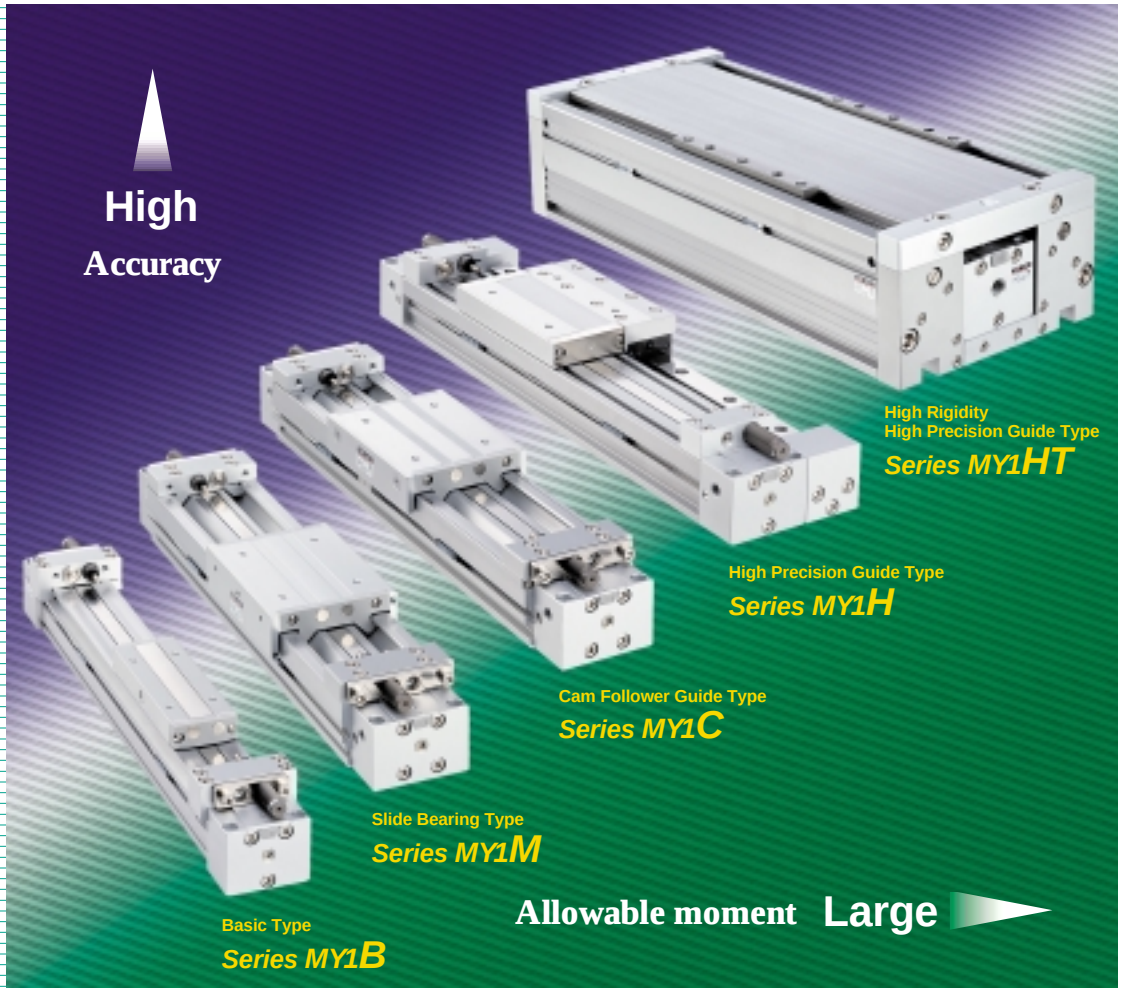
NS20-112

SMC

Mechanically Jointed Rodless Cylinder

MY1 Series

MY1B, MY1M, MY1MW, MY1C, MY1CW, MY1H, MY1HT



Now available with dust cover on selected models.

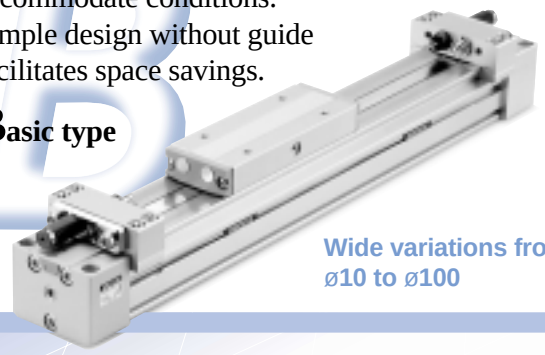
Mechanically Jointed Rodless Cylinder

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

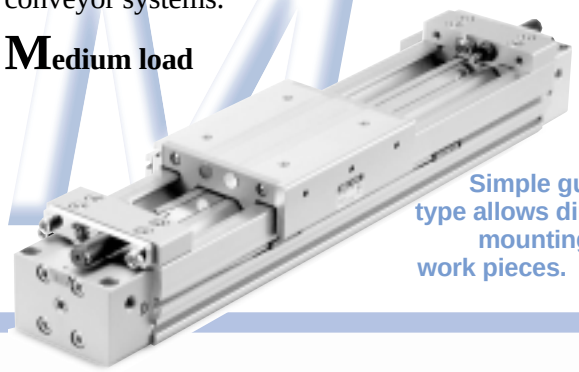


Wide variations from ø10 to ø100

Slide Bearing Type — Series MY1M

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

Medium load

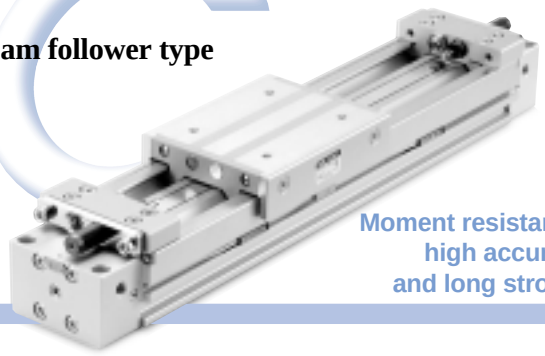


Simple guide type allows direct mounting of work pieces.

Cam Follower Guide type — Series MY1C

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

Cam follower type

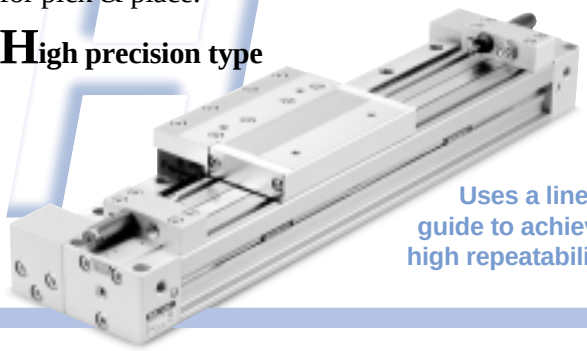


Moment resistance, high accuracy and long strokes

High Precision Guide type — Series MY1H

Small and medium sizes ø10 to ø40 are ideal for pick & place.

High precision type

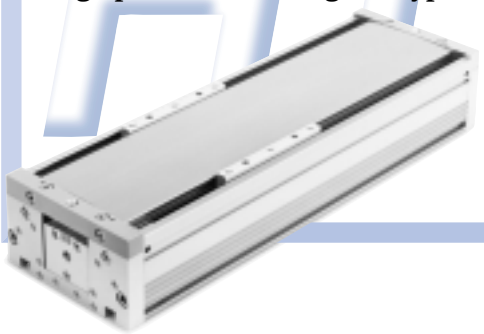


Uses a linear guide to achieve high repeatability

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.

Centralized piping

Piping ports are concentrated on one side.

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)

Side support

Prevents cylinder tube deflection in long strokes.

Interchangeability

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

Minimum size of ø10 introduced to series MY1B/MY1H.

New

Basic type

MY1B10

Height **27** mm

High precision guide type

MY1H10

Strok
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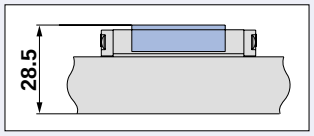
.5mm.



<Scale:100%>

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

es variations

New

Note 1)

Guide type		Piping type	Bore size (mm)										Air cushion	Stroke adjusting unit	Side support	Floating bracket
			10	16	20	25	32	40	50	63	80	100				
1B	Basic	Centralized piping / Standard piping	●	●	●	●	●	●	●	●	●	●	Note 2)	●	●	●
1M	Slide bearing		●	●	●	●	●	●	●	●	●	●	●	●	●	●
1C	Cam follower guide		●	●	●	●	●	●	●	●	●	●	●	●	●	●
1H	High precision guide		●	●	●	●	●	●	●	●	●	●	●	●	●	●
1HT	High rigidity High precision guide								●	●	●	●	●	●	●	●

Note 1) ø10 is available with central piping only. Note 2) ø10 is available with rubber bumper only.
Note 3) The applicability of order made options differs depending on size and model. Refer to the order made section on page 105 for details.

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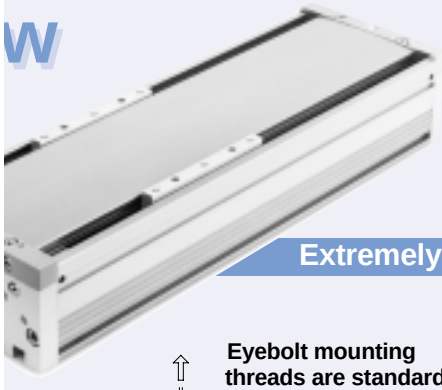


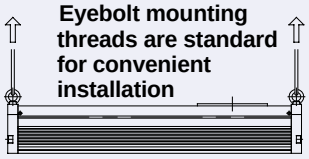
Uses two linear guides.
Max. load weight 320kg (ø63)

High rigidity/High precision guide type

MY1HT50, 63

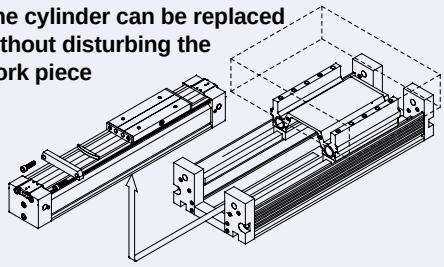
Extremely easy to maintain

Eyebolt mounting threads are standard for convenient installation

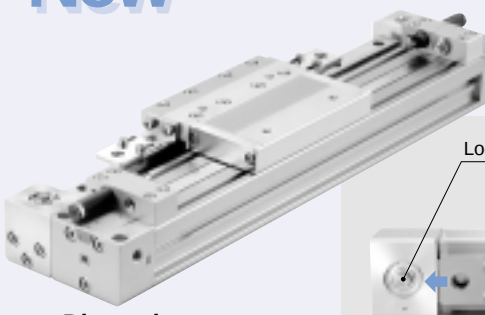


Using eyebolts

The cylinder can be replaced without disturbing the work piece



New



Lo

Dimensions same as standard

Can be locked on one side or on both sides

djusting unit
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End
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Note 3)
Order made

Intermediate strokes

Long strokes

Helical insert threads

Dust seal band
NBR lining

Holder mounting bracket

End lock type
ntroduced to
eries MY1H.

Allows fine stroke control

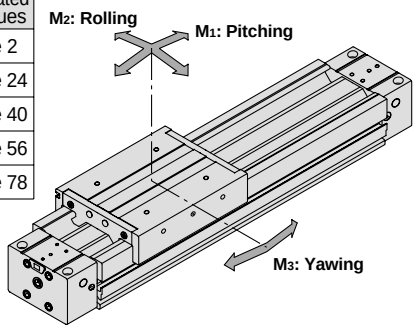
Table of Contents

Standards for Tentative Model Selection

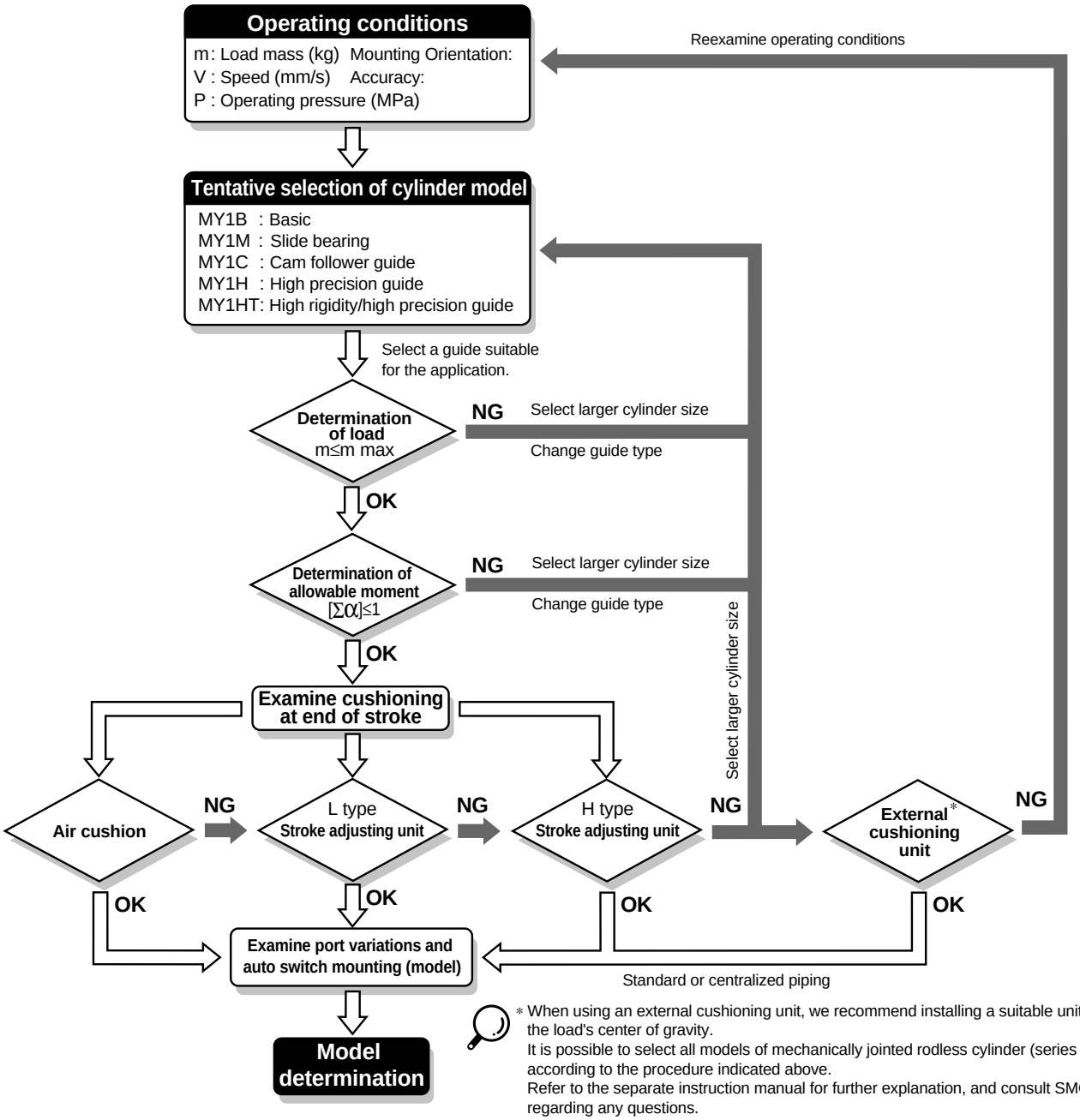
Cylinder model	Guide type	Standards for guide selection	Graphs for related allowable values
MY1B	**Basic**	Guaranteed accuracy not required, generally combined with separate guide	Refer to page 2
MY1M	**Slide bearing**	Slide table accuracy approx. ±0.12mm Note 2)	Refer to page 24
MY1C	**Cam follower guide**	Slide table accuracy approx. ±0.05mm Note 2)	Refer to page 40
MY1H	**High precision guide**	Slide table accuracy of ±0.05mm or less required Note 2)	Refer to page 56
MY1HT	**High rigidity/high precision guide**	Slide table accuracy of ±0.05mm or less required Note 2)	Refer to page 78

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 catalog is applied. (reference value)



Selection Flow Chart

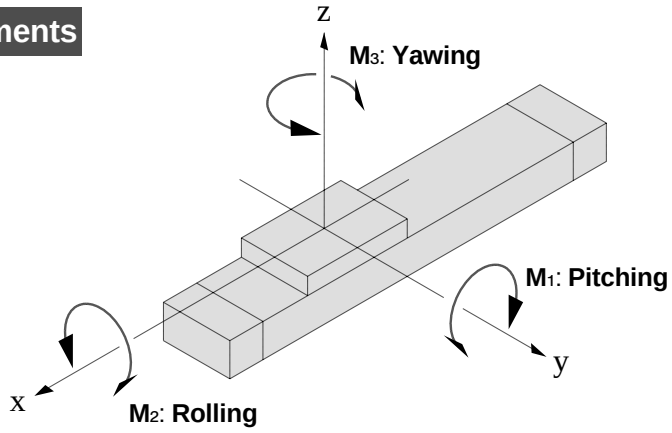


* When using an external cushioning unit, we recommend installing a suitable unit near the load's center of gravity.
It is possible to select all models of mechanically jointed rodless cylinder (series MY1) according to the procedure indicated above.
Refer to the separate instruction manual for further explanation, and consult SMC regarding any questions.

Types of Moment Applied to Rodless Cylinders

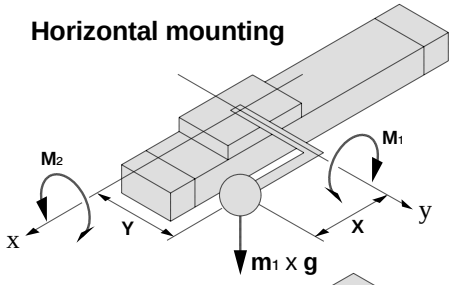
Multiple moments may be generated depending on the mounting orientation, load and position of the center of gravity.

Coordinates and moments

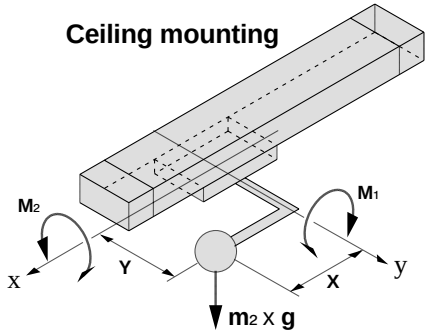


Static moment

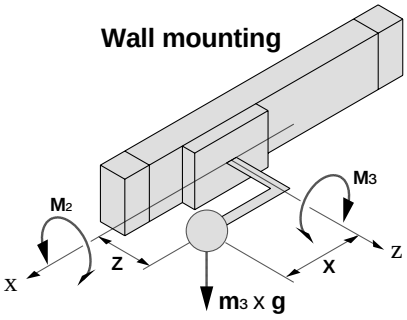
Horizontal mounting



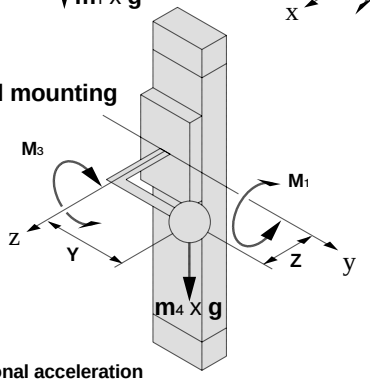
Ceiling mounting



Wall mounting



Vertical mounting

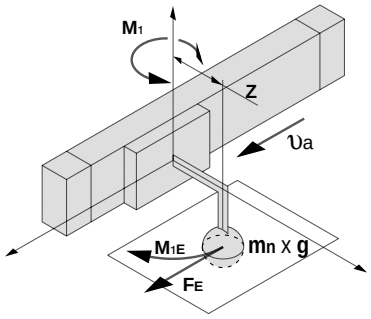


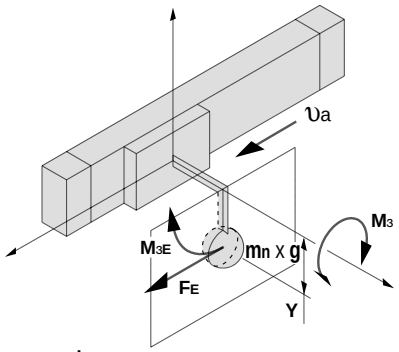
g: Gravitational acceleration

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

Note) m_4 is a 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.

Dynamic moment





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

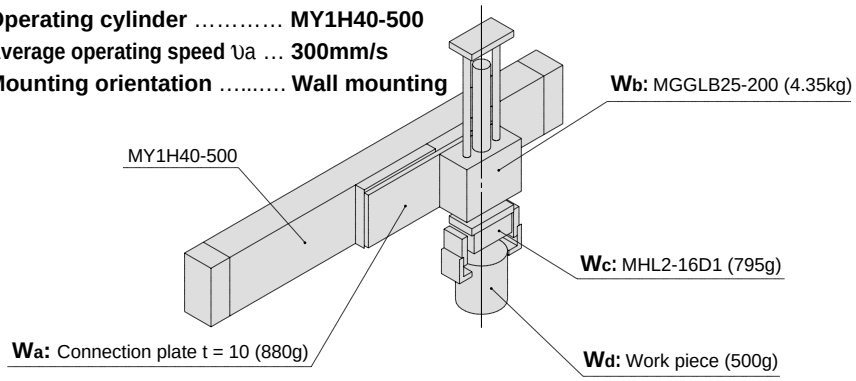
Mounting orientation		Horizontal	Ceiling	Wall	Vertical
Dynamic load F_E		$\frac{1.4}{100} \times Ua \times m_n \times g$			
Dynamic moment	M_{1E}	$\frac{1}{3} \times F_E \times Z$			
	M_{2E}	**Dynamic moment M_{2E} does not occur.**			
	M_{3E}	$\frac{1}{3} \times F_E \times Y$			

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

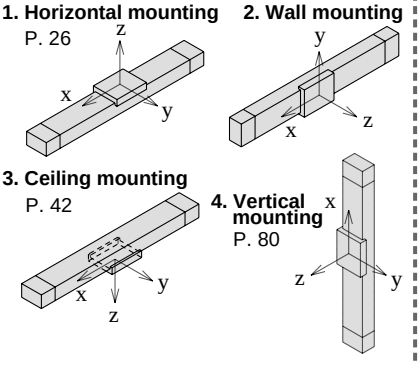
Calculation of Guide Load Factor

1 Operating conditions

Operating cylinder …… **MY1H40-500**
Average operating speed υa … **300mm/s**
Mounting orientation ……..… **Wall mounting**

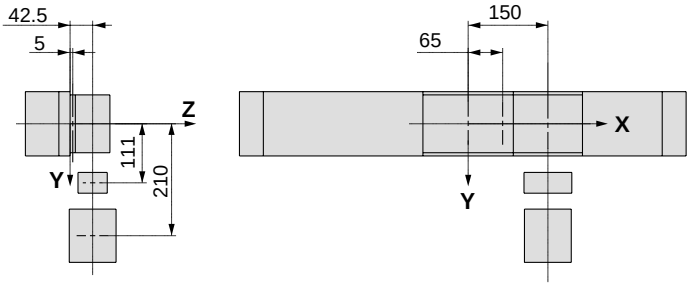


Mounting orientation



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

2 Load blocking



Work piece mass and center 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
Wa	0.88kg	65mm	0mm	5mm
Wb	4.35kg	150mm	0mm	42.5mm
Wc	0.795kg	150mm	111mm	42.5mm
Wd	0.5kg	150mm	210mm	42.5mm

n = a, b, c, d

3 Calculation of composite center of gravity

$m_3 = \Sigma m_n$
$= 0.88 + 4.35 + 0.795 + 0.5 =$ **6.525kg**

$X = \frac{1}{m_3} \times \Sigma (m_n \times x_n)$
$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) =$ **138.5mm**

$Y = \frac{1}{m_3} \times \Sigma (m_n \times y_n)$
$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) =$ **29.6mm**

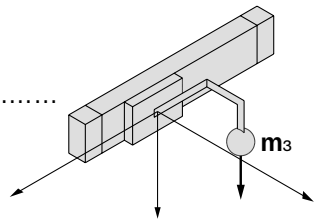
$Z = \frac{1}{m_3} \times \Sigma (m_n \times z_n)$
$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) =$ **37.4mm**

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 $\alpha_1 = m_3 / m_3$ max = 6.525/50 = **0.13**

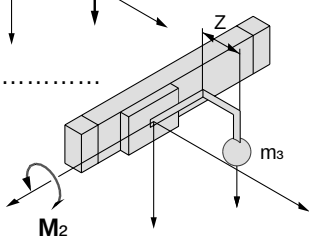


M_2: Moment

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

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

Load factor $\alpha_2 = M_2 / M_2$ max = 2.39/50 = **0.05**

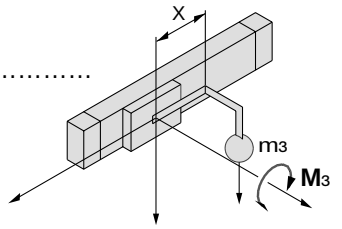


M_3: Moment

M_3 max (from 3 of graph MY1H/M_3) = 38.7 (N·m) ……

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

Load factor $\alpha_3 = M_3/M_3$ max = 8.86/38.7 = **0.23**



5 Calculation of load factor for dynamic moment

Equivalent load F_E at impact

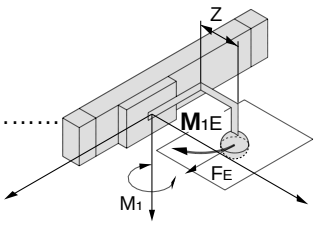
$$F_E = \frac{1.4}{100} \times \upsilon a \times g \times m = \frac{1.4}{100} \times 300 \times 9.8 \times 6.525 = 268.6 \text{ (N)}$$

M_{1E}: Moment

M_{1E} max (from 4 of graph MY1H/M_1 where 1.4υa = 420mm/s) = 35.9 (N·m) ……

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

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

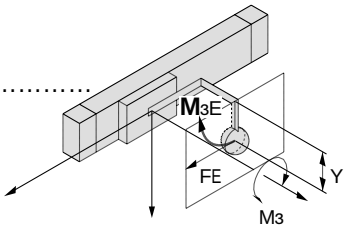


M_{3E}: Moment

M_{3E} max (from 5 of graph MY1H/M3 where 1.4υa = 420mm/s) = 27.6 (N·m) ……

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

Load factor $\alpha 5 = M_{3E}/M_{3E}$ max = 2.65/27.6 = **0.10**



6 Sum and examination of guide load factors

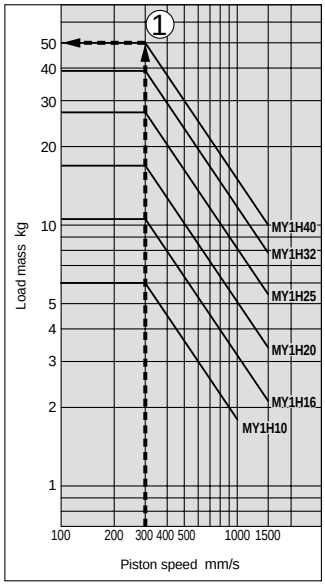
$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.60 \leq 1$

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

Note: 1 in = 25.4 mm
1 N·m = 0.7375 ft·lb

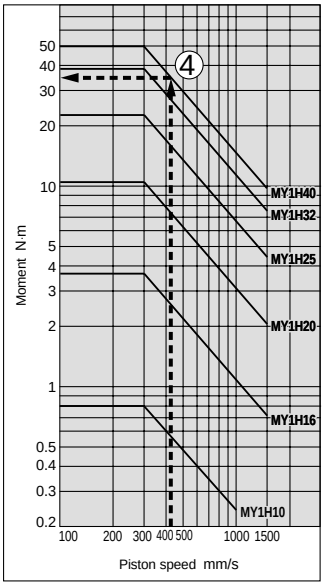
Load mass

MY1H/m_3

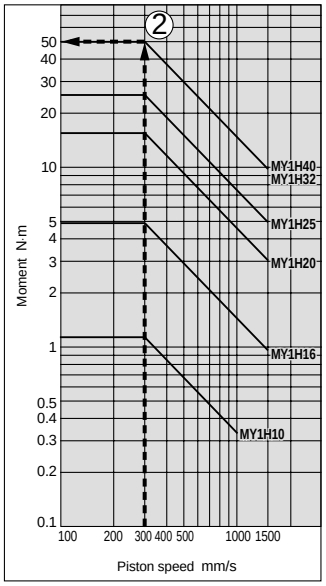


Allowable moment

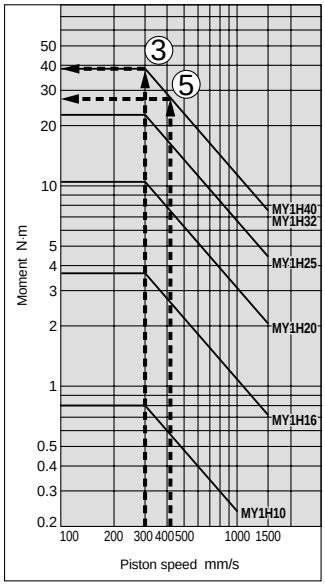
MY1H/M_1



MY1H/M_2



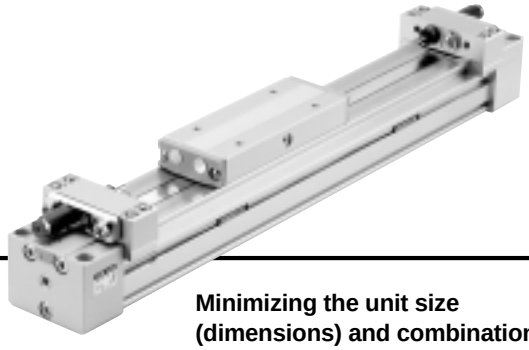
MY1H/M_3



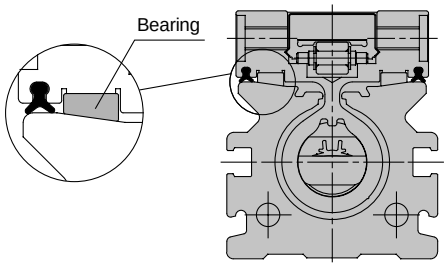
Series MY1B

Basic Type

ø10, ø16, ø20, ø25, ø32, ø40, ø50, ø63, ø80, ø100



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



Maximum Allowable Moment/Maximum Allowable Load

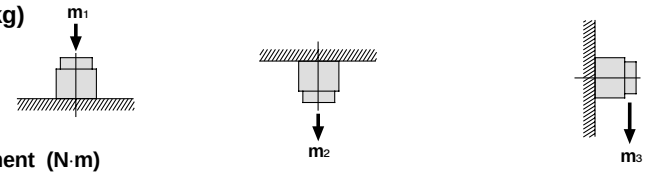
Model	Bore size (mm)	Max. allowable moment (N·m)			Max. allowable load (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1B	**10**	0.8	0.1	0.3	5.0	1.0	0.5
	16	2.5	0.3	0.8	15	3.0	1.7
	20	5.0	0.6	1.5	21	4.2	3.0
	25	10	1.2	3.0	29	5.8	5.4
	32	20	2.4	6.0	40	8.0	8.8
	40	40	4.8	12	53	10.6	14
	50	78	9.3	23	70	14	20
	63	160	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 weight. Refer to each graph regarding the maximum allowable moment and maximum allowable load for a particular piston speed.

