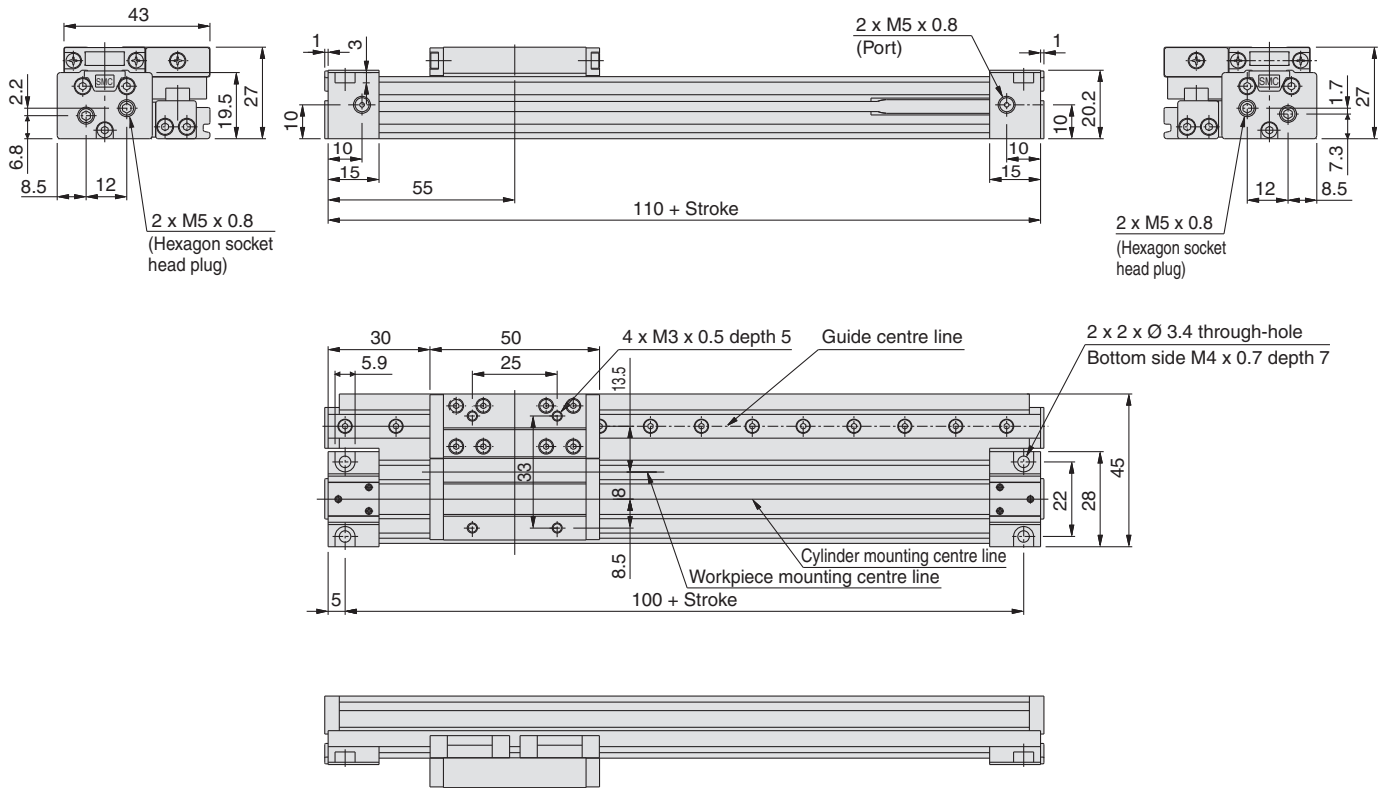
\*\* Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

**Centralised Piping Type Ø 10**

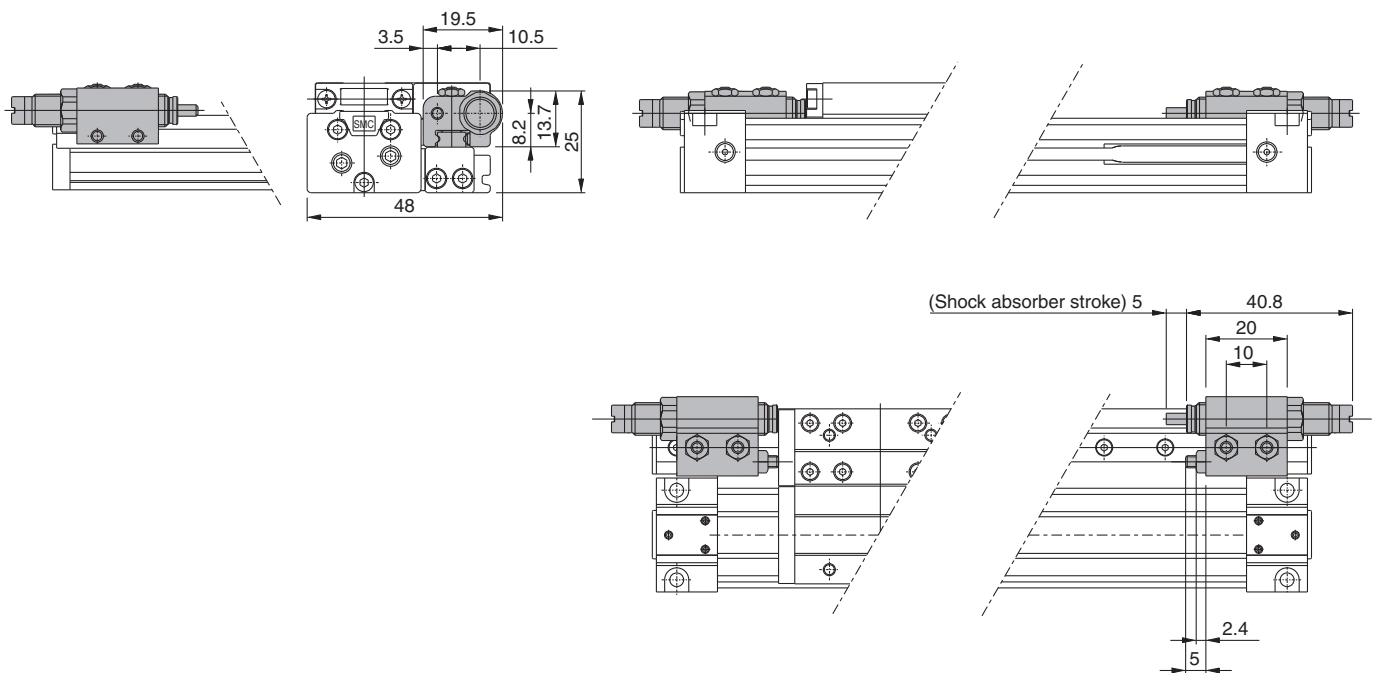
Refer to page 122 regarding centralised piping port variations.

**MY1H10G — Stroke**



**With shock absorber + Adjustment bolt**

**MY1H10G — Stroke H**

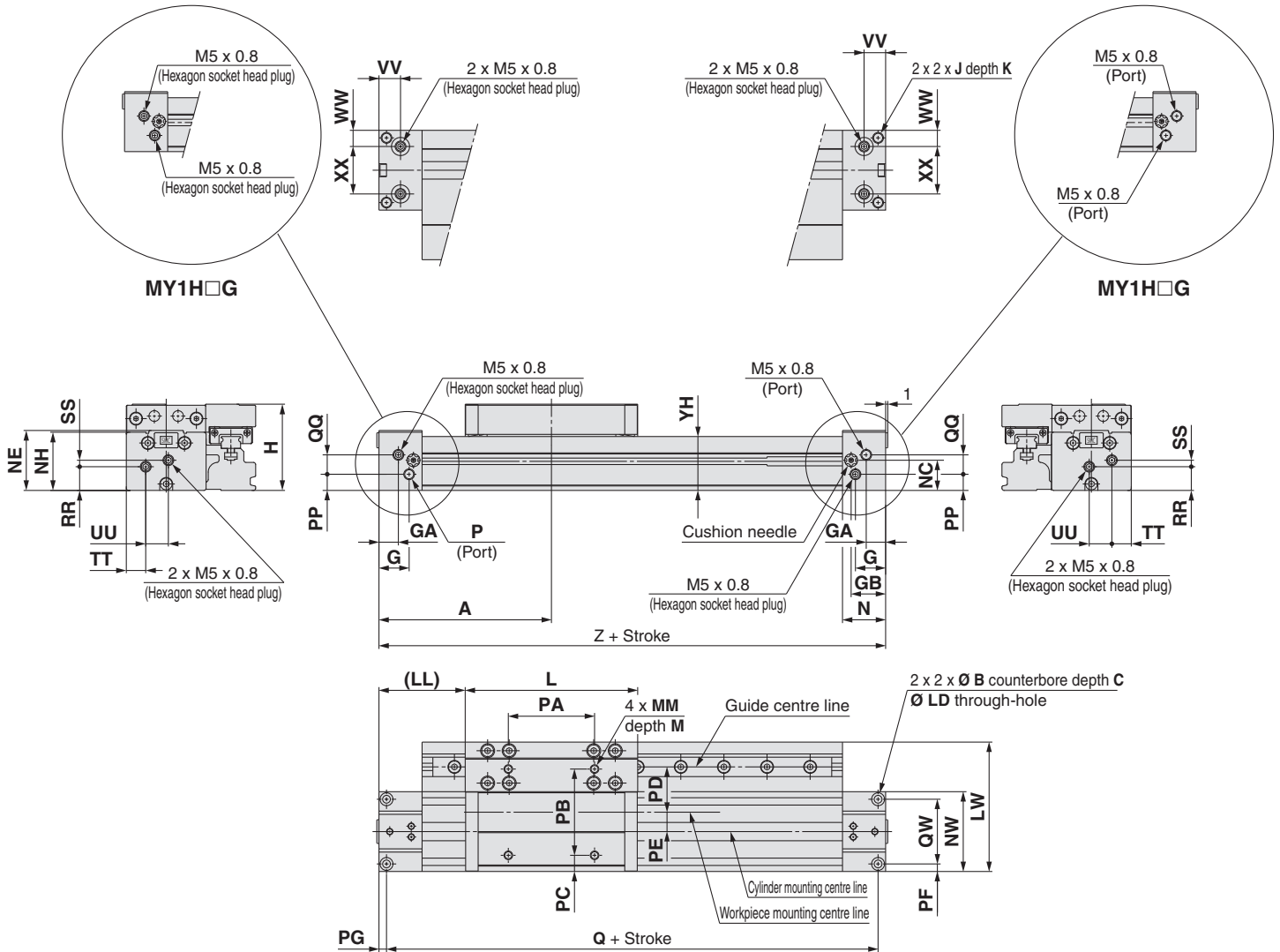


# Series MY1H

## Standard Type/Centralised Piping Type $\varnothing 16, \varnothing 20$

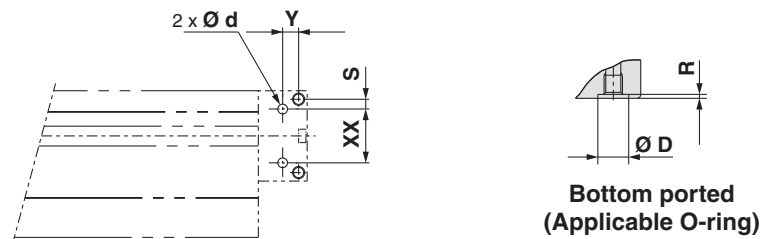
Refer to page 122 regarding centralised piping port variations.

### MY1H16□/20□ – Stroke



Model	A	B	C	G	GA	GB	H	J	K	L	LD	LL	LW	M	MM	N	NC	NE	NH	NW
MY1H16□	80	6	3.5	14	9	16	40	M5 x 0.8	10	80	3.5	40	60	7	M4 x 0.7	20	14	27.8	27	37
MY1H20□	100	7.5	4.5	12.5	12.5	20.5	46	M6 x 1	12	100	4.5	50	78	8	M5 x 0.8	25	17.5	34	33.5	45

Model	PA	PB	PC	PD	PE	PF	PG	PP	Q	QQ	QW	RR	SS	TT	UU	VV	WW	XX	YH	Z
MY1H16□	40	40	7.5	21	9	3.5	3.5	7.5	153	9	30	11	3	9	10.5	10	7.5	22	25	160
MY1H20□	50	40	14.5	27	12	4.5	4.5	11.5	191	11	36	14.5	5	10.5	12	12.5	10.5	24	31.5	200



### Hole Size for Centralised Piping on the Bottom

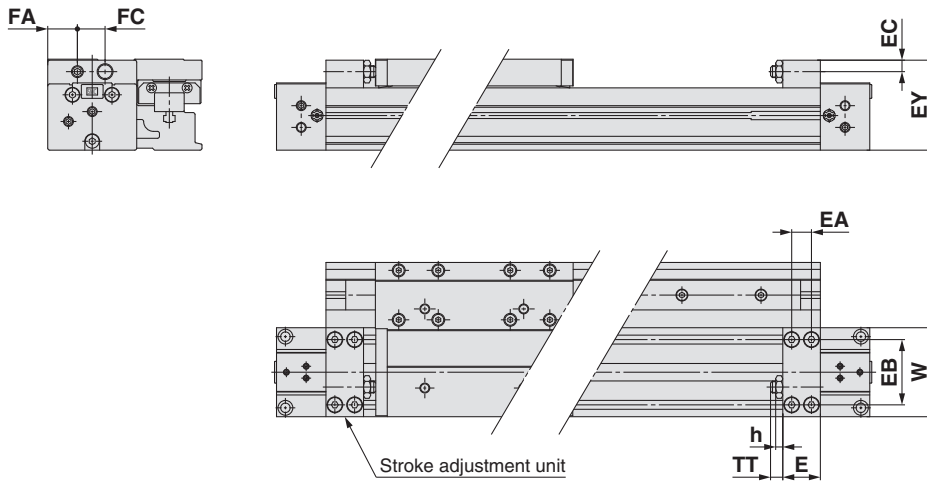
Model	WX	Y	S	d	D	R	Applicable O-ring
MY1H16□	22	6.5	4	4	8.4	1.1	C6
MY1H20□	24	8	6	4	8.4	1.1	

(Machine the mounting side to the dimensions below.)

### Stroke Adjustment Unit

With adjustment bolt

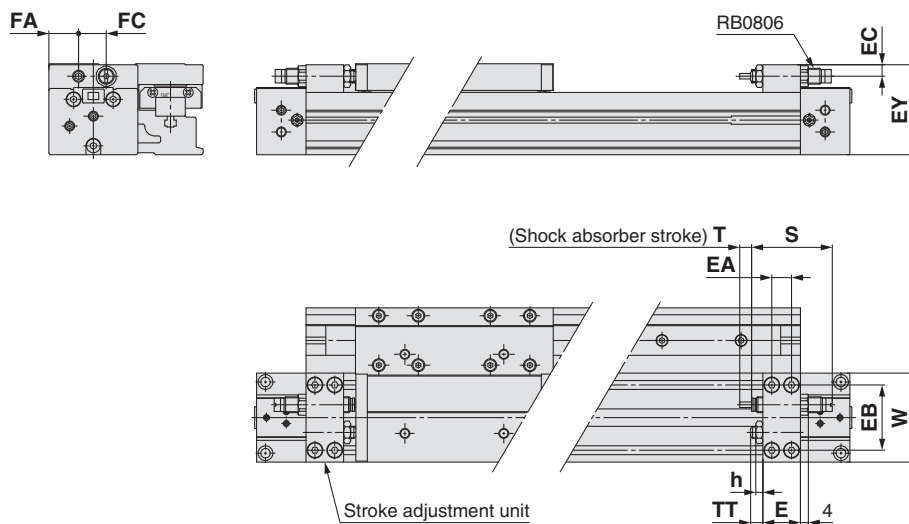
MY1H Bore size □ – Stroke A



Applicable bore size	E	EA	EB	EC	EY	FA	FC	h	TT	W
MY1H16	14.6	7	28	5.8	39.5	11.5	13	3.6	5.4 (Max. 11)	37
MY1H20	19	10	33	5.8	45.5	15	14	3.6	6 (Max. 12)	45

With low load shock absorber + Adjustment bolt

MY1H Bore size □ – Stroke L



[mm]

Applicable bore size	E	EA	EB	EC	EY	F	FA	FC	h	S	T	TT	W	Shock absorber model
MY1H16	14.6	7	28	5.8	39.5	4	11.5	13	3.6	40.8	6	5.4 (Max. 11)	37	RB0806
MY1H20	19	10	33	5.8	45.5	4	15	14	3.6	40.8	6	6 (Max. 12)	45	RB0806

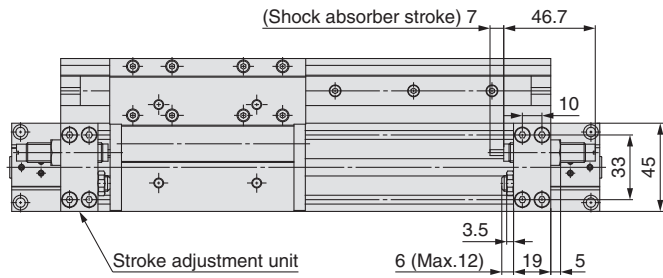
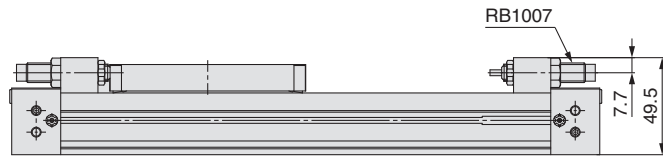
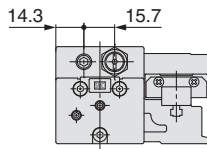


# Series MY1H

## Stroke Adjustment Unit

With high load shock absorber + Adjustment bolt

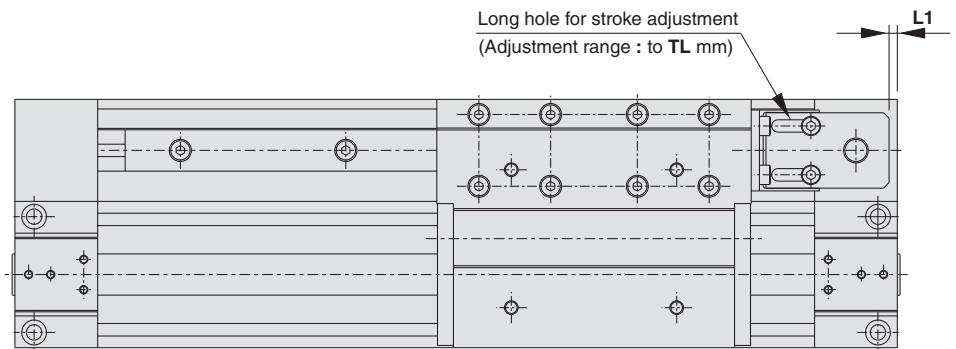
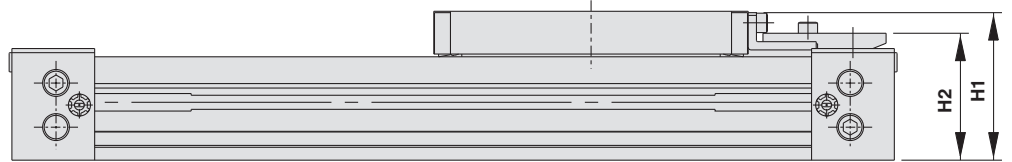
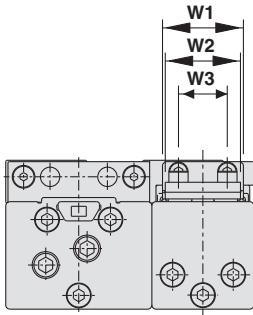
MY1H20 □ - **Stroke** H



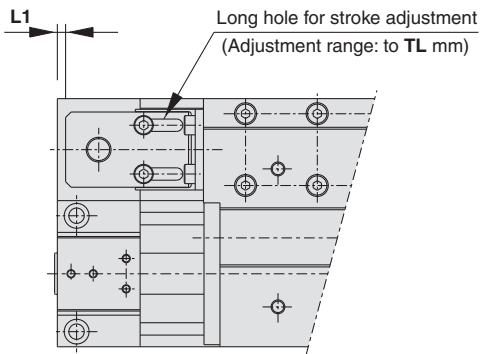
**With End Lock  $\varnothing 16, \varnothing 20$**

[Dimensions for types other than end lock are identical to the standard type dimensions. For details about dimensions, etc., refer to pages 89 and 90.]

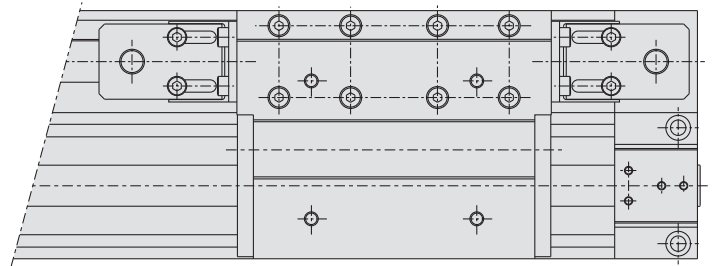
**MY1H□—□E  
(Right end)**



**MY1H□—□F  
(Left end)**



**MY1H□—□W  
(Both ends)**



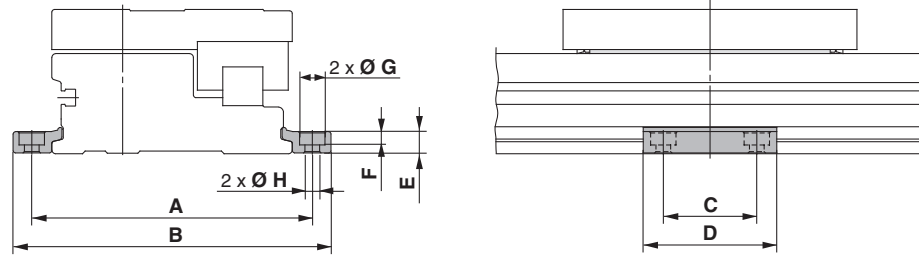
[mm]

Model	H1	H2	L1	TL	W1	W2	W3
MY1H16□	39.2	33	0.5	5.6	18	16	10.4
MY1H20□	45.7	39.5	3	6	18	16	10.4

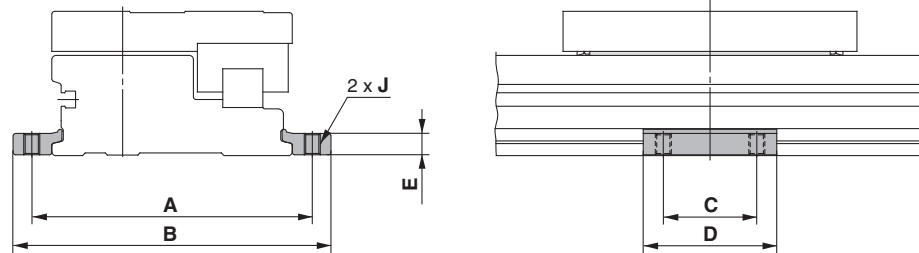
# Series MY1H

## Side Support

### Side support A MY-S□A



### Side support B MY-S□B



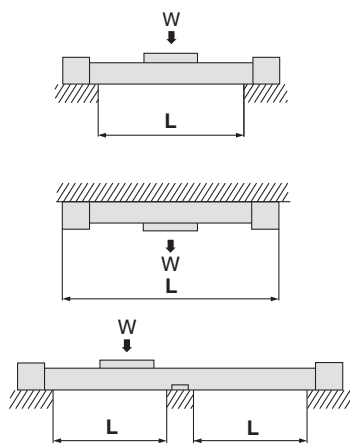
[mm]

Model	Applicable bore size	A	B	C	D	E	F	G	H	J
MY-S10 <sup>A</sup> <sub>B</sub>	MY1H10	53	61.6	12	21	3	1.2	6.5	3.4	M4 x 0.7
MY-S16 <sup>A</sup> <sub>B</sub>	MY1H16	71	81.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20 <sup>A</sup> <sub>B</sub>	MY1H20	91	103.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S25 <sup>A</sup> <sub>B</sub>	MY1H25	105	119	35	50	8	5	9.5	5.5	M6 x 1
MY-S32 <sup>A</sup> <sub>B</sub>	MY1H32	130	148	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S40 <sup>A</sup> <sub>B</sub>	MY1H40	145	167	55	80	14.8	8.5	14	9	M10 x 1.5

\* A set of side supports consists of a left support and a right support.

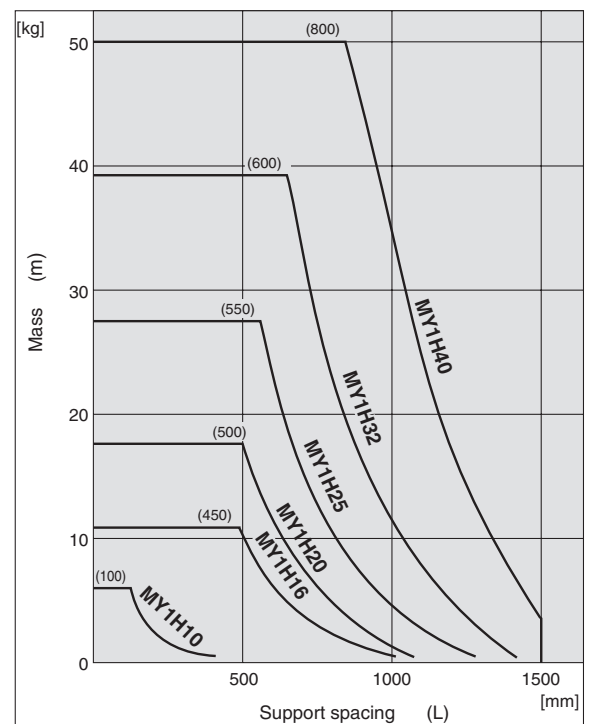
## Guide for Side Support Application

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load mass. In such a case, use a side support in the middle section. The spacing (L) of the support must be no more than the values shown in the graph on the right.



### ⚠ Caution

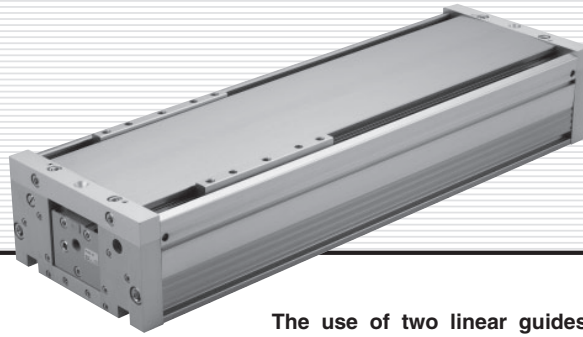
1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value is within the allowable limits shown in the graph.
2. Support brackets are not for mounting; use them solely for providing support.



# Series MY1HT

High Rigidity/Linear Guide Type

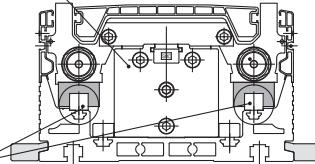
Ø 50, Ø 63



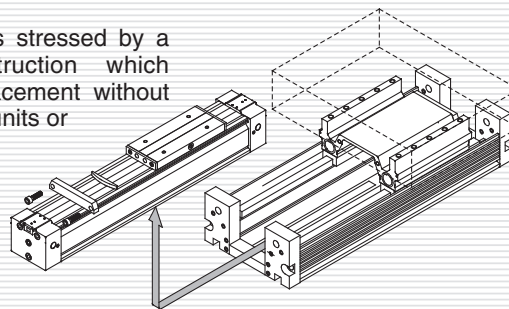
The use of two linear guides allows a maximum load of 320 kg. (Ø 63)

Rodless cylinder  
MY1BH

2 linear guides



Easy maintenance is stressed by a revolutionary construction which allows cylinder replacement without disturbing the guide units or workpiece.



# Series MY1HT Prior to Use

## Maximum Allowable Moment/Maximum Load Mass

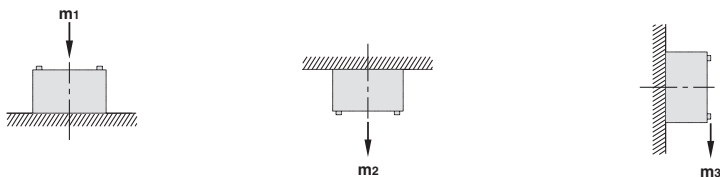
Model	Bore size [mm]	Maximum allowable moment [N·m]			Maximum load mass [kg]		
		M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	m <sub>1</sub>	m <sub>2</sub>	m <sub>3</sub>
MY1HT	50	140	180	140	200	140	200
	63	240	300	240	320	220	320

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

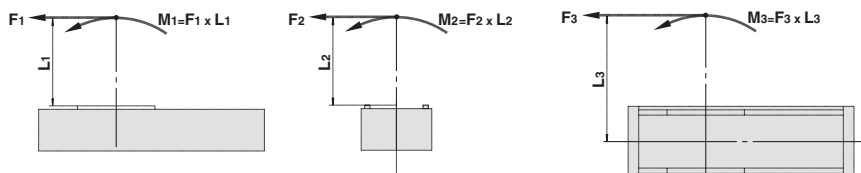
## Maximum Allowable Moment

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

### Load mass (kg)



### Moment (N·m)



### <Calculation of guide load factor>

1. Maximum allowable load (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  $v_a$  (average speed) for (1) and (2), and  $v$  (collision speed  $v = 1.4v_a$ ) for (3). Calculate  $m_{max}$  for (1) from the maximum allowable load graph ( $m_1, m_2, m_3$ ) and  $M_{max}$  for (2) and (3) from the maximum allowable moment graph ( $M_1, M_2, M_3$ ).

## Maximum Load Mass

Select the load 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.

$$\text{Sum of guide load factors } \Sigma \alpha = \frac{\text{Load mass [m]}}{\text{Maximum allowable load [m}_{max}\text{]}} + \frac{\text{Static moment [M] }^{(1)}}{\text{Allowable static moment [M}_{max}\text{]}} + \frac{\text{Dynamic moment [M}_E\text{] }^{(2)}}{\text{Allowable dynamic moment [M}_{Emax}\text{]}} \leq 1$$

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 workpiece, multiple moments may occur. When this happens, the sum of the load factors ( $\Sigma \alpha$ ) is the total of all such moments.

### 2. Reference formula [Dynamic moment at impact]

Use the following formulae to calculate dynamic moment when taking stopper impact into consideration.

**m**: Load mass (kg)

**F**: Load (N)

**F<sub>E</sub>**: Load equivalent to impact (at impact with stopper) (N)

**v<sub>a</sub>**: Average speed (mm/s)

**M**: Static moment (N·m)

$$v = 1.4v_a \text{ (mm/s)} \quad F_E = 1.4v_a \cdot \delta \cdot m \cdot g$$

$$\therefore M_E = \frac{1}{3} \cdot F_E \cdot L_1 = 4.57v_a \delta m L_1$$

**v**: Collision speed (mm/s)

**L<sub>1</sub>**: Distance to the load's centre of gravity (m)

**M<sub>E</sub>**: Dynamic moment (N·m)

**δ**: Damper coefficient

With rubber bumper = 4/100

(MY1B10, MY1H10)

With air cushion = 1/100

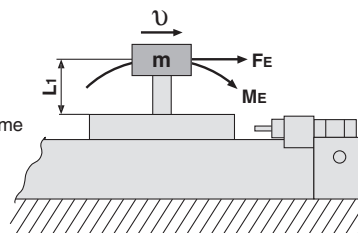
With shock absorber = 1/100

**g**: Gravitational acceleration (9.8 m/s<sup>2</sup>)

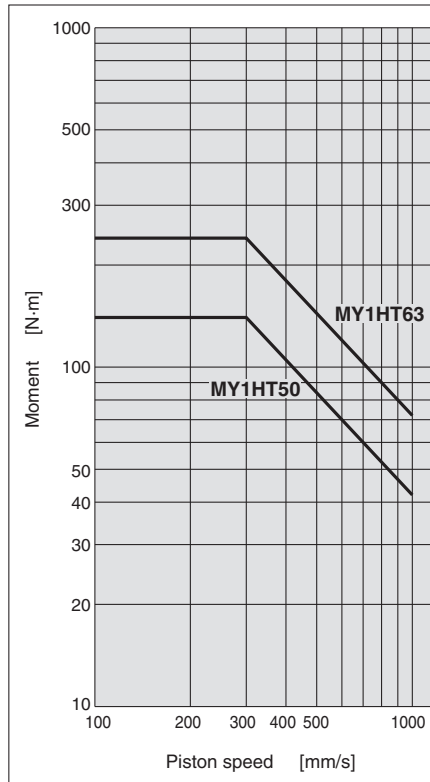
Note 4)  $1.4v_a \delta$  is a dimensionless coefficient for calculating impact force.

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.

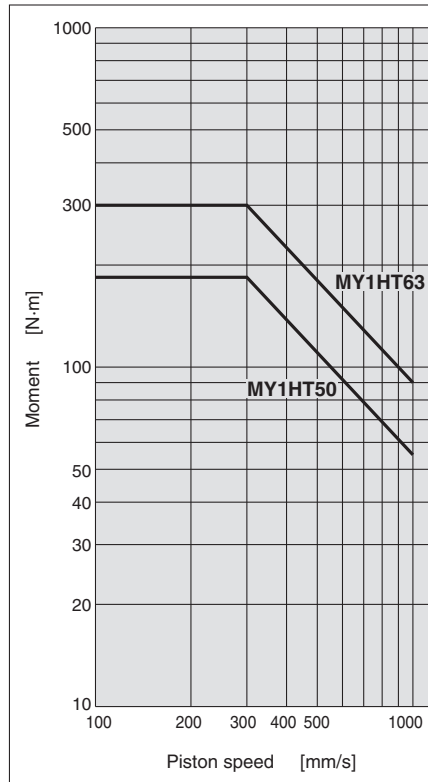
3. For detailed selection procedures, refer to pages 98 and 99.