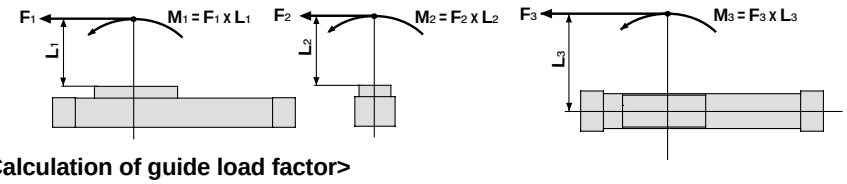
Design precautions

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 1500mm/s for bore sizes ø16, ø50, ø63, ø80 and ø100.

Load (kg)



Moment (N·m)



<Calculation of guide load factor>

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

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

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

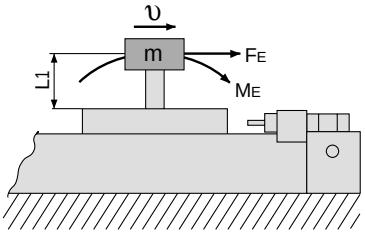
Note 1) Moment caused by the load, etc., with cylinder in resting condition.
Note 2) Moment caused by the impact load equivalent at the stroke end (at the time of impact with stopper).
Note 3) Depending on the shape of the work piece, multiple moments may occur. When this happens, the sum of the load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

2. Reference formulae [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_E : Load equivalent to impact (at impact with stopper) (N)
υa : Average speed (mm/s)
M : Static moment (N·m)
υ : Impact speed (mm/s)
L_1 : Distance to the load's center of gravity (m)
M_E : Dynamic moment (N·m)
g : Gravitational acceleration (9.8m/s²)

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

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



Note 4) $\frac{1.4}{100}\upsilon a$ is a dimensionless coefficient for calculating impact force.

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

3. Refer to pages 4 and 5 for detailed selection procedures.

Maximum allowable moment

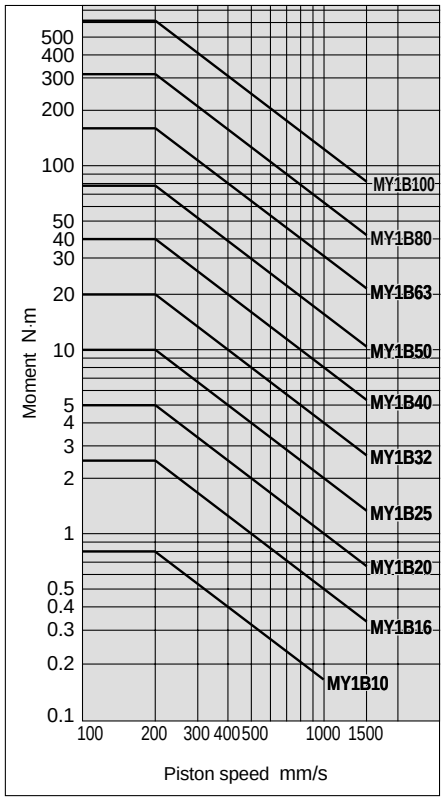
Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

Note:
1 N·m = 0.7375 ft·lb
1 kg = 2.2046 lb
1 in = 25.4 mm

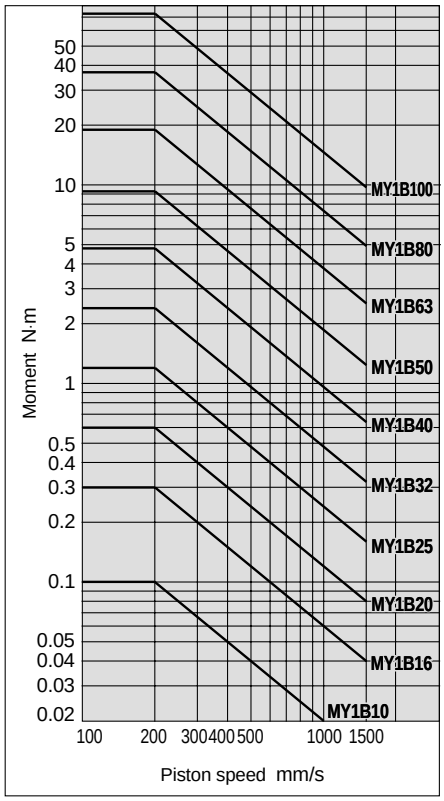
Maximum allowable load

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.

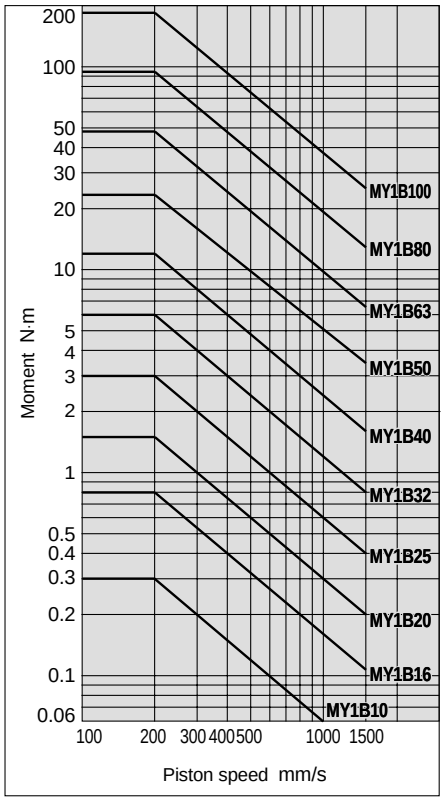
MY1B/M1



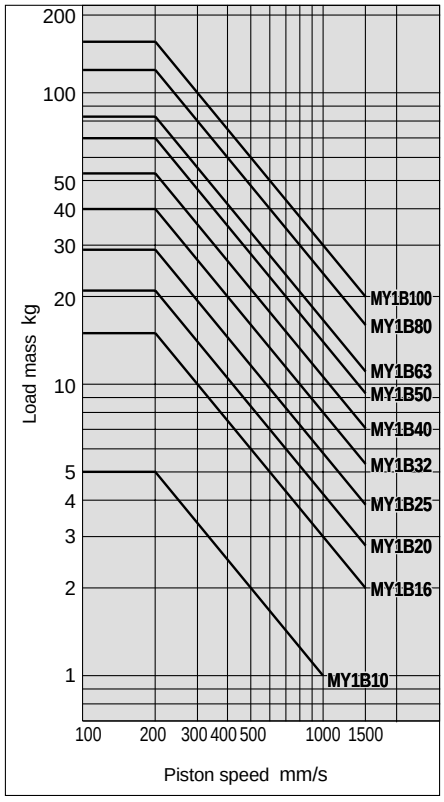
MY1B/M2



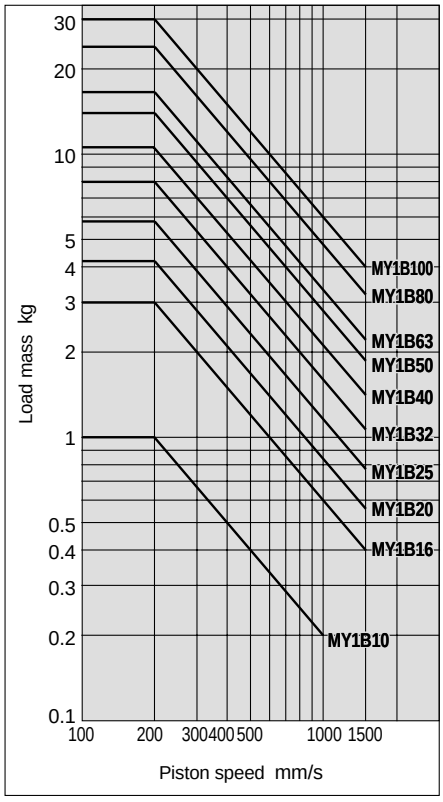
MY1B/M3



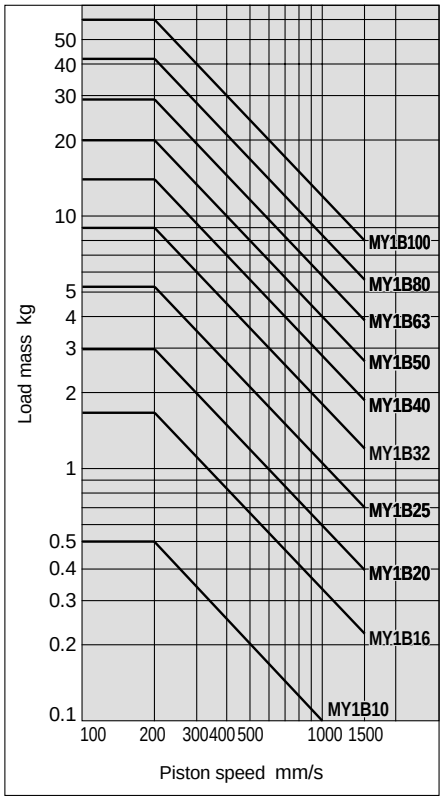
MY1B/m1



MY1B/m2



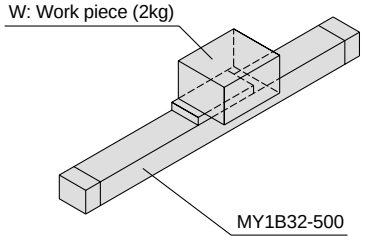
MY1B/m3



Calculation of Guide Load Factor

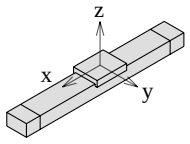
1 Operating conditions

Cylinder ……..…… **MY1B32-500**
Average operating speed υ**a** …… **300mm/s**
Mounting orientation ……..…… **Horizontal mounting**

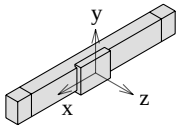


Mounting orientation

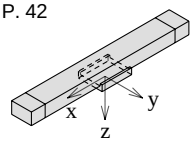
1. Horizontal mounting



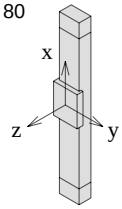
2. Wall mounting
P. 58



3. Ceiling mounting
P. 42

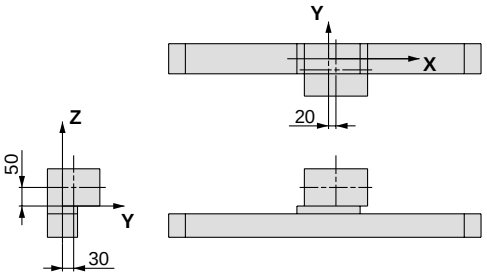


4. Vertical mounting
P. 80



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

2 Load blocking



Work piece mass and center of gravity

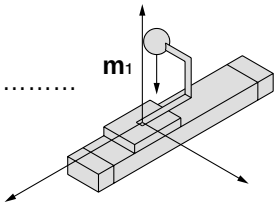
Work piece no.	Mass m	Center of gravity		
		X-axis	Y-axis	Z-axis
W	2kg	20mm	30mm	50mm

3 Calculation of load factor for static load

m_1: Mass

m_1 max (from 1 of graph MY1B/m_1 = 27 (kg) ……

Load factor $\alpha_1 = m_1/m_1$ max = 2/27 = **0.07**

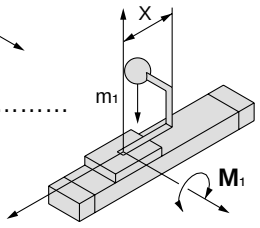


M_1: Moment

M_1 max (from 2 of graph MY1B/M_1) = 13 (N·m) ……

$M_1 = m_1 \times g \times X = 2 \times 9.8 \times 20 \times 10^{-3} = 0.39$ (N·m)

Load factor $\alpha_2 = M_1/M_1$ max = 0.39/13 = **0.03**

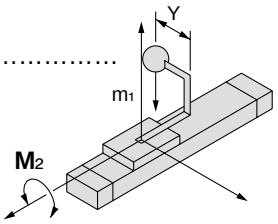


M_2: Moment

M_2 max (from 3 of graph MY1B/M_2) = 1.6 (N·m) ……

$M_3 = m_1 \times g \times Y = 2 \times 9.8 \times 30 \times 10^{-3} = 0.59$ (N·m)

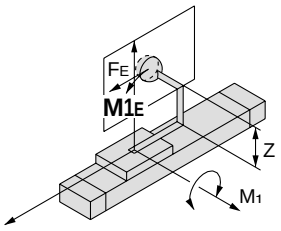
Load factor $\alpha_3 = M_2/M_2$ max = 0.59/1.6 = **0.37**



4 Calculation of load factor for dynamic moment

Equivalent load F_E at impact

$$F_E = \frac{1.4}{100} \times \upsilon a \times g \times m = \frac{1.4}{100} \times 300 \times 9.8 \times 2 = 82.3\ (N)$$

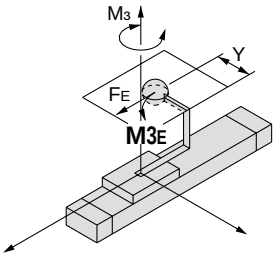


M_{1E}: Moment

M_{1E} max (from 4 of graph MY1B/M_1 where 1.4υa = 420mm/s) = 9.5 (N·m) ……

$$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 82.3 \times 50 \times 10^{-3} = 1.37\ (N \cdot m)$$

Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 1.37/9.5 = **0.14**



M_{3E}: Moment

M_{3E} max (from 5 of graph MY1B/M_3 where 1.4υa = 420mm/s) = 2.9 (N·m) ……

$$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 82.3 \times 30 \times 10^{-3} = 0.82\ (N \cdot m)$$

Load factor $\alpha_5 = M_{3E}/M_{3E}$ max = 0.82/2.9 = **0.28**

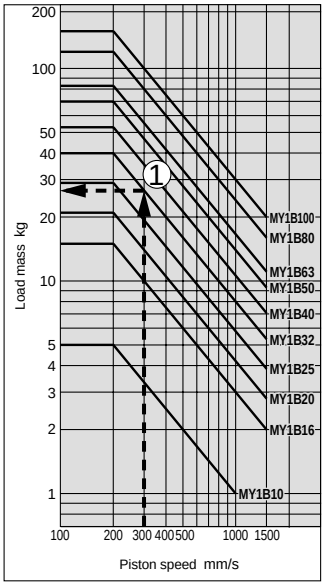
5 Sum and examination of guide load factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.89 \leq 1$

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

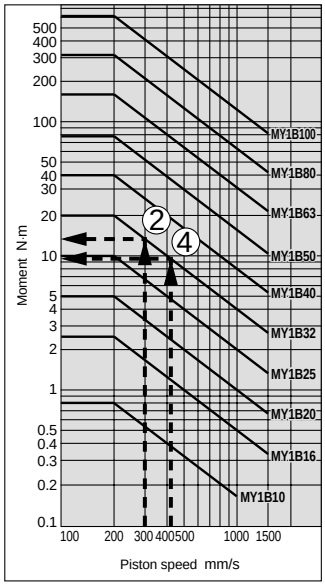
Load mass

MY1B/m_1

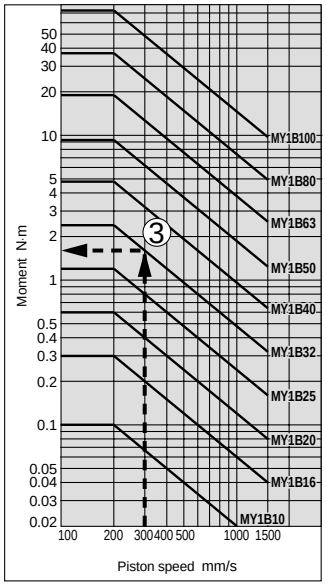


Allowable moment

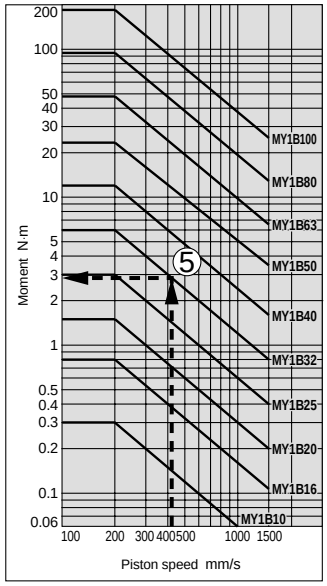
MY1B/M_1



MY1B/M_2



MY1B/M_3



How to Order

Basic Type **MY1B** **25** □ — **300** □ □ — **Z73** □

Basic type

Bore size

10	10mm
16	16mm
20	20mm
25	25mm
32	32mm
40	40mm
50	50mm
63	63mm
80	80mm
100	100mm

Piping

Nil	Standard type
G	Centralized piping type

Note) For ø10, only G is available.

Stroke

Refer to the standard stroke table on page 7.

Stroke adjusting unit

Only the A unit is available for ø16. Stroke adjusting unit is not available for ø50, ø63, ø80 and ø100. Refer to page 9 for detailed information on stroke adjusting unit specifications.

Nil	Without adjusting unit
A	With adjusting bolt
L	With low load shock absorber + adjusting bolt
H	With high load shock absorber + adjusting bolt
AL	With one A unit and one L unit each
AH	With one A unit and one H unit each
LH	With one L unit and one H unit each

Shock absorbers for L and H units

Bore size (mm) / Unit no.	10	20	25	32	40
L unit	—	RB0806	RB1007	RB1412	
H unit	RB0805	RB1007	RB1412	RB2015	

Stroke adjusting unit Note)

Nil	Both ends
S	One end

Note) "S" is applicable for stroke adjusting units A, L and H.

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Auto switch type

Nil	Without auto switch

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

Options

Stroke adjusting unit numbers

Bore size (mm) / Unit no.	10	16	20	25	32
A unit	MY-A10A	MY-A16A	MY-A20A	MY-A25A	MY-A32A
L unit	—	—	MY-A20L	MY-A25L	MY-A32L
H unit	MY-A10H	—	MY-A20H	MY-A25H	MY-A32H

Bore size (mm) / Unit no.	40
A unit	MY-A40A
L unit	MY-A40L
H unit	MY-A40H

Side support numbers

Bore size (mm) / Type	10	16	20	25	32
Side support A	MY-S10A	MY-S16A	MY-S20A	MY-S25A	
Side support B	MY-S10B	MY-S16B	MY-S20B	MY-S25B	

Bore size (mm) / Type	40	50	63	80	100
Side support A	MY-S32A	MY-S50A	MY-S63A		
Side support B	MY-S32B	MY-S50B	MY-S63B		

Refer to page 17 for detailed information on dimensions, etc.

Applicable auto switches/ Refer to pages 96 through 108 for detailed auto switch specifications.

For ø10, ø16, ø20

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

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

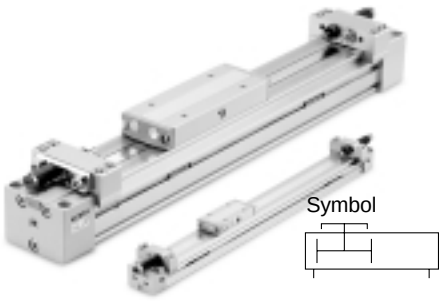
∗∗ Solid state switches marked with a "○" symbol are produced upon receipt of order.

For ø25, ø32, ø40, ø50, ø63, ø80, ø100

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch models: Electrical entry direction: Perpendicular	Auto switch models: Electrical entry direction: In-line	Lead wire length (m)∗: 0.5 (Nil)	Lead wire length (m)∗: 3 (L)	Lead wire length (m)∗: 5 (Z)	Applicable load	
Reed switch	—	Grommet	Yes	3 wire (NPN equiv.)	—	5V	—	—	**Z76**	●	●	—	IC circuit	—
				2 wire	24V	12V	100V	—	**Z73**	●	●	●	—	Relay, PLC
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay, PLC
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○		
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—	
	Diagnostic indication (2 color indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit	
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○		
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—	

∗ Lead wire length symbols: 0.5m …… Nil (Example) Y59A
3m …….. L Y59AL
5m …….. Z Y59AZ

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



Specifications

Bore size (mm)		10	16	20	25	32	40	50	63	80	100
Fluid		Air									
Action		Double acting									
Operating pressure range		0.2 to 0.8MPa	0.1 to 0.8MPa (14 to 116 psi)								
Proof pressure		1.2MPa (174 psi)									
Ambient and fluid temperature		5 to 60°C (41 to 140°F)									
Cushion		Rubber bumper	Air cushion								
Lubricaton		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 $^{+2.8}_{0}$								
Port size	**Front/Side ports**	M5 x 0.8 (10-32 nominal)			Rc 1/8		Rc 1/4	Rc 3/8		Rc1/2	
	Bottom ports (centralized piping type only)		ø4		ø5	ø6	ø8	ø10	ø11	ø16	ø18

Made To Order

Refer to page 109 regarding order made specifications for series MY1B.

Stroke adjusting unit specificatons

Bore size (mm)	10		16	20			25			32			40		
Unit symbol	A	H	A	A	L	H	A	L	H	A	L	H	A	L	H
Configuration and shock absorber	With adjusting bolt	RB 0805 + With adjusting bolt	With adjusting bolt	With adjusting bolt	RB 0806 + With adjusting bolt	RB 1007 + With adjusting bolt	With adjusting bolt	RB 1007 + With adjusting bolt	RB 1412 + With adjusting bolt	With adjusting bolt	RB 1412 + With adjusting bolt	RB 2015 + With adjusting bolt	With adjusting bolt	RB 1412 + With adjusting bolt	RB 2015 + With adjusting bolt
Stroke fine adjusting range (mm)	0 to -5		0 to -5.6	0 to -6			0 to -11.5			0 to -12			0 to -16		
Stroke adjusting range	When exceeding the stroke fine adjusting range: Use order made specifications "-X416" and"-X417". (Refer to page110 for details.)														

Shock absorber specifications

Model		RB 0805	RB 0806	RB 1007	RB 1412	RB 2015
Max. energy absorption J (ft¥lb)		1.0 (0.7)	2.9 (2.1)	5.9 (4.4)	19.6 (14.4)	58.8 (43.4)
Stroke absorption mm (in)		5 (0.2)	6 (0.2)	7 (0.3)	12 (0.5)	15 (0.6)
Max. impact speed (mm/s)		1000 (39.4)	1500 (59.1)	1500 (59.1)	1500 (59.1)	1500 (59.1)
Max. operating frequency (cycles/min)		80	80	70	45	25
Spring force (N) (lbf)	**Extended**	1.96 (0.44)	1.96 (0.44)	4.22 (0.95)	6.86 (1.54)	8.34 (1.87)
	Compressed	3.83 (0.86)	4.22 (0.95)	6.86 (1.54)	15.98 (3.59)	20.50 (4.61)
Operating temperature range		5 to 60°C (41 to 140°F)				

Piston speed

Bore size (mm)		10	16 to 100
Without stroke adjusting unit		100 to 500mm/s	100 to 1000mm/s
Stroke adjusting unit	A unit	100 to 200mm/s	100 to 1000mm/s Note 1)
	L unit and H unit	100 to 1000mm/s	100 to 1500mm/s Note 2)

Note 1) Be aware that when the stroke adjusting range is increased by manipulating the adjusting bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 9, the **piston spee**d should be **100 to 200mm per second.**

Note 2) For centralized piping, the piston speed is 100 to 1000mm per second.

Note 3) Use at a speed within the absorption capacity range. Refer to page 8.

Theoretical output

Unit: N (lbf)

Bore size (mm)	Piston area (mm²)	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
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
80	5024	1004	1507	2009	2512	3014	3516	4019
100	7850	1570	2355	3140	3925	4710	5495	6280

Calculation method
Example: **MY1B25-300A**

Basic weight 1.33kg
Cylinder stroke 300mm
Additional weight..... 0.12/50mm stroke
1.33 + 0.12 x 300 ÷ 50 + 0.06 x 2 = Approx. 2.17kg
Weight of A unit 0.06kg

Note: 1N = 0.2248
1MPa = 145 psi
1mm² = 0.0016in²

Standard strokes

Bore size (mm)	Standard stroke (mm)*	Max. manufacturable stroke (mm)
10 and16	100, 200, 300, 400, 500, 600, 700 800, 900, 1000, 1200, 1400, 1600 1800, 2000	3000
20, 25, 32, 40 50, 63, 80, 100		5000

* Strokes are manufacturable in 1mm increments, up to the maximum stroke. However, when exceeding a 2000mm stroke, specify "-XB11" at the end of the model number. Refer to the order made specifications on page 109.

Weights

Unit: kg (lb)

Bore size (mm)	Basic weight	Additional weight per 50mm of stroke	Side support weight (per set) Type A and B	Stroke adjusting unit weight (per unit) A unit	L unit	H unit
10	0.15 (0.33)	0.04 (0.09)	0.003 (0.007)	0.01 (0.02)	—	0.02 (0.04)
16	0.61 (1.34)	0.06 (0.13)	0.01 (0.02)	0.04 (0.09)	—	—
20	1.06 (2.33)	0.10 (0.22)	0.02 (0.04)	0.05 (0.11)	0.05 (0.11)	0.10 (0.22)
25	1.33 (2.9)	0.12 (0.26)	0.02 (0.04)	0.06 (0.13)	0.10 (0.22)	0.18 (0.40)
32	2.65 (5.8)	0.18 (0.40)	0.02 (0.04)	0.12 (0.26)	0.21 (0.46)	0.40 (0.88)
40	3.87 (8.5)	0.27 (0.60)	0.04 (0.09)	0.23 (0.51)	0.32 (0.71)	0.49 (1.08)
50	7.78 (17.2)	0.44 (0.97)	0.04 (0.09)	—	—	—
63	13.10 (28.8)	0.70 (1.54)	0.08 (0.18)	—	—	—
80	20.70 (45.6)	1.18 (2.60)	0.17 (0.37)	—	—	—
100	35.70 (78.7)	1.97 (4.34)	0.17 (0.37)	—	—	—

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.

<Air cushion>

Air cushions are a standard feature on mechanically jointed rodless cylinders. (Except ø10.)
The air cushion mechanism is installed to avoid excessive impact of the piston at the stroke end during high speed operation. The air cushion does not act to decelerate the piston near the stroke end.
The ranges of load and speed that air cushions can absorb are within the air cushion limit lines shown in the graphs.

<Stroke adjusting unit with shock absorber>

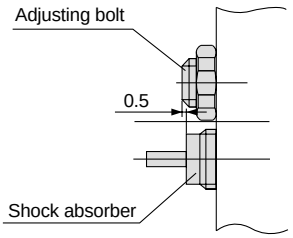
Use this unit when operating with a load or speed exceeding the air cushion limit line, or when cushioning is necessary because the cylinder stroke is outside of the effective air cushion stroke range due to stroke adjustment.

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

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

⚠ Caution

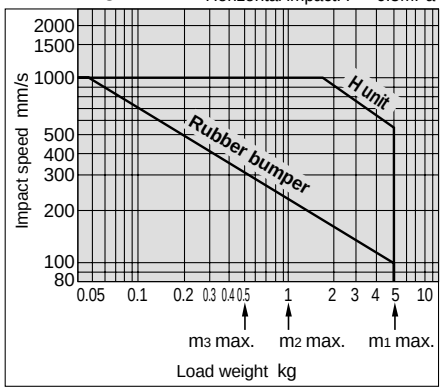
1. **Refer to the diagram below when using the adjusting bolt to perform stroke adjustment.**
   When the effective stroke of the shock absorber decreases as a result of stroke adjustment, the absorption capacity decreases dramatically. Secure the adjusting bolt at the position where it protrudes approximately 0.5mm from the shock absorber.



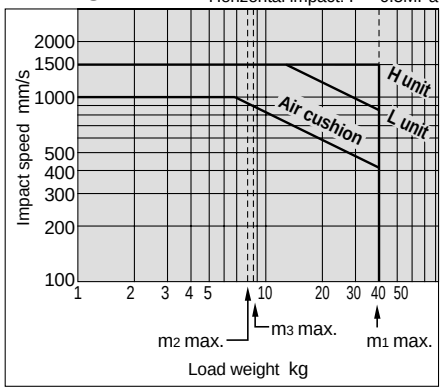
2. Do not use a shock absorber and air cushion together.