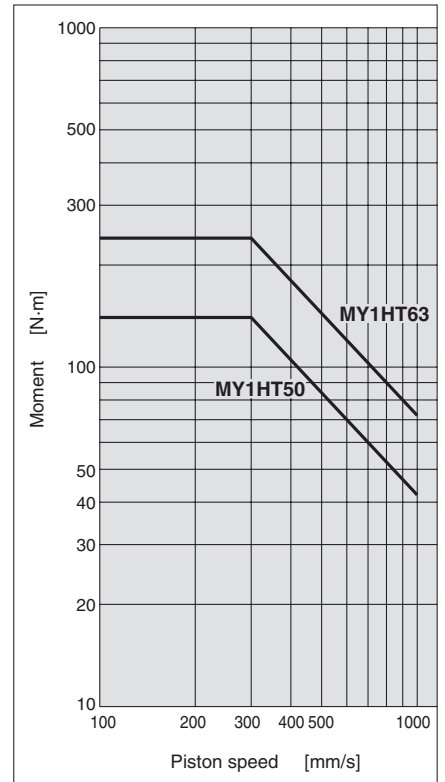
**MY1HT/M<sub>1</sub>**



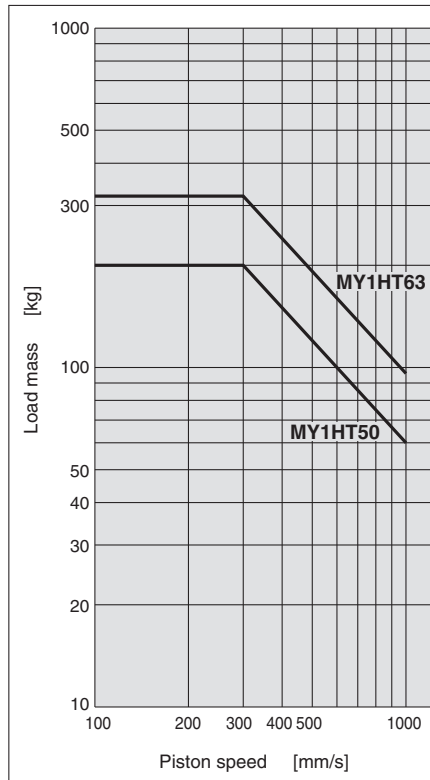
**MY1HT/M<sub>2</sub>**



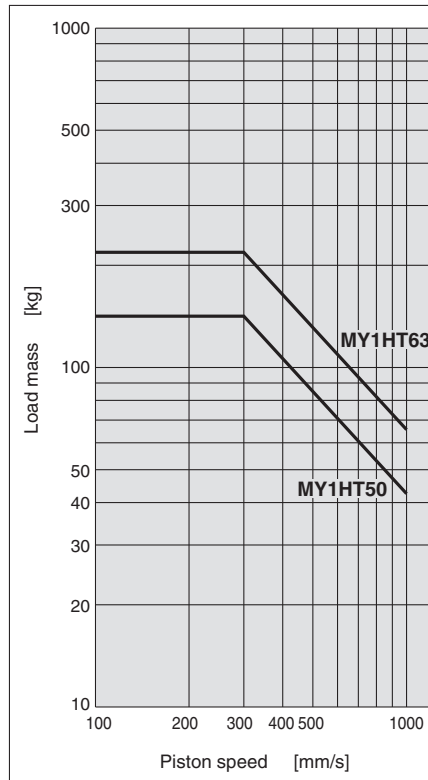
**MY1HT/M<sub>3</sub>**



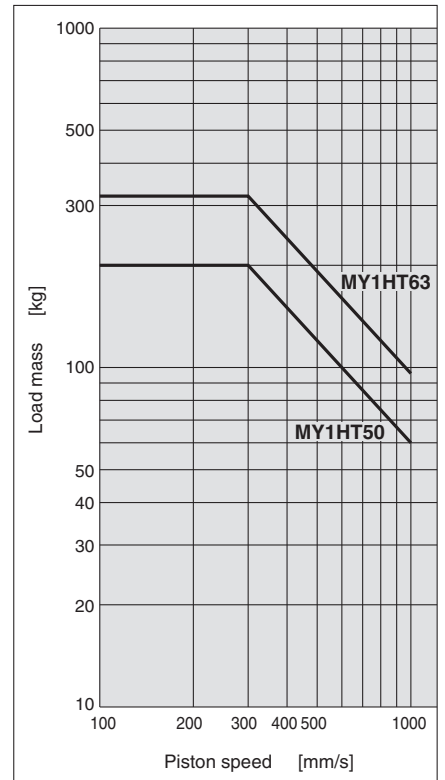
**MY1HT/m<sub>1</sub>**



**MY1HT/m<sub>2</sub>**



**MY1HT/m<sub>3</sub>**



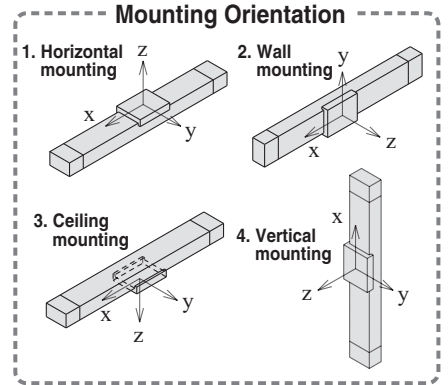
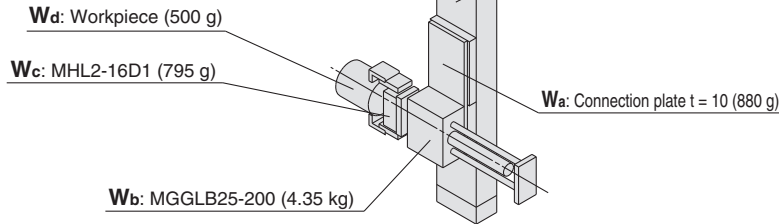
# Series MY1HT Model Selection

Following are the steps for selecting the most suitable Series MY1HT to your application.

## Calculation of Guide Load Factor

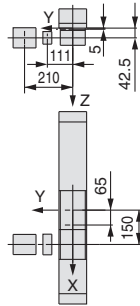
### 1. Operating Conditions

Cylinder ..... MY1HT50-600  
 Average operating speed  $v_a$  ... 700 mm/s  
 Mounting orientation ..... Vertical mounting  
 Cushion ..... Shock absorber  
 ( $\delta = 1/100$ )



For actual examples of calculation for each orientation, refer to the pages above.

### 2. Load Blocking



### Mass and Centre of Gravity for Each Workpiece

Workpiece no. $W_n$	Mass $m_n$	Centre of gravity		
		X-axis $X_n$	Y-axis $Y_n$	Z-axis $Z_n$
$W_a$	0.88 kg	65 mm	0 mm	5 mm
$W_b$	4.35 kg	150 mm	0 mm	42.5 mm
$W_c$	0.795 kg	150 mm	111 mm	42.5 mm
$W_d$	0.5 kg	150 mm	210 mm	42.5 mm

$n = a, b, c, d$

### 3. Composite Centre of Gravity Calculation

$$m_4 = \sum m_n = 0.88 + 4.35 + 0.795 + 0.5 = 6.525 \text{ kg}$$

$$X = \frac{1}{m_4} \times \sum (m_n \times x_n) = \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) = 138.5 \text{ mm}$$

$$Y = \frac{1}{m_4} \times \sum (m_n \times y_n) = \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) = 29.6 \text{ mm}$$

$$Z = \frac{1}{m_4} \times \sum (m_n \times z_n) = \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) = 37.4 \text{ mm}$$

### 4. Calculation of Load Factor for Static Load

$m_4$ : Mass

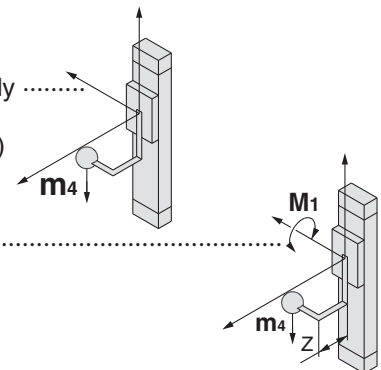
$m_4$  is the mass which can be transferred by the thrust, and as a rule, is actually ..... about 0.3 to 0.7 of the thrust. (This differs depending on the operating speed.)

$M_1$ : Moment

$M_1$  max (from (1) of graph MY1HT/ $M_1$ ) = 60 (N·m) .....

$$M_1 = m_4 \times g \times Z = 6.525 \times 9.8 \times 37.4 \times 10^{-3} = 2.39 \text{ (N·m)}$$

$$\text{Load factor } \alpha_1 = M_1 / M_1 \text{ max} = 2.39 / 60 = 0.04$$

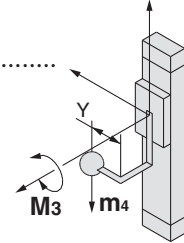


$M_3$  : Moment

$M_3 \text{ max}$  (from (2) of graph MY1HT/ $M_3$ ) = 60 (N·m) .....

$$M_3 = m_4 \times g \times Y = 6.525 \times 9.8 \times 29.6 \times 10^{-3} = 1.89 \text{ (N·m)}$$

$$\text{Load factor } \alpha_2 = M_3 / M_3 \text{ max} = 1.89 / 60 = 0.03$$



## 5. Calculation of Load Factor for Dynamic Moment

Equivalent load  $F_E$  at impact

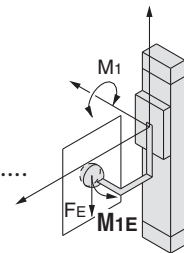
$$F_E = 1.4 \nu a \times \delta \times m \times g = 1.4 \times 700 \times \frac{1}{100} \times 6.525 \times 9.8 = 626.7 \text{ (N)}$$

$M_{1E}$  : Moment

$M_{1E} \text{ max}$  (from (3) of graph MY1HT/ $M_1$  where  $1.4 \nu a = 980 \text{ mm/s}$ ) = 42.9 (N·m) .....

$$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 626.7 \times 37.4 \times 10^{-3} = 7.82 \text{ (N·m)}$$

$$\text{Load factor } \alpha_3 = M_{1E} / M_{1E} \text{ max} = 7.82 / 42.9 = 0.18$$

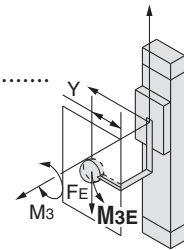


$M_{3E}$  : Moment

$M_{3E} \text{ max}$  (from (4) of graph MY1HT/ $M_3$  where  $1.4 \nu a = 980 \text{ mm/s}$ ) = 42.9 (N·m) .....

$$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 626.7 \times 29.6 \times 10^{-3} = 6.19 \text{ (N·m)}$$

$$\text{Load factor } \alpha_4 = M_{3E} / M_{3E} \text{ max} = 6.19 / 42.9 = 0.14$$



## 6. Sum and Examination of Guide Load Factors

$$\sum \alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 = 0.39 \leq 1$$

The above calculation is within the allowable value, and therefore the selected model can be used.

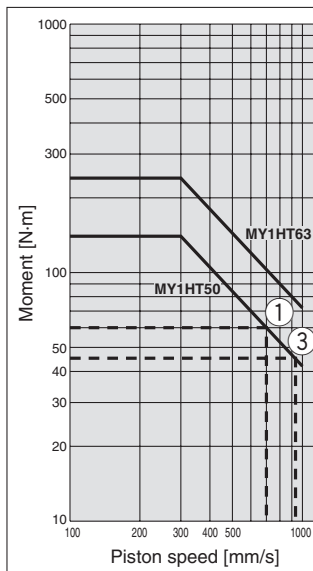
Select a shock absorber separately.

In an actual calculation, when the total sum of guide load factors  $\sum \alpha$  in the formula above is more than 1, consider either decreasing the speed, increasing the bore size, or changing the product series.

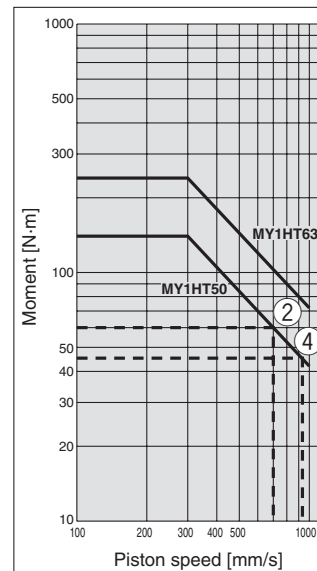
This calculation can be easily made using the "SMC Pneumatics CAD System".

### Allowable Moment

MY1HT/ $M_1$



MY1HT/ $M_3$





# Mechanically Jointed Rodless Cylinder High Rigidity/Linear Guide Type

## Series MY1HT

Ø 50, Ø 63

### How to Order

High Rigidity/  
Linear Guide Type

MY1HT 50 [ ] [ ] - 400 L - Y7BW [ ] - [ ]

High rigidity/Linear guide type  
(2 linear guides)

Bore size

50	50 mm
63	63 mm

Port thread type

Symbol	Type	Bore size
—	Rc	
TN	NPT	Ø 50, Ø 63
TF	G	

Piping

—	Standard type
G	Centralised piping type

Stroke

Refer to "Standard Stroke"  
on page 101.

Made to Order

Refer to page 101  
for details.

Number of  
auto switches

—	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch

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

\* For the applicable auto switch model,  
refer to the table below.

Stroke adjustment unit

L	One shock absorber at each stroke end
H	Two shock absorbers at each stroke end
LH	One shock absorber at left side, two shock absorbers at right side
HL	Two shock absorbers at left side, one shock absorber at right side

\* The positions right and left are for when the label is on the  
front side. Refer to the figure below for details.

#### Option

##### Stroke Adjustment Unit Part No.

Bore size [mm]	50	63
Unit type	MYT-A50L	MYT-A63L

##### Side Support Part No.

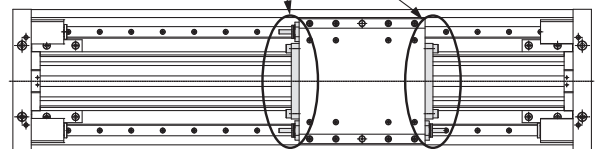
Type	Bore size [mm]	50	63
Side support A		MY-S63A	
Side support B		MY-S63B	

For details about dimensions, etc., refer to page 106.

A set of side supports consists of a left support and a right support.

Two shock absorbers at left side

One shock absorber at right side



Note) With top cover removed

Label position

#### Applicable Auto Switches/Refer to pages 107 to 117 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)			Pre-wired connector	Applicable load		
					DC	AC	Perpendicular	In-line	0.5 (-)	3 (L)	5 (Z)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y69A	Y59A	●	●	○	○	IC circuit	
				3-wire (PNP)				Y7PV	Y7P	●	●	○	○		
				2-wire				Y69B	Y59B	●	●	○	○		
	Diagnostic indication (2-colour indication)			3-wire (NPN)	5 V, 12 V	—	Y7N WV	Y7N W	●	●	○	○	○	○	IC circuit
				3-wire (PNP)			Y7P WV	Y7P W	●	●	○	○	○		
				2-wire			Y7B WV	Y7B W	●	●	○	○	○		
Water resistant (2-colour indication)	—	—	—	—	—	—	Y7BA**	—	●	○	○	○	—		
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	24 V	5 V	—	—	Z76	●	●	—	—	IC circuit	—
				2-wire				100 V	12 V	100 V or less	—	Z73	●	●	●
			No	2-wire				—	Z80	●	●	—	—	IC circuit	Relay, PLC

\*\* Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance.

Consult with SMC regarding water resistant types with the above model numbers.

\* Lead wire length symbols: 0.5 m ..... — (Example) Y7BW  
3 m ..... L (Example) Y7BWL  
5 m ..... Z (Example) Y7BWZ

\* Solid state auto switches marked with "○" are produced upon receipt of order.

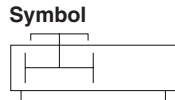
\* Separate switch spacers (BMP1-032) are required for retrofitting of auto switches.

\* There are other applicable auto switches than listed above. For details, refer to page 117.

\* Auto switches are shipped together (not assembled). (For details about auto switch mounting, etc., refer to pages 115 to 117.)

# Mechanically Jointed Rodless Cylinder High Rigidity/Linear Guide Type **Series MY1HT**

## Specifications



Bore size [mm]	<b>50</b>	<b>63</b>
Fluid	Air	
Action	Double acting	
Operating pressure range	0.1 to 0.8 MPa	
Proof pressure	1.2 MPa	
Ambient and fluid temperature	5 to 60 °C	
Piston speed	100 to 1000 mm/s	
Cushion	Shock absorbers on both ends (Standard)	
Lubrication	Non-lube	
Stroke length tolerance	2700 or less <sup>+1.8</sup> , 2701 to 5000 <sup>+2.8</sup>	
Port size	Side port	Rc 3/8

Note) Use at a speed within the absorption capacity range. Refer to page 102.

## Stroke Adjustment Unit Specifications

Applicable bore size [mm]	<b>50</b>		<b>63</b>	
Unit symbol, contents	L	H	L	H
	RB2015 and adjustment bolt: 1 set each	RB2015 and adjustment bolt: 2 sets each	RB2725 and adjustment bolt: 1 set each	RB2725 and adjustment bolt: 2 sets each
Fine stroke adjustment range [mm]	0 to -20		0 to -25	
Stroke adjustment range	For adjustment method, refer to page 103.			

\* Stroke adjustment range is applicable for one side when mounted on a cylinder.

Shock absorber model	<b>RB2015 x 1 pc.</b>	<b>RB2015 x 2 pcs.</b>	<b>RB2725 x 1 pc.</b>	<b>RB2725 x 2 pcs.</b>
Maximum energy absorption [J]	58.8	88.2 <sup>Note)</sup>	147	220.5 <sup>Note)</sup>
Stroke absorption [mm]	15	15	25	25
Maximum collision speed [mm/s]	1000		1000	
Maximum operating frequency [cycle/min]	25	25	10	10
Spring force [N]	Extended	16.68	8.83	17.66
	Retracted	41.00	20.01	40.02
Operating temperature range [°C]	5 to 60			

Note) Maximum energy absorption for 2 pcs. is calculated by multiplying the value for 1 pc. by 1.5.

\* The shock absorber service life is different from that of the MY1HT cylinder depending on operating conditions. Refer to the RB Series Specific Product Precautions for the replacement period.

## Theoretical Output

Bore size [mm]	Piston area [mm <sup>2</sup> ]	Operating pressure [Mpa]						
		0.2	0.3	0.4	0.5	0.6	0.7	0.8
<b>50</b>	1962	392	588	784	981	1177	1373	1569
<b>63</b>	3115	623	934	1246	1557	1869	2180	2492

Note) Theoretical output (N) = Pressure [Mpa] x Piston area (mm<sup>2</sup>)

## Standard Stroke

Bore size [mm]	Standard stroke [mm]	Intermediate stroke (-XB10)	Long stroke (-XB11)	Maximum manufacturable stroke
<b>50・63</b>	200, 400, 600, 800, 1000, 1500, 2000	Intermediate strokes of 201 to 1999 mm (1mm increments) other than standard strokes	—	5000

Note) Cylinders other than the standard stroke type are manufactured upon request for special order. Ordering example

\* Add "-XB10" to the end of the part number for intermediate strokes.

## Made to Order: Specifications (Refer to page 118 to 120 for details.)

Symbol	Specifications
<b>-XB10</b>	Intermediate stroke type
<b>-XC67</b>	NBR rubber lining in dust seal band
<b>20-</b>	Cooper-free

## Weight

Bore size [mm]	Basic weight	Additional weight per each 25 mm of stroke	Weight of moving parts	Side support weight (per set)	Stroke adjustment unit weight		
				Type A and B	L unit weight	LH unit weight	H unit weight
<b>50</b>	30.62	0.87	5.80	0.17	0.62	0.93	1.24
<b>63</b>	41.69	1.13	8.10	0.17	1.08	1.62	2.16

Calculation: (Example) **MY1HT50-400L**

- Basic weight .....30.62 kg
  - Additional weight ....0.87/25 st
  - L unit weight .....0.62 kg
  - Cylinder stroke..... 400 st
- 30.62 + 0.87 x 400 ÷ 25 + 0.62 x 2 ≒ 45.8

# Series MY1HT

## Cushion Capacity

### Cushion Selection

<Stroke adjusting unit with built-in shock absorber>

#### L unit

Use this unit when cushioning is necessary outside the air cushion stroke 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.

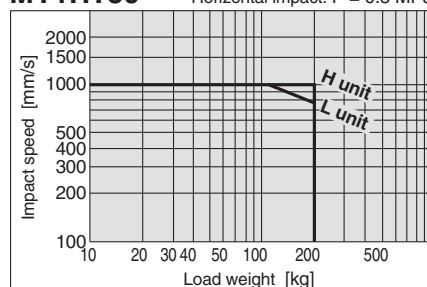
#### H unit

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.

### Stroke Adjusting Unit Absorption Capacity

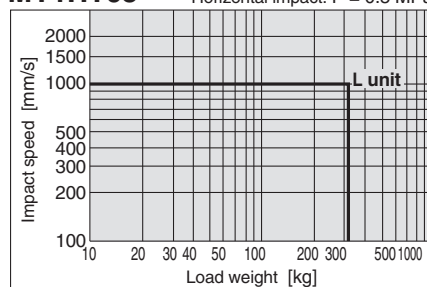
#### MY1HT50

Horizontal impact: P = 0.5 MPa



#### MY1HT63

Horizontal impact: P = 0.5 MPa



### Stopper Bolt Holding Screw Tightening Torque

#### Stopper bolt holding screw tightening torque

Unit: [N·m]

Bore size [mm]	Tightening torque
50	0.6
63	1.5

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

Unit: [N·m]

Type of impact	Horizontal	Vertical (downward)	Vertical (upward)
Kinetic energy E <sub>1</sub>		$\frac{1}{2} m \cdot v^2$	
Thrust energy E <sub>2</sub>	F·s	F·s + m·g·s	F·s - m·g·s
Absorbed energy E		E <sub>1</sub> + E <sub>2</sub>	

#### Symbols

v: Speed of impacting object (m/s)  
 m: Weight of impacting object (kg)  
 F: Cylinder thrust (N)  
 g: Gravitational acceleration (9.8m/s<sup>2</sup>)  
 s: Shock absorber stroke (m)

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

## ⚠ Specific Product Precautions

### Mounting

#### ⚠ Caution

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

Since the slide table (slider) is supported by precision bearings, do not subject it to strong impact or excessive moment when mounting work pieces.

2. Perform careful alignment when connecting to a load which has 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 for connection to a load which has an external guide mechanism. Since fluctuation of the centre axis increases as the stroke becomes longer, use a method of connection which can absorb the variations (floating mechanism).

3. Do not put hands or fingers inside when the body is suspended.

Since the body is heavy, use eye bolts when suspending it. (The eye bolts are not included with the body.)

### 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.

### Handling

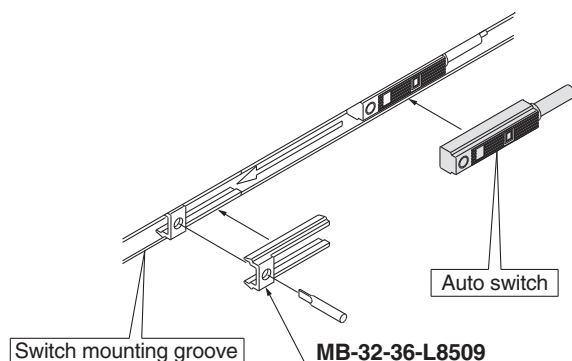
#### ⚠ Caution

2. Air leakage will result from negative pressure.

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.

### Auto Switch Mounting

#### ⚠ Caution



**Stroke Adjustment Method**

**Caution**

- As shown in Figure (1), to adjust the stopper bolt within the adjustment range A, insert a hexagon wrench from the top to loosen the hexagon socket head set screw by approximately one turn, and then adjust the stopper bolt with a flat head screwdriver.
- When the adjustment described in 1 above is insufficient, the shock absorber can be adjusted. Remove the covers as shown in Figure (2) and make further adjustment by loosening the hexagon nut.
- Various dimensions are indicated in Table (1). Never make an adjustment that exceeds the dimensions in the table, as it may cause an accident and/or damage.

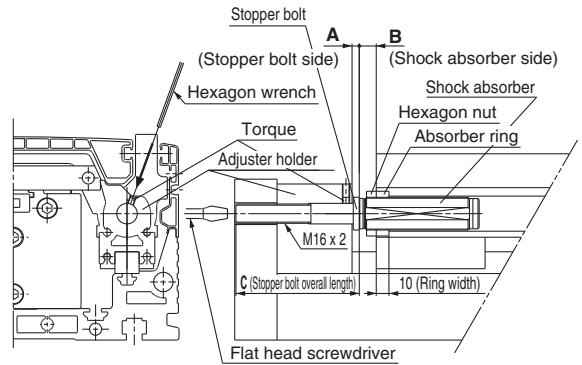


Figure (1) Stroke adjusting section detail

**Table (1)** [mm]

Bore size [mm]	50	63
A to A Max.	6 to 26	6 to 31
B to B Max.	14 to 54	14 to 74
C	87	102
Max. adjustment range	60	85

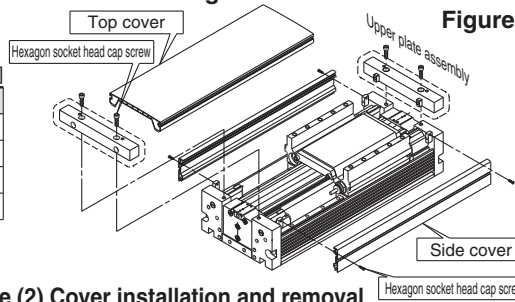


Figure (2) Cover installation and removal

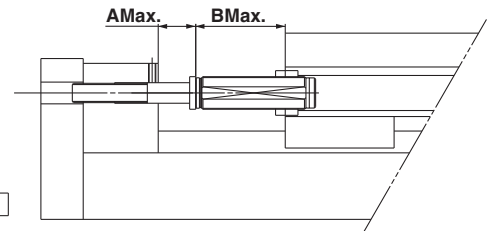


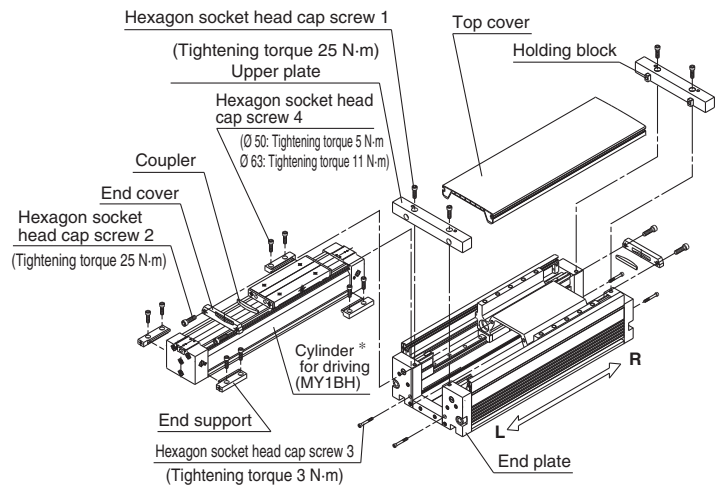
Figure (3) Maximum stroke adjustment detail

**Disassembly and Assembly Procedure**

**Caution**

**Disassembly step**

- Remove the hexagon socket head cap screws 1, and remove the upper plates.
- Remove the top cover.
- Remove the hexagon socket head cap screws 2, and remove the end covers and couplers.
- Remove the hexagon socket head cap screws 3.
- Remove the hexagon socket head cap screws 4, and remove the end supports.
- Remove the cylinder.



**Assembly step**

- Insert the MY1BH cylinder.
- Temporarily fasten the end supports with the hexagon socket head cap screws 4.
- With two hexagon socket head cap screws 3 on the L or R side, pull the end support and the cylinder.
- Tighten the hexagon socket head cap screws 3 on the other side to eliminate the looseness in the axial direction. (At this point, a space is created between the end support and the end plate on one side, but this is not a problem.)
- Re-tighten the hexagon socket head cap screws 4.
- Fasten the end cover with the hexagon head cap screws 2, while making sure that the coupler is in the right direction.
- Place the top cover on the body.
- Insert the holding blocks into the top cover and fasten the upper plates with the hexagon socket head cap screws 1.

**\* Cylinder For Driving (Series MY1BH)**

Since Series MY1BH is a cylinder for driving for Series MY1HT, its construction is different from Series MY1B. Do not use Series MY1B as a cylinder for driving, since it will lead to damage.

**How to Order**

High rigidity/Linear guide type **MY1HT** 50 [ ] [ ] - 300 L - Z73 [ ]

Cylinder for driving **MY1BH** 50 [ ] [ ] - 300

**Bore size**

50	50 mm
63	63 mm

**Port thread type**

Symbol	Type	Bore size
—	Rc	
TN	NPT	Ø 50, Ø 63
TF	G	

**Stroke [mm]**

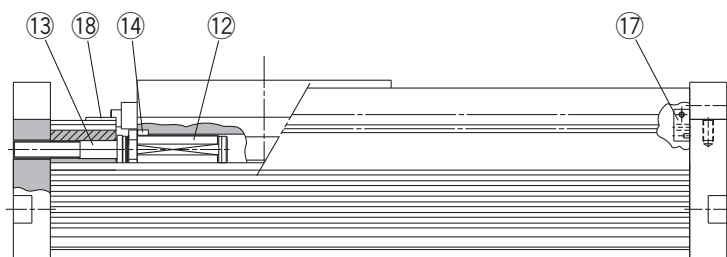
— Standard type

G Centralised piping type

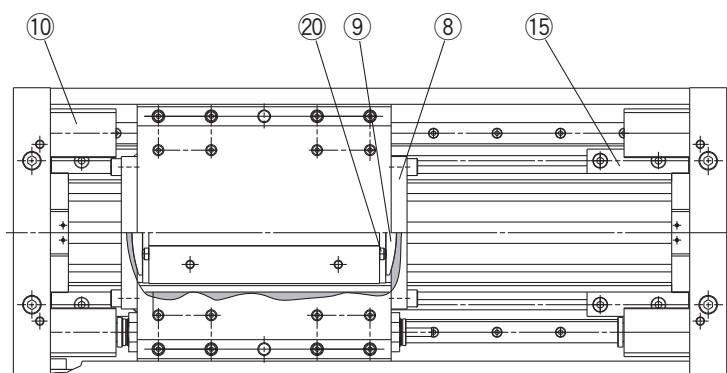
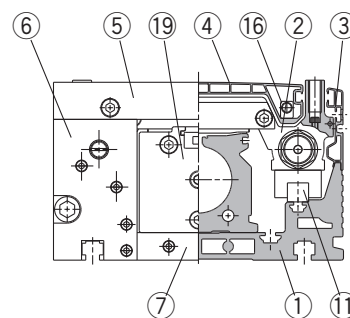
# Series MY1HT

## Construction

### Standard type



Note) With top cover removed



Note) With top cover removed

### Component Parts

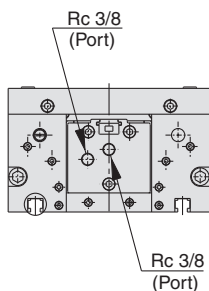
No.	Description	Material	Note
1	Guide frame	Aluminium alloy	Hard anodised
2	Slide table	Aluminium alloy	Hard anodised
3	Side cover	Aluminium alloy	Hard anodised
4	Top cover	Aluminium alloy	Hard anodised
5	Upper plate	Aluminium alloy	Hard anodised
6	End plate	Aluminium alloy	Hard anodised
7	Bottom plate	Aluminium alloy	Hard anodised
8	End cover	Aluminium alloy	Chromated
9	Coupler	Aluminium alloy	Chromated
10	Adjuster holder	Aluminium alloy	Hard anodised
11	Guide	—	
12	Shock absorber	—	
13	Stopper bolt	Carbon steel	Nickel plated
14	Absorber ring	Rolled steel	Nickel plated
15	End support	Aluminium alloy	Hard anodised
16	Top block	Aluminium alloy	Chromated
17	Side block	Aluminium alloy	Chromated
18	Slide plate	Special resin	
19	Rodless cylinder	—	MY1BH
20	Stopper	Carbon steel	Nickel plated

# Mechanically Jointed Rodless Cylinder High Rigidity/Linear Guide Type **Series MY1HT**

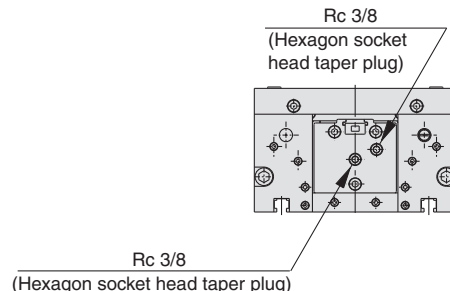
## Standard Type/Centralised Piping Type $\varnothing 50, \varnothing 63$

Refer to page 122 regarding centralised piping port variations.

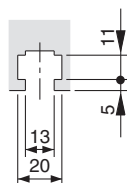
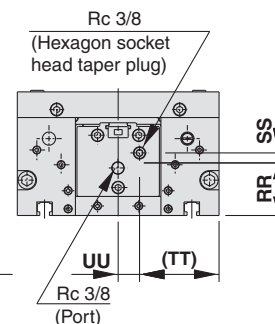
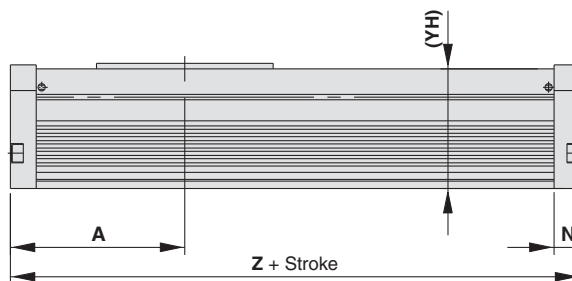
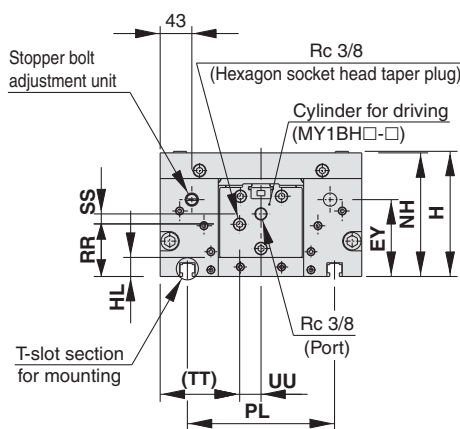
### MY1HT50□/63□ — Stroke



MY1HT□G

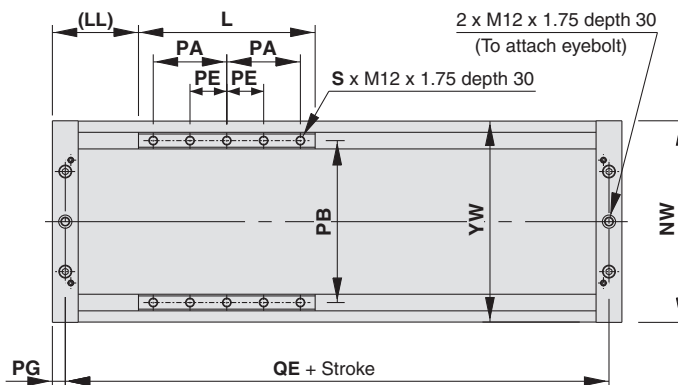


MY1HT□G



Applicable nut JIS B 1163  
Square nut M12

### Dimensions of T-slot for mounting



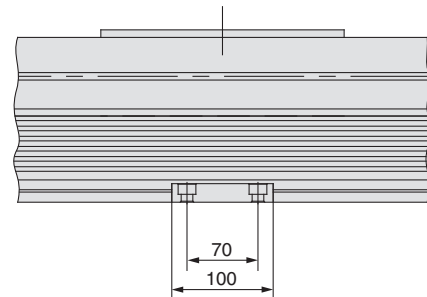
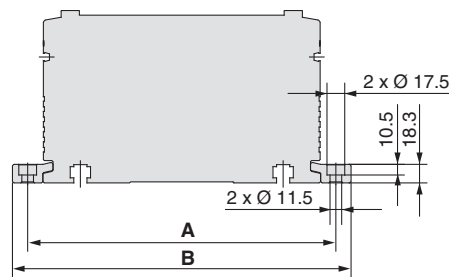
Model	A	EY	H	HL	L	LL	N	NH	NW	PA	PB	PE	PG
MY1HT50□	207	97.5	145	23	210	102	30	143	254	90	200	-	15
MY1HT63□	237	104.5	170	26	240	117	35	168	274	100	220	50	17.5

Model	PL	QE	RR	S	SS	TT	UU	YH	YW	Z
MY1HT50□	180	384	57	6	10	103.5	23.5	136.4	253	414
MY1HT63□	200	439	71.5	10	13.5	108	29	162.6	273	474

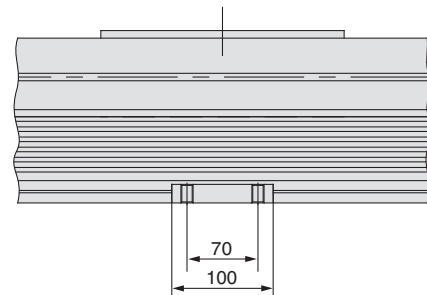
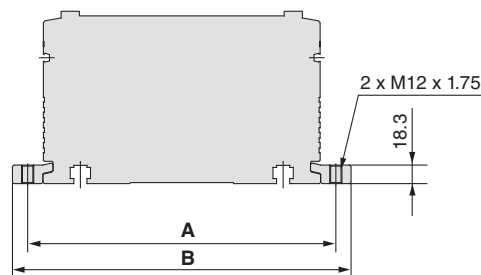
# Series MY1HT

## Side Support

### Side support A MY-S63A



### Side support B MY-S63B



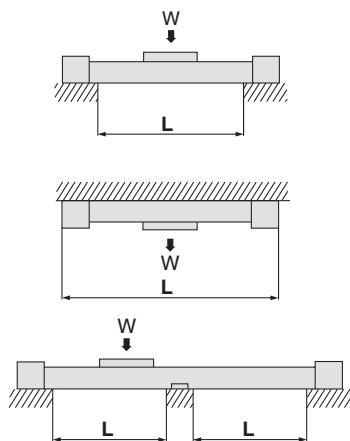
### Dimensions

Model	Applicable bore size	[mm]	
		A	B
MY-S63 <sub>A</sub>	MY1HT50	284	314
	MY1HT63	304	334

\* A set of side supports consists of a left support and a right support.