Absorption capacity of rubber bumper, air cushion and stroke adjusting units

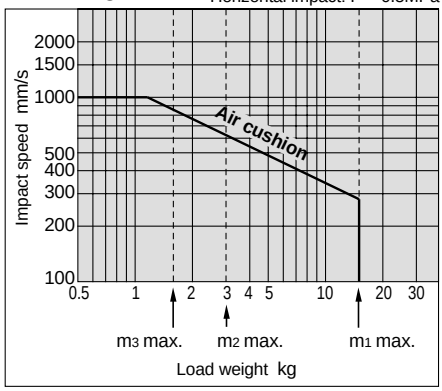
MY1B10 Horizontal impact: P = 0.5MPa



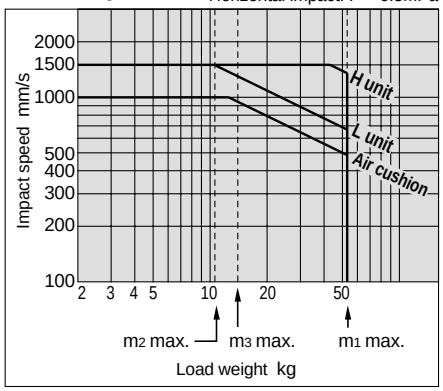
MY1B32 Horizontal impact: P = 0.5MPa



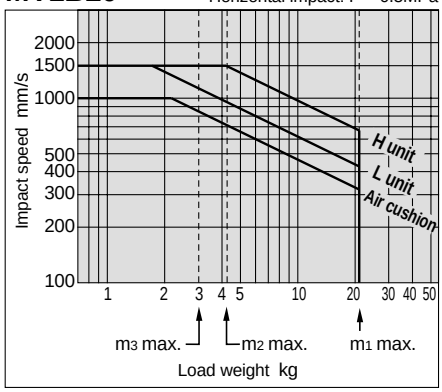
MY1B16 Horizontal impact: P = 0.5MPa



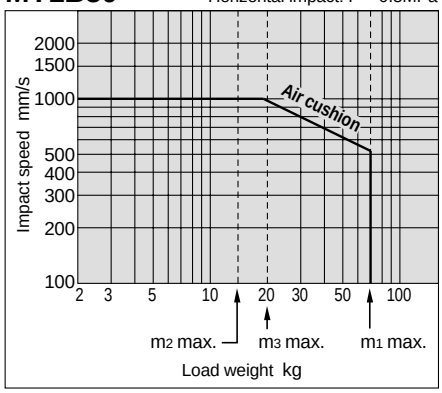
MY1B40 Horizontal impact: P = 0.5MPa



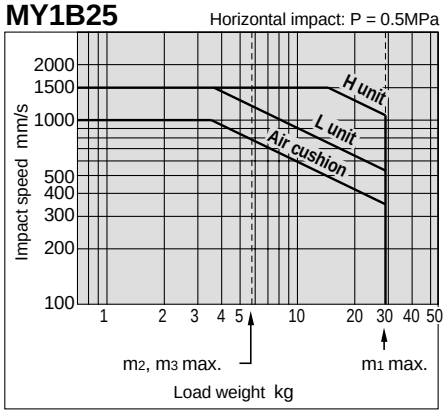
MY1B20 Horizontal impact: P = 0.5MPa



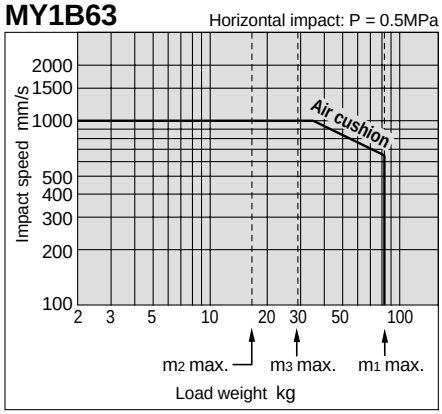
MY1B50 Horizontal impact: P = 0.5MPa



MY1B25 Horizontal impact: P = 0.5MPa

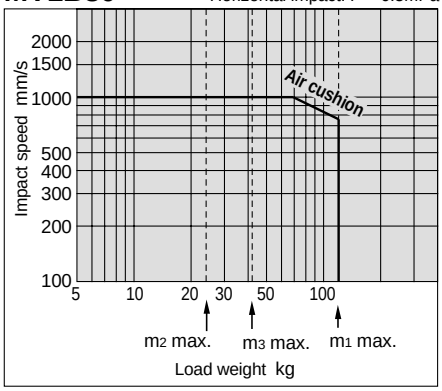


MY1B63 Horizontal impact: P = 0.5MPa



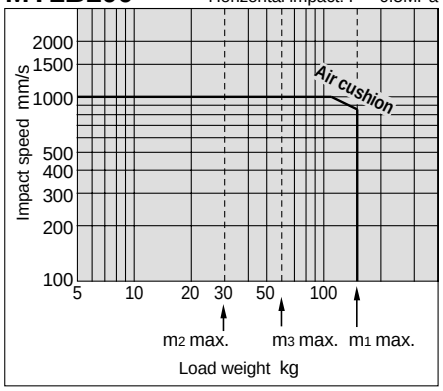
MY1B80

Horizontal impact: P = 0.5MPa



MY1B100

Horizontal impact: P = 0.5MPa



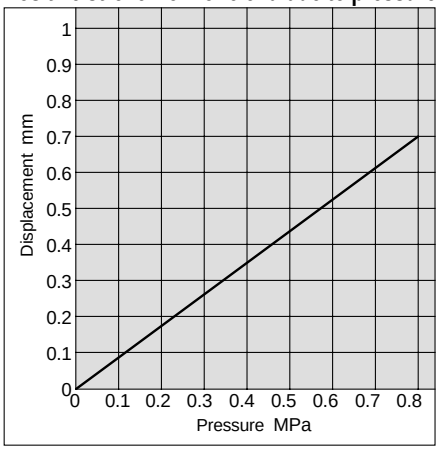
Air cushion stroke

Unit: mm

Bore size (mm)	Cushion stroke
16	12
20	15
25	15
32	19
40	24
50	30
63	37
80	40
100	40

Rubber bumper (ø10 only)

Positive stroke from one end due to pressure



Stroke adjusting unit holding bolt tightening torque

Unit: N·m

Bore size (mm)	Unit	Tightening torque
10	A	0.3
	H	
16	A	0.6
20	A	1.5
	L	
	H	
25	A	3.0
	L	
	H	
32	A	5.0
	L	
	H	
40	A	10
	L	
	H	

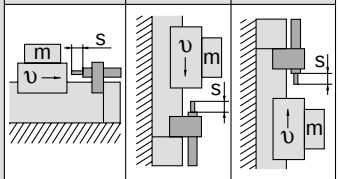
Stroke adjusting unit lock plate holding bolt tightening torque

Unit: N·m

Bore size (mm)	Unit	Tightening torque
20	H	1.2
25	L	1.2
	H	3.3
32	L	3.3
	H	10
40	L	3.3
	H	10

Calculation of absorption energy for stroke adjusting unit with shock absorber

Unit: N·m

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

Symbols

υ : Speed of impacting object (m/s)

m : Weight of impacting object (kg)

F : Cylinder thrust (N)

g : Gravitational acceleration (9.8m/s²)

s : Shock absorber stroke (m)

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

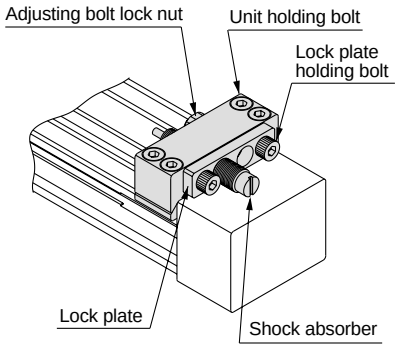
⚠ Specific product precautions

Be sure to read before handling. Refer to pages 112 through 119 for safety instructions and common precautions.

⚠ Caution

Be careful not to get hands caught in the unit.

- When using a product with stroke adjusting unit, the space between the slide table (slider) and the stroke adjusting unit becomes narrow, 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 fastened by uniformly tightening the four unit holding bolts.

⚠ Caution

Do not operate with the stroke adjusting 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 this case, we recommend using the adjusting bolt mounting brackets available with order made specifications -X 416 and -X 417. (Except ø10.)

For other lengths, consult SMC. (Refer to "Stroke adjustment unit holding bolt tightening torque".)

<Stroke adjustment with adjusting bolt>

Loosen the adjusting bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Re-tighten 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 ø20 L unit.) (Refer to "Stroke adjusting unit lock plate holding bolt tightening torque".)

Note)

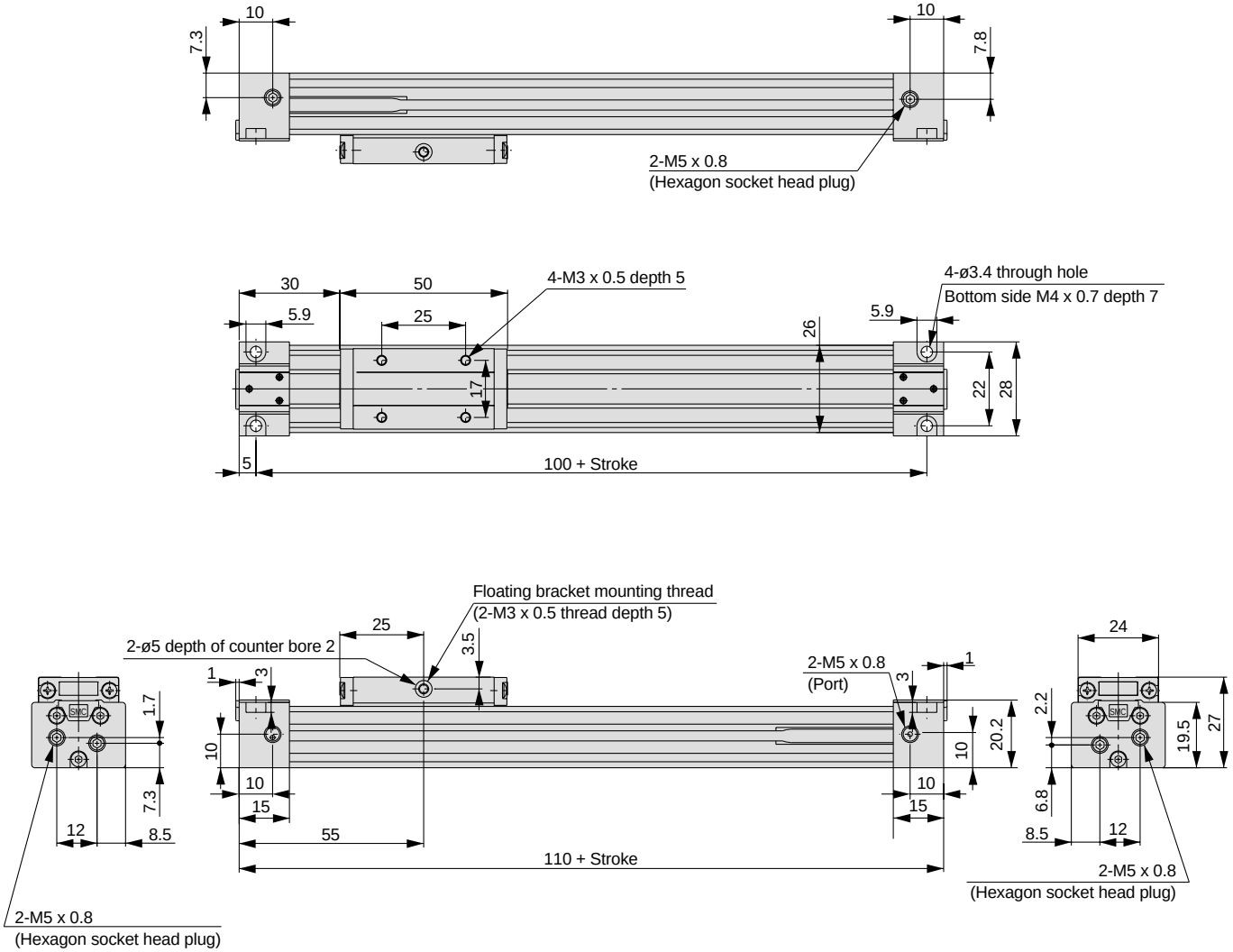
Slight bending may occur in the lock plate due to tightening of the lock plate holding bolts. This is not a problem for the shock absorber and locking function.

Centralized Piping Type / Dimensions (mm) ø10 CAD

MY1B10G — Stroke

1 in = 25.4 mm

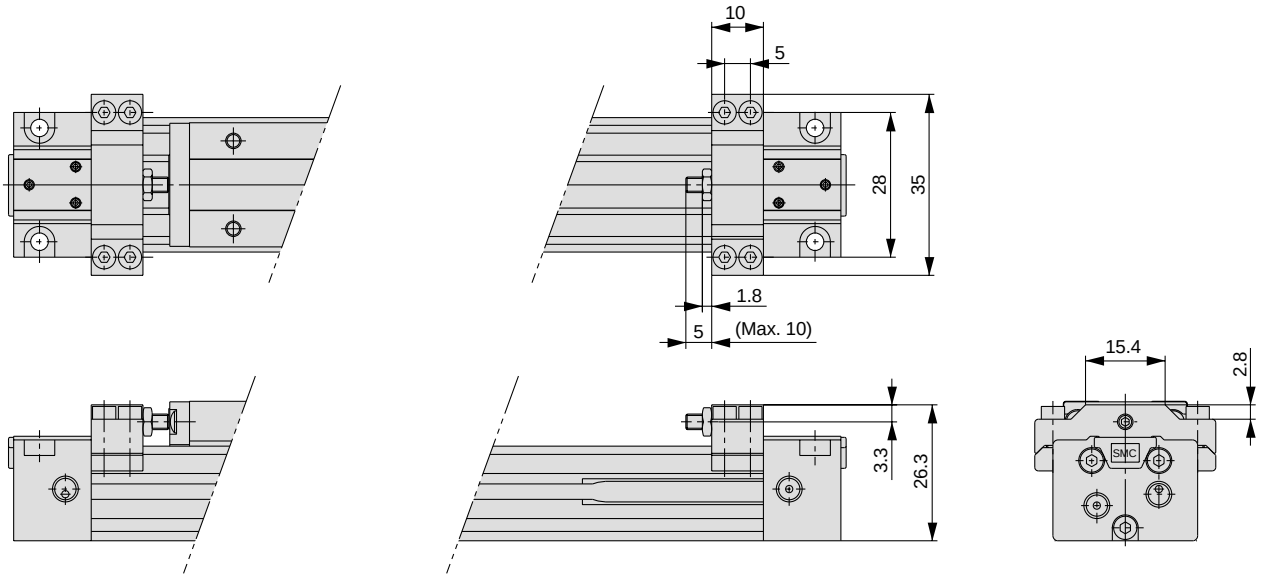
[Refer to page 120 regarding centralized piping port variations.]



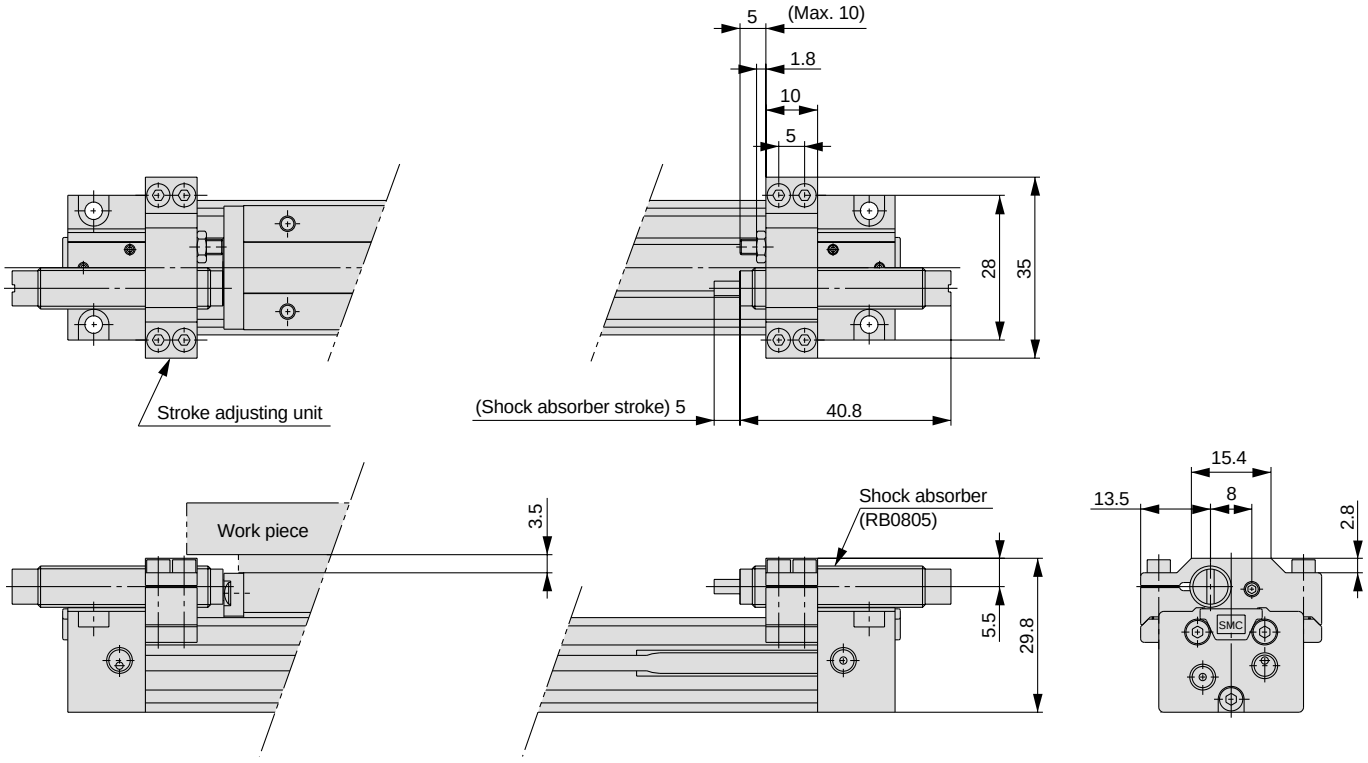
Dimensions (mm)

1 in = 25.4 mm

MY1B10G — Stroke A (with adjusting bolt)



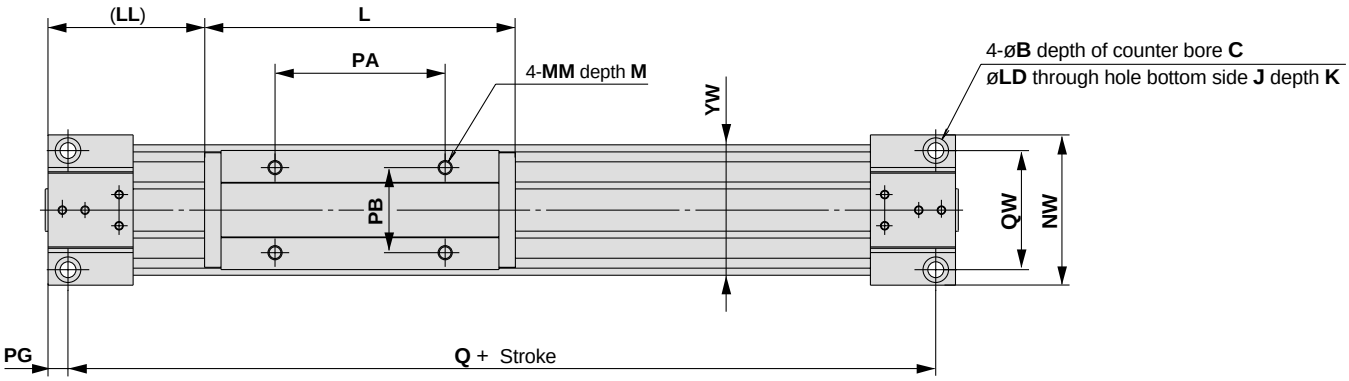
MY1B10G — Stroke H (with high load shock absorber + stopper bolt)

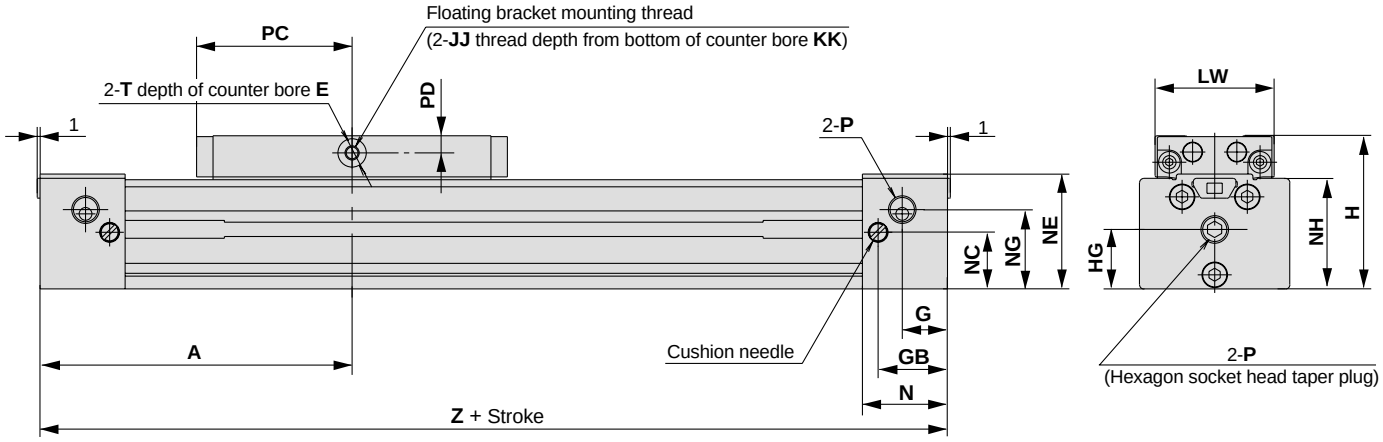


Standard Type / Dimensions (mm) ø16 to ø40

MY1B Bore size — Stroke

1 in = 25.4 mm





Model	A	B	C	E	G	GB	H	HG	J	JJ	K	KK	L	LD	LL	LW	PG
MY1B16	80	6	3.5	2	9	17	37	13.5	M5 x 0.8	M4 x 0.7	10	6.5	80	3.5	40	30	3.5
MY1B20	100	7.5	4.5	2	12.5	20.5	46	17.5	M6 x 1	M4 x 0.7	12	10	100	4.5	50	37	4.5
MY1B25	110	9	5.5	2	16	24.5	54	21	M6 x 1	M5 x 0.8	9.5	9	110	5.6	55	42	7
MY1B32	140	11	6.5	2	19	30	68	26	M8 x 1.25	M5 x 0.8	16	10	140	6.8	70	52	8
MY1B40	170	14	8.5	2	23	36.5	84	33.5	M10 x 1.5	M6 x 1	15	13.0	170	8.6	85	64	9

Model	M	MM	N	NC	NE	NG	NH	NW	P	PA	PB	PC	PD	Q	QW	T	YW	Z
MY1B16	6	M4 x 0.7	20	13.5	27.8	13.5	27	37	M5 x 0.8	40	20	40	4.5	153	30	7	32	160
MY1B20	8	M5 x 0.8	25	17.5	34	17.5	33.5	45	M5 x 0.8	50	25	50	5	191	36	8	40	200
MY1B25	9	M5 x 0.8	30	20	40.5	28	39	53	Rc 1/8	60	30	55	6	206	42	10	46	220
MY1B32	12	M6 x 1	37	25	50	33	49	64	Rc 1/8	80	35	70	10	264	51	10	55	280
MY1B40	12	M6 x 1	45	30.5	63	42.5	61.5	75	Rc 1/4	100	40	85	12.0	322	59	14	67	340

"P" indicates cylinder supply ports. ∗ The plug for MY1B16-20-P is a hexagon socket head plug.

CAD

MY1B16 ——— SMY1B16, #1 (#1 + #7)

MY1B20 ——— SMY1B20, #1 (#1 + #9)

For ø25 to ø40

MY1B (Bore size) —— SMY1B (Bore size), #1 (#1 + #10)

CAD

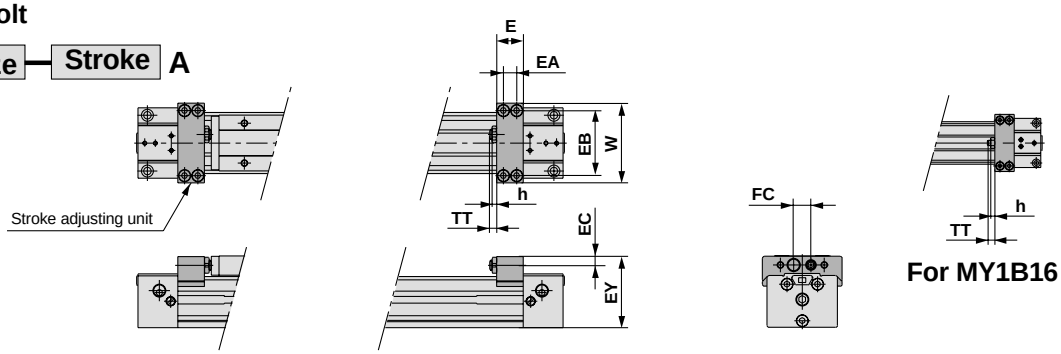
Dimensions (mm)

1 in = 25.4 mm

Stroke Adjusting Unit

With adjusting bolt

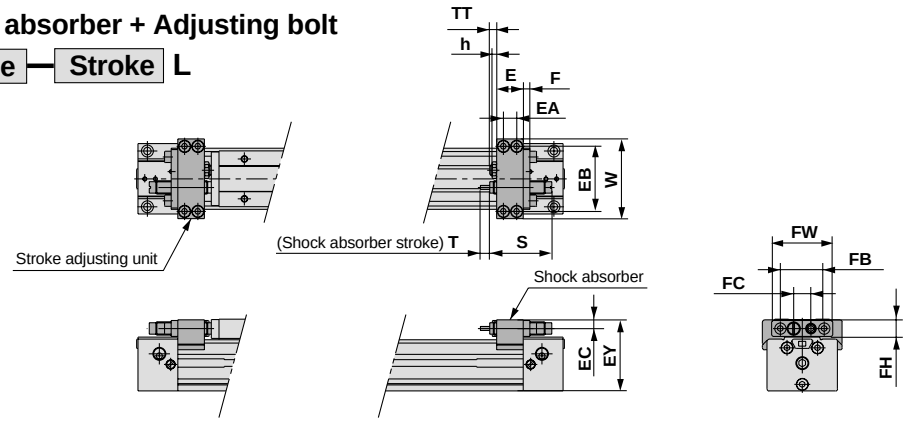
MY1B Bore size — Stroke A



Applicable cylinder	E	EA	EB	EC	EY	FC	h	TT	W
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
MY1B25	20	10	49	6.5	53.5	13	3.5	5 (max. 16.5)	60
MY1B32	25	12	61	8.5	67	17	4.5	8 (max. 20)	74
MY1B40	31	15	76	9.5	81.5	17	4.5	9 (max. 25)	94

Low load shock absorber + Adjusting bolt

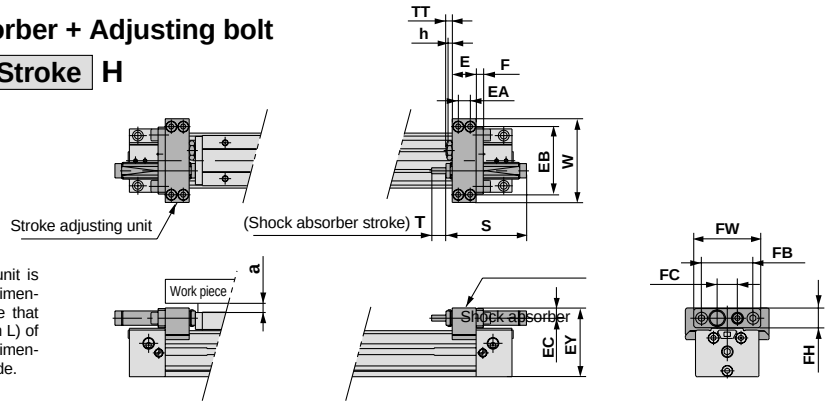
MY1B Bore size — Stroke L



Applicable cylinder	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model
MY1B20	19	9	43	5.8	45.6	4	—	13	—	—	3.2	40.8	6	6 (max. 12)	53	RB0806
MY1B25	20	10	49	6.5	53.5	6	33	13	12	46	3.5	46.7	7	5 (max. 16.5)	60	RB1007
MY1B32	25	12	61	8.5	67	6	43	17	16	56	4.5	67.3	12	8 (max. 20)	74	RB1412
MY1B40	31	15	76	9.5	81.5	6	43	17	16	56	4.5	67.3	12	9 (max. 25)	94	

High load shock absorber + Adjusting bolt

MY1B 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 work piece side.

Applicable cylinder	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model	a
MY1B20	20	10	49	6.5	47.5	6	33	13	12	46	3.5	46.7	7	5 (max. 11)	60	RB1007	2.5
MY1B25	20	10	57	8.5	57.5	6	43	17	16	56	4.5	67.3	12	5 (max. 16.5)	70	RB1412	4.5
MY1B32	25	12	74	11.5	73	8	57	22	22	74	5.5	73.2	15	8 (max. 20)	90	RB2015	6
MY1B40	31	15	82	12	87	8	57	22	22	74	5.5	73.2	15	9 (max. 25)	100		4

CAD

・Stroke adjusting unit
With adjusting bolt
MY1B16 —— SMY1B16, #3 (#1 + #3 + #7)
MY1B20 —— SMY1B20, #3 (#1 + #3 + #9)
For ø25 to ø40
MY1B (Bore size) —— SMY1B (Bore size), #3 (#1 + #3 + #10)

・Low load shock absorber + Adjusting bolt
MY1B20 —— SMY1B20, #4 (#1 + #4 + #9)
For ø25 to ø40
MY1B (Bore size) —— SMY1B (Bore size), #4 (#1 + #4 + #10)

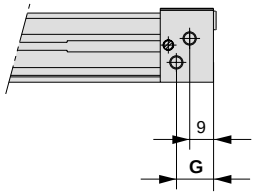
・High load shock absorber + Adjusting bolt
MY1B20 —— SMY1B20, #5 (#1 + #5 + #9)
For ø25 to ø40
MY1B (Bore size) —— SMY1B (Bore size), #5 (#1 + #5 + #10)

Centralized Piping Type / Dimensions (mm) ø16 to ø40

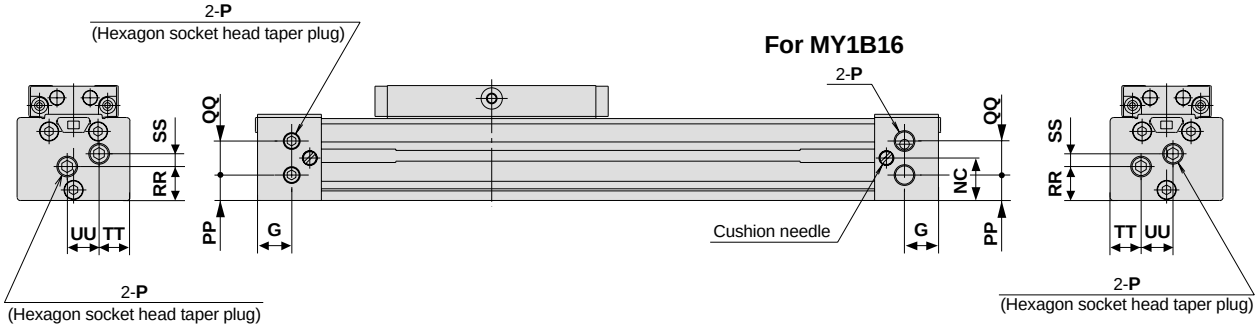
1 in = 25.4 mm

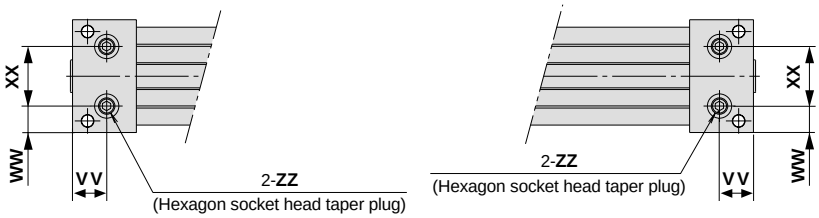
MY1B Bore size **G** — Stroke

Refer to pg 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping and for the stroke adjusting unit are identical to the standard type dimensions.
Refer to pgs 12 and 13 for details regarding dimensions, etc.



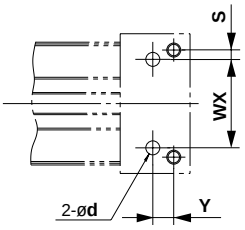
For MY1B16

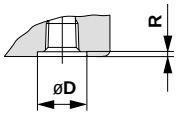




Model	G	NC	P	PP	QQ	RR	SS	TT	UU	VV	WW	XX	ZZ
MY1B16G	14	14	M5 x 0.8	7.5	9	11	3	9	10.5	10	7.5	22	M5 x 0.8
MY1B20G	12.5	17.5	M5 x 0.8	11.5	11	14.5	5	10.5	12	12.5	10.5	24	M5 x 0.8
MY1B25G	16	20	Rc 1/8	12	16	16	6	14.5	15	16	12.5	28	Rc 1/16
MY1B32G	19	25	Rc 1/8	17	16	23	4	16	16	19	16	32	Rc 1/16
MY1B40G	23	30.5	Rc 1/4	18.5	24	27	10.5	20	22	23	19.5	36	Rc 1/8

"P" indicates cylinder supply ports. ∗ The plug for MY1B16/20-P-ZZ is a hexagon socket head plug.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom (Machine the mounting side to the dimensions below.)