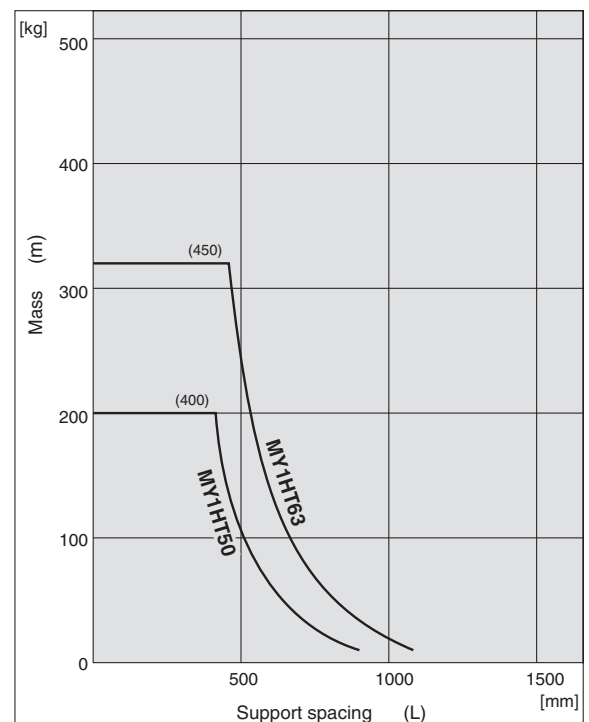
## Guide for Side Support Application

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load mass. In such a case, use a side support in the middle section. The spacing (L) of the support must be no more than the values shown in the graph on the right.



### Caution

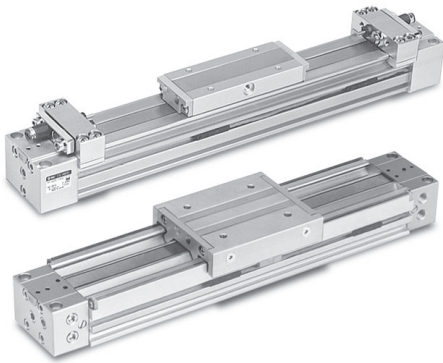
1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value is within the allowable limits shown in the graph.
2. Support brackets are not for mounting; use them solely for providing support.





## Series MY1

# Auto Switch Specifications



### Applicable auto switches

Auto switch models		Electrical entry
Reed switches	D-A9□	Grommet (In-line)
	D-A9□V	Grommet (Perpendicular)
	D-Z7□, Z80	Grommet (In-line)
Solid switches	D-M9□	Grommet (In-line)
	D-M9□V	Grommet (Perpendicular)
	D-M9□W	Grommet (2 colour indicator, In-line)
	D-M9□WV	Grommet (2 colour indicator, Perpendicular)
	D-M9□A	Grommet (water resistant, 2-colour indicator, in line)
	D-M9□AV	Grommet (water resistant, 2-colour indicator, perpendicular)
	D-Y59A, Y59B, Y7P	Grommet (In-line)
	D-Y69A, Y69B, Y7PV	Grommet (Perpendicular)
	D-Y7□W	Grommet (2 colour indicator, In-line)
	D-Y7□WV	Grommet (2 colour indicator, Perpendicular)



# Reed Switches

## D-A9□/3 Wire, 2 Wire (Direct Mount Type)

D-A90(V), D-A93(V), D-A96(V)



Applicable cylinder series

- MY1B (Basic)
- MY1M (Slide bearing)
- MY1C (Cam follower guide)
- MY1H (High precision guide)

Bore size [mm]	
10	16 20 25 32 40 50 63 80 100
MY1B (Basic)	●
MY1M (Slide bearing)	●
MY1C (Cam follower guide)	●
MY1H (High precision guide)	●

### Auto Switch Specifications

#### D-A90, D-A90V (without indicator light)

Auto switch part no.	D-A90	D-A90V	
Electrical entry direction	In-line	Perpendicular	
Applicable load	IC circuit, Relay, PLC		
Load voltage	24 V $\frac{AC}{DC}$ or less	48 V $\frac{AC}{DC}$ or less	100 V $\frac{AC}{DC}$ or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	1 or less (including lead wire length of 3 m)		

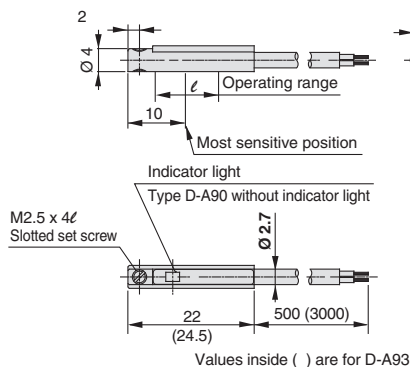
#### D-A93, A93V, D-A96, A96V (with indicator light)

Auto switch part no.	D-A93		D-A93V		D-A96	D-A96V
Electrical entry direction	In-line		Perpendicular		In-line	Perpendicular
Applicable loads	Relay, PLC		Relay, PLC		IC circuit	
Load voltage	24 V DC	100 V AC	24 V DC	100 V AC	4 to 8 V DC	
Load current range and max. load current	5 to 40 mA	5 to 20 mA	5 to 40 mA	5 to 20 mA	20 mA	
Contact protection circuit	None					
Internal voltage drop	2.4 V or less (to 20 mA) 3 V or less (to 40 mA)		2.7 V or less		0.8 V or less	
Indicator light	Red LED lights up when ON					

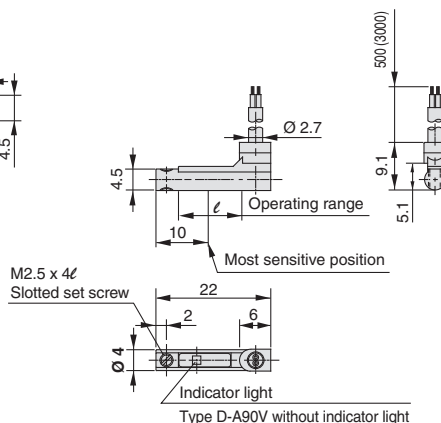
- Lead wires — Heavy duty oil resistant vinyl cord,  $\varnothing$  2.7, 0.5 m  
D-A90(V), D-A93(V) 0.18 mm<sup>2</sup> x 2 wire (Brown, Blue [Red, Black])  
D-A96(V) 0.15 mm<sup>2</sup> x 3 wire (Brown, Black, Blue [Red, White, Black])
  - Insulation resistance — 50 M $\Omega$  or more at 500 V DC (between lead wire and case)
  - Withstand voltage — 1000 V AC for 1 min. (between lead wire and case)
  - Operating time — 1.2 ms
  - Ambient temperature — -10 to 60 °C
  - Impact resistance — 300 m/s<sup>2</sup>
  - Leakage current — None
  - Enclosure — IEC529 standard IP67, watertight (JISC0920)
- For a lead wire length of 3 m, "L" is shown at the end of the part number. Example) D-A90L

### Dimensions

#### D-A90, D-A93, D-A96



#### D-A90V, D-A93V, D-A96V



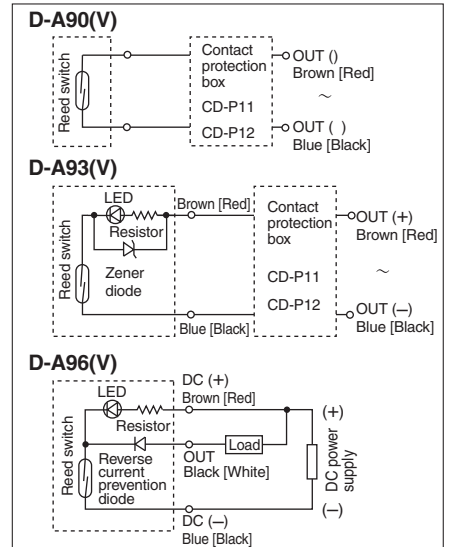
### Weight

Unit: g

Model	Lead wire length 0.5m	Lead wire length 3m
D-A9/A9□V	8	41

### Auto switch internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.



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

D-A9□ and D-A9□ type switches do not have internal contact protection circuits.

1. The operated load is an induction load.
  2. The length of wiring to the load is 5 m or more.
  3. The load voltage is 100 V AC.
- A contact protection box should be used in any of the above situations.

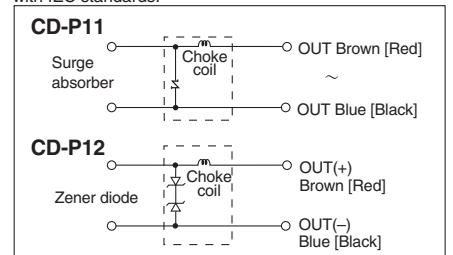
#### Contact protection box specifications

Part No.	CD-P11	CD-P12
Load voltage	100 V AC	24 V DC
Max. load current	25 mA	50 mA

\* Lead wire lengths ..... Switch connection side 0.5 m  
Load connection side 0.5 m

#### Contact protection box internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.



# Reed Switches

## D-Z7□, Z80/3 Wire, 2 Wire (Direct Mount Type)

D-Z73, D-Z76, D-Z80



Applicable cylinder series

MY1B (Basic)	16	20	25	32	40	50	63	80	100
MY1M (Slide bearing)									
MY1C (Cam follower guide)									
MY1HT (High rigidity/ High precision guide)									

Bore size [mm]	
16	20
25	32
40	50
63	80
100	

### Auto Switch Specifications

#### D-Z7□ (with indicator light)

Auto switch part no.	D-Z73		D-Z76
Electrical entry direction	In-line		
Applicable load	Relay, PLC		IC circuit
Load voltage	24 V DC	100 V AC	4 to 8 V DC
Load current range and max. load current	5 to 40 mA	5 to 20 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	2.4 V or less (to 20 mA)/3 V or less (to 40 mA)		0.8 V or less
Indicator light	Red LED lights up when ON		

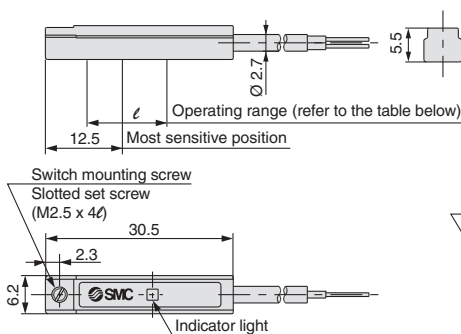
#### D-Z80 (without indicator light)

Auto switch part no.	D-Z80		
Electrical entry direction	In-line		
Applicable load	Relay, PLC, IC circuit,		
Load voltage	24 V AC or less	48 V AC or less	100 V AC or less
Maximum load current	50 mA	40 mA	20 mA
Contact protection circuit	None		
Internal voltage drop	1 or less (including lead wire length of 3 m)		

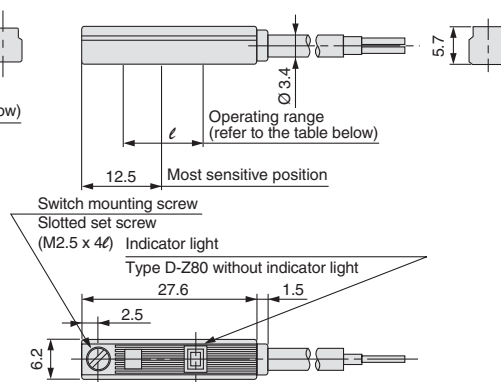
- Leakage current — None
  - Operating time — 1.2 ms
  - Lead wires — Heavy duty oil resistant vinyl cord,  $\varnothing$  3.4, 0.2 mm<sup>2</sup>, 2 wire (Brown, Blue [Red, Black]), 3 wire (Brown, Black, Blue [Red, White, Black]), 0.5 m\* D-Z73 only  $\varnothing$  2.7, 0.18 mm<sup>2</sup>, 2 wire
  - Impact resistance — 300 m/S<sup>2</sup>
  - Insulation resistance — 50 M $\Omega$  or more at 500 V DC (between lead wire and case)
  - Withstand voltage — 1500 V AC for 1 min. (between lead wire and case)
  - Ambient temperature — -10 to 60 °C
  - Enclosure — IEC529 standard IP67, watertight (JISC0920)
- \* For a lead wire length of 3 m, "L" is shown at the end of the part number. Example) D-Z73L

### Dimensions

#### D-Z73



#### D-Z76, Z80



Bore size	Bore size [mm]	
Operating range	180	200
Operating range $\ell$ [mm]	15	15

Note) There is a guide including hysteresis, but is not guaranteed. There may be large variations (as much as 30 %) depending on the ambient environment.

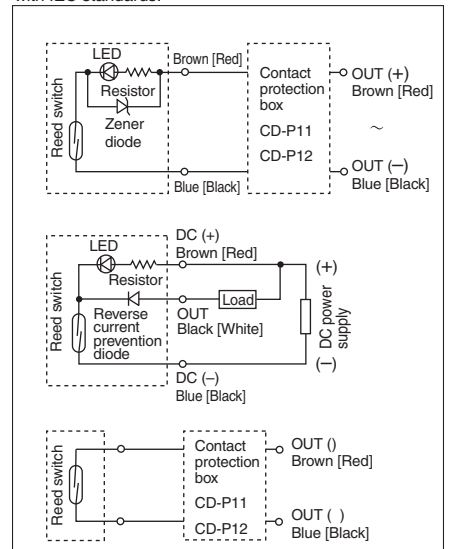
### Weight

Unit: g

Model	Lead wire length 0.5m	Lead wire length 3m
D-Z73	7	31
D-Z76	10	55
D-Z80	9	49

### Auto switch internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.



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

D-Z7□ and D-Z80□ type switches do not have internal contact protection circuits.

1. The operated load is an induction load.
  2. The length of wiring to the load is 5 m or more.
  3. The load voltage is 100 V AC.
- A contact protection box should be used in any of the above situations.

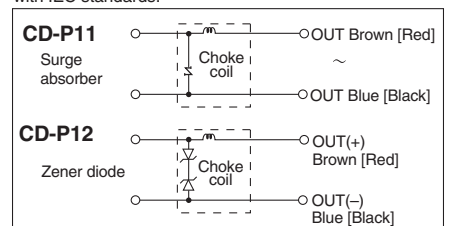
### Contact protection box specifications

Part No.	CD-P11	CD-P12
Load voltage	100 V AC	24 V DC
Max. load current	25 mA	50 mA

D-Z80 type switches are 100 V AC or less. Since there is no particular specified voltage, select a type based on the operating voltage.

### Contact protection box internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.



# Solid State Switches

## D-M9/3 Wire, 2 Wire (Direct Mount Type)

D-M9N (V), D-M9P (V), D-M9B (V)



Applicable cylinder series

MY1B (Basic)  
MY1M (Slide bearing)  
MY1C (Cam follower guide)  
MY1H (High precision guide)

		Bore size [mm]									
		10	16	20	25	32	40	50	63	80	100
MY1B (Basic)		●	●	●	●	●	●	●	●	●	●
MY1M (Slide bearing)		●	●	●	●	●	●	●	●	●	●
MY1C (Cam follower guide)		●	●	●	●	●	●	●	●	●	●
MY1H (High precision guide)		●	●	●	●	●	●	●	●	●	●

### Auto Switch Specifications

D-M9□, D-M9□V (with indicator light)

Auto switch part no.	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
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				24 V DC Relay, PLC	
Power supply voltage	5, 12, 24 V DC (4.5 to 28 V DC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less <sup>(0.8 V or less at 10 mA load current)</sup>		0.8 V or less		4 V or less	
Leakage current	100 μA or less at 24 V DC				0.8 mA or less at 24 V DC	
Indicator light	Red LED lights up when ON					

- **Lead wires** — Heavy duty oil resistant vinyl cord, Ø 2.7, 0.5 m  
D-M9N(V), D-M9P(V) 0.15 mm<sup>2</sup> x 3 wire (Brown, Black, Blue [Red, White, Black])  
D-M9B(V) 0.18 mm<sup>2</sup> x 2 wire (Brown, Blue [Red, Black])
- **Insulation resistance** — 50 MΩ or more at 500 V DC (between lead wire and case)
- **Withstand voltage** — 1000 V AC for 1 min. (between lead wire and case)
- **Indicator light** — Lights up when ON
- **Ambient temperature** — -10 to 60 °C
- **Operating time** — 1 ms or less
- **Enclosure** — IEC529 standard IP67, watertight (JISC0920)
- **Impact resistance** — 1000 m/s<sup>2</sup>
- For a lead wire length of 3 m, "L" is shown at the end of the part number. Example) D-M9NL

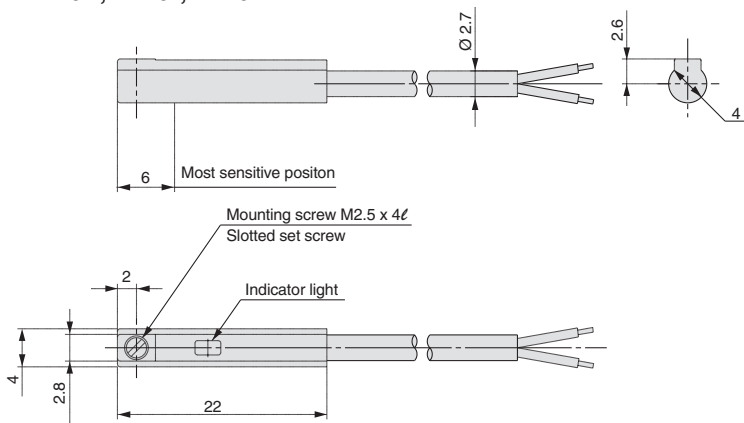
### Weight

Model	D-M9N	D-M9P	D-M9B	D-M9NV	D-M9PV	D-M9BV
Lead wire length 0.5 m	7	7	6	7	7	6
Lead wire length 3 m	37	37	31	37	37	31

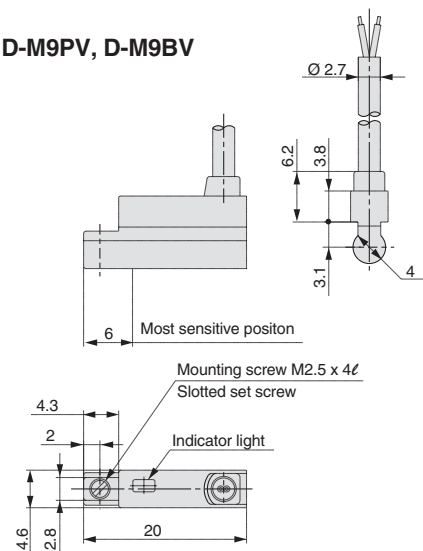
Unit: [g]

### Dimensions

D-M9N, D-M9P, D-M9B

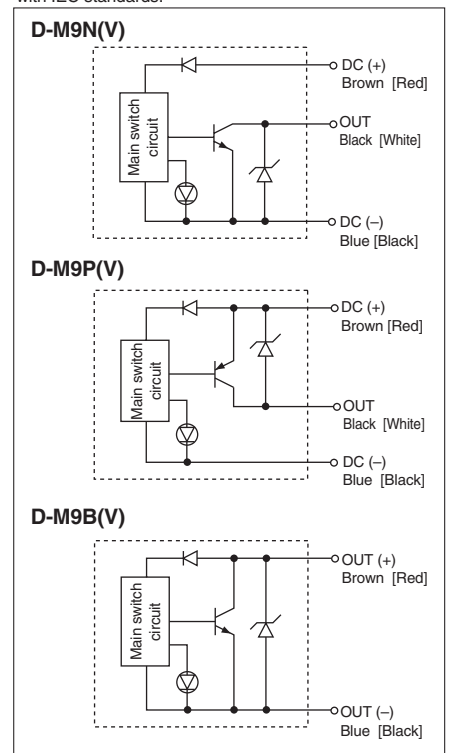


D-M9NV, D-M9PV, D-M9BV



### Auto switch internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.



# 2 Colour Indication Solid State Switches

## D-M9□W/3 Wire, 2 Wire

D-M9NW(V), D-M9PW(V), D-M9BW(V)



Applicable cylinder series

- MY1B (Basic)
- MY1M (Slide bearing)
- MY1C (Cam follower guide)
- MY1H (High precision guide)

		Bore size [mm]									
		10	16	20	25	32	40	50	63	80	100
MY1B (Basic)		●	●	●						●	●
MY1M (Slide bearing)			●	●	●	●	●	●	●		
MY1C (Cam follower guide)			●	●	●	●	●	●	●		
MY1H (High precision guide)		●	●	●							

### Auto Switch Specifications

#### D-M9□W, D-M9□WV (with indicator light)

Auto switch part no	D-M9NW	D-M9NWV	D-M9PW	D-M9PWV	D-M9BW	D-M9BWV
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				24 V DC Relay, PLC	
Power supply voltage	5, 12, 24 V DC (4.5 to 28 V DC)				—	
Current consumption	10 mA or less				—	
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less (0.8 V or less at 10 mA load current)		0.8 V or less		4 V or less	
Leakage current	100 μA or less at 24 V DC				0.8 mA or less at 24 V DC	
Indicator light	Actuated position ..... Red LED lights up Optimum operating position ..... Green LED lights up					

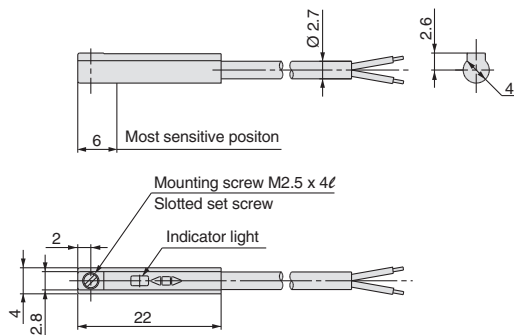
- **Lead wires** — Heavy duty oil resistant vinyl cord, Ø 2.7, 0.5 m  
D-M9NW(V), D-M9PW(V) 0.15 mm<sup>2</sup> x 3 wire (Brown, Black, Blue [Red, White, Black])  
D-M9BW(V) 0.18 mm<sup>2</sup> x 2 wire (Brown, Blue [Red, Black])
- **Insulation resistance** — 50 MΩ or more at 500 V DC (between lead wire and case)
- **Withstand voltage** — 1000 V AC for 1 min. (between lead wire and case)
- **Ambient temperature** — -10 to 60 °C • **Operating time** — 1 ms or less • **Impact resistance** — 1000 m/s<sup>2</sup>
- **Enclosure** — IEC529 standard IP67, watertight (JISC0920)
- For a lead wire length of 3 m, "L" is shown at the end of the part number. Example) D-M9NWL

### Weight

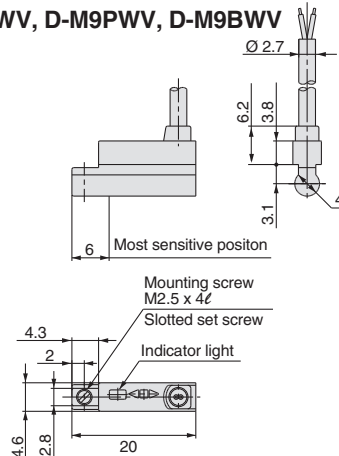
Model	D-M9NW	D-M9NWV	D-M9PW	D-M9PWV	D-M9BW	D-M9BWV
Lead wire length 0.5 m	7	7	7	7	7	7
Lead wire length 3 m	34	34	34	34	32	32

### Dimensions

D-M9NW, D-M9PW, D-M9BW



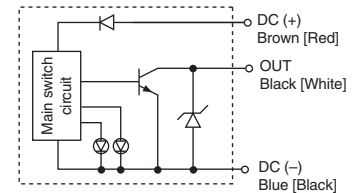
D-M9NWV, D-M9PWV, D-M9BWV



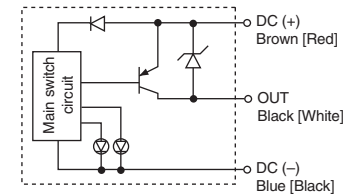
### Auto switch internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.

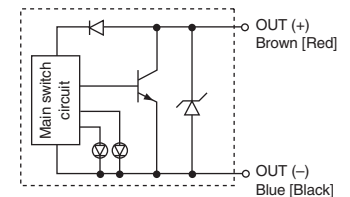
#### D-M9NW(V)



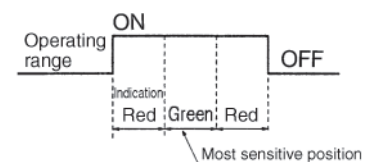
#### D-M9PW(V)



#### D-M9BW(V)



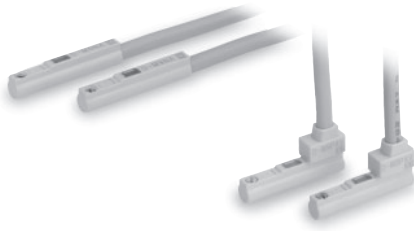
### Indicator light/Display method



# Water Resistant 2 Colour Indication Solid State Switch

## D-M9□A(V) (Direct Mount Type)

D-M9NA(V), D-M9PA(V), D-M9BA(V)



Applicable cylinder series

- MY1B (Basic)
- MY1M (Slide bearing)
- MY1C (Cam follower guide)
- MY1H (High precision guide)

		Bore size [mm]									
		10	16	20	25	32	40	50	63	80	100
MY1B (Basic)	●	●	●	●	●	●	●	●	●	●	●
MY1M (Slide bearing)	●	●	●	●	●	●	●	●	●	●	●
MY1C (Cam follower guide)	●	●	●	●	●	●	●	●	●	●	●
MY1H (High precision guide)	●	●	●	●	●	●	●	●	●	●	●

### Auto Switch Specifications

D-M9□A, D-M9□AV (with indicator light)		PLC: Programmable Logic Controller					
Auto switch part no.	D-M9NA	D-M9NAV	D-M9PA	D-M9PAV	D-M9BA	D-M9BAV	
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				24 V DC relay, PLC		
Power supply voltage	5, 12, 24 V DC (4.5 to 28 V)				—		
Current consumption	10 mA or less				—		
Load voltage	28 V DC or less		—		24 VDC (10 to 28 V DC)		
Load current	40 mA or less				2.5 to 40 mA		
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less		
Leakage current	100 A or less at 24 V DC				0.8 mA or less		
Indicator light	Operating position ..... Red LED illuminates. Optimum operating position ..... Green LED illuminates.						

- Lead wires — Oilproof heavy-duty vinyl cable:  $\varnothing 2.7 \times 3.2$  ellipse
- D-M9BA(V) 0.15 mm<sup>2</sup> x 2 cores
- D-M9NA(V), D-M9PA(V) 0.15 mm<sup>2</sup> x 3 cores

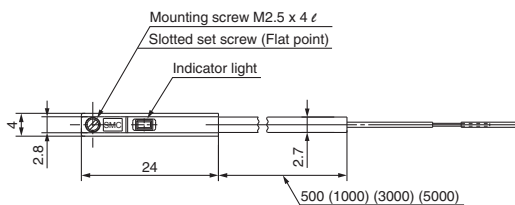
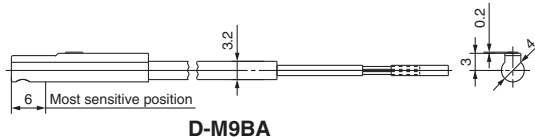
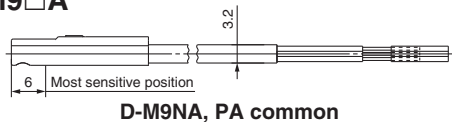
### Weight

Unit: [g]

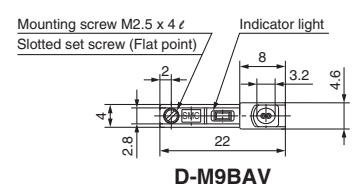
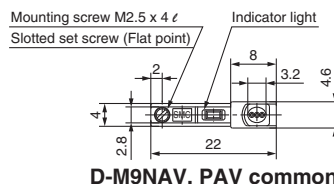
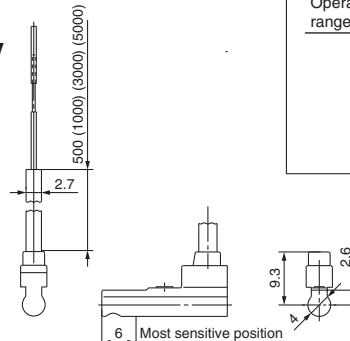
Auto switch part no.	D-M9NA(V)	D-M9PA(V)	D-M9BA(V)
Lead wire length [m]			
0.5	8	8	7
1	14	14	13
3	41	41	38
5	68	68	63

### Dimensions

D-M9□A

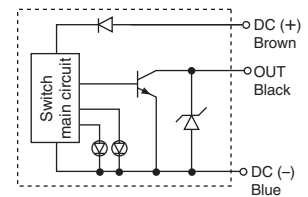


D-M9□AV

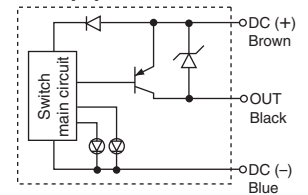


### Auto Switch Internal Circuit

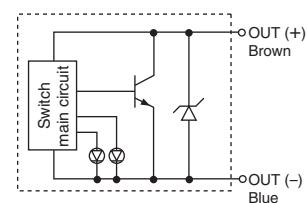
D-M9NA(V)



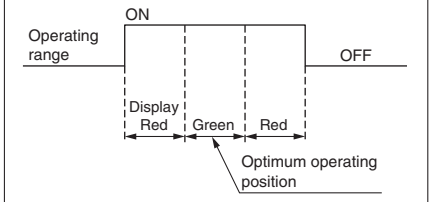
D-M9PA(V)



D-M9BA(V)



### Indicator light / Display method



# Solid State Auto Switches

## D-Y5, Y6, Y7P(V)/3 Wire, 2 Wire (Direct Mount Type)

D-Y59<sup>A</sup><sub>B</sub>, D-Y69<sup>A</sup><sub>B</sub>, D-Y7P(V)



Applicable  
cylinder series

MY1B (Basic)  
MY1M (Slide bearing)  
MY1C (Cam follower guide)  
MY1HT (High rigidity/High precision guide)

		Bore size [mm]								
		16	20	25	32	40	50	63	80	100
MY1B (Basic)										
MY1M (Slide bearing)										
MY1C (Cam follower guide)										
MY1HT (High rigidity/High precision guide)										

### Auto Switch Specifications

#### D-Y5, D-Y6, D-Y7P, D-Y7PV (with indicator light)

Auto switch model no.	D-Y59A	D-Y69A	D-Y7P	D-Y7PV	D-Y59B	D-Y69B
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			24 V DC Relay, PLC		
Power supply voltage	5, 12, 24 V DC (4.5 to 28 V DC)			—		
Current consumption	10 mA or less			—		
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less (0.8 V or less at 10mA load current)		0.8 V or less		4 V or less	
Leakage current	100 $\mu$ A or less at 24 V DC			0.8 mA or less at 24 DC		
Indicator light	Red LED lights up when ON					

- Operating time — 1ms or less
- Lead wires — Heavy duty oil resistant flexible vinyl cord,  
 $\varnothing$  3.4, 0.15 mm<sup>2</sup>, 3 wire (Brown, Black, Blue [Red, White, Black]), 2 wire (Brown, Blue [Red, Black]) 0.5m\*
- \* For a lead wire length of 3m, "L" is shown at the end of the part number. Example) D-Y59AL
- Impact resistance — 1000 m/S<sup>2</sup>
- Insulation resistance — 50 M $\Omega$  or more at 500 V DC (between lead wire and case)
- Withstand voltage — 1000 V AC for 1min. (between lead wire and case)
- Ambient temperature — -10 to 60 °C
- Enclosure — IEC529 standard IP67, watertight (JISC0920)

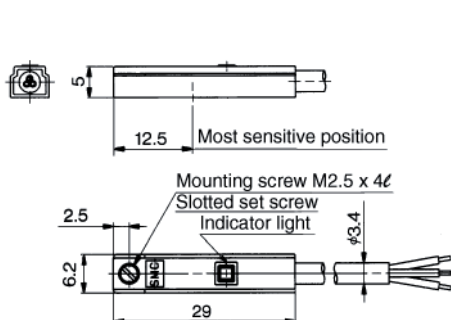
### Weight

Model	Lead wire length 0.5 m	Lead wire length 3 m
D-Y59A, Y69A, Y7P, Y7PV	10	53
D-Y59B, Y69B	9	50

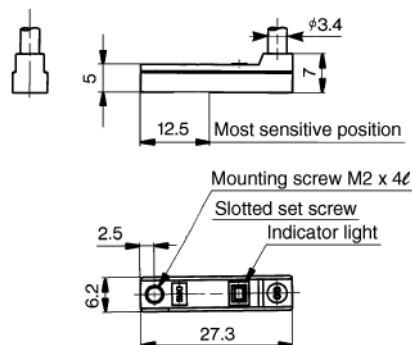
Unit: [g]