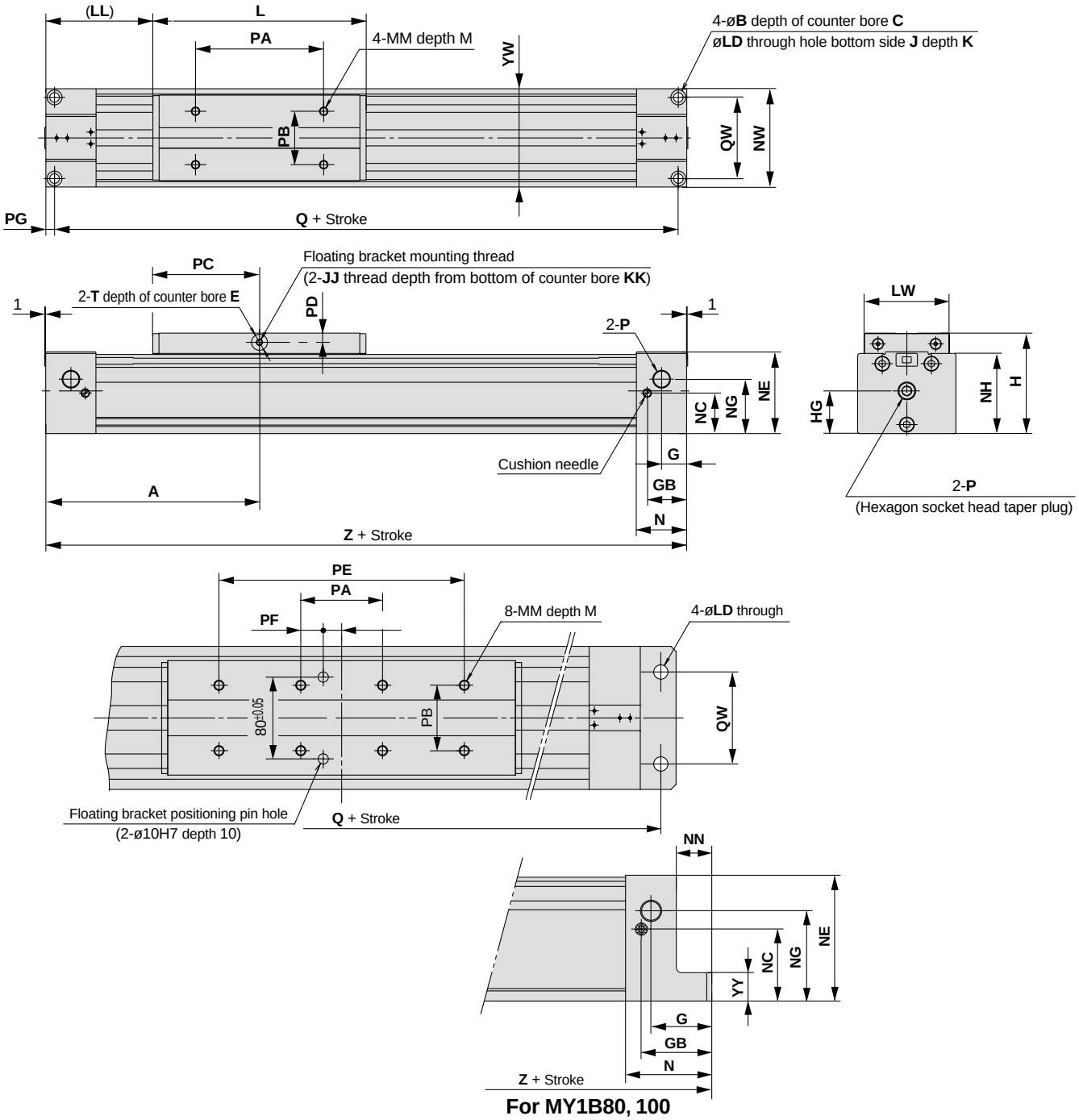
Model	WX	Y	S	d	D	R	Applicable O-ring
MY1B16G	22	6.5	4	4	8.4	1.1	C6
MY1B20G	24	8	6	4	8.4	1.1	
MY1B25G	28	9	7	6	11.4	1.1	C9
MY1B32G	32	11	9.5	6	11.4	1.1	
MY1B40G	36	14	11.5	8	13.4	1.1	C11.2

CAD MY1B16G —— SMY1B16, #2 (#2 + #7)
MY1B20G —— SMY1B20, #2 (#2 + #9)
For ø25 to ø40
MY1B (Bore size) G——SMY1B (Bore size) ——SMY1B (Bore size), #2 (#2 + #10)

Standard Type / Dimensions ø50 to ø100

1 in = 25.4 mm

MY1B Bore size — Stroke



For MY1B80, 100

Model	A	B	C	E	G	GB	H	HG	J	JJ	K	KK	L	LD	LL	LW	NN	YY	PG
MY1B 50	200	14	8.5	3	23.5	37	94	40	M12 x 1.75	M6 x 1	25	17	200	9	100	80	—	—	8
MY1B 63	230	17	10.5	3	25	39	116	51	M14 x 2	M8 x 1.25	28	24	230	11	115	96	—	—	10
MY1B 80	345	—	—	—	60	71.5	150	66	—	—	—	—	340	14	175	112	35	28	15
MY1B100	400	—	—	—	70	79.5	190	85	—	—	—	—	400	18	200	140	45	35	20

Model	M	MM	N	NC	NE	NG	NH	NW	P	PA	PB	PC	PD	PE	PF	Q	QW	T	YW	Z
MY1B 50	14	M8 x 1.25	47	38	76.5	51	75	92	Rc 3/8	120	50	100	8.5	—	—	384	76	15	92	400
MY1B 63	16	M8 x 1.25	50	51	100	59	95	112	Rc 3/8	140	60	115	9.5	—	—	440	92	16	112	460
MY1B 80	20	M10 x 1.5	85	65	124	82	124	140	Rc 1/2	80	65	—	—	240	22	660	90	—	140	690
MY1B100	25	M12 x 1.75	95	85	157	103	157	176	Rc 1/2	120	85	—	—	280	42	760	120	—	176	800

MY1B (Bore size) —— SMY1B (Bore size), #1 (#1 + #6)

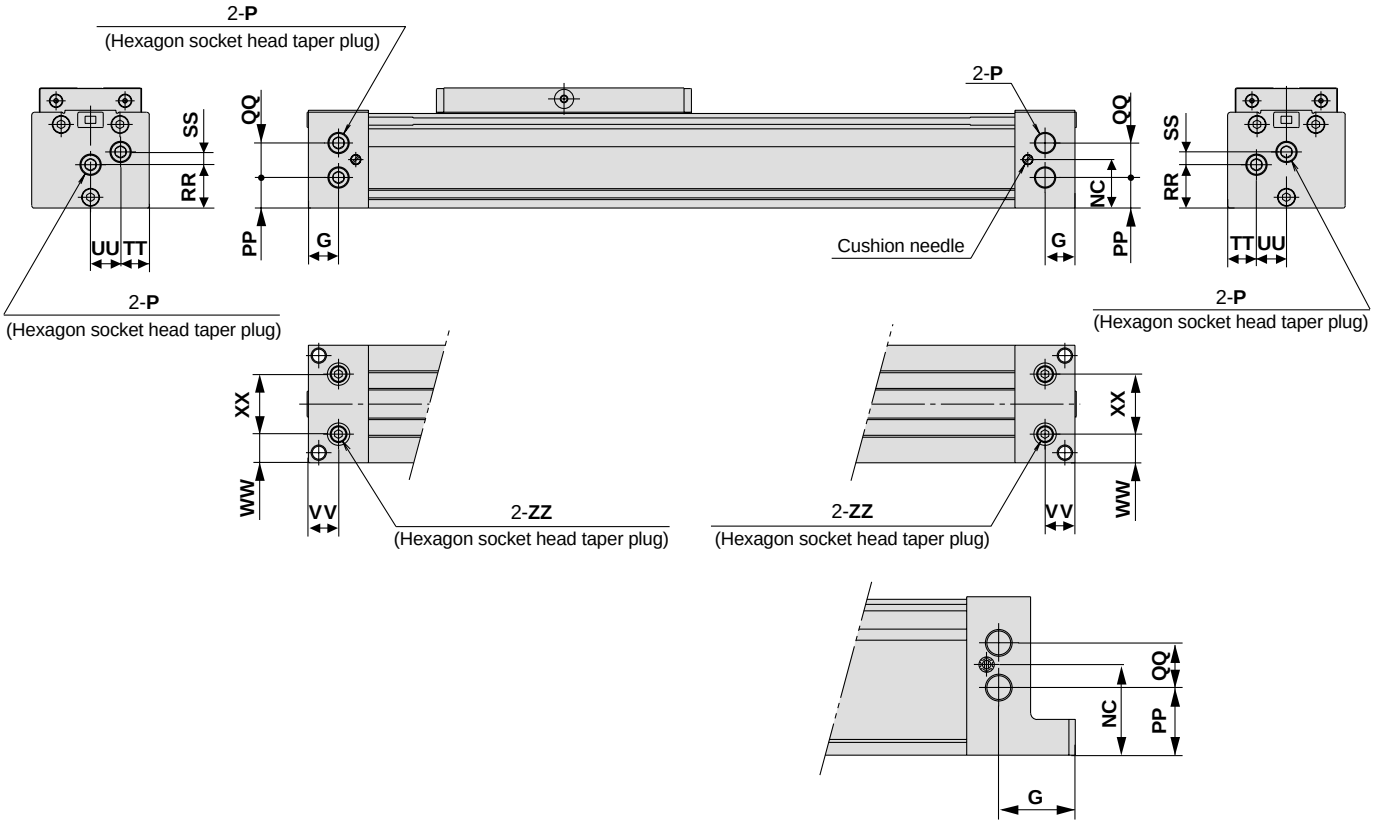
∗ "P" indicates cylinder supply ports.

Centralized Piping Type / Dimensions (mm) ø50 to ø100

1 in = 25.4 mm

MY1B Bore size **G—** Stroke

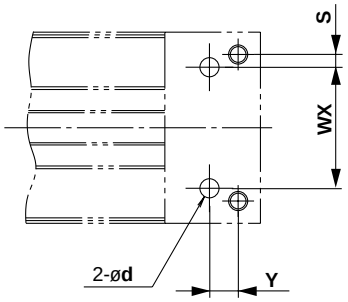
Refer to page 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping are identical to the standard type dimensions.
Refer to page 15 for details regarding dimensions etc.

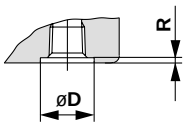


For MY1B80, 100

Model	G	P	NC	PP	QQ	RR	SS	TT	UU	V V	WW	XX	ZZ
MY1B 50G	23.5	Rc 3/8	38	24	27	34	10	22.5	23.5	23.5	22.5	47	Rc 1/4
MY1B 63G	25	Rc 3/8	51	37.5	29.5	45.5	13.5	27	29	25	28	56	Rc 1/4
MY1B 80G	60	Rc 1/2	71	53	35	61	15	30	40	60	25	90	Rc 1/2
MY1B100G	70	Rc 1/2	88	69	38	75	20	40	48	70	28	120	Rc 1/2

∗ "P" indicates cylinder supply ports.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom (Machine the mounting side to the dimensions below.)

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1B 50G	47	15.5	14.5	10	17.5	1.1	C15
MY1B 63G	56	15	18	10	17.5	1.1	
MY1B 80G	90	45	—	18	26	1.8	P22
MY1B100G	120	50	—	18	26	1.8	

CAD MY1B Bore size G — SMY1B Bore size, #2 (#2 + #6)

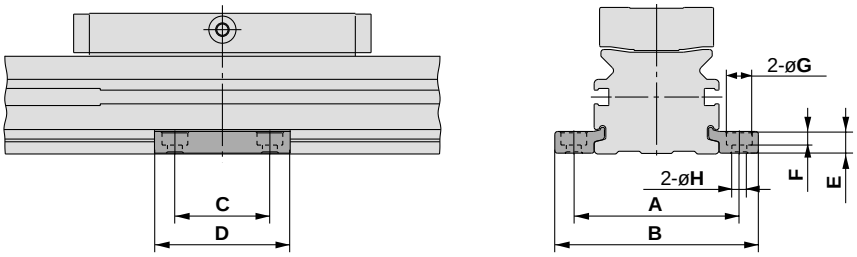
Side Support

CAD

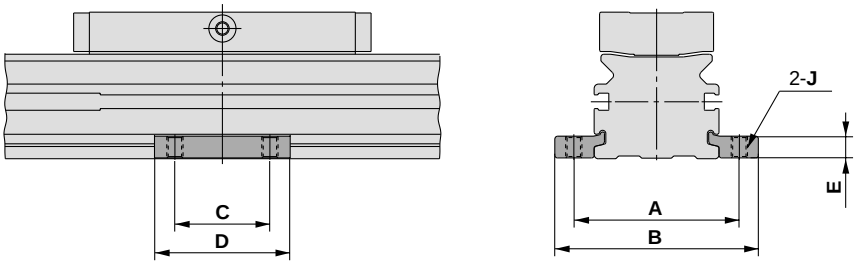
Dimensions (mm)

1 in = 25.4 mm

Side support A
MY-S A



Side support B
MY-S B



Model	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S10 A/B	MY1B 10	35	43.6	12	21	3.6	1.8	6.5	3.4	M4 x 0.7
MY-S16 A/B	MY1B 16	43	53.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20 A/B	MY1B 20	53	65.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S25 A/B	MY1B 25	61	75	35	50	8	5	9.5	5.5	M6 x 1
	MY1B 32	70	84							
MY-S32 A/B	MY1B 40	87	105	45	64	11.7	6	11	6.6	M8 x 1.25
	MY1B 50	113	131							
MY-S50 A/B	MY1B 63	136	158	55	80	14.8	8.5	14	9	M10 x 1.5
MY-S63 A/B	MY1B 80	170	200	70	100	18.3	10.5	17.5	11.5	M12 x 1.75
	MY1B100	206	236							

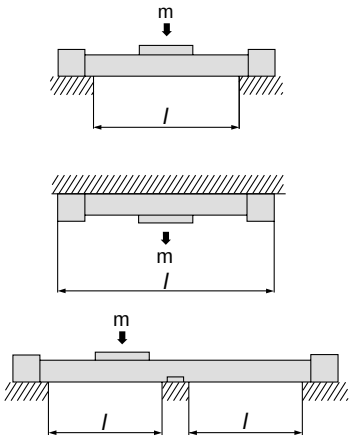
CAD

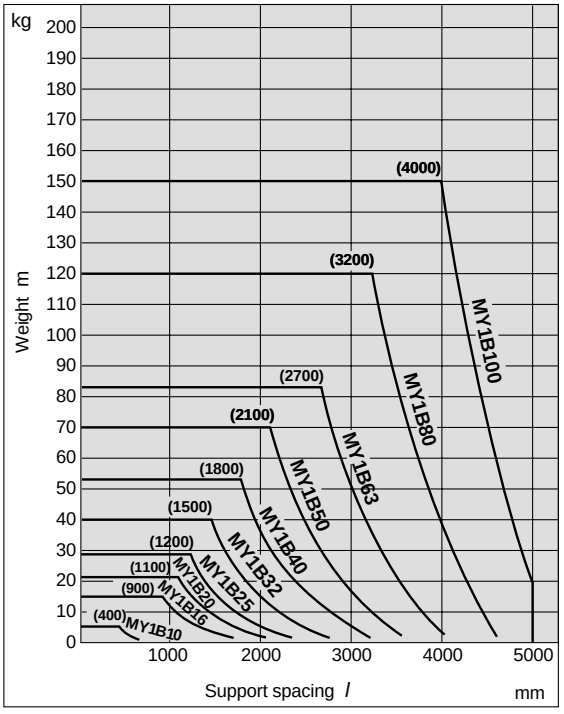
- Side support A
  MY-S16A —— SMY1B16, #5 (#1 + #5 + #7)
  MY-S20A —— SMY1B20, #7 (#1 + #7 + #9)
  For ø25 to ø63
  MY-S (Bore size) A —— SMY1B (Bore size), #8 (#1 + #8 + #10)

- Side support B
  MY-S16B —— SMY1B16, #6 (#1 + #6 + #7)
  MY-S20B —— SMY1B20, #8 (#1 + #8 + #9)
  For ø25 to ø63
  MY-S (Bore size) B —— SMY1B (Bore size), #9 (#1 + #9 + #10)

Guide for Using Side Supports

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.

Floating Bracket / Dimensions

CAD

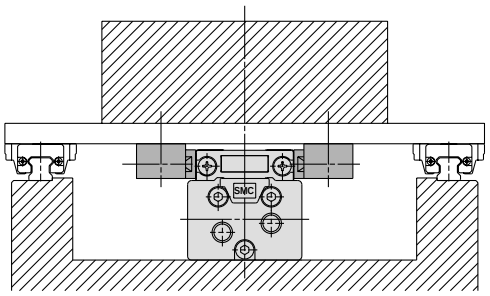
1 in = 25.4 mm

Facilitates connection to other guide systems.

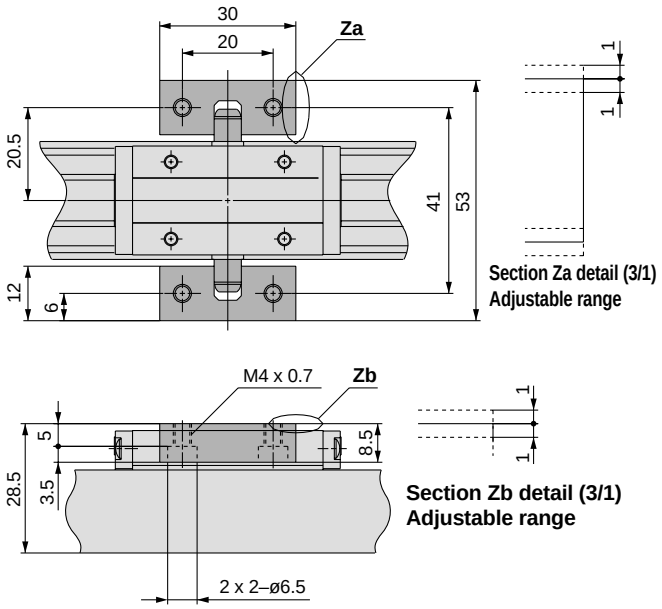
Applicable bore size

ø10

Application example



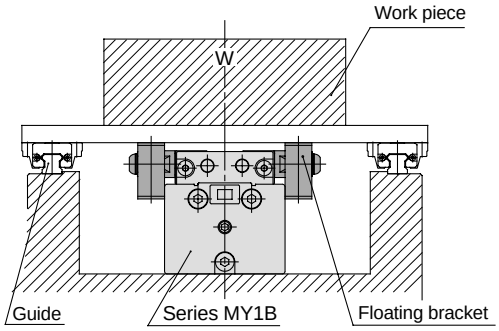
Mounting example



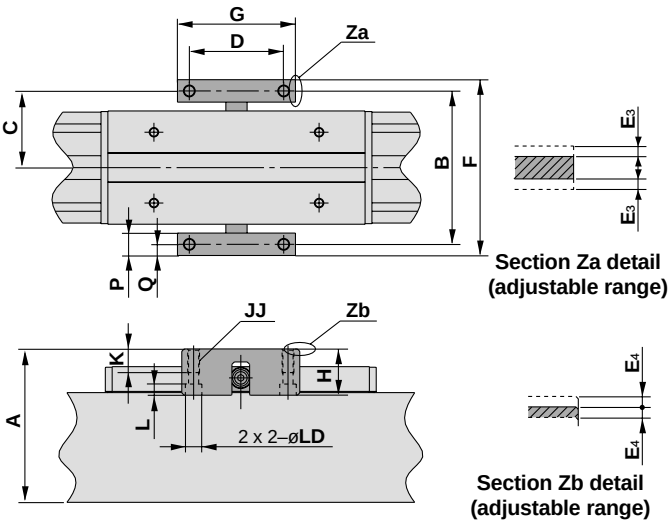
Applicable bore size

ø16, ø20

Application example



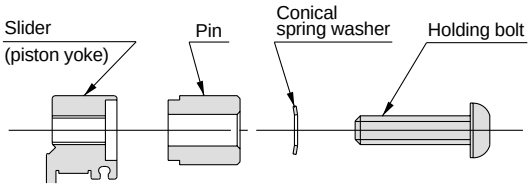
Mounting example



Model	Applicable cylinder	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 cylinder	JJ	K	L	P	Q	E_3	E_4	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

Installation of holding bolts



Holding bolt tightening torque

Unit: 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		

CAD

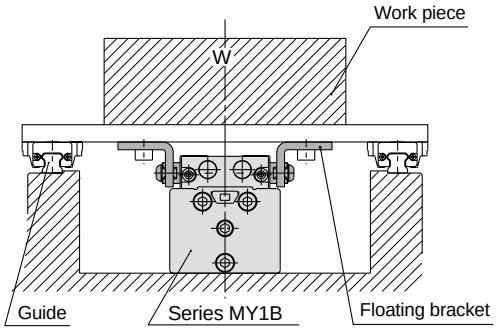
Dimensions (mm)

1 in = 25.4 mm

pplicable bore size

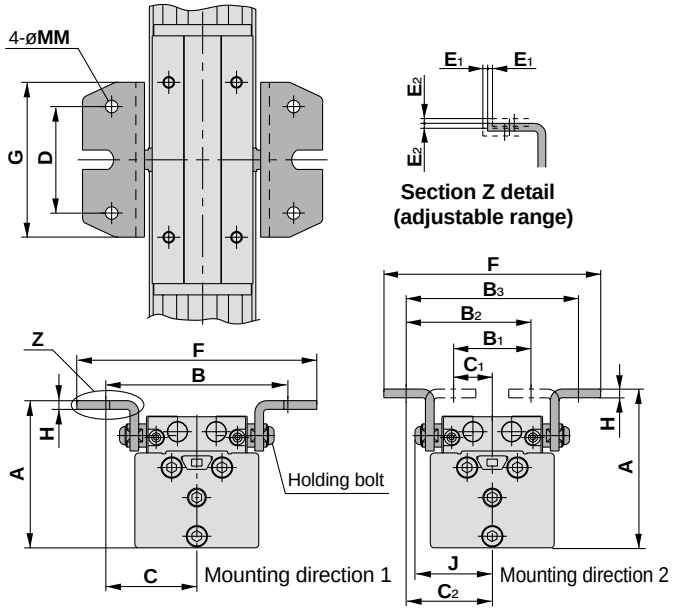
ø25, ø 32, ø40

Application example



Mounting example

One set of brackets can be mounted in two directions for compact combinations.



Model	Applicable cylinder	Common					Mounting direction 1			
		D	G	H	J	MM	A	B	C	F
MY-J25	MY1B25	40	60	3.2	35	5.5	63	78	39	100
MY-J32	MY1B32	55	80	4.5	40	6.5	76	94	47	124
MY-J40	MY1B40	74	100	4.5	47	6.5	92	112	56	144

Model	Applicable cylinder	Mounting direction 2							Adjustable range	
		A	B_1	B_2	B_3	C_1	C_2	F	E_1	E_2
MY-J25	MY1B25	65	28	53	78	14	39	96	1	1
MY-J32	MY1B32	82	40	64	88	20	44	111	1	1
MY-J40	MY1B40	98	44	76	108	22	54	131	1	1

Note) One set of floating brackets consists of one right piece and one left piece.

CAD MY-J16 ——SMY1B16, #4 (#1 + #4 + #7)

MY-J20 ——SMY1B20, #6 (#1 + #6 + #9)

For ø25 to ø40

Mounting direction 1

MY-J (Bore size) ——SMY1B (Bore size), #6 (#1 + #6 + #10)

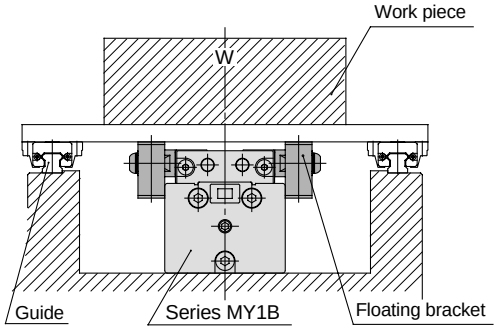
Mounting direction 2

MY-J (Bore size) ——SMY1B (Bore size), #7 (#1 + #7 + #10)

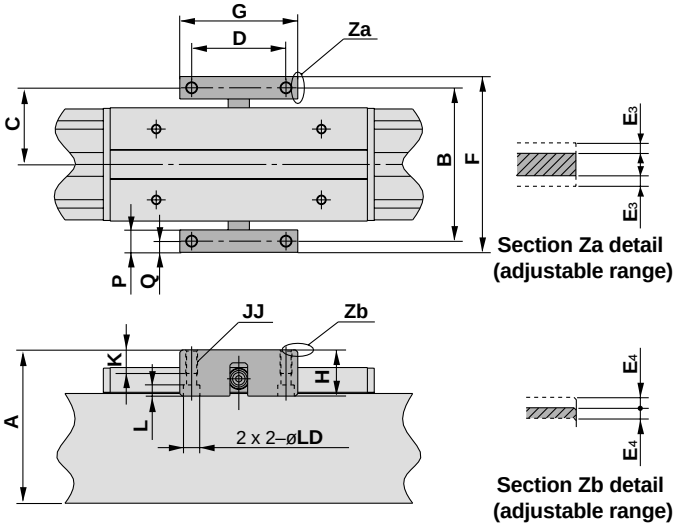
Applicable bore size

ø50, ø63

Application example



Mounting example



Model	Applicable cylinder	A	B	C	D	F	G	H
MY-J50	MY1B50	110	110	55	70	126	90	37
MY-J63	MY1B63	131	130	65	80	149	100	37

Model	Applicable cylinder	JJ	K	L	P	Q	E_3	E_4	LD
MY-J50	MY1B50	M8 to 1.25	20	7.5	16	8	2.5	2.5	11
MY-J63	MY1B63	M10 to 1.5	20	9.5	19	9.5	2.5	2.5	14

CAD MY-J (Bore size) ——SMY1B (Bore size), #3 (#1 + #3 + #6)

Floating Bracket / Dimensions (mm) CAD

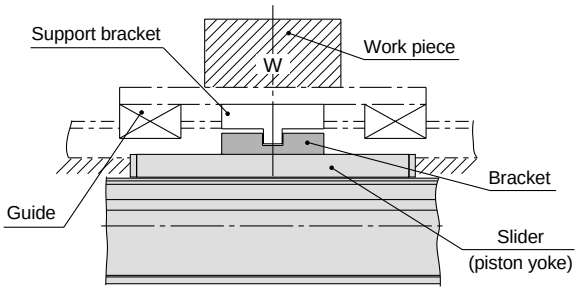
Facilitates connection to other guide systems.

1 in = 25.4 mm

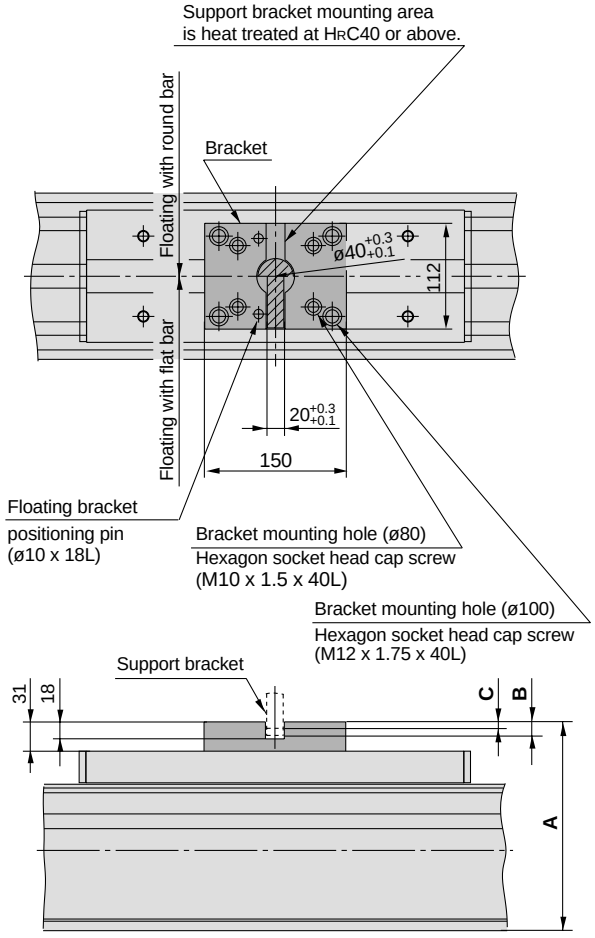
Applicable bore size

ø80, ø100

Application example



Mounting example



Model	Applicable cylinder	**A**	**B** (max.)	**C** (min.)
MY-J 80	**MY1B 80**	181	15	9
MY-J100	**MY1B100**	221	15	9

Hexagon socket head cap screw tightening torque

Unit: N·m

Model	Tightening torque
MY-J 80	25
MY-J100	44

Note) • Flat bar or round bar mounting are possible for the support bracket (slanted lines) mounted by the customer.
• The floating bracket is packaged with (4) hexagon socket head cap screws and (2) parallel pins at the time of shipment.
• "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.

Floating bracket operating precautions

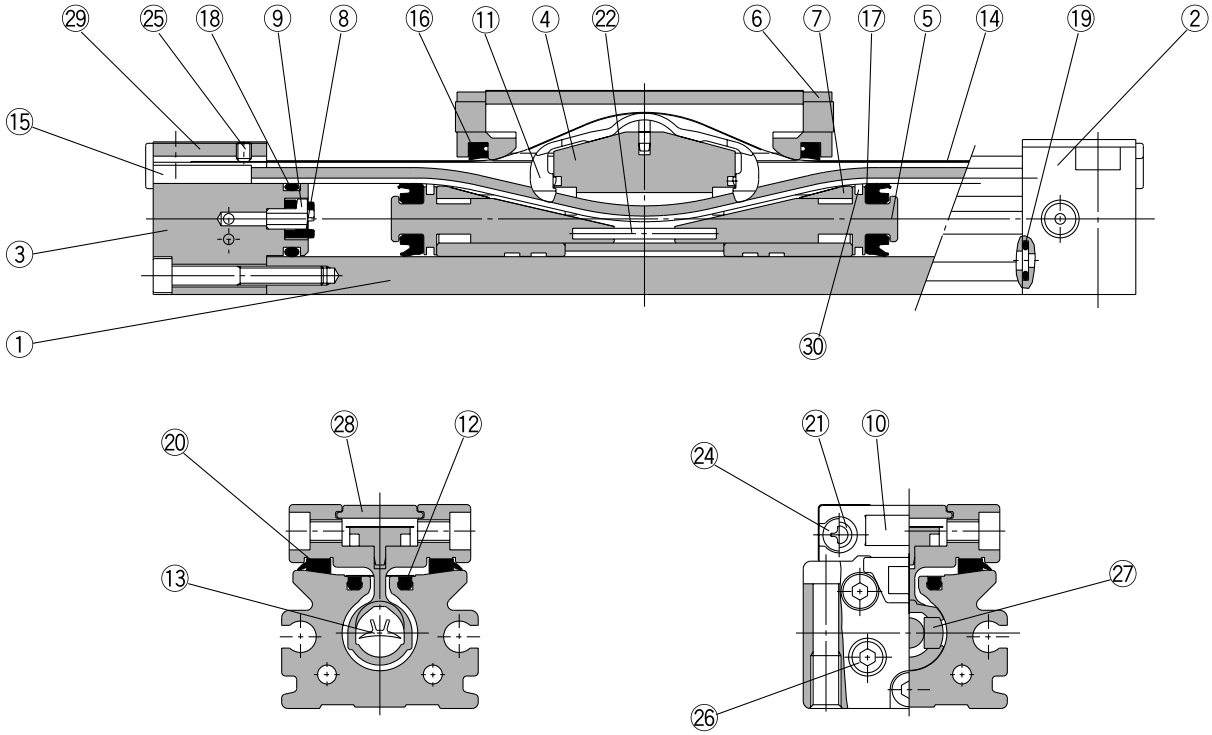
⚠ Caution

Make sure that the amount of divergence from the external guide is within the adjustable range.

Using the floating bracket facilitates connection to an external guide. However, with a rod type guide, etc., the amount of displacement is large and the floating bracket may not be able to absorb the variation. Check the amount of displacement and mount the floating bracket within the adjustable range.
When the displacement amount exceeds the adjustable range, use a separate floating mechanism.