### Dimensions

#### D-Y59A, D-Y7P, D-Y59B

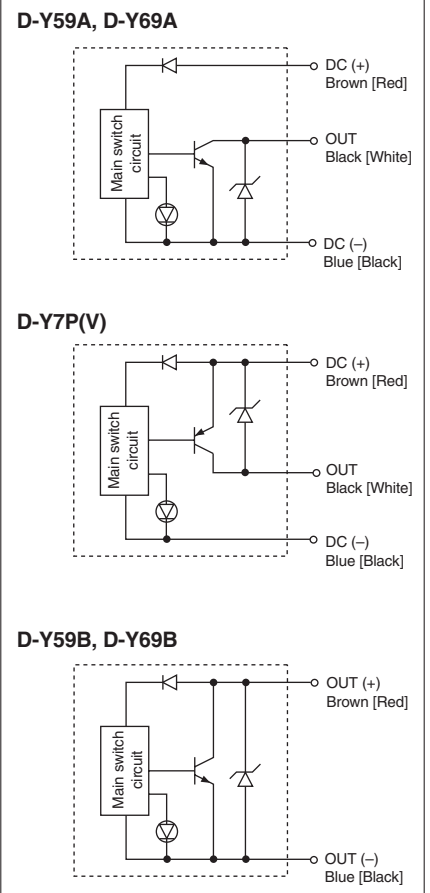


#### D-Y69A, D-Y7PV, D-Y69B



### Auto switch internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.





# Solid State Switches

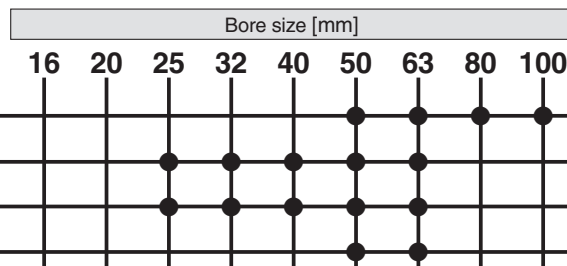
## D-Y7□W/3 Wire, 2 Wire (Direct Mount Type)

D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)



Applicable cylinder series

- MY1B (Basic)
- MY1M (Slide bearing)
- MY1C (Cam follower guide)
- MY1HT (High rigidity/High precision guide)



### Auto Switch Specifications

D-Y7□W, D-Y7□WV (with indicator light)

Auto switch part no	D-Y7NW	D-Y7NWV	D-Y7PW	D-Y7PWV	D-Y7BW	D-Y7BWV
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			24 V DC Relay, PLC		
Power supply voltage	5, 12, 24 V DC (4.5 to 28 V DC)			—		
Current consumption	10mA or less			—		
Load voltage	28 V DC or less		—		24 V DC (10 to 28 V DC)	
Load current	40 mA or less		80 mA or less		5 to 40 mA	
Internal voltage drop	1.5 V or less (0.8 V or less at 10 mA load current)		0.8 V or less		4 or less	
Leakage current	100 μA or less at 24 V DC			0.8 mA or less at 24 V DC		
Indicator light	Actuated position ..... Red LED lights up Optimum operating position ..... Green LED lights up					

- Operating time — 1ms or less
- Lead wires — Heavy duty oil resistant flexible vinyl cord, Ø 3.4, 0.15 mm<sup>2</sup>; 3 wire (Brown, Black, Blue [Red, White, Black]), 2 wire (Brown, Blue [Red, Black]), 0.5m\*

- Impact resistance — 1000 m/s<sup>2</sup>
- Insulation resistance — 50 M or more at 500 V DC (between lead wire and case)
- Withstand voltage — 1000 V AC for 1min. (between lead wire and case)
- Ambient temperature — -10 to 60 °C
- Enclosure — IEC529 standard IP67, watertight (JIS C0920)

\* For a lead wire length of 3 m, "L" is shown at the end of the part number. Example D-Y7NWL

### Auto switch weights

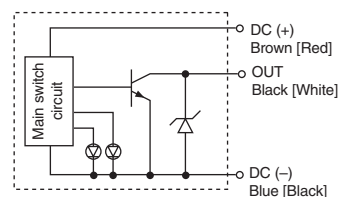
Model	Lead wire length 0.5 m	Lead wire length 3 m
D-Y7NW, Y7PW, Y7BW	10	53
D-Y7NWV, Y7PWV, Y7BWV	9	50

Unit: [g]

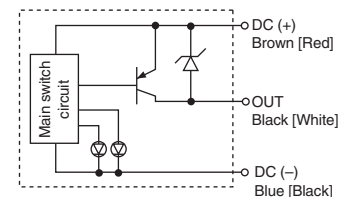
### Auto switch internal circuits

Lead wire colours inside ( ) are those prior to conformity with IEC standards.

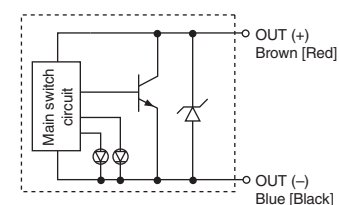
D-Y7NW(V)/3 wire NPN output



D-Y7PW(V)/3 wire PNP output

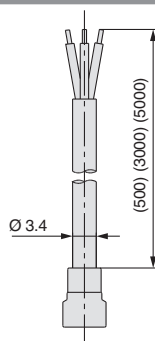
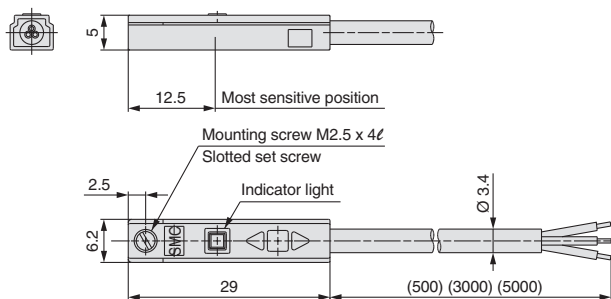


D-Y7BW(V)/2 wire

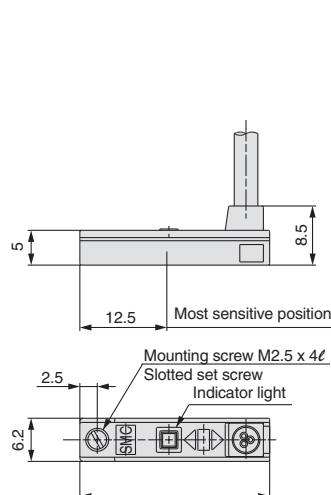


### Auto Switch Dimensions

D-Y7□W



D-Y7□WV



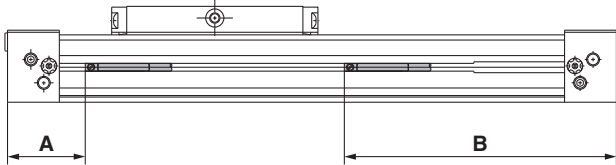
# Series MY1

# Auto Switch Mounting 1

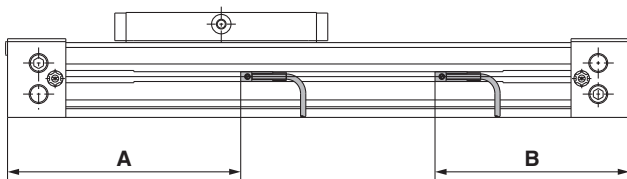
## Proper Auto Switch Mounting Position (Detection at stroke end)

### MY1B (Basic type)

Ø 10, Ø 16, Ø 20



Ø 50 to Ø 100



### Proper Auto Switch Mounting Position

[mm]

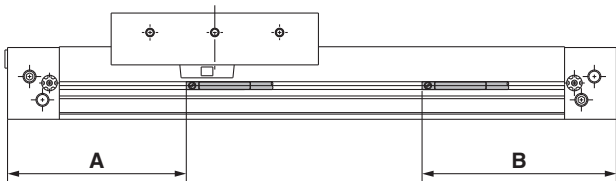
Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Y7BA D-Z7□/Z80	
	A	B	A	B	A	B
Bore size						
10	24	86	20	90	—	—
16	31.5	128.5	27.5	132.5	—	—
20	39	161	35	165	—	—
50	—	—	—	—	272.5	127.5
63	322.5	137.5	—	—	317.5	142.5
80	489.5	200.5	—	—	484.5	205.5
100	574.5	225.5	—	—	569.5	230.5

Note 1) D-M9□□□ type cannot be mounted on Ø 50.

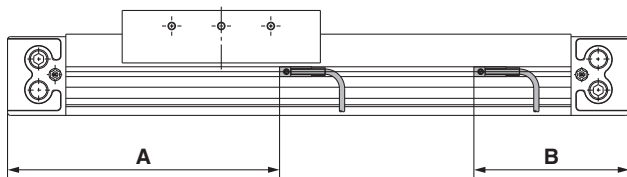
Note 2) Adjust the auto switch after confirming the operating condition in the actual setting.

### MY1M (Slide bearing guide type)

Ø 16, Ø 20



Ø 25 to Ø 63



### Proper Auto Switch Mounting Position

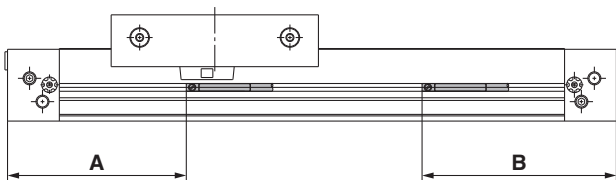
[mm]

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Z7□/Z80	
	A	B	A	B	A	B
Bore size						
16	74	86	70	90	—	—
20	94	106	90	110	—	—
25	143.5	75.5	—	—	139.5	80.5
32	189.5	90.5	—	—	184.5	95.5
40	234.5	105.5	—	—	229.5	110.5
50	283.5	116.5	—	—	278.5	121.5
63	328.5	131.5	—	—	323.5	136.5

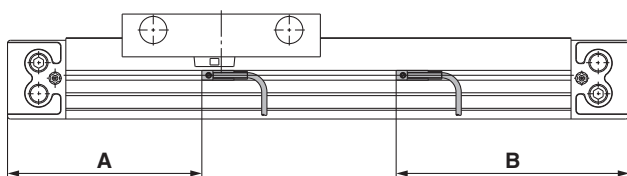
Note) Adjust the auto switch after confirming the operating condition in the actual setting.

### MY1C (Cam follower guide type)

Ø 16, Ø 20



Ø 25 to Ø 63



### Proper Auto Switch Mounting Position

[mm]

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Z7□/Z80	
	A	B	A	B	A	B
Bore size						
16	74	86	70	90	—	—
20	94	106	90	110	—	—
25	102	118	—	—	97	123
32	132	148	—	—	127	153
40	162.5	175.5	—	—	157.5	182.5
50	283.5	116.5	—	—	278.5	121.5
63	328.5	131.5	—	—	323.5	136.5

Note) Adjust the auto switch after confirming the operating condition in the actual setting.

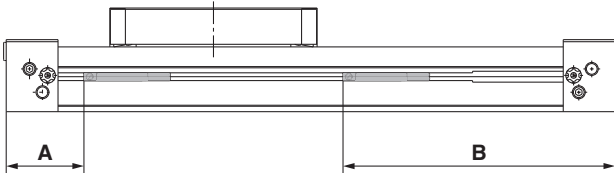


# Series MY1

# Auto Switch Mounting 2

## Proper Auto Switch Mounting Position (Detection at stroke end)

MY1H (Linear guide type)  
 Ø 10, Ø 16, Ø 20

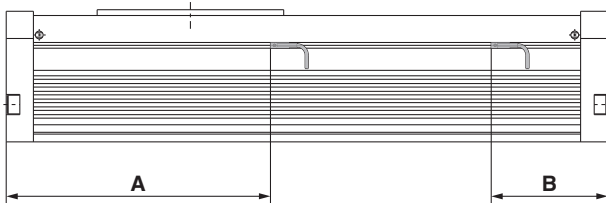


### Proper Auto Switch Mounting Position [mm]

Auto switch model	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□A D-M9□AV		D-A9□ D-A9□V		D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Z7□/Z80	
	A	B	A	B	A	B
Bore size						
10	24	86	20	90	—	—
16	31.5	128.5	27.5	132.5	—	—
20	39	161	35	165	—	—

Note) Adjust the auto switch after confirming the operating condition in the actual setting.

MY1HT (High rigidity/Linear guide type)  
 Ø 50, Ø 63



### Proper Auto Switch Mounting Position [mm]

Auto switch model	D-Y59□/Y7P D-Y69□/Y7PV D-Y7□W D-Y7□WV D-Y7BA D-Z7□/Z80	
	A	B
Bore size		
50	290.5	123.5
63	335.5	138.5

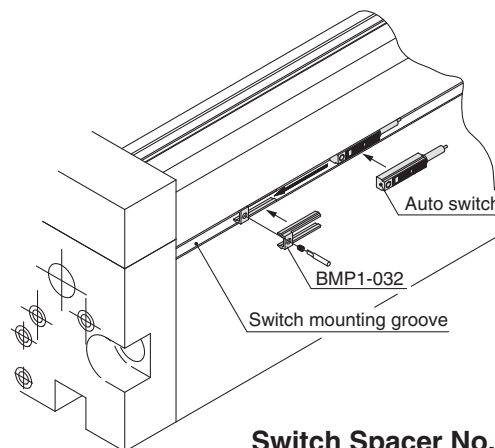
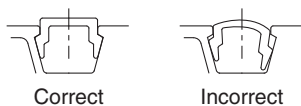
Note) Adjust the auto switch after confirming the operating condition in the actual setting.

## How to Mount the Auto Switch (For MY1HT)

When attaching an auto switch, first take a switch spacer between your fingers and press it into a switch mounting groove. When doing this, confirm that it is set in the correct mounting orientation, or reattach if necessary.

Next, insert an auto switch into the groove and slide it until it is positioned under the switch spacer.

After establishing the mounting position, use a watchmaker's flat head screwdriver to tighten the auto switch mounting screw which is included.



Note) When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm. Also, tighten with a torque of about 0.05 to 0.1 N·m. As a guide, it should be turned about 90° past the point at which tightening can be felt.

### Switch Spacer No.

Cylinder series	Applicable bore size [mm]	
	50	63
MY1HT	BMP1-032	

## Operating Range

Note) Since this is a guideline including hysteresis, not meant to be guaranteed. (Assuming approximately ± 30% dispersion.)  
There may be the case it will vary substantially depending on an ambient environment.

### MY1B (Basic type) [mm]

Auto switch model	Bore size						
	10	16	20	50	63	80	100
D-A9□/A9□V	6	6.5	8.5	—	—	—	—
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3.5	4	5.5	—	12	12	11.5
D-Z7□/Z80	—	—	—	11.5	11.5	11.5	11.5
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	—	—	—	3.5	3.5	3.5	3.5

D-M9□□□ type cannot be mounted on Ø 50.

### MY1M (Slide bearing guide type) [mm]

Auto switch model	Bore size						
	16	20	25	32	40	50	63
D-A9□/A9□V	11	7.5	—	—	—	—	—
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	7.5	7.5	8.5	8.5	9.5	7	6
D-Z7□/Z80	—	—	12	12	12	11.5	11.5
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	—	—	5	5	5	5.5	5.5

### MY1C (Cam follower guide type) [mm]

Auto switch model	Bore size						
	16	20	25	32	40	50	63
D-A9□/A9□V	11	7.5	—	—	—	—	—
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	7.5	7.5	7	8	8.5	7	6
D-Z7□/Z80	—	—	12	12	12	11.5	11.5
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	—	—	5	5	5	5.5	5.5

### MY1H (Linear guide type) [mm]

Auto switch model	Bore size		
	10	16	20
D-A9□/A9□V	11	6.5	8.5
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	3	4.5	5
D-Z7□/Z80	—	—	—
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV	—	—	—

### MY1HT

(High rigidity/Linear guide type) [mm]

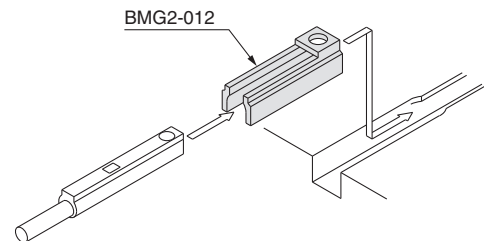
Auto switch model	Bore size	
	50	63
D-Z7□/Z80	11	11
D-Y59□/Y69□ D-Y7P/Y7PV D-Y7□W/Y7□WV D-Y7BA	5	5

## Switch Mounting Bracket: Part No.

Auto switch model	Bore size [mm]	
	Ø 10, Ø 16, Ø 20	Ø 50, Ø 63
D-A9□/A9□V D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	—	BMG2-012

Note1) MY1B/MY1C/MY1M, D-A9□□ type cannot be mounted on Ø 50 to Ø 100 of Series MY1. D-M9□□□ type cannot be mounted on Ø 50 of Series MY1B.

Ø 50, Ø 63: M9□(V)/M9□W(V)/M9□A(V)



Besides the models listed in How to Order, the following auto switches are applicable.  
Refer to pages 107 to 117 for the detailed specifications.

Auto switch type	Part no.	Electrical entry (Fetching direction)	Features	Applicable bore size
Solid state	D-Y69A, Y69B, Y7PV	Grommet (Perpendicular)	—	Ø 25 to Ø 100
	D-Y7NWW, Y7PWV, Y7BWV		Diagnostic indication (2-colour indication)	
	D-Y59A, Y59B, Y7P	Grommet (In-line)	—	
	D-Y7NW, Y7PW, Y7BW		Diagnostic indication (2-colour indication)	

\* For solid state auto switches, auto switches with a pre-wired connector are also available. Refer to website on [www.smc.eu](http://www.smc.eu) for details.

\* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H/Y7G/Y7H types) are also available.

# Series MY1

# Made to Order Specifications

Please contact SMC for detailed dimensions, specifications, and lead times.