Construction/ ø10

Centralized piping type/MY1B10G



arts list

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover WR**	Aluminum alloy	Hard anodized
3	**Head cover WL**	Aluminum alloy	Hard anodized
4	**Piston yoke**	Aluminum alloy	Hard anodized
5	**Piston**	Aluminum 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	

Parts list

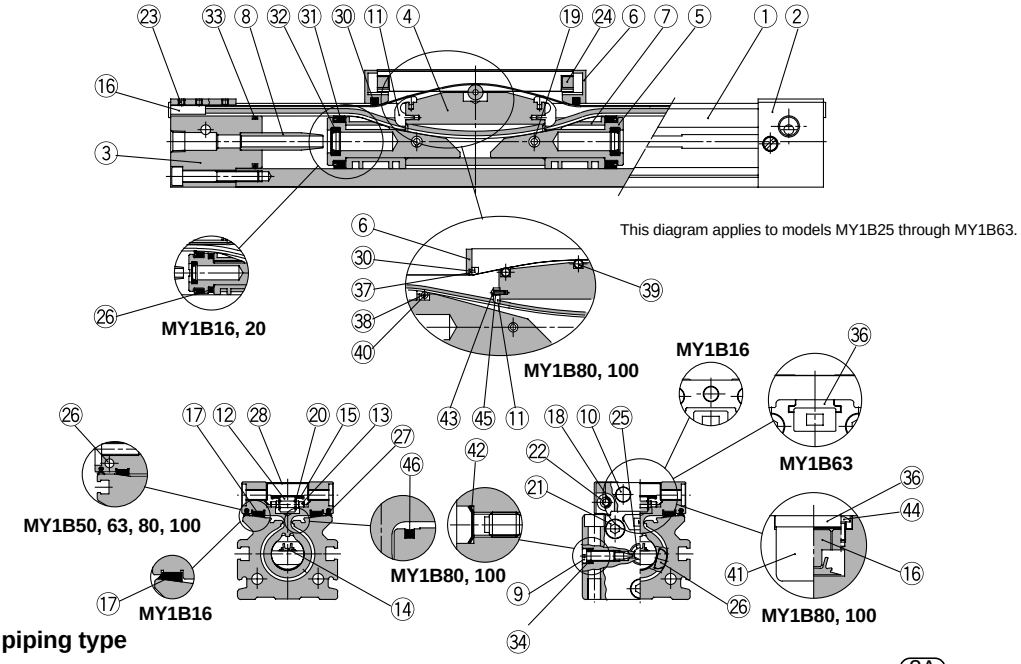
No.	Description	Material	Note
15	**Belt clamp**	Special resin	
20	**Bearing**	Special resin	
21	**Spacer**	Chrome molybdenum steel	Nickel plated
22	**Spring pin**	Stainless steel	
23	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
24	**Round head Phillips screw**	Carbon steel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

eal list

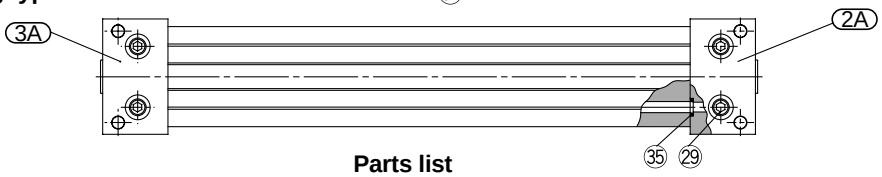
No.	Description	Material	Qty.	**MY1B10**
13	**Seal belt**	Special resin	1	MY10-16A-stroke
14	**Dust seal band**	Stainless steel	1	MY10-16B-stroke
16	**Scraper**	NBR	2	MYB10-15AR0597
17	**Piston seal**	NBR	2	GMY10
18	**Tube gasket**	NBR	2	P7
19	**O-ring**	NBR	4	ø5.33 x ø3.05 x ø1.14

Construction/ø16 to ø100

Standard type



Centralized piping type



Parts list

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover R**	Aluminum alloy	Hard anodized
2A	**Head cover WR**	Aluminum alloy	Hard anodized
3	**Head cover L**	Aluminum alloy	Hard anodized
3A	**Head cover WL**	Aluminum alloy	Hard anodized
4	**Piston yoke**	Aluminum alloy	Hard anodized
5	**Piston**	Aluminum alloy	Chromated
6	**End cover**	Special resin	
		Carbon steel	Nickel plated (ø80 and ø100)
7	**Wear ring**	Special resin	
8	**Cushion ring**	Brass	
9	**Cushion needle**	Rolled steel	Nickel plated
10	**Stopper**	Carbon steel	Nickel plated (ø16 to ø40)
11	**Belt separator**	Special resin	
12	**Guide roller**	Special resin	
13	**Guide roller shaft**	Stainless steel	
16	**Belt clamp**	Special resin	
		Aluminum alloy	Chromated (ø80 and ø100)
17	**Bearing**	Special resin	
18	**Spacer**	Stainless steel	
19	**Spring pin**	Carbon tool steel	Black zinc chromated

Parts list

No.	Description	Material	Note
20	**Type E retaining ring**	Cold rolled special steel strip	
21	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
22	**Hexagon socket head button bolt**	Chrome molybdenum steel	Nickel plated
23	**Hexagon socket head set screw**	Chrome molybdenum steel	Black zinc chromated/Nickel plated
24	**Double round parallel key**	Carbon steel	(ø16 to ø40)
25	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
26	**Magnet**	Rare earth magnet	
27	**Side scraper**	Special resin	(Except ø16)
28	**Top cover**	Stainless steel	
29	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
36	**Head plate**	Aluminum alloy	Hard anodized (ø63 to ø100)
37	**Backup plate**	Special resin	
38	**Guide roller B**	Special resin	(ø80 and ø100)
39	**Guide roller A**	Stainless steel	(ø80 and ø100)
40	**Guide roller shaft B**	Stainless steel	(ø80 and ø100)
41	**Side cover**	Aluminum alloy	Hard anodized (ø80 and ø100)
42	**Type CR retaining ring**	Spring steel	(ø80 and ø100)
43	**Hexagon socket head button bolt**	Chrome molybdenum steel	Nickel plated (ø80 and ø100)
44	**Hexagon socket head button bolt**	Chrome molybdenum steel	Nickel plated (ø80 and ø100)
45	**Spacer B**	Stainless steel	(ø80 and ø100)
46	**Seal magnet**	Rubber magnet	(ø80 and ø100)

Seal list

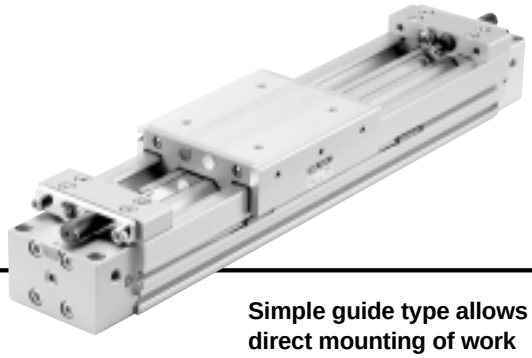
No.	Description	Material	Qty.	MY1B16	MY1B20	MY1B25	MY1B32	MY1B40	MY1B50	MY1B63	MY1B80	MY1B100
14	**Seal belt**	Special resin	1	MY16-16A-Stroke	MY20-16A-Stroke	MY25-16A-Stroke	MY32-16A-Stroke	MY40-16A-Stroke	MY50-16A-Stroke	MY63-16A-Stroke	MY80-16A-Stroke	MY100-16A-Stroke
15 Note)	**Dust seal band**	Stainless steel	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke	MY80-16B-Stroke	MY100-16B-Stroke
30	**Scraper**	NBR	2	MYB16-15AA7163	MYB20-15AA7164	MYB25-15AA5900	MYB32-15AA5901	MYB40-15AA5902	MYB50-15AA7165	MYB63-15AA7166	MYB80-15AK2470	MYB100-15AK2471
31	**Piston seal**	NBR	2	GMY16	GMY20	GMY25	GMY32	GMY40	GMY50	GMY63	GMY80	GMY100
32	**Cushion seal**	NBR	2	MYB16-15-A7163	MYB20-15-A7164	RCS-8	RCS-10	RCS-12	MC-16	MC-20	MC-25	MC-30
33	**Tube gasket**	NBR	2	P12	P16	TMY-25	TMY-32	TMY-40	P44	P53	P70	P90
34	**O-ring**	NBR	2	ø4 x ø1.8 x ø1.1	ø5.1 x ø3 x ø1.05	ø7.15 x ø3.75 x ø1.7	ø7.15 x ø3.75 x ø1.7	ø8.3 x ø4.5 x ø1.9	ø8.3 x ø4.5 x ø1.9	C-4	C-6	C-6
35	**O-ring**	NBR	2	ø6.2 x ø3 x ø1.6	ø7 x ø4 x ø1.5	P-5	P-6	C-9	C-12.5	C-14	P22	P24

Note) Two types of dust seal band are available. Verify the type to use, since the part number varies depending on the treatment of the hexagon socket head set screw ㉓.
(A) Black zinc chromated ⟶ MY□□-16B-Stroke (B) Nickel plated ⟶ MY□□-16BW-Stroke

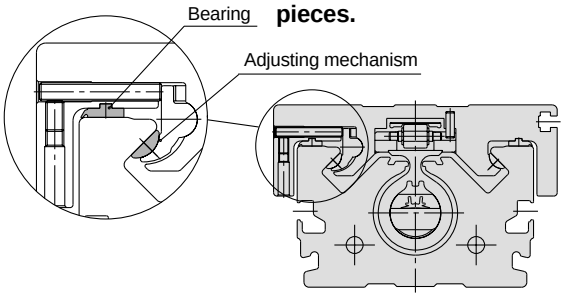
Series MY1M

Slide Bearing Type

ø16, ø20, ø25, ø32, ø40, ø50, ø63



Simple guide type allows direct mounting of work pieces.

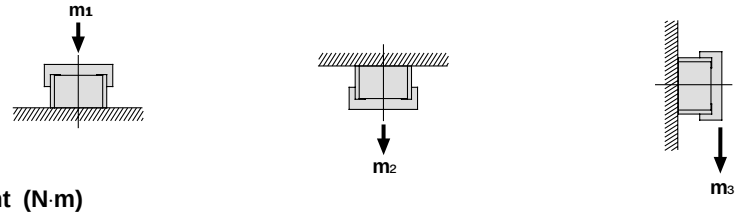


Maximum Allowable Moment/Maximum Allowable Load

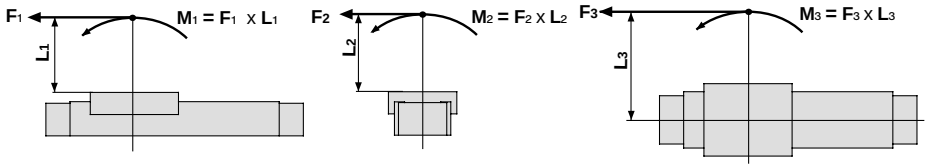
Model	Bore size (mm)	Max. allowable moment (N·m)			Max. allowable load (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1M	**16**	6.0	3.0	1.0	18	7	2.1
	20	10	5.2	1.7	26	10.4	3
	25	15	9.0	2.4	38	15	4.5
	32	30	15	5.0	57	23	6.6
	40	59	24	8.0	84	33	10
	50	115	38	15	120	48	14
	63	140	60	19	180	72	21

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.

Load (kg)



Moment (N·m)



<Calculation of guide load factor>

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

∗ To evaluate, use υa (average speed) for (1) and (2), and υ (impact speed $\upsilon = 1.4\upsilon a$) for (3).

Calculate m max for (1) from the maximum allowable load graph (m_1, m_2, m_3) and Mmax for (2) and (3) from the maximum allowable moment graph (M_1, M_2, M_3).

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

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

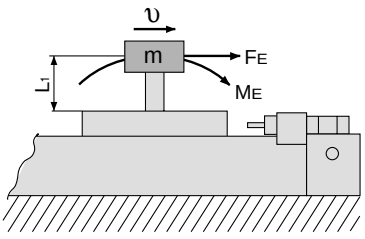
2. Reference formulae [Dynamic moment at impact]

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

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

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

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



Note 4) $\frac{1.4}{100}\upsilon a$ is a dimensionless coefficient for calculating impact force.

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

3. Refer to pages 26 and 27 for detailed selection procedures.

Maximum allowable moment

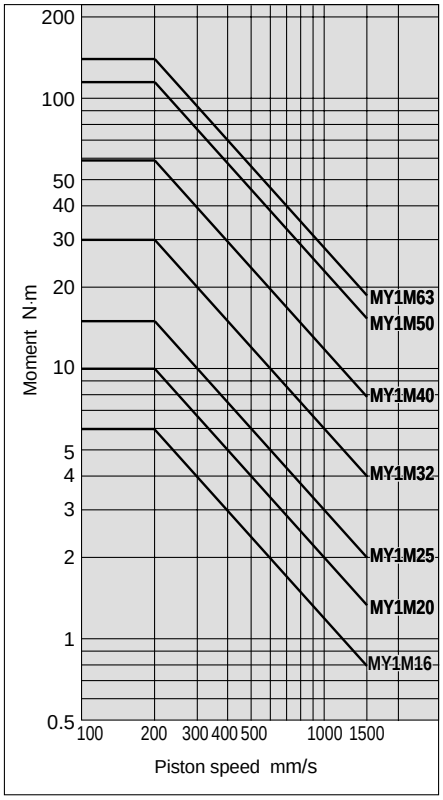
Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

Note:
1 N·m = 0.7375 ft·lb
1 kg = 2.2046 lb
1 in = 25.4 mm

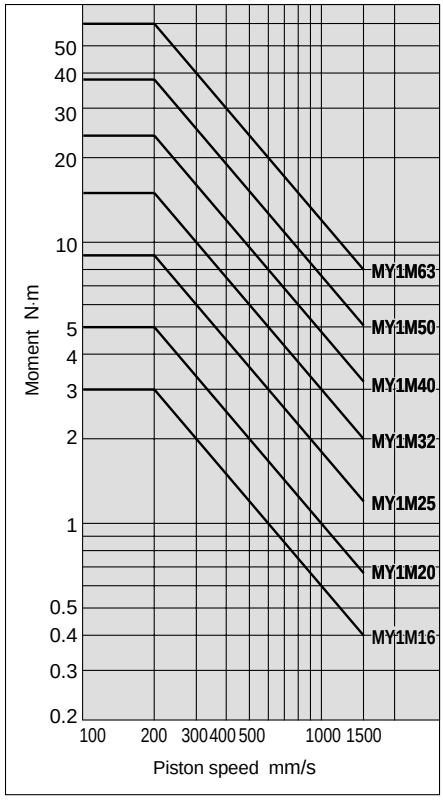
Maximum allowable load

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.

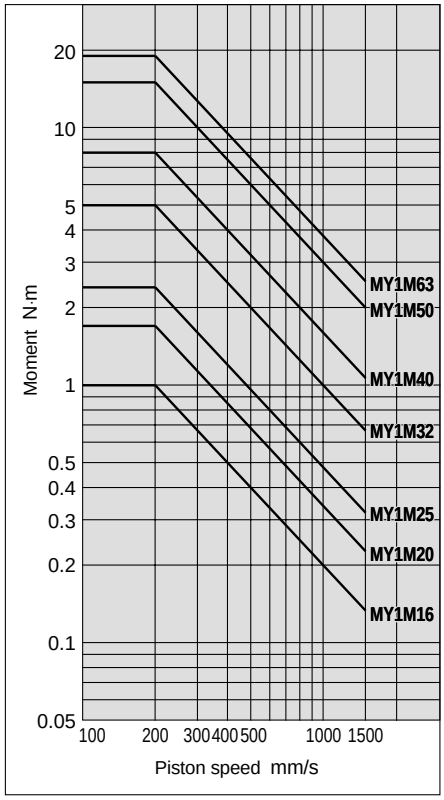
MY1M/M1



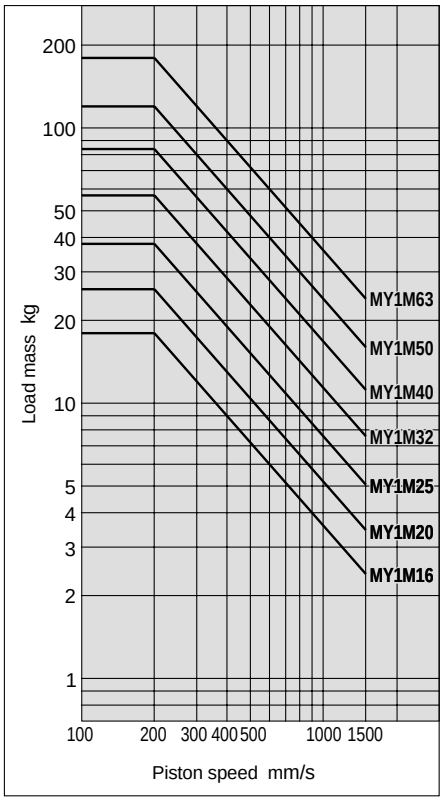
MY1M/M2



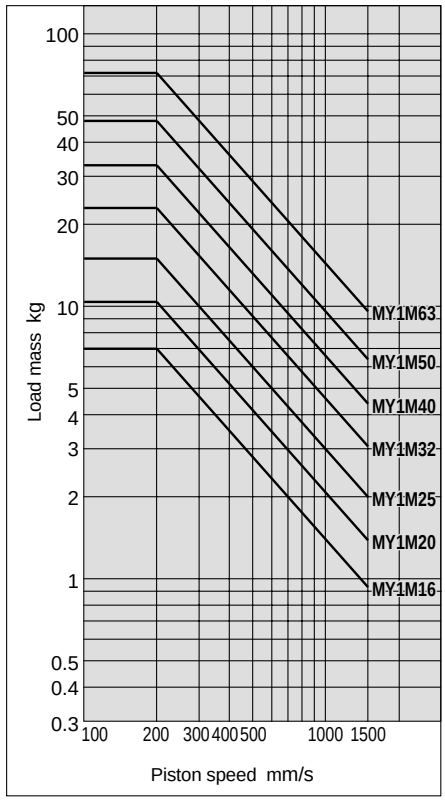
MY1M/M3



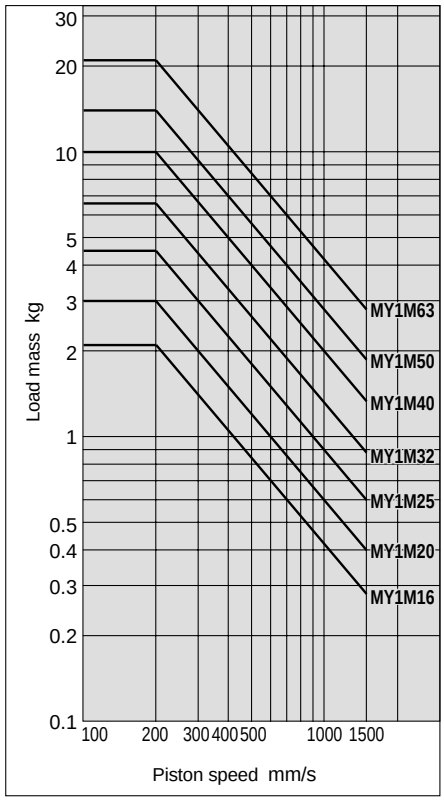
MY1M/m1



MY1M/m2



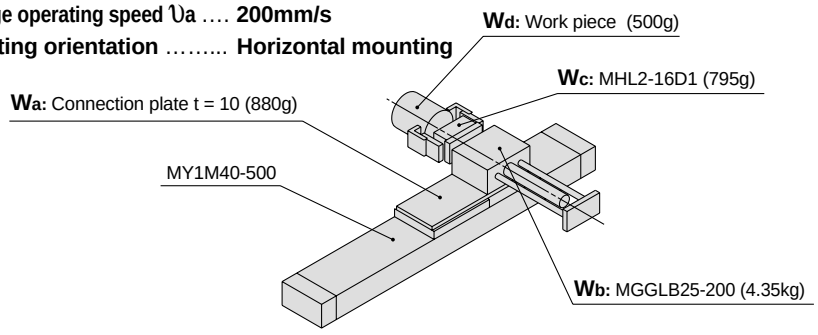
MY1M/m3



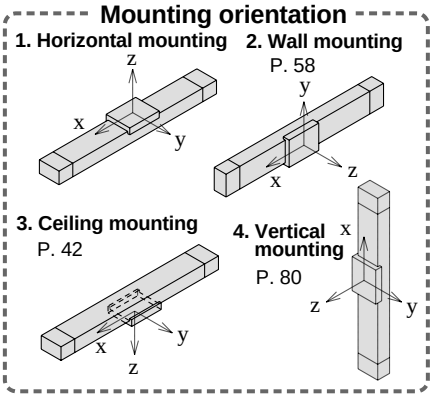
Calculation of Guide Load Factor

1 Operating conditions

Cylinder …… **MY1M40-500**
Average operating speed υ**a** …. **200mm/s**
Mounting orientation ……... **Horizontal mounting**

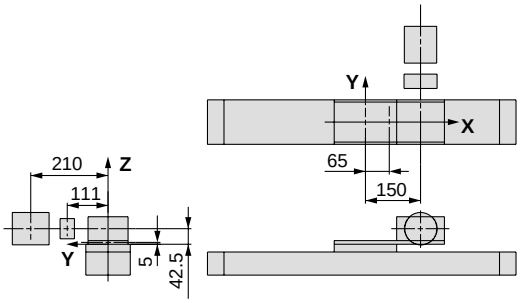


Mounting orientation



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

2 Load blocking



Mass and center of gravity for each work piece

Work piece no.	Mass m	Center of gravity		
		X-axis Xn	Y-axis Yn	Z-axis Zn
Wa	0.88kg	65mm	0mm	5mm
Wb	4.35kg	150mm	0mm	42.5mm
Wc	0.795kg	150mm	111mm	42.5mm
Wd	0.5kg	150mm	210mm	42.5mm

n = a, b, c, d

3 Composite center of gravity calculation

$\mathbf{m_1} = \Sigma m_n$
$= 0.88 + 4.35 + 0.795 + 0.5 =$ **6.525kg**

$\mathbf{X} = \frac{1}{m_1} \times \Sigma (m_n \times X_n)$
$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) =$ **138.5mm**

$\mathbf{Y} = \frac{1}{m_1} \times \Sigma (m_n \times y_n)$
$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) =$ **29.6mm**

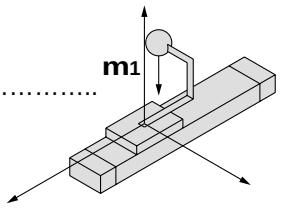
$\mathbf{Z} = \frac{1}{m_1} \times \Sigma (m_n \times z_n)$
$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) =$ **37.4mm**

4 Calculation of load factor for static load

m_1: Mass

m_1 max (from 1 of graph MY1M/m_1) = 84 (kg) ……

Load factor $\alpha_1 = m_1/m_1$ max = 6.525/84 = **0.08**

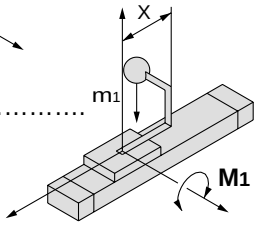


M_1: Moment

M_1 max (from 2 of graph MY1M/M_1) = 59 (N·m) ……

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

Load factor $\alpha 2 = M_1/M_1$ max = 8.86/59 = **0.15**

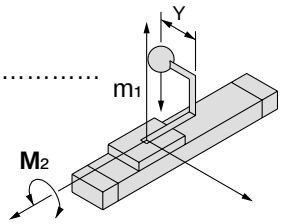


M_2: Moment

M_2 max (from 3 of graph MY1M/M_2) = 24 (N·m) ……

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

Load factor $\alpha_3 = M_2/M_2$ max = 1.89/24 = **0.08**



5 Calculation of load factor for dynamic moment

Equivalent load F_E at impact

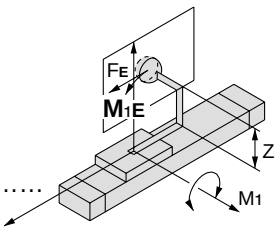
$$F_E = \frac{1.4}{100} \times \upsilon a \times g \times m = \frac{1.4}{100} \times 200 \times 9.8 \times 6.525 = 179.1 \text{ (N)}$$

M_{1E}: Moment

M_{1E} max (from 4 of graph MY1M/M_1 where $1.4\upsilon a$ = 280mm/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 $\alpha_4 = M_{1E}/M_{1E}$ max = 2.23/42.1 = **0.05**

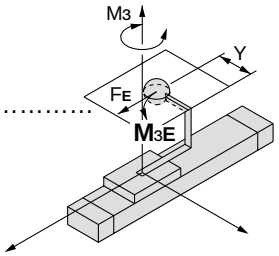


M_{3E}: Moment

M_{3E} max (from 5 of graph MY1M/M_3 where $1.4\upsilon a$ = 280mm/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 $\alpha_5 = M_{3E}/M_{3E}$ max = 1.77/5.7 = **0.31**



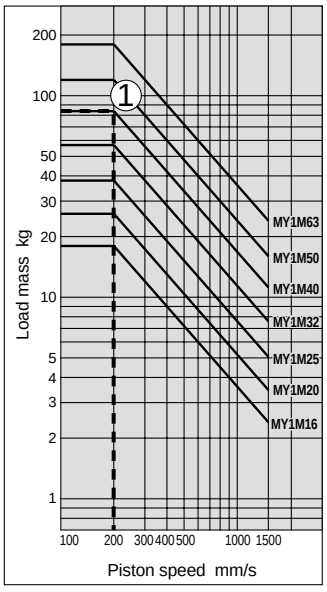
6 Sum and examination of guide load factors

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

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

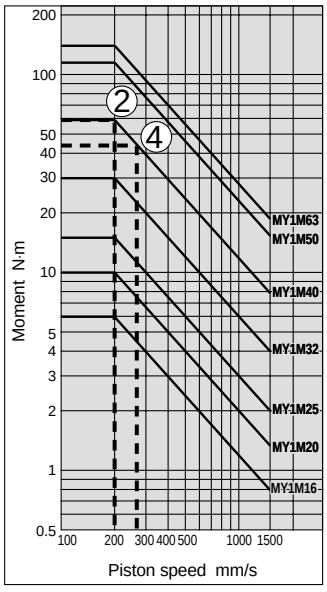
Load mass

MY1M/m_1

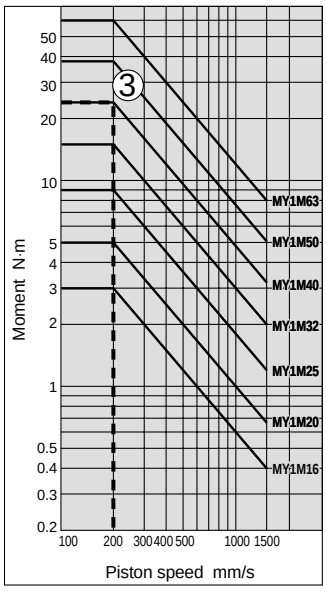


Allowable moment

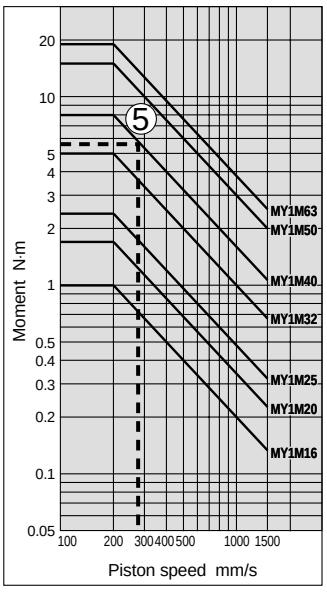
MY1M/M_1



MY1M/M_2



MY1M/M_3



How to Order

Slide Bearing Guide Type **MY1M** **25** □ — **300** □ □ — **Z73** □

Slider bearing guide type

Bore size

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

Piping

Nil	Standard type
G	Centralized piping type

Stroke

Refer to the standard stroke table on page 29.

Stroke adjusting unit Note)

Nil	Both ends
S	One end

Note) "S" is applicable for stroke adjusting units A, L and H.

Auto switch type

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Stroke adjusting unit

Nil	Without adjusting unit
A	With adjusting bolt
L	With low load shock absorber + adjusting bolt
H	With high load shock absorber + adjusting bolt
AL	With one A unit and one L unit each
AH	With one A unit and one H unit each
LH	With one L unit and one H unit each

Shock absorbers for L and H units

Bore size (mm) / Unit no.	16	20	25	32	40	50	63
L unit	RB0806		RB1007	RB1412		RB2015	
H unit	—	RB1007	RB1412	RB2015		RB2725	

Note) MY1M16 is not available with H unit.

Options

Stroke adjusting unit numbers

Bore size (mm) / Unit no.	16	20	25	32
A unit	MYM-A16A	MYM-A20A	MYM-A25A	MYM-A32A
L unit	MYM-A16L	MYM-A20L	MYM-A25L	MYM-A32L
H unit	—	MYM-A20H	MYM-A25H	MYM-A32H

Bore size (mm) / Unit no.	40	50	63
A unit	MYM-A40A	MYM-A50A	MYM-A63A
L unit	MYM-A40L	MYM-A50L	MYM-A63L
H unit	MYM-A40H	MYM-A50H	MYM-A63H

Side support numbers

Bore size (mm) / Type	16	20	25	32
Side support A	MY-S16A	MY-S20A	MY-S25A	MY-S32A
Side support B	MY-S16B	MY-S20B	MY-S25B	MY-S32B

Bore size (mm) / Type	40	50	63
Side support A	MY-S40A		MY-S63A
Side support B	MY-S40B		MY-S63B

Refer to page 36 for detailed information on dimensions, etc.

Applicable auto switches/ Refer to pages 96 through 108 for detailed auto switch specifications.

For **ø16, ø20**

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

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

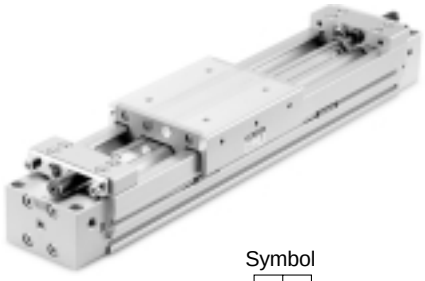
∗∗ Solid state switches marked with a "○" symbol are produced upon receipt of order.

For **ø25, ø32, ø40, ø50, ø63**

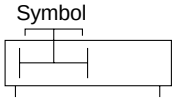
Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch models: Electrical entry direction: Perpendicular	Auto switch models: Electrical entry direction: In-line	Lead wire length (m)∗: 0.5 (Nil)	Lead wire length (m)∗: 3 (L)	Lead wire length (m)∗: 5 (Z)	Applicable load	
Reed switch	—	Grommet	Yes	3 wire (NPN equiv.)	—	5V	—	—	**Z76**	●	●	—	IC circuit	—
				2 wire	24V	12V	100V	—	**Z73**	●	●	●	—	Relay, PLC
			No			5V 12V	100V or less	—	**Z80**	●	●	—	IC circuit	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay, PLC
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○		
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—	
	Diagnostic indication (2 color indicator)			3 wire (NPN)		5V 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit	
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○		
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—	

∗ Lead wire length symbols: 0.5m …….. Nil (Example) Y59A
3m……..... L Y59AL
5m…….. Z Y59AZ

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



Symbol



Specifications

Bore size (mm)		16	20	25	32	40	50	63
Fluid		Air						
Action		Double acting						
Operating pressure range		0.15 to 0.8MPa (22 to 116 psi)						
Proof pressure		1.2MPa (174 psi)						
Ambient and fluid temperature		5 to 60°C (41 to 140°F)						
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 $^{+2.8}_{0}$				
Port size	**Front/Side ports**	M5 x 0.8 (10-32 nominal)		Rc 1/8		Rc 1/4	Rc 3/8	
	Bottom ports (centralized piping type only)	ø4		ø5	ø6	ø8	ø10	ø11

Stroke adjusting unit specifications

Bore size (mm)	16		20			25			32			40			50			63		
Unit symbol	A	L	A	L	H	A	L	H	A	L	H	A	L	H	A	L	H	A	L	H
Configuration and shock absorber	With adjusting bolt	With RB 0806 + adjusting bolt	With adjusting bolt	With RB 0806 + adjusting bolt	With RB 1007 + adjusting bolt	With adjusting bolt	With RB 1007 + adjusting bolt	With RB 1412 + adjusting bolt	With adjusting bolt	With RB 1412 + adjusting bolt	With RB 2015 + adjusting bolt	With adjusting bolt	With RB 1412 + adjusting bolt	With RB 2015 + adjusting bolt	With adjusting bolt	With RB 2015 + adjusting bolt	With RB 2725 + adjusting bolt	With adjusting bolt	With RB 2015 + adjusting bolt	With RB 2725 + adjusting bolt
Stroke fine adjusting range (mm)	0 to –5.6		0 to –6			0 to –11.5			0 to –12			0 to –16			0 to –20			0 to –25		
Stroke adjusting range	When exceeding the stroke fine adjusting range: Use order made specifications "-X416" and "-X417". (Refer to page110 for details.)																			

Shock absorber specifications

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

Piston speed

Bore size (mm)		16 to 63
Without stroke adjusting unit		100 to 1000mm/s
Stroke adjusting unit	A unit	100 to 1000mm/s Note 1)
	L unit and H unit	100 to 1500mm/s Note 2)

Note 1) Be aware that when the stroke adjusting range is increased by manipulating the adjusting bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 30, the **piston speed** should be **100 to 200mm per second.**

Note 2) For centralized piping, the piston speed is 100 to 1000mm per second.

Note 3) Use at a speed within the absorption capacity range. Refer to page 30.

Theoretical output

Unit: N

Bore size (mm)	Piston area (mm²)	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

Standard strokes

Bore size (mm)	Standard stroke (mm)*	Max. manufacturable stroke (mm)
16	100, 200, 300, 400, 500, 600, 700 800, 900, 1000, 1200, 1400, 1600 1800, 2000	3000
20, 25, 32, 40 50, 63		5000

* Strokes are manufacturable in 1mm increments, up to the maximum stroke. However, when exceeding a 2000mm stroke, specify "-XB11" at the end of the model number. Refer to the order made specifications on page 109.

Made To Order

Refer to page 109 regarding order made specifications for series MY1M.

Note: 1N = 0.2248 lb
1MPa = 145 psi
1mm² = 0.0016in²

Weights

Unit: kg (lb)

Bore size (mm)	Basic weight	Additional weight per 50mm of stroke	Side support weight (per set)	Stroke adjusting unit weight (per unit)		
			Type A and B	A unit	L unit	H unit
16	0.67 (1.48)	0.12 (0.26)	0.01 (0.02)	0.03 (0.07)	0.04 (0.09)	—
20	1.11 (2.45)	0.16 (0.35)	0.02 (0.04)	0.04 (0.09)	0.05 (0.11)	0.08 (0.18)
25	1.64 (3.62)	0.24 (0.53)	0.02 (0.04)	0.07 (0.15)	0.11 (0.24)	0.18 (0.40)
32	3.27 (7.21)	0.38 (0.84)	0.04 (0.09)	0.14 (0.31)	0.23 (0.51)	0.39 (0.86)
40	5.88 (12.96)	0.56 (1.23)	0.08 (0.18)	0.25 (0.55)	0.34 (0.75)	0.48 (1.06)
50	10.06 (22.2)	0.77 (1.70)	0.08 (0.18)	0.36 (0.79)	0.51 (1.12)	0.81 (1.78)
63	16.57 (36.5)	1.11 (2.45)	0.17 (0.37)	0.68 (1.50)	0.83 (1.83)	1.08 (2.38)

Calculation method Example: **MY1M25-300A**

Basic weight 1.64kg
Additional weight ..... 0.24/50mm stroke
Weight of A unit 0.07kg

Cylinder stroke 300mm
1.64 + 0.24 x 300 ÷ 50 + 0.07 x 2 = Approx. 3.22kg

Cushion Capacity

Cushion selection

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

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

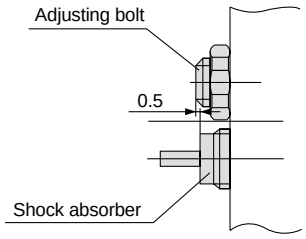
L unit
Use this unit when the cylinder stroke is outside of the effective air cushion range even if the load and speed are within the air cushion limit line, or when the cylinder is operated in a load and speed range above the air cushion limit line and below the L unit limit line.

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 diagram below when using the adjusting 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 0.5mm from the shock absorber.



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

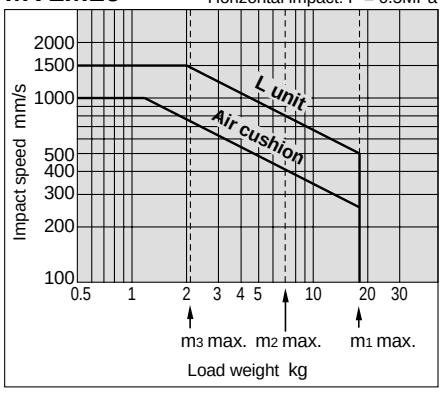
Air cushion stroke

Unit: mm

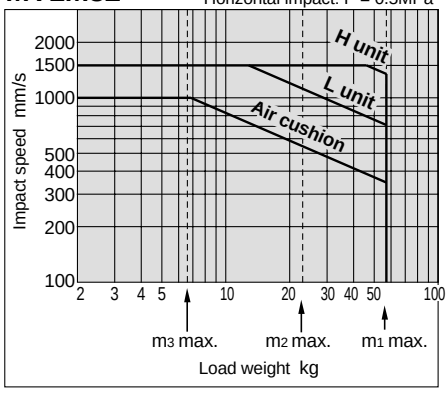
Bore size (mm)	Cushion stroke
16	12
20	15
25	15
32	19
40	24
50	30
63	37

Absorption capacity of air cushion and stroke adjusting units

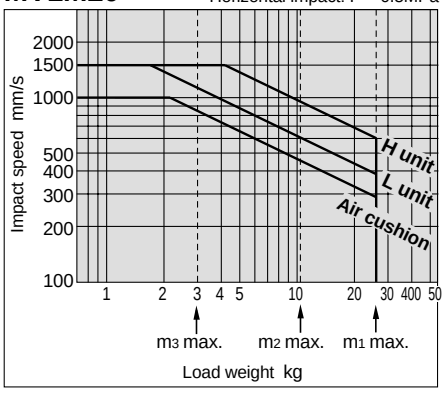
MY1M16 Horizontal impact: P = 0.5MPa



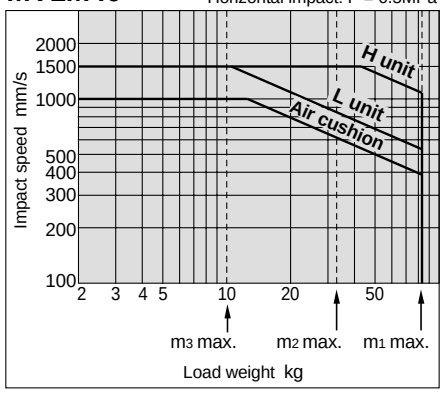
MY1M32 Horizontal impact: P = 0.5MPa



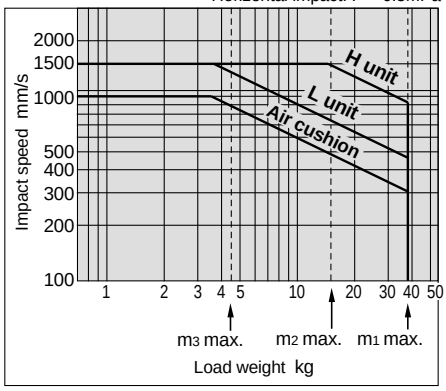
MY1M20 Horizontal impact: P = 0.5MPa



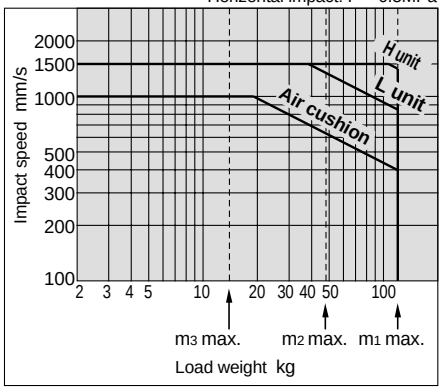
MY1M40 Horizontal impact: P = 0.5MPa



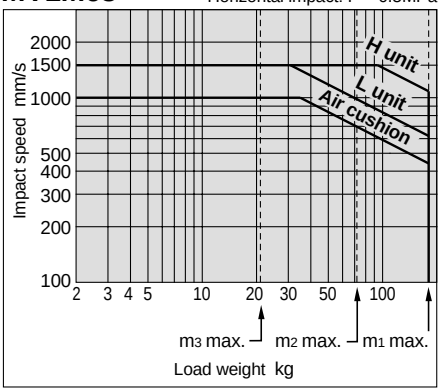
MY1M25 Horizontal impact: P = 0.5MPa



MY1M50 Horizontal impact: P = 0.5MPa



MY1M63 Horizontal impact: P = 0.5MPa



Note:
1 MPa = 145 psi
1 kg = 2.2046 lb
1 N·m = 0.7375 ft·lb

Stroke adjusting unit holding bolt tightening torque

Unit: N·m

Bore size (mm)	Unit	Tightening torque
16	A	0.6
	L	
20	A	1.5
	L	
	H	
25	A	3.0
	L	
	H	5.0
32	A	5.0
	L	
	H	12
40	A	12
	L	
	H	
50	A	12
	L	
	H	
63	A	24
	L	
	H	

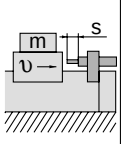
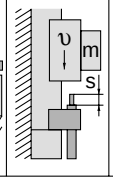
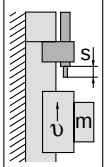
Stroke adjusting unit lock plate holding bolt tightening torque

Unit: 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 absobed energy for stroke adjusting unit with shock absorber

Unit N·m

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

Symbols

υ: Speed of impacting object (m/s)
m: Weight of impacting object (kg)
F: Cylinder thrust (N)
g: Gravitational acceleration (9.8m/s²)
s: Shock absorber stroke (m)

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

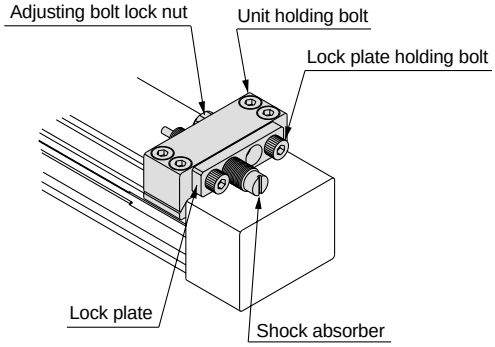
⚠ Specific product precautions

Be sure to read before handling. Refer to pages 112 through 119 for safety instructions and common precautions.

⚠ Caution

Be careful not to get hands caught in the unit.

- When using a product with stroke adjusting unit, the space between the slide table (slider) and the stroke adjusting unit becomes narrow, 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 fastened by uniformly tightening the four unit holding bolts.

⚠ Caution

Do not operate with the stroke adjusting 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 this case, we recommend using the adjusting bolt mounting brackets available with order made specifications – X 416 and – X 417. For other lengths, consult SMC. (Refer to "Stroke adjustment unit holding bolt tightening torque".)

<Stroke adjustment with adjusting bolt>

Loosen the adjusting bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Re-tighten 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 ø10 and ø20 L unit.) (Refer to "Stroke adjusting unit lock plate holding bolt tightening torque".)

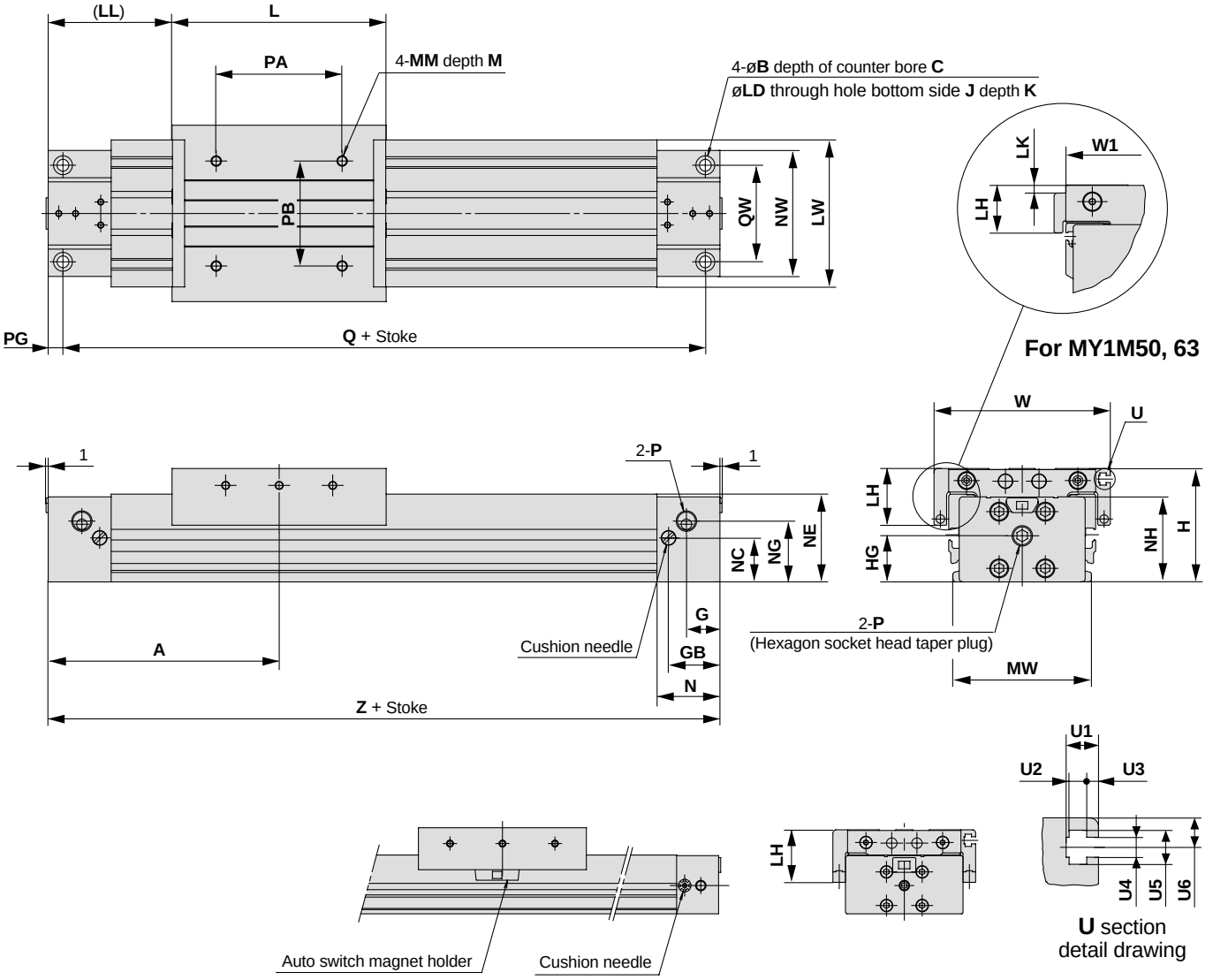
Note)

Slight bending may occur in the lock plate due to tightening of the lock plate holding bolts. This is not a problem for the shock absorber and locking function.

Standard Type / Dimensions (mm) ø16 to ø63

1 in = 25.4 mm

MY1M **Bore size** — **Stroke**



For MY1M16, 20

Model	A	B	C	G	GB	H	HG	J	K	L	LD	LH	(LL)	LW	M	MM	MW	N
MY1M16	80	6	3.5	8.5	16.2	40	13.5	M5 x 0.8	10	80	3.6	22.5	40	54	6	M4 x 0.7	—	20
MY1M20	100	7.5	4.5	10.5	20	46	17	M6 x 1	12	100	4.8	23	50	58	7.5	M5 x 0.8	—	25
MY1M25	110	9	5.5	16	24.5	54	22	M6 x 1	9.5	102	5.6	27	59	70	10	M5 x 0.8	66	30
MY1M32	140	11	6.5	19	30	68	27	M8 x 1.25	16	132	6.8	35	74	88	13	M6 x 1	80	37
MY1M40	170	14	8.5	23	36.5	84	34.5	M10 x 1.5	15	162	8.6	38	89	104	13	M6 x 1	96	45
MY1M50	200	17	10.5	25	37.5	107	45	M14 x 2	28	200	11	29	100	128	15	M8 x 1.25	—	47
MY1M63	230	19	12.5	27.5	39.5	130	59	M16 x 2	32	230	13.5	32.5	115	152	16	M10 x 1.5	—	50

Model	NC	NE	NG	NH	NW	P	PA	PB	PG	Q	QW	W	W1	LK	Z
MY1M16	13.5	28	13.5	27.7	56	M5 x 0.8	40	40	3.5	153	48	68	—	—	160
MY1M20	17	34	17	33.7	60	M5 x 0.8	50	40	4.5	191	45	72	—	—	200
MY1M25	21	41.8	29	40.5	60	Rc 1/8	60	50	7	206	46	84	—	—	220
MY1M32	26	52.3	34	50	74	Rc 1/8	80	60	8	264	60	102	—	—	280
MY1M40	32	65.3	42.5	63.5	94	Rc 1/4	100	80	9	322	72	118	—	—	340
MY1M50	43.5	84.5	54	83.5	118	Rc 3/8	120	90	10	380	90	144	128	2	400
MY1M63	56	104	68	105	142	Rc 3/8	140	110	12	436	110	168	152	5.5	460

"P" indicates cylinder supply ports. ∗ The plug for MY1M16/20-P is a hexagon socket head plug.

U section detail dimensions

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
MY1M25	5.5	3	2	3.4	5.8	5
MY1M32	5.5	3	2	3.4	5.8	7
MY1M40	6.5	3.8	2	4.5	7.3	8
MY1M50	6.5	3.8	2	4.5	7.3	8
MY1M63	8.5	5	2.5	5.5	8.4	8

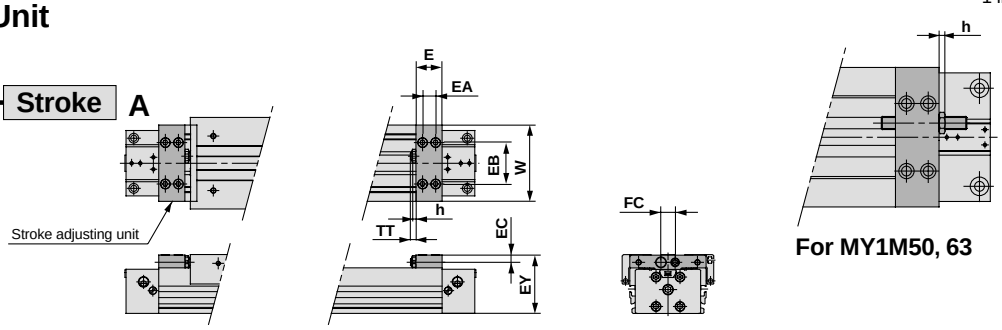
CAD

Dimensions (mm)

1 in = 25.4 mm

Stroke Adjusting Unit
With adjusting bolt

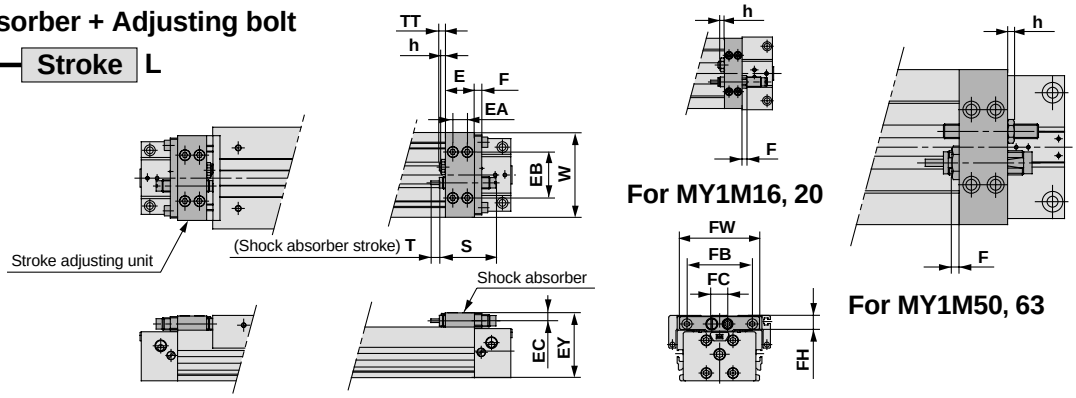
MY1M Bore size — Stroke **A**



Model	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

Low load shock absorber + Adjusting bolt

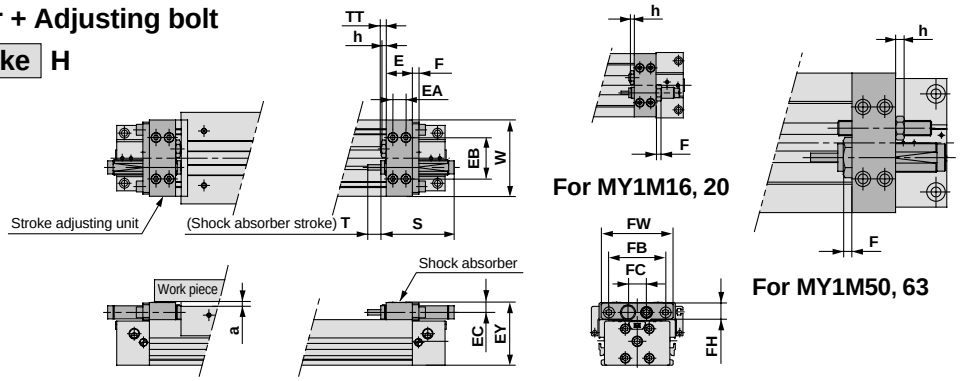
MY1M Bore size — Stroke **L**



Model	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

High load shock absorber + Adjusting 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 work piece that exceeds the overall length (dimension L) of the slide table, allow a clearance of dimension "a" or larger on the work piece side.

Model	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

CAD

- Stroke adjusting unit
  With adjusting bolt
  MY1M16 — SMY1M16, #3 (#1 + #3 + #7)
  For ø20 to ø63
  MY1M (Bore size) — SMY1M (Bore size)
  #3 (#1 + #3 + #8)

- Low load shock absorber + Adjusting bolt
  MY1M16 — SMY1M16, #4 (#1 + #4 + #7)
  For ø20 to ø63
  MY1M (Bore size) — SMY1M (Bore size), #4 (#1 + #4 + #8)

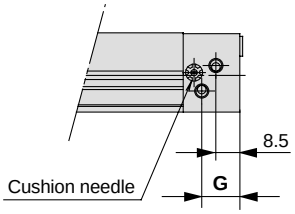
- High load shock absorber + Adjusting bolt
  MY1M (Bore size) — SMY1M (Bore size), #5 (#1 + #5 + #8)

Centralized Piping Type / Dimensions (mm) ø16, ø20

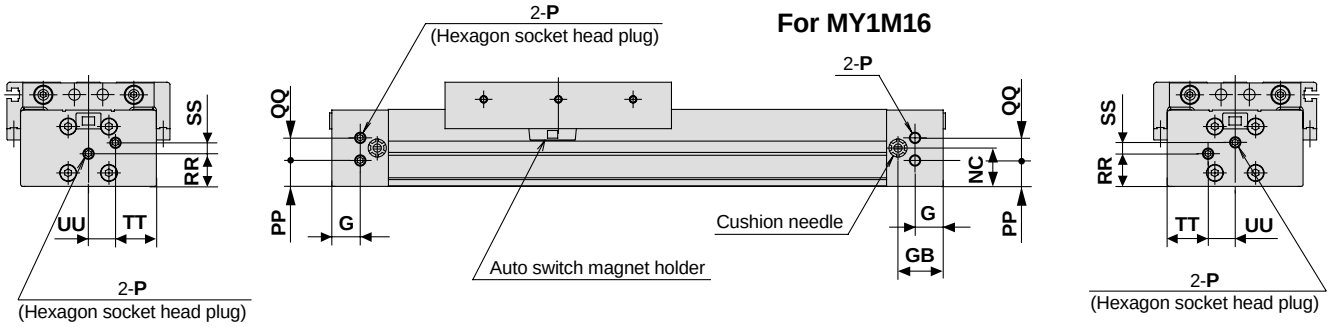
1 in = 25.4 mm

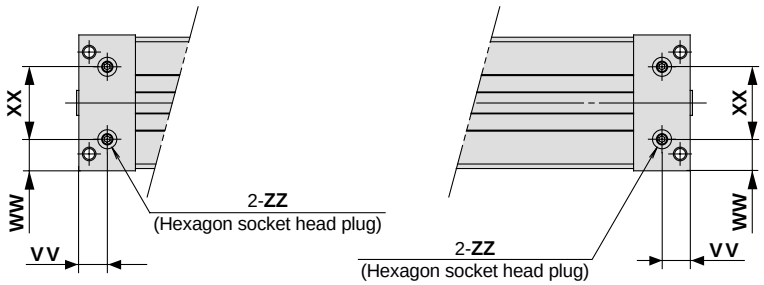
MY1M Bore size G — Stroke

Refer to page 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping and for the stroke adjusting unit are identical to the standard type dimensions.
Refer to pages 32 and 33 for details regarding dimensions etc.



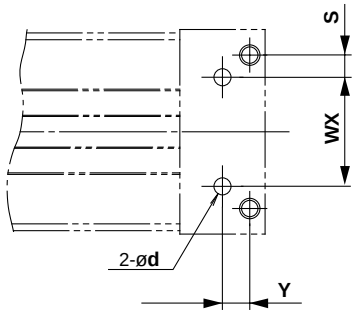
For MY1M16

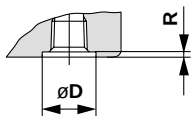




Model	G	GB	NC	P	PP	QQ	RR	SS	TT	UU	VV	WW	XX	ZZ
MY1M16G	13.5	16.2	14	M5 x 0.8	7.5	9	11	2.5	15	14	10	13	30	M5 x 0.8
MY1M20G	12.5	20	17	M5 x 0.8	11.5	10	14.5	5	18	12	12.5	14	32	M5 x 0.8

"P" indicates cylinder supply ports.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom

(Machine the mounting side to the dimensions below.)

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1M16G	30	6.5	9	4	8.4	1.1	C6
MY1M20G	32	8	6.5	4	8.4	1.1	

CAD MY1M16G —— SMY1M16, #2 (#2 + #7)
CAD MY1M20G —— SMY1M20, #2 (#2 + #8)

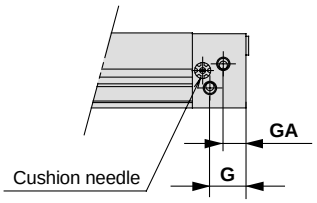
Centralized Piping Type / Dimensions (mm) ø25 to ø63

CAD

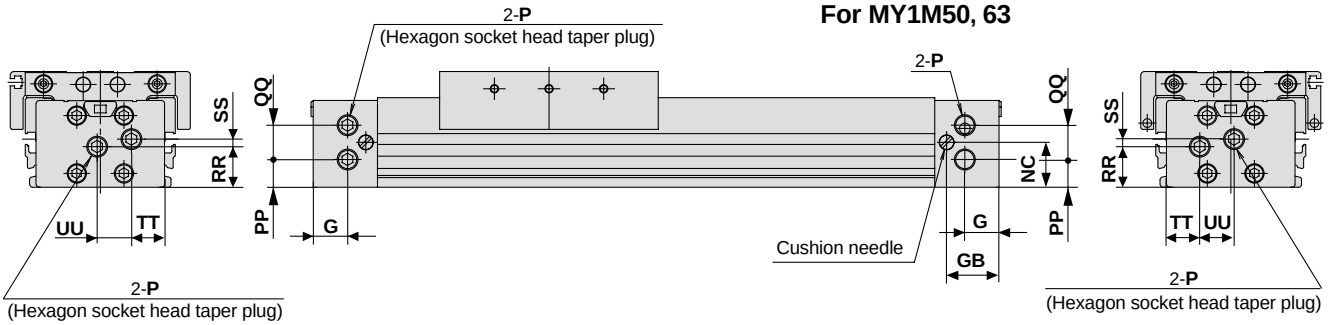
MY1M Bore size **G** — Stroke

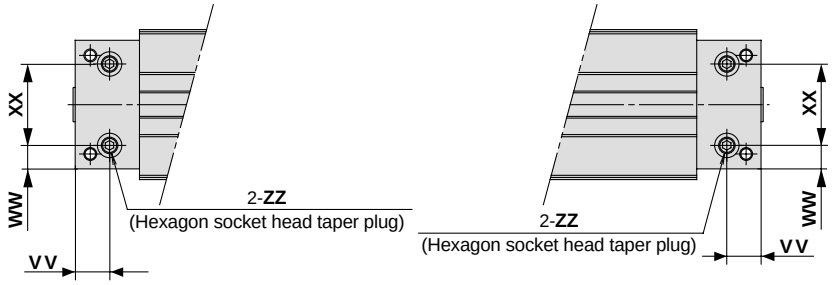
1 in = 25.4 mm

Refer to page 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping and for the stroke adjusting unit are identical to the standard type dimensions.
Refer to pages 32 and 33 for details regarding dimensions, etc.



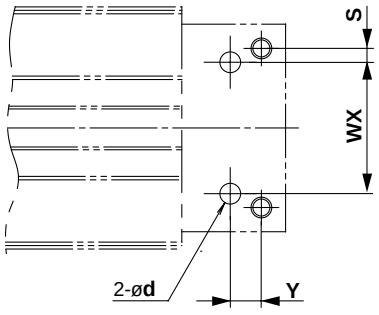
For MY1M50, 63

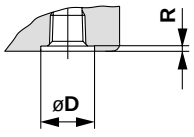




Model	G	GA	GB	NC	P	PP	QQ	RR	SS	TT	UU	VV	WW	XX	ZZ
MY1M25G	16	—	24.5	21	Rc 1/8	13	16	19	3.5	15.5	16	16	11	38	Rc 1/16
MY1M32G	19	—	30	26	Rc 1/8	18	16	24	4	21	16	19	13	48	Rc 1/16
MY1M40G	23	—	36.5	32	Rc 1/4	16.5	26	25.5	10.5	22.5	24.5	23	20	54	Rc 1/8
MY1M50G	27	25	37.5	43.5	Rc 3/8	26	28	35	10	35	24	28	22	74	Rc 1/4
MY1M63G	29.5	27.5	39.5	60	Rc 3/8	42	30	49	13	43	28	30	25	92	Rc 1/4

"P" indicates cylinder supply ports.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom

(Machine the mounting side to the dimensions below.)