## Made to Order application list

		Helical insert threads X168	Dust seal band NBR XC67	Shock Absorber Soft Type XB22	Konck Pin holes XC56
MY1B	Basic type	●	●	●	
MY1M	Slide bearing guide type	●	●	●	
MY1C	Cam follower guide type	●	●	●	●
MY1H	High precision guide type	●	●	●	●
MY1HT	High rigidity/High precision guide type		●		

## 1 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.

MY1 **B** Bore size Stroke Auto switch Symbol -X168

Series/Bore size		10	16	20	25	32	40	50	63	80	100
<b>B</b> Basic type		●	●	●	●	●	●	●	●	●	●
<b>M</b> Slide bearing guide type			●	●	●	●	●	●	●	●	●
<b>C</b> Cam follower guide type			●	●	●	●	●	●	●	●	●
<b>H</b> High precision guide type		●	●	●	●	●	●	●	●	●	●
<b>HT</b> High rigidity/High precision guide type								●	●		

(●) indicates available by special order.

Example) MY1B40G-300L-Z73-X168

## 2 Dust Seal Band NBR Lining Specification -XC67

The standard vinyl chloride lining specification is changed to NBR lining. Improved oil resistance and peeling resistance.

Note) Consult SMC for specific oil resistance.

MY1 **B** Bore size Stroke Auto switch Symbol -XC67

Series/Bore size		10	16	20	25	32	40	50	63	80	100
<b>B</b> Basic type		●	●	●	●	●	●	●	●	●	●
<b>M</b> Slide bearing guide type			●	●	●	●	●	●	●	●	●
<b>C</b> Cam follower guide type			●	●	●	●	●	●	●	●	●
<b>H</b> High precision guide type		●	●	●	●	●	●	●	●	●	●
<b>HT</b> High rigidity/High precision guide type								●	●		

Furthermore, Ø 10, Ø 80 and Ø 100 are available only in stainless steel plate and the NBR lining specification is not available.

Example) MY1B40G-300L-Z73-XC67

For ordering dust seal band (NBR lining) only

MY Bore size -16 B N - Stroke

Dust seal band NBR lining

Dust seal band hexagon socket head set screw treatment

—	Black zinc chromated
W	Nickel plated

Refer to "Dust seal band" in the construction figures of each series for details.

Example) MY25-16BNW-300

# Series MY1

# Made to Order Specifications

Please contact SMC for detailed dimensions, specifications, and lead times.

## 3 Shock Absorber Soft Type Series RJ Type

Symbol  
**-XB22**

### Maximum Impact Weight Graph (Shock Absorber Performance Line Graph)

\* Values in the maximum impact mass graph are at room temperature (20 to 25 °C).

Ensure that the impact mass and the impact speed are within the absorbed energy graphs below. Refer to each cylinder selection calculation for load factors and guide load factors.

MY1 **B** Bore size - Stroke - Auto switch Symbol -XB22

• Series/Bore size

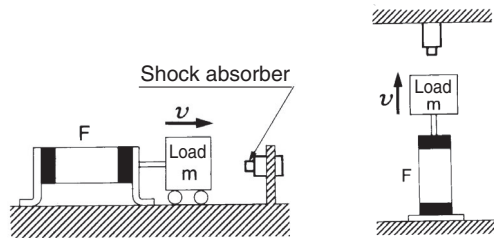
Example) MY1B40G-300L-Z73-XB22

<b>B</b>	Basic type
<b>M</b>	Slide bearing guide type
<b>C</b>	Cam follower guide type
<b>H</b>	High precision guide type

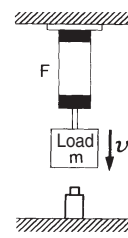
#### ■ Type of collision

##### Horizontally-applied impact

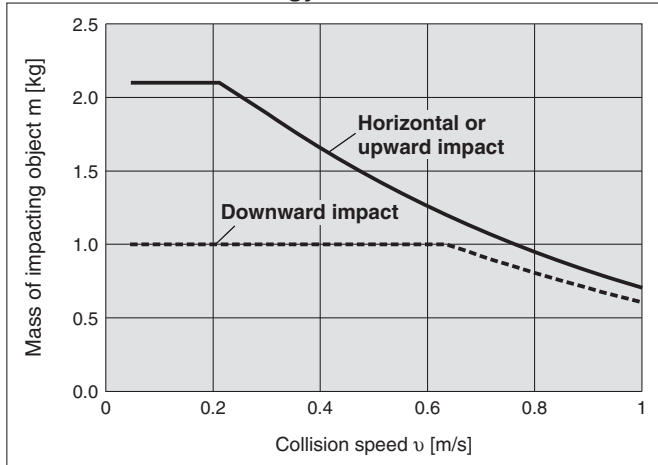
##### Air cylinder impact (horizontal/upward)



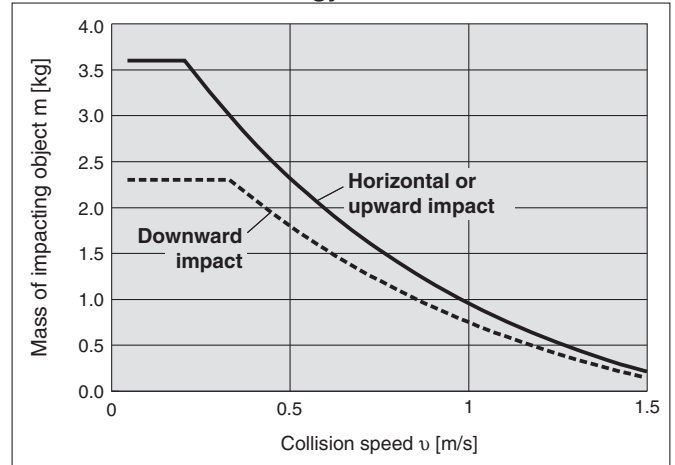
##### Air cylinder impact (downward)



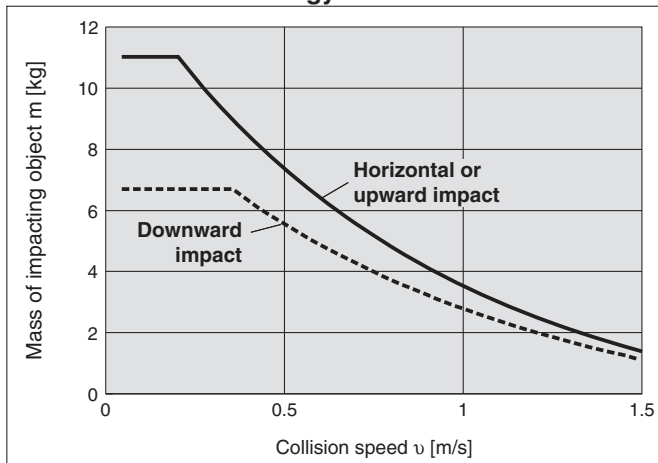
#### RJ0805 Absorbed Energy



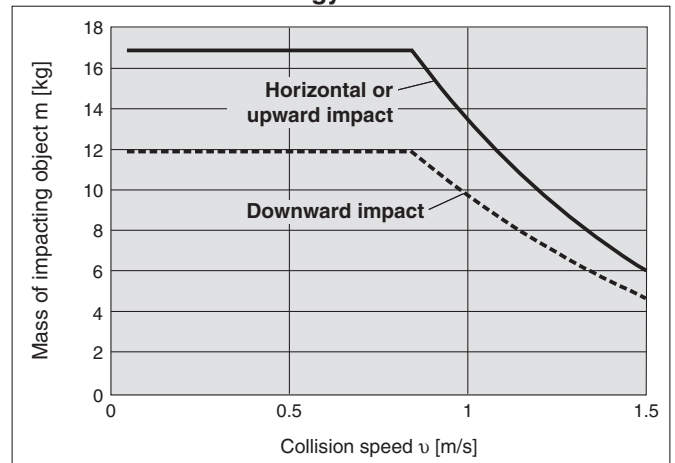
#### RJ0806H Absorbed Energy



#### RJ1007H Absorbed Energy



#### RJ1412H Absorbed Energy



\* Be sure to read "Specific Products Precautions" on RJ catalogue Series.

# Series MY1

# Made to Order Specifications

Please contact SMC for detailed dimensions, specifications, and lead times.

## 4 With Knock Pin Holes

Symbol  
**-XC56**

Cylinder with knock positioning pin hole.

MY1 **H** Bore size - Stroke - Auto switch Symbol -XC56

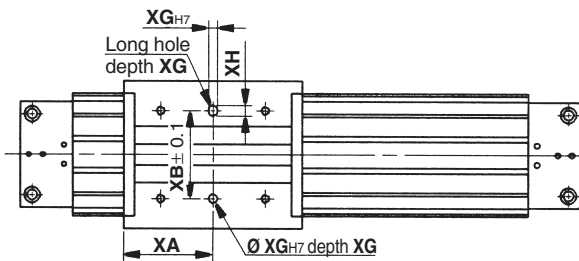
• Series/Bore size

<b>H</b>	Linear guide
<b>C</b>	Cam follower guide type

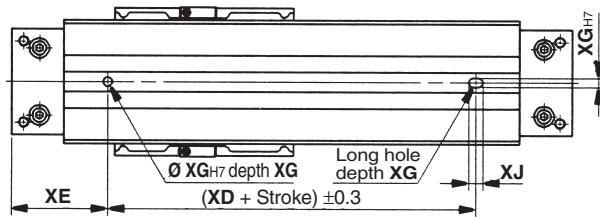
Example) MY1H40G-300L-Z73-XC56

### Dimensions

#### Series MY1C

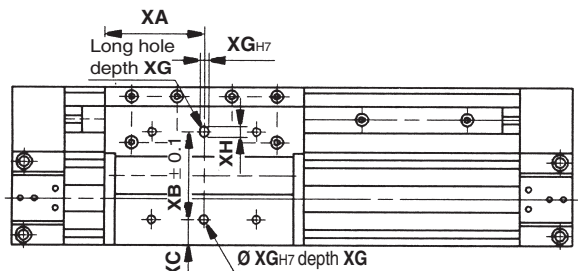


Mounting surface of a workpiece for the slide table

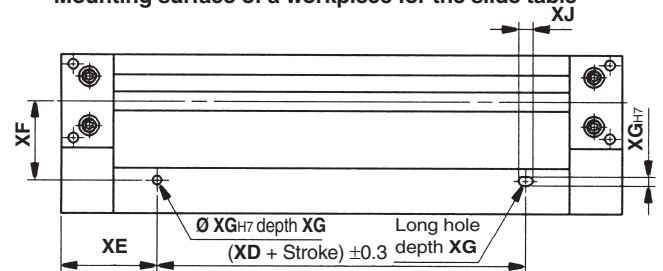


Mounting surface of cylinder tube

#### Series MY1H



Mounting surface of a workpiece for the slide table



Mounting surface of cylinder tube

Bore size	XA	XB	XD	XE	XG	XH	XJ
16	40	40	80	40	4	5	9
20	50	40	100	50	4	5	9
25	51	50	110	55	5	6	10
32	66	60	140	70	6	7	11
40	81	80	180	80	6	7	11
50	100	90	230	85	8	9	13
63	115	110	280	90	10	10	15

Bore size	XA	XB	XC	XD	XE	XF	XG	XH	XJ
10	25	33	3.5	70	20	21.5	3	4	5
16	40	40	7.5	80	40	30	4	5	7
20	50	40	14.5	100	50	39	4	5	7

## 5 Magnet for ø10 Solid State Auto Switch Specifications

Symbol  
**-X1810**

By incorporating the use of the magnet for solid state auto switches, switch operation stability can be achieved.

\* If you are using, or planning to use, the cylinder in combination with a solid state auto switch, but are currently only ordering the cylinder, please add the "-X1810" suffix to the end of the product number.

MY1 **B** 10G - Stroke -X1810

• Magnet for ø10 solid state auto switch specifications

• Type

<b>B</b>	Basic
<b>H</b>	Linear guide

• Stroke adjustment unit

\* If an auto switch is included in the product number, the "-X1810" suffix does not need to be added to the end of the product number.

Example) MY1B10G-300H-M9BL

## Mounting

### ⚠ Caution

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

- Since the slide table (slider) is supported by precision bearings (MY1C, MY1H) or resin bearings, do not subject it to strong impact or excessive moment when mounting work pieces.

#### 2. Perform careful alignment when connecting to a load which has 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 for connection to a load which has an external guide mechanism.

Since fluctuation of the centre axis increases as the stroke becomes longer, use a method of connection which can absorb the variations (floating mechanism).

Furthermore, use the special floating brackets, which have been provided for series MY1B.

#### 3. 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.

### ⚠ 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. However, series other than series MY1H allow readjustment and bearing replacement, etc.

In this case, refer to the outline for bearing replacement in the instruction manual.

### ⚠ Caution

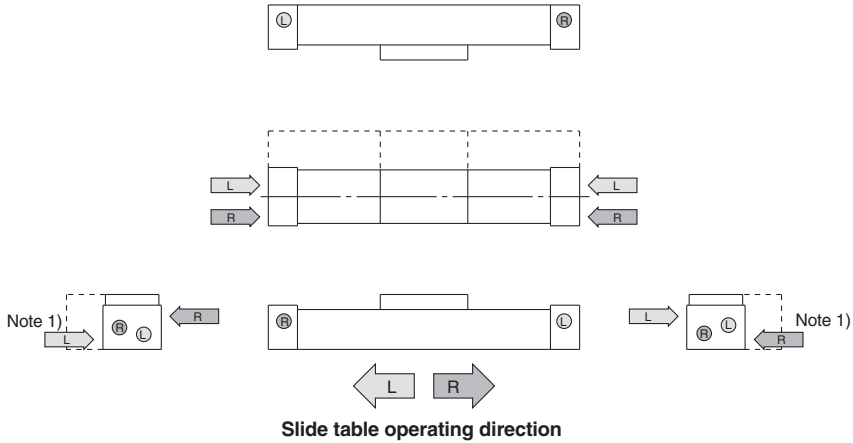
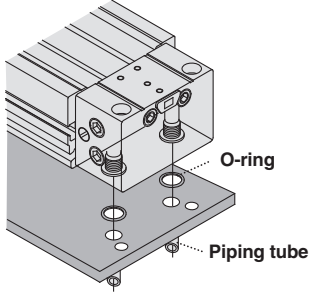
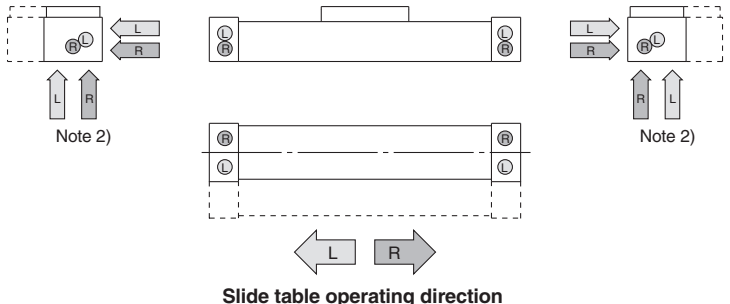
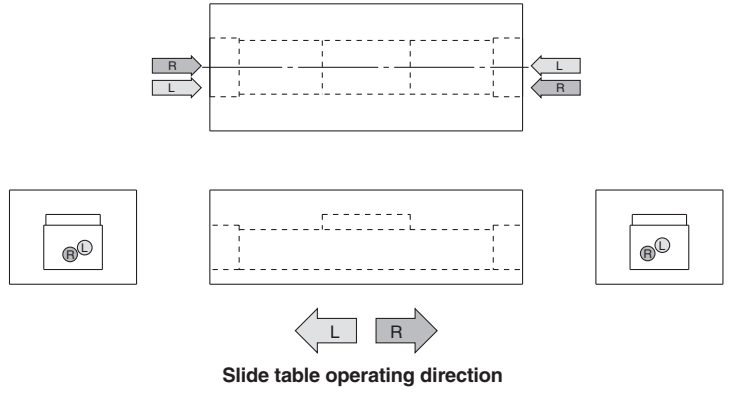
#### 1. External air leakage may occur.

- In operating conditions where negative pressure is generated inside the cylinder because of external or inertial forces, etc., take note that external air leakage may occur due to separation of the seal belt.

## ⚠ Caution

### Centralised Piping Port Variations

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




Applicable cylinder	Port variations
<p><b>MY1B10</b> <b>MY1H10</b></p>	 <p>Note 1) These ports are not applicable to MY1H10.</p> <p style="text-align: center;"><b>Slide table operating direction</b></p>
<p><b>MY1B16 to 100</b> <b>MY1M16 to 63</b> <b>MY1C16 to 63</b> <b>MY1H16 to 40</b></p>  <p>O-ring Piping tube</p> <p>Note 2) Refer to the above diagram for bottom piping.</p>	 <p>Note 2)</p> <p style="text-align: center;"><b>Slide table operating direction</b></p>
<p><b>MY1HT50, 63</b></p>	 <p style="text-align: center;"><b>Slide table operating direction</b></p>





## Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

-  **Caution:** Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- \*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
- ISO 4413: Hydraulic fluid power – General rules relating to systems.
- IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Manipulating industrial robots - Safety. etc.

### Warning

- The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**  
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- Only personnel with appropriate training should operate machinery and equipment.**  
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
  - The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
  - When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
  - Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
  - Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
  - Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
  - An application which could have negative effects on people, property, or animals requiring special safety analysis.
  - Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

## Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited warranty and Disclaimer

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2) Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
- For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.

\*2) Vacuum pads are excluded from this 1 year warranty. A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Caution

- The product is provided for use in manufacturing industries.**  
The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary. If anything is unclear, contact your nearest sales branch.

### Caution

- SMC products are not intended for use as instruments for legal metrology.**
- Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

## Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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Croatia	+385 (0)13707288	www.smc.hr	office@smc.hr	Poland	+48 222119600	www.smc.pl	office@smc.pl
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Italy	+39 0292711	www.smcitalia.it	mailbox@smcitalia.it	UK	+44 (0)845 121 5122	www.smcpnematics.co.uk	sales@smcpneumatics.co.uk
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