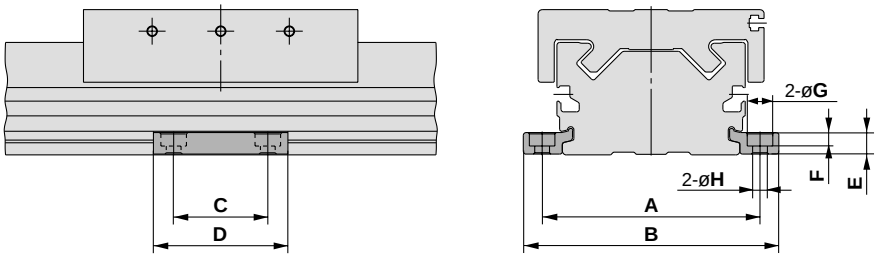
Model	WX	Y	S	d	D	R	Applicable O-ring
MY1M25G	38	9	4	6	11.4	1.1	C9
MY1M32G	48	11	6			1.1	
MY1M40G	54	14	9	8	13.4	1.1	C11.2
MY1M50G	74	18	8	10	17.5	1.1	C15
MY1M63G	92	18	9	10	17.5	1.1	

CAD MY1M Bore size G —— SMY1M Bore size, #2 (#2 + #8)

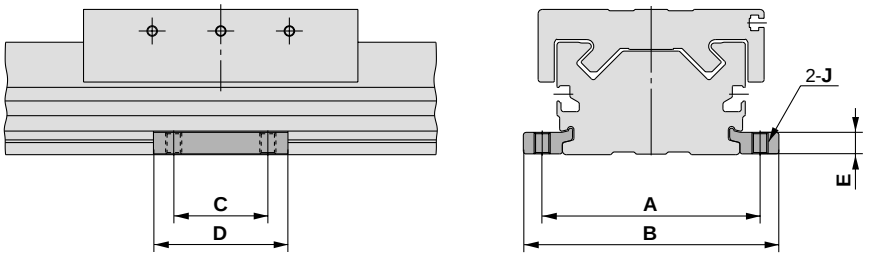
Side Support / Dimensions (mm)

1 in = 25.4 mm

Side support A
MY-S A



Side support B
MY-S B



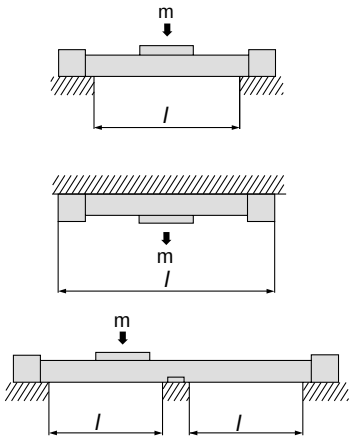
Model	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S16$^{A}_{B}$	MY1M16	61	71.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20$^{A}_{B}$	MY1M20	67	79.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S25$^{A}_{B}$	MY1M25	81	95	35	50	8	5	9.5	5.5	M6 x 1
MY-S32$^{A}_{B}$	MY1M32	100	118	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S40$^{A}_{B}$	MY1M40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

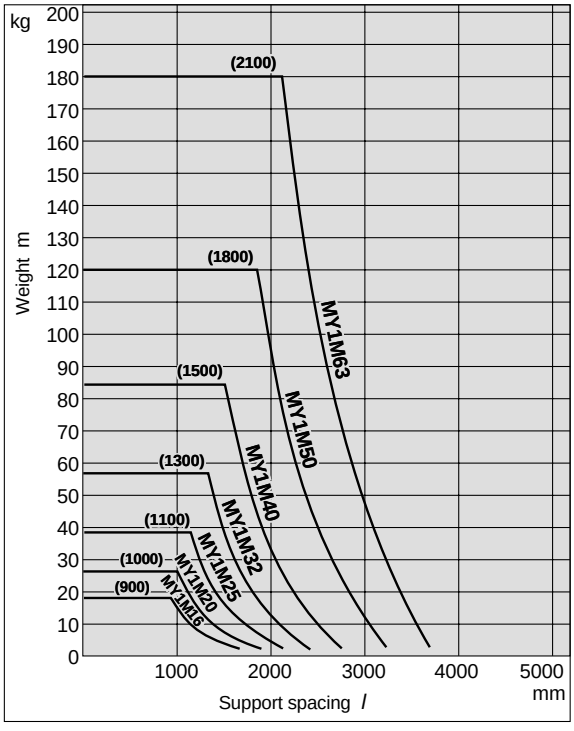
CAD
- Side support A
MY-S16A —— SMY1B16, #5 (#1 + #5 + #7)
For ø20 to ø63
MY-S (Bore size) A —— SMY1M (Bore size), #6 (#1 + #6 + #8)

- Side support B
MY-S16B —— SMY1M16, #6 (#1 + #6 + #7)
For ø20 to ø63
MY-S (Bore size) B —— SMY1M (Bore size) #7 (#1 + #7 + #8)

Guide for Using Side Supports

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.



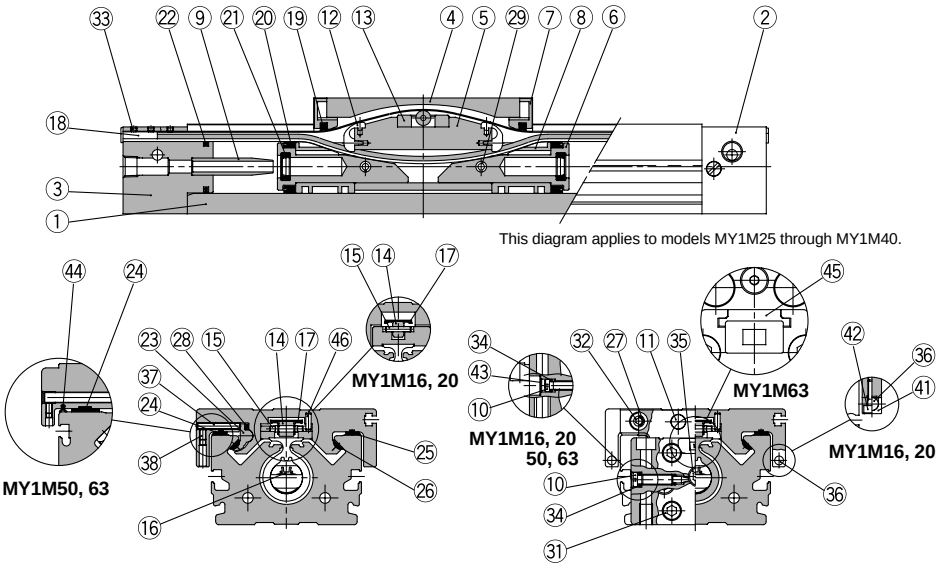


⚠ Caution

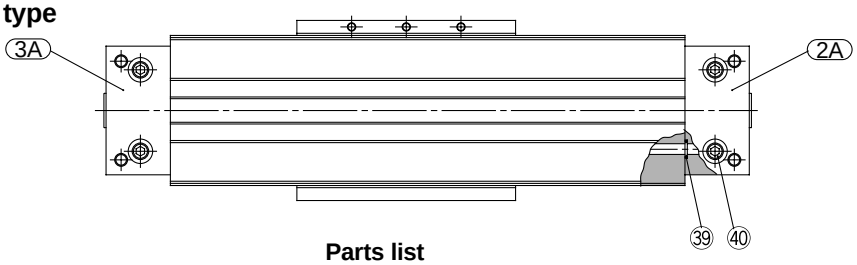
1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value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

Construction

Standard type



Centralized piping type



Parts list

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover R**	Aluminum alloy	Hard anodized
2A	**Head cover WR**	Aluminum alloy	Hard anodized
3	**Head cover L**	Aluminum alloy	Hard anodized
3A	**Head cover WL**	Aluminum alloy	Hard anodized
4	**Slide table**	Aluminum alloy	Hard anodized
5	**Piston yoke**	Aluminum alloy	Chromated
6	**Piston**	Aluminum alloy	Chromated
7	**End cover**	Special resin	
8	**Wear ring**	Special resin	
9	**Cushion ring**	Brass	
10	**Cushion needle**	Rolled steel	Nickel plated
11	**Stopper**	Carbon steel	
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**	Aluminum alloy	Hard anodized
24	**Bearing R**	Special resin	

Parts list

No.	Description	Material	Note
25	**Bearing L**	Special resin	
26	**Bearing S**	Special resin	
27	**Spacer**	Stainless steel	
28	**Backup spring**	Stainless steel	
29	**Spring pin**	Carbon tool steel	Black zinc chromated
31	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
32	**Hexagon socket head button bolt**	Chrome molybdenum steel	Nickel plated
33	**Hexagon socket head set screw**	Chrome molybdenum steel	Black zinc chromated/Nickel plated
35	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
36	**Magnet**	Rare earth magnet	
37	**Hexagon socket head set screw**	Chrome molybdenum steel	Black zinc chromated
38	**Hexagon socket head set screw**	Chrome molybdenum steel	Black zinc chromated
40	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
41	**Magnet holder**	Special resin	(ø16, ø20)
42	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
43	**Type CR retaining ring**	Spring steel	(except ø25 to ø40)
44	**Side scraper**	Special resin	(ø50, ø63)
45	**Head plate**	Aluminum alloy	Hard anodized (ø63)
46	**Parallel pin**	Stainless steel	(except ø16, ø20)

Seal list

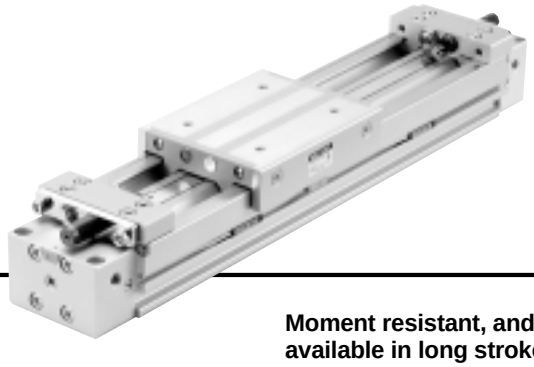
No.	Description	Material	Qty.	MY1M16	MY1M20	MY1M25	MY1M32	MY1M40	MY1M50	MY1M63
16	**Seal belt**	Special resin	1	MY16-16A-Stroke	MY20-16A-Stroke	MY25-16A-Stroke	MY32-16A-Stroke	MY40-16A-Stroke	MY50-16A-Stroke	MY63-16A-Stroke
Note) 17	**Dust seal band**	Stainless steel	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
19	**Scraper**	NBR	2	MYM16-15AK0500	MYM20-15AK0501	MYM25-15AA5903	MYM32-15AA5904	MYM40-15AA5905	MYM50-15AK0502	MYM63-15AK0503
20	**Piston seal**	NBR	2	GMY16	GMY20	GMY25	GMY32	GMY40	GMY50	GMY63
21	**Cushion seal**	NBR	2	MYB16-15-A7163	MYB20-15-A7164	RCS-8	RCS-10	RCS-12	MC-16	MC-20
22	**Tube gasket**	NBR	2	P12	P16	TMY-25	TMY-32	TMY-40	P44	P53
34	**O-ring**	NBR	2	ø4 x ø1.8 x ø1.1	ø5.1 x ø3 x ø1.05	ø7.15 x ø3.75 x ø1.7	ø8.3 x ø4.5 x ø1.9	C-4	C-4	C-4
39	**O-ring**	NBR	4	ø7 x ø4 x ø1.5	ø7 x ø4 x ø1.5	C-6	C-7	C-9	C-11.2	C-14

Note) Two types of dust seal band 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

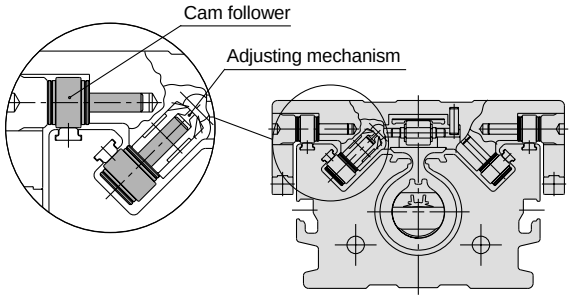
Series MY1C

Cam Follower Guide Type

ø16, ø20, ø25, ø32, ø40, ø50, ø63



Moment resistant, and available in long strokes

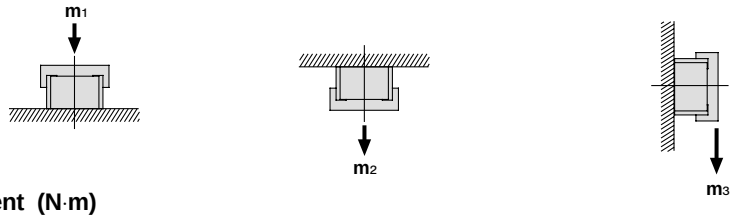


Maximum Allowable Moment/Maximum Allowable Load

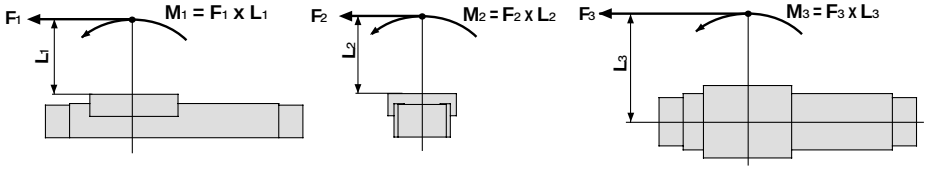
Model	Bore size (mm)	Max. allowable moment (N·m)			Max. allowable load (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1C	16	6.0	3.0	2.0	18	7	2.1
	20	10	5.0	3.0	25	10	3
	25	15	8.5	5.0	35	14	4.2
	32	30	14	10	49	21	6
	40	60	23	20	68	30	8.2
	50	115	35	35	93	42	11.5
	63	150	50	50	130	60	16

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.

Load (kg)



Moment (N·m)



<Calculation of guide load factor>

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

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

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

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

2. Reference formulae [Dynamic moment at impact]

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

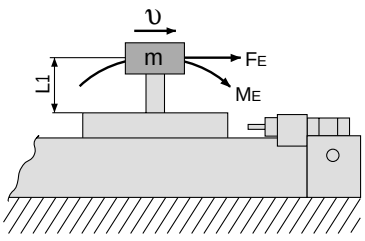
m : Load mass (kg)
F : Load (N)
F_E : Load equivalent to impact (at impact with stopper) (N)
υa: Average speed (mm/s)
M : Static moment (N·m)
υ : Impact speed (mm/s)
L_1 : Distance to the load's center of gravity (m)
M_E : Dynamic moment (N·m)
g : Gravitational acceleration (9.8m/s²)

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

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

Note 4) $\frac{1.4}{100}\upsilon a$ is a dimensionless coefficient for calculating impact force.

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



3. Refer to pages 42 and 43 for detailed selection procedures.

Maximum allowable moment

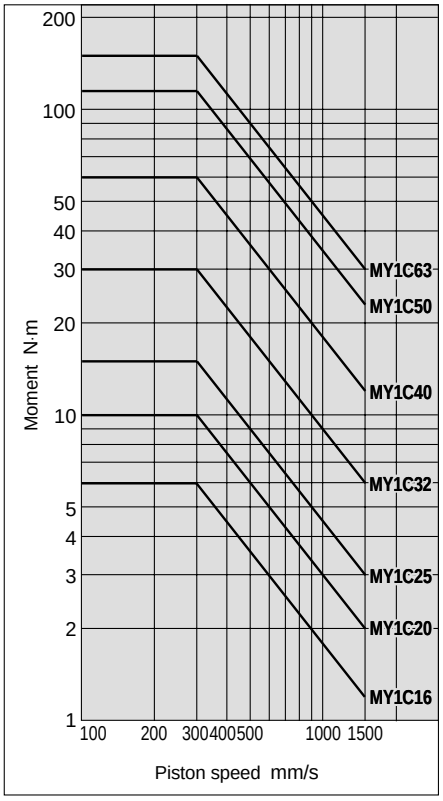
Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

Note:
1 N·m = 0.7375 ft·lb
1 kg = 2.2046 lb
1 in = 25.4 mm

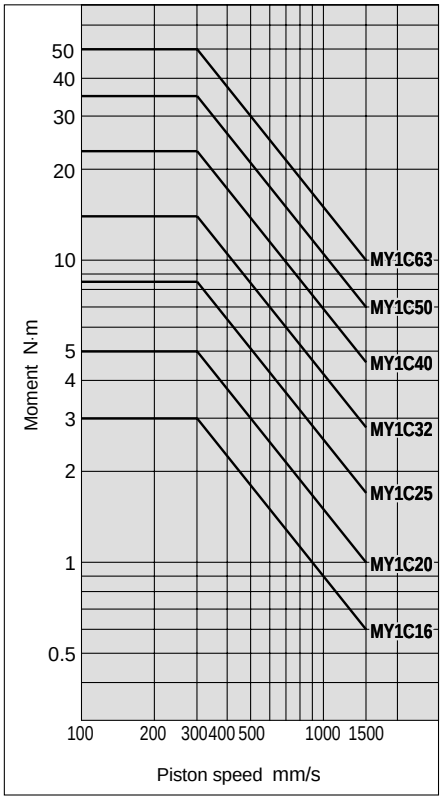
Maximum allowable load

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.

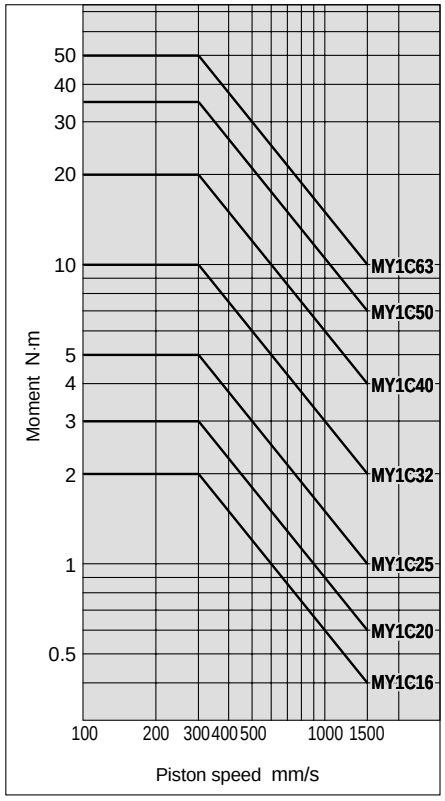
MY1C/M1



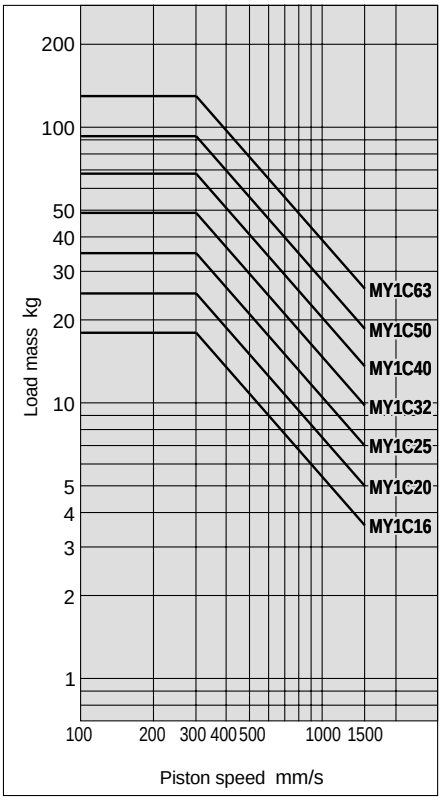
MY1C/M2



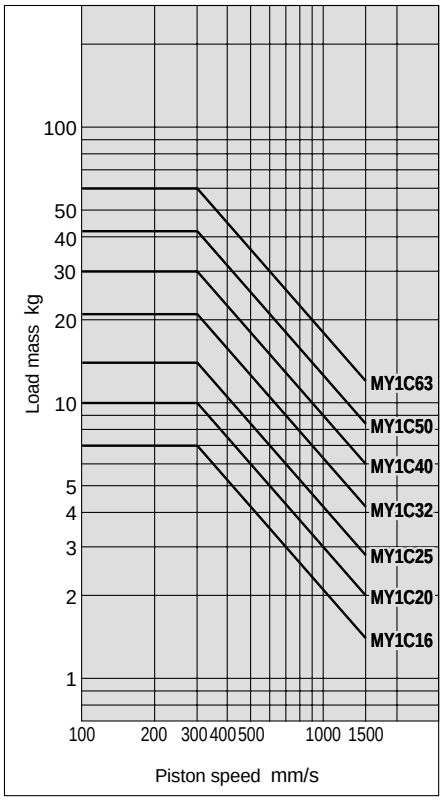
MY1C/M3



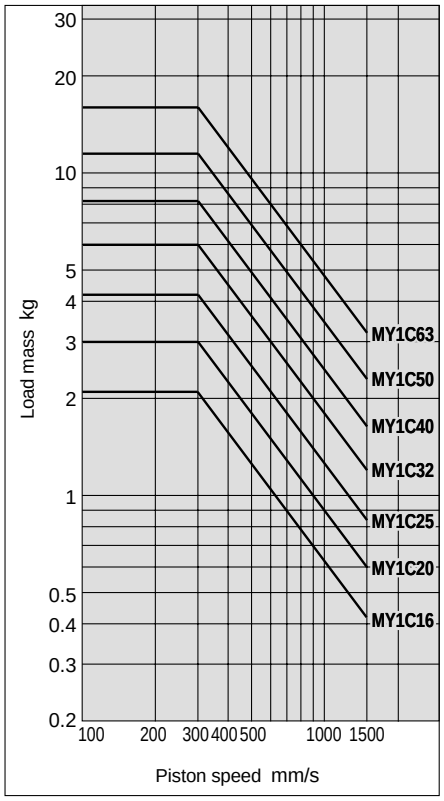
MY1C/m1



MY1C/m2



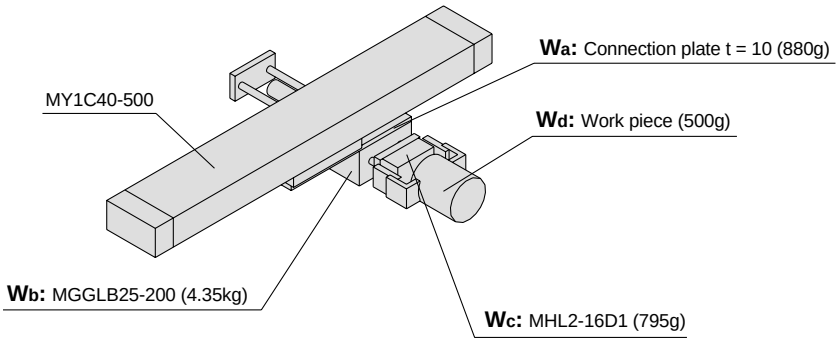
MY1C/m3



Calculation of Guide Load Factor

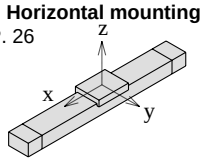
1 Operating conditions

Cylinder …….. **MY1H40-500**
Average operating speed υa … **300mm/s**
Mounting orientation …..…… **Ceiling mounting**

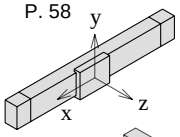


Mounting orientation

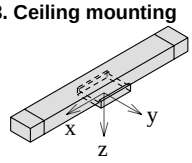
1. Horizontal mounting P. 26



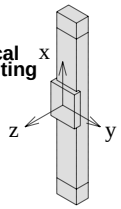
2. Wall mounting P. 58



3. Ceiling mounting

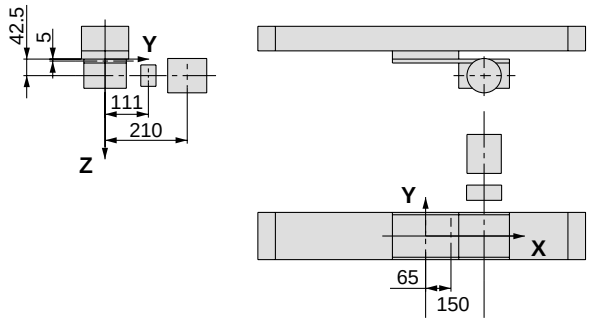


4. Vertical mounting P. 80



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

2 Load blocking



Mass and center of gravity for each work piece

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

n = a, b, c, d

3 Composite center of gravity calculation

$m_2 = \Sigma m_n$
$= 0.88 + 4.35 + 0.795 + 0.5 =$ **6.525kg**

$X = \frac{1}{m_2} \times \Sigma (m_n \times x_n)$
$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) =$ **138.5mm**

$Y = \frac{1}{m_2} \times \Sigma (m_n \times y_n)$
$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) =$ **29.6mm**

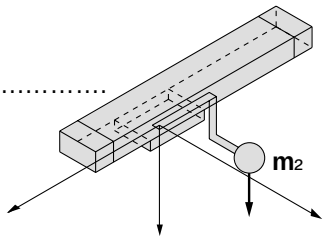
$Z = \frac{1}{m_2} \times \Sigma (m_n \times z_n)$
$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) =$ **37.4mm**

4 Calculation of load factor for static load

m_2: Mass

m_2 max (from 1 of graph MY1C/m_2) = 30 (kg) ……

Load factor $\alpha_1 = m_2 / m_2$ max = 6.525/30 = **0.22**

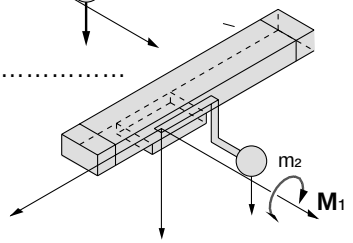


M_1: Moment

M_1 max (from 2 of graph MY1C/M_1) = 60 (N·m) ……

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

Load factor $\alpha_2 = M_1 / M_1$ max = 8.86/60 = **0.15**

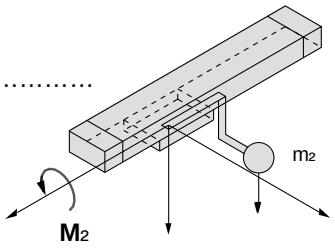


M_2: Moment

M_2 max (from 3 of graph MY1C/M_2) = 23.0 (N·m) ……

$M_2 = m_2 \times g \times X = 6.525 \times 9.8 \times 29.6 \times 10^{-3} = 1.89$ (N·m)

Load factor $\alpha_3 = M_2/M_2$ max = 1.89/23.0 = **0.08**



5 Calculation of load factor for dynamic moment

Equivalent load F_E at impact

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

M_{1E}: Moment

M_{1E} max (from 4 of graph MY1C/M_1 where $1.4\upsilon a$ = 420mm/s) = 42.9 (N·m) ……

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

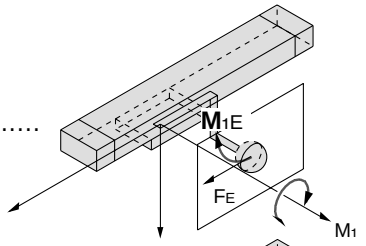
Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 3.35/42.9 = **0.08**

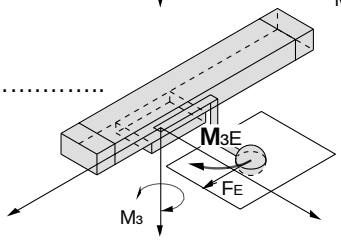
M_{3E}: Moment

M_{3E} max (from 5 of graph MY1C/M_3 where $1.4\upsilon a$ = 420mm/s) = 14.3 (N·m) ……

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

Load factor $\alpha_5 = M_{3E}/M_{3E}$ max = 2.65/14.3 = **0.19**





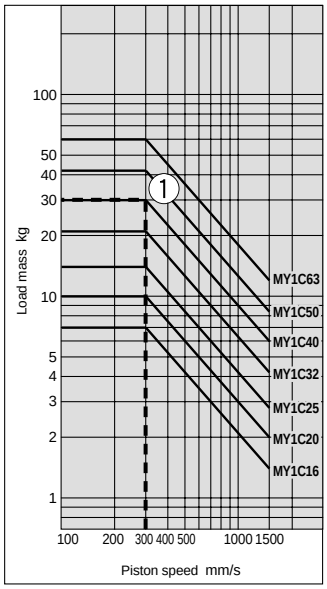
6 Sum and examination of guide load factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.89 \leq 1$

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

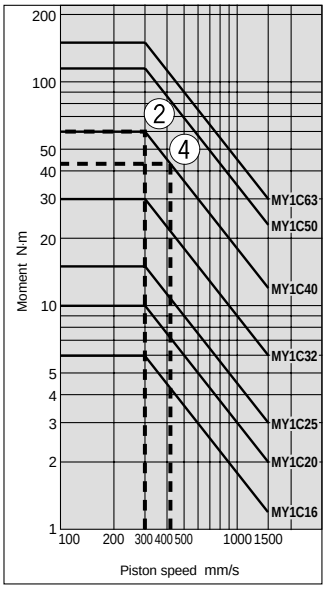
Load mass

MY1C/m_2

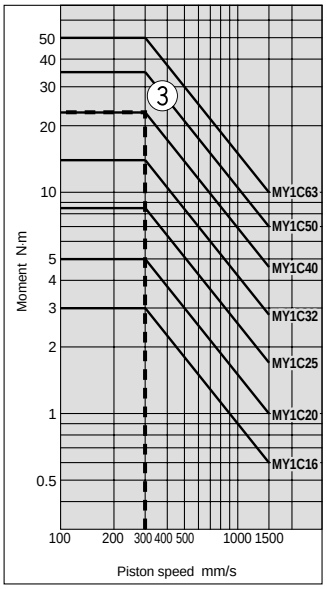


Allowable moment

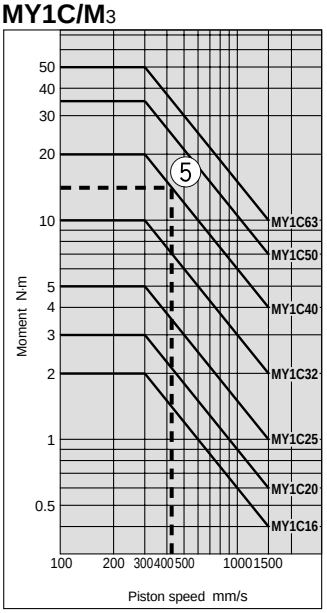
MY1C/M_1



MY1C/M_2



MY1C/M_3



How to Order

Cam Follower Guide Type

MY1C **25** □ — **300** □ □ — **Z73** □

Cam follower guide type

Bore size

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

Piping

Nil	Standard type
G	Centralized piping type

Stroke

Refer to the standard stroke table on page 45.

Stroke adjusting unit Note)

Nil	Both ends
S	One end

Note) "S" is applicable for stroke adjusting units A, L and H.

Auto switch type

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Stroke adjusting unit

Nil	Without adjusting unit
A	With adjusting bolt
L	With low load shock absorber + adjusting bolt
H	With high load shock absorber + adjusting bolt
AL	With one A unit and one L unit each
AH	With one A unit and one H unit each
LH	With one L unit and one H unit each

Shock absorbers for L and H units

Bore size (mm) / Unit no.	16	20	25	32	40	50	63
L unit	RB0806		RB1007	RB1412		RB2015	
H unit	—	RB1007	RB1412	RB2015		RB2725	

Note) MY1C16 is not available with H unit.

Options

Sroke adjusting unit numbers

Bore size (mm) / Unit type	16	20	25	32
A unit	MYM-A16A	MYM-A20A	MYM-A25A	MYM-A32A
L unit	MYM-A16L	MYM-A20L	MYM-A25L	MYM-A32L
H unit	—	MYM-A20H	MYM-A25H	MYM-A32H

Bore size (mm) / Unit type	40	50	63
A unit	MYM-A40A	MYM-A50A	MYM-A63A
L unit	MYM-A40L	MYM-A50L	MYM-A63L
H unit	MYM-A40H	MYM-A50H	MYM-A63H

Side support numbers

Bore size (mm) / Type	16	20	25	32
Side support A	MY-S16A	MY-S20A	MY-S25A	MY-S32A
Side support B	MY-S16B	MY-S20B	MY-S25B	MY-S32B

Bore size (mm) / Type	40	50	63
Side support A	MY-S40A		MY-S63A
Side support B	MY-S40B		MY-S63B

Refer to page 52 for detailed information on dimensions, etc.

Applicable auto switches/

Refer to pages 96 through 108 for detailed auto switch specifications.

For **ø16, ø20**

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

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

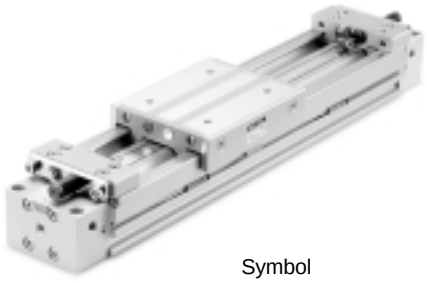
∗∗ Solid state switches marked with a "O" symbol are produced upon receipt of order.

For **ø25, ø32, ø40, ø50, ø63**

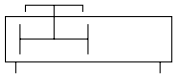
Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch models: Electrical entry direction: Perpendicular	Auto switch models: Electrical entry direction: In-line	Lead wire length (m)∗: 0.5 (Nil)	3 (L)	5 (Z)	Applicable load	
Reed switch	—	Grommet	Yes	3 wire (NPN equiv.)	—	5V	—		**Z76**	●	●	—	IC circuit	—
				2 wire	24V	12V	100V		**Z73**	●	●	●	—	Relay, PLC
			No			5V, 12V	100V or less		**Z80**	●	●	—	IC circuit	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—		**Y69A**	**Y59A**	●	●	○	IC circuit	Relay, PLC
				3 wire (PNP)					**Y7PV**	**Y7P**	●	●	○		
				2 wire		12V			**Y69B**	**Y59B**	●	●	○	—	
	Diagnostic indication (2 color indicator)			3 wire (NPN)		5V, 12V			**Y7NWV**	**Y7NW**	●	●	○	IC circuit	
				3 wire (PNP)					**Y7PWV**	**Y7PW**	●	●	○		
				2 wire		12V			**Y7BWV**	**Y7BW**	●	●	○	—	

∗ Lead wire length symbols: 0.5m …… Nil (Example) Y59A
3m …… L Y59AL
5m …… Z Y59AZ

∗∗ Solid state switches marked with a "O" symbol are produced upon receipt of order.



Symbol



Specifications

Bore size (mm)		16	20	25	32	40	50	63
Fluid		Air						
Action		Double acting						
Operating pressure range		0.1 to 0.8MPa (14 to 116 psi)						
Proof pressure		1.2MPa (174 psi)						
Ambient and fluid temperature		5 to 60°C (41 to 140°F)						
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 $^{+2.8}_{0}$				
Port size	**Front/Side ports**	M5 x 0.8 (10-32 nominal)		Rc 1/8		Rc 1/4	Rc 3/8	
	Bottom ports (centralized piping type only)	ø4		ø5	ø6	ø8	ø10	ø11

troke adjusting unit specifications

Bore size (mm)	16		20			25			32			40			50			63		
Unit symbol	A	L	A	L	H	A	L	H	A	L	H	A	L	H	A	L	H	A	L	H
Configuration and shock absorber	With adjusting bolt	With RB 0806 + adjusting bolt	With adjusting bolt	With RB 0806 + adjusting bolt	With RB 1007 + adjusting bolt	With adjusting bolt	With RB 1007 + adjusting bolt	With RB 1412 + adjusting bolt	With adjusting bolt	With RB 1412 + adjusting bolt	With RB 2015 + adjusting bolt	With adjusting bolt	With RB 1412 + adjusting bolt	With RB 2015 + adjusting bolt	With adjusting bolt	With RB 2015 + adjusting bolt	With RB 2725 + adjusting bolt	With adjusting bolt	With RB 2015 + adjusting bolt	With RB 2725 + adjusting bolt
Stroke fine adjusting range (mm)	0 to –5.6		0 to –6			0 to –11.5			0 to –12			0 to –16			0 to –20			0 to –25		
Stroke adjusting range	When exceeding the stroke fine adjusting range: Use order made specifications "-X416" and"-X417". (Refer to page 110 for details.)																			

Shock absorber specifications

Model		RB 0806	RB 1007	RB 1412	RB 2015	RB 2725
Max. energy absorption J (ft¥lb)		2.9 (2.1)	5.9 (4.3)	19.6 (14.4)	58.8 (43.4)	147 (108)
Stroke absorption (mm)		6	7	12	15	25
Max. impact speed (mm/s)		1500				
Max. operating frequency (cycles/min)		80	70	45	25	10
Spring force N (lbf)	**Extended**	1.96 (0.44)	4.22 (0.95)	6.86 (1.54)	8.34 (1.87)	8.83 (1.88)
	Compressed	4.22(0.95)	6.86 (1.54)	15.98 (3.59)	20.50 (4.6)	20.01 (4.5)
Operating temperature range		5 to 60°C (41 to 140°F)				

Piston speed

Bore size (mm)		16 to 63
Without stroke adjusting unit		100 to 1000mm/s
Stroke adjusting unit	A unit	100 to 1000mm/s Note 1)
	L unit and H unit	100 to 1500mm/s Note 2)

Note 1) Be aware that when the stroke adjusting range is increased by manipulating the adjusting bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 46, the **piston speed** should be **100 to 200mm per second.**

Note 2) For centralized piping, the piston speed is 100 to 1000mm per second.

Note 3) Use at a speed within the absorption capacity range. Refer to page 46.

Theoretical output

Unit: N

Bore size (mm)	Piston area (mm²)	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

Standard strokes

Bore size (mm)	Standard stroke (mm)*	Max. manufacturable stroke (mm)
16	100, 200, 300, 400, 500, 600, 700 800, 900, 1000, 1200, 1400, 1600 1800, 2000	3000
20, 25, 32, 40 50, 63		5000

* Strokes are manufacturable in 1mm increments, up to the maximum stroke. However, when exceeding a 2000mm stroke, specify "-XB11" at the end of the model number. Refer to the order made specifications on page 109.

ade To Order

Refer to page 109 regarding order made specifications for series MY1C.

Note: 1N = 0.2248lbf
1MPa = 145psi
1mm² = 0.0016in²

Weights

Unit: kg (lb)

Bore size (mm)	Basic weight	Additional weight per 50mm of stroke	Side support weight (per set) Type A and B	Stroke adjusting unit weight (per unit) A unit	L unit	H unit
16	0.67 (1.5)	0.12 (0.26)	0.01 (0.02)	0.03 (0.07)	0.04 (0.09)	—
20	1.06 (2.3)	0.15 (0.33)	0.02 (0.04)	0.04 (0.09)	0.05 (0.11)	0.08 (0.18)
25	1.58 (3.5)	0.24 (0.53)	0.02 (0.04)	0.07 (0.15)	0.11 (0.24)	0.18 (0.40)
32	3.14 (6.9)	0.37 (0.82)	0.04 (0.09)	0.14 (0.31)	0.23 (0.51)	0.39 (0.86)
40	5.60 (12.3)	0.52 (1.15)	0.08 (0.18)	0.25 (0.55)	0.34 (0.75)	0.48 (1.06)
50	10.14 (22.4)	0.76 (1.68)	0.08 (0.18)	0.36 (0.79)	0.51 (1.12)	0.81 (1.79)
63	16.67 (36.8)	1.10 (2.43)	0.17 (0.37)	0.68 (1.50)	0.83 (1.83)	1.08 (2.38)

Calculation method Example: **MY1C25-300A**

Basic weight 1.58kg
Additional weight..... 0.24/50mm stroke
Weight of A unit 0.07kg

Cylinder stroke 300mm
1.58 + 0.24 x 300 ÷ 50 + 0.07 x 2 = Approx. 3.16kg

Cushion Capacity

Cushion selection

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

<Stroke adjusting unit with shock absorber>

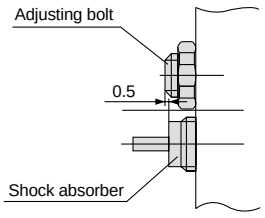
Use this unit when operating with a load or speed exceeding the air cushion limit line, or when cushioning is necessary because the cylinder stroke is outside of the effective air cushion stroke range due to stroke adjustment.

L unit
Use this unit when 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 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 diagram below when using the adjusting 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 0.5mm from the shock absorber.



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

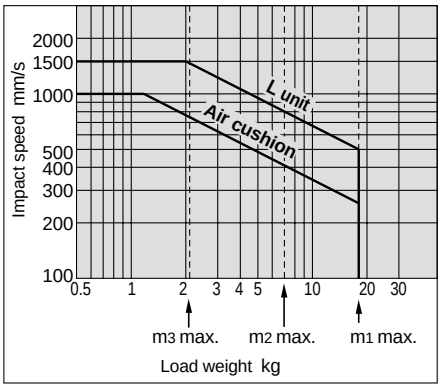
Air cushion stroke

Unit: mm

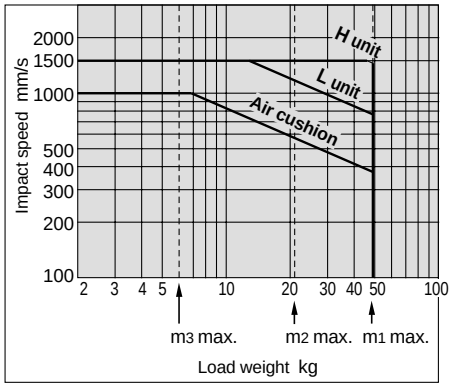
Bore size (mm)	Cushion stroke
16	12
20	15
25	15
32	19
40	24
50	30
63	37

Absorption capacity of air cushion and stroke adjusting units

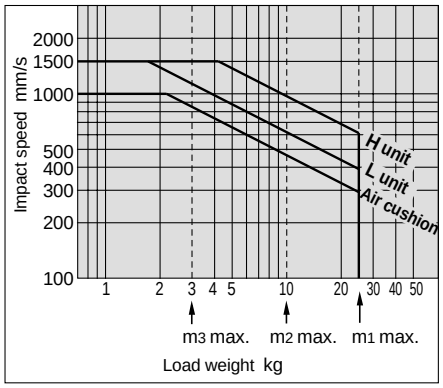
MY1C16 Horizontal impact: P = 0.5MPa



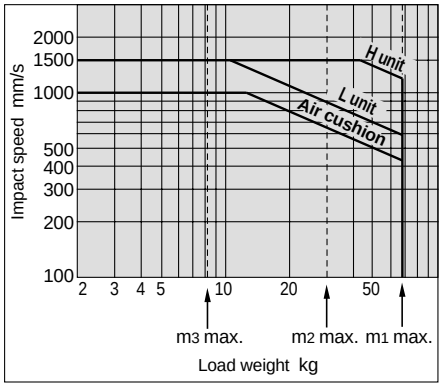
MY1C32 Horizontal impact: P = 0.5MPa



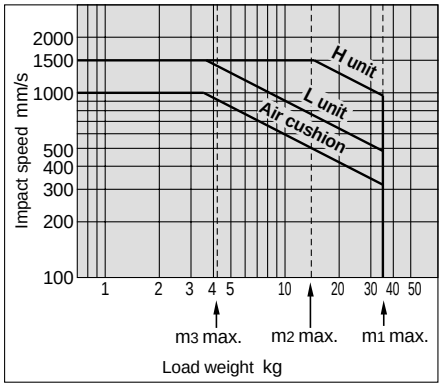
MY1C20 Horizontal impact: P = 0.5MPa



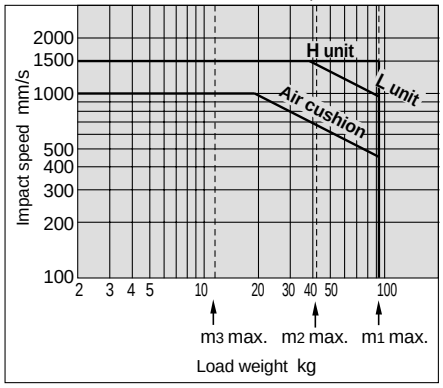
MY1C40 Horizontal impact: P = 0.5MPa



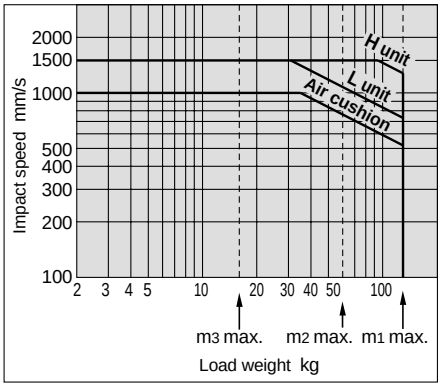
MY1C25 Horizontal impact: P = 0.5MPa



MY1C50 Horizontal impact: P = 0.5MPa



MY1C63 Horizontal impact: P = 0.5MP



Stroke adjusting unit holding bolt tightening torque

Unit: N·m

Bore size (mm)	Unit	Tightening torque
16	A	0.6
	L	
20	A	1.5
	L	
	H	
25	A	3.0
	L	
	H	5.0
32	A	5.0
	L	
	H	12
40	A	12
	L	
	H	
50	A	12
	L	
	H	
63	A	24
	L	
	H	

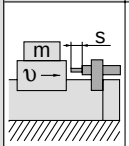
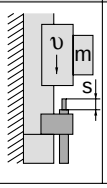
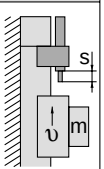
Stroke adjusting unit lock plate holding bolt tightening torque

Unit: 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

Unit: N·m

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

Symbols

υ: Speed of impacting object (m/s)

m: Weight of impacting object (kg)

F: Cylinder thrust (N)

g: Gravitational acceleration (9.8m/s²)

s: Shock absorber stroke (m)

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

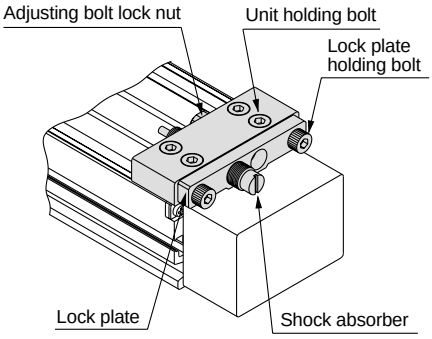
⚠ Specific product precautions

Be sure to read before handling. Refer to pages 112 through 119 for safety instructions and common precautions.

⚠ Caution

Be careful not to get hands caught in the unit.

· When using a product with stroke adjusting unit, the space between the slide table (slider) and the stroke adjusting unit becomes narrow, 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 fastened by uniformly tightening the four unit holding bolts.

⚠ Caution

Do not operate with the stroke adjusting 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 this case, we recommend using the adjusting bolt mounting brackets available with order made specifications – X 416 and – X 417. For other lengths, consult SMC. (Refer to "Stroke adjustment unit holding bolt tightening torque".)

<Stroke adjustment with adjusting bolt>

Loosen the adjusting bolt lock nut, and adjust the stroke from the lock plate side using a hexagon wrench. Re-tighten 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 ø16, ø20, ø50, ø63)

(Refer to "Stroke adjusting unit lock plate holding bolt tightening torque".)

Note)

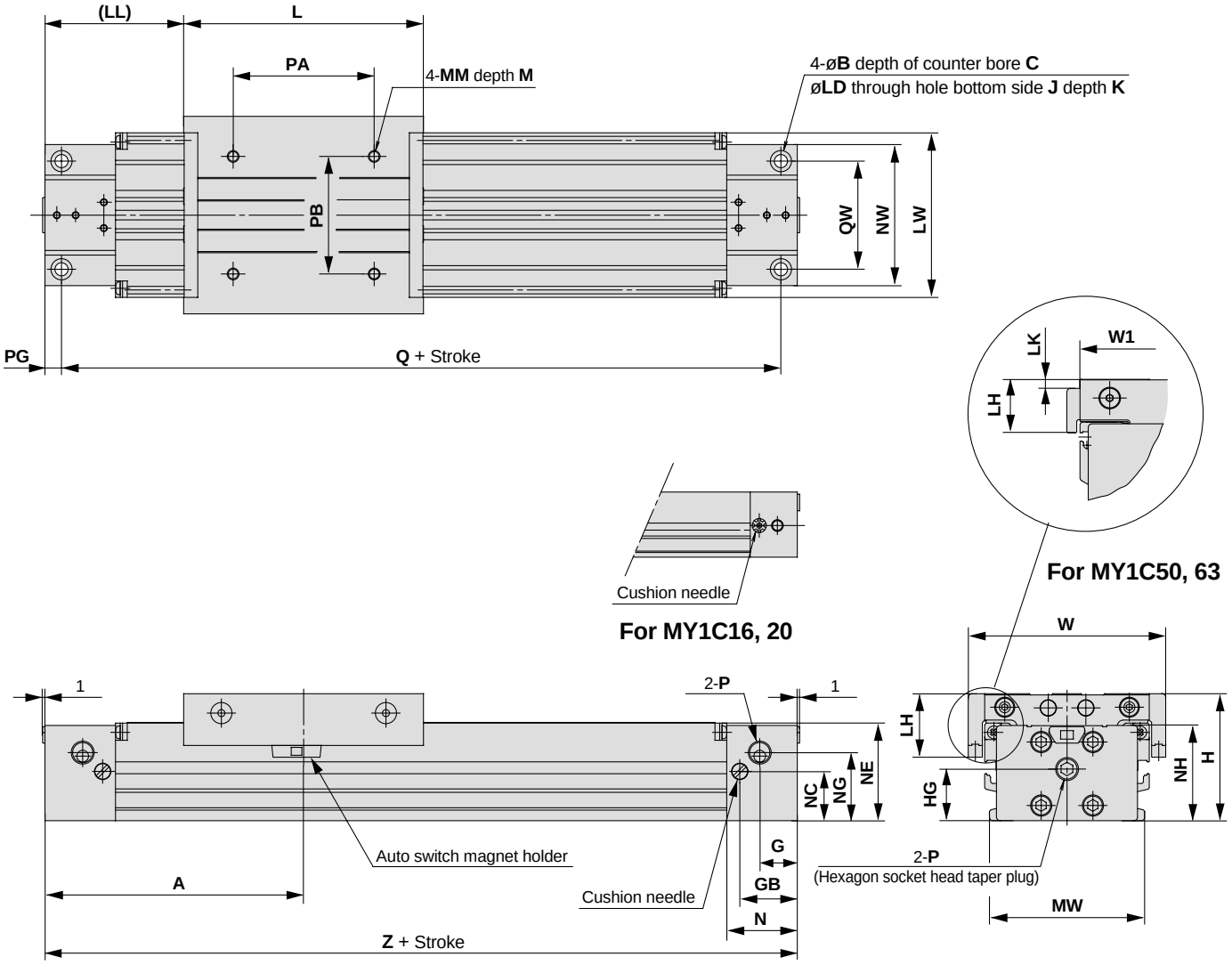
Slight bending may occur in the lock plate due to tightening of the lock plate holding bolts. This is not a problem for the shock absorber and locking function.

Standard Type / Dimensions (mm) ø16 to ø63

CAD

1 in = 25.4 mm

MY1C Bore size — Stroke



Model	A	B	C	G	GB	H	HG	J	K	L	LD	LH	LK	(LL)	LW	M	MM	MW
MY1C16	80	6	3.5	8.5	16.2	40	13.5	M5 x 0.8	10	80	3.6	22.5	—	40	54	6	M4 x 0.7	—
MY1C20	100	7.5	4.5	10.5	20	46	17	M6 x 1	12	100	4.8	23	—	50	58	7.5	M5 x 0.8	—
MY1C25	110	9	5.5	16	24.5	54	22	M6 x 1	9.5	102	5.6	27	—	59	70	10	M5 x 0.8	66
MY1C32	140	11	6.5	19	30	68	27	M8 x 1.25	16	132	6.8	35	—	74	88	13	M6 x 1	80
MY1C40	170	14	8.5	23	36.5	84	34.5	M10 x 1.5	15	162	8.6	38	—	89	104	13	M6 x 1	96
MY1C50	200	17	10.5	25	37.5	107	45	M14 x 2	28	200	11	29	2	100	128	15	M8 x 1.25	—
MY1C63	230	19	12.5	27.5	39.5	130	59	M16 x 2	32	230	13.5	32.5	5.5	115	152	16	M10 x 1.5	—

Model	N	NC	NE	NG	NH	NW	P	PA	PB	PG	Q	QW	W	W1	Z
MY1C16	20	13.5	28	13.5	27.7	56	M5 x 0.8	40	40	3.5	153	48	68	—	160
MY1C20	25	17	34	17	33.7	60	M5 x 0.8	50	40	4.5	191	45	72	—	200
MY1C25	30	21	41.8	29	40.5	60	Rc 1/8	60	50	7	206	46	84	—	220
MY1C32	37	26	52.3	34	50	74	Rc 1/8	80	60	8	264	60	102	—	280
MY1C40	45	32	65.3	42.5	63.5	94	Rc 1/4	100	80	9	322	72	118	—	340
MY1C50	47	43.5	84.5	54	83.5	118	Rc 3/8	120	90	10	380	90	144	128	400
MY1C63	50	56	104	68	105	142	Rc 3/8	140	110	12	436	110	168	152	460

"P" indicates cylinder supply ports. ∗ The plug for MY1C16/20-P is a hexagon socket head plug.

CAD MY1C16 —— SMY1C16, #1 (#1 + #7)
For ø20 to ø63
MY1C Bore size —— SMY1C Bore size, #1 (#1 + #8)

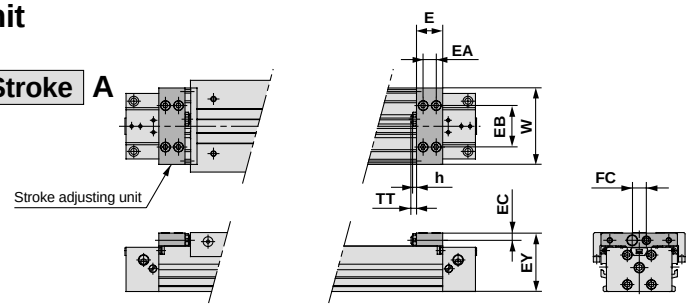
CAD

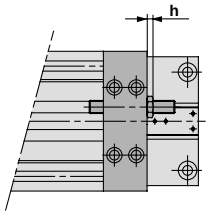
Dimensions (mm)

1 in = 25.4 mm

Stroke adjusting unit
With adjusting bolt

MY1C Bore size — Stroke **A**



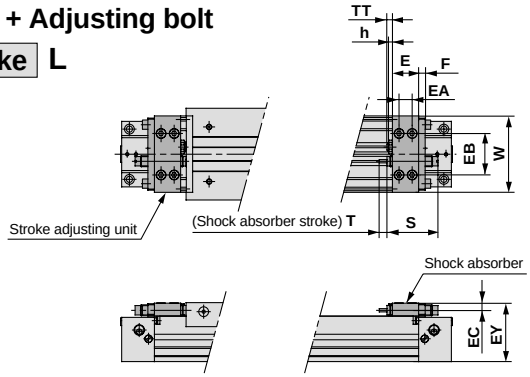


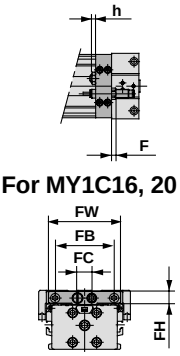
For MY1C50, 63

Model	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

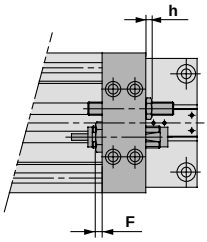
Low load shock absorber + Adjusting bolt

MY1C Bore size — Stroke **L**





For MY1C16, 20



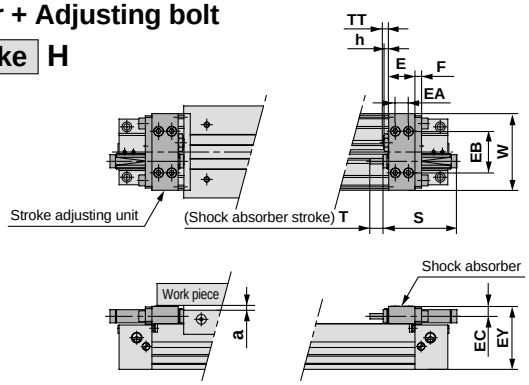
For MY1C50, 63

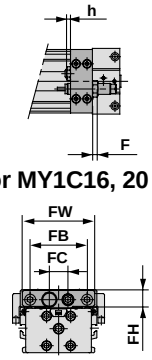
Model	E	EA	EB	EC	EY	F	FB	FC	FH	FW	h	S	T	TT	W	Shock absorber model
MY1C16	14.6	7	30	5.8	39.5	4	—	14	—	—	3.6	40.8	6	5.4 (max. 11)	58	RB0806
MY1C20	20	10	32	5.8	45.5	4	—	14	—	—	3.6	40.8	6	5 (max. 11)	58	RB0806
MY1C25	24	12	38	6.5	53.5	6	54	13	13	66	3.5	46.7	7	5 (max. 16.5)	70	RB1007
MY1C32	29	14	50	8.5	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

High load shock absorber + Adjusting bolt

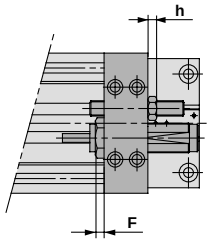
MY1C Bore size — Stroke **H**

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





For MY1C16, 20



For MY1C50, 63

Model	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

CAD

- Stroke adjusting unit
  With adjusting bolt
  MY1C16 —— SMY1C16, #3 (#1 + #3 + #7)
  For ø20 to ø63
  MY1C (Bore size) —— SMY1C (Bore size), #3 (#1 + #3 + #8)

- Low load shock absorber + Adjusting bolt
  MY1C16 —— SMY1C16, #4 (#1 + #4 + #7)
  For ø20 to ø63
  MY1C (Bore size) —— SMY1C (Bore size), #4 (#1 + #4 + #8)

- High load shock absorber + Adjusting bolt
  MY1C (Bore size) —— SMY1C (Bore size), #5 (#1 + #5 + #8)

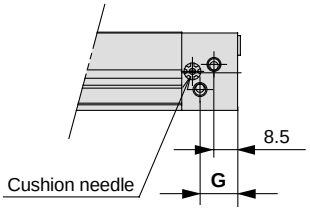
Centralized Piping Type / Dimensions (mm) ø16 to ø20

CAD

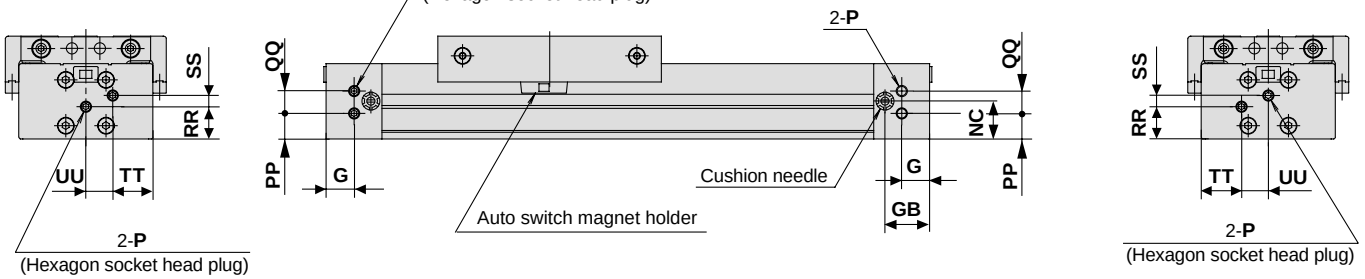
MY1C Bore size **G** — Stroke

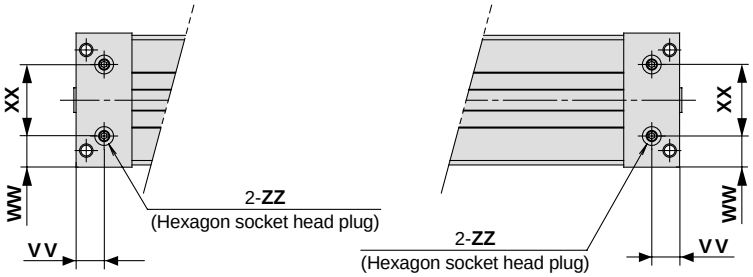
1 in = 25.4 mm

Refer to page 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping and for the stroke adjusting unit are identical to the standard type dimensions.
Refer to pages 48 and 49 for details regarding dimensions, etc.



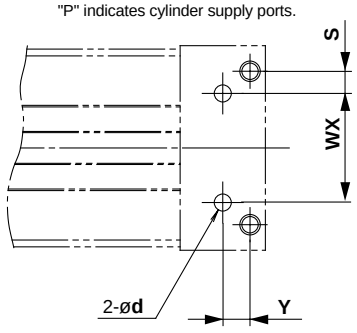
For MY1C16

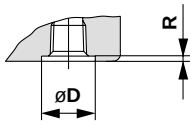




Model	G	GB	NC	P	PP	QQ	RR	SS	TT	UU	VV	WW	XX	ZZ
MY1C16G	13.5	16.2	14	M5 x 0.8	7.5	9	11	2.5	15	14	10	13	30	M5 x 0.8
MY1C20G	12.5	20	17	M5 x 0.8	11.5	10	14.5	5	18	12	12.5	14	32	M5 x 0.8

"P" indicates cylinder supply ports.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom

(Machine the mounting side to the dimensions below.)

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1C16G	30	6.5	9	4	8.4	1.1	C6
MY1C20G	32	8	6.5	4	8.4	1.1	

CAD

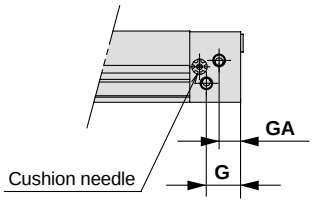
MY1C16G —— SMY1C16, #2 (#2 + #7)
MY1C20G —— SMY1C20, #2 (#2 + #8)

Centralized Piping Type / Dimensions (mm) ø25 to ø63

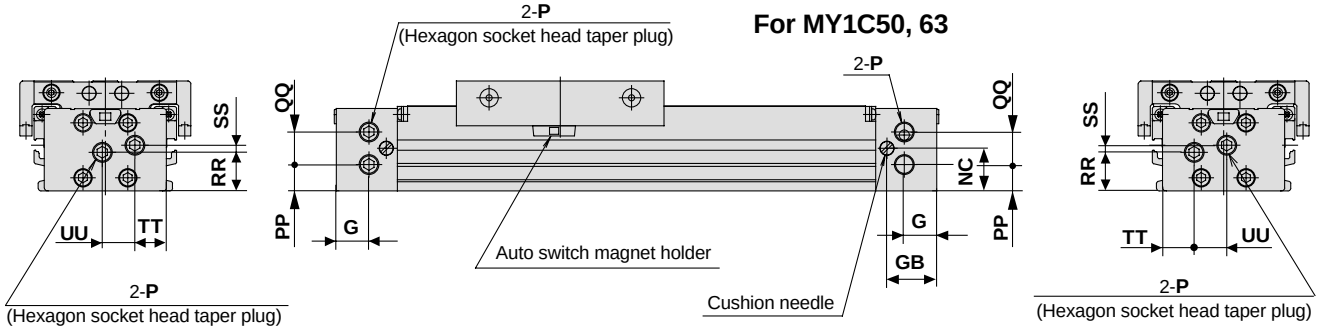
1 in = 25.4 mm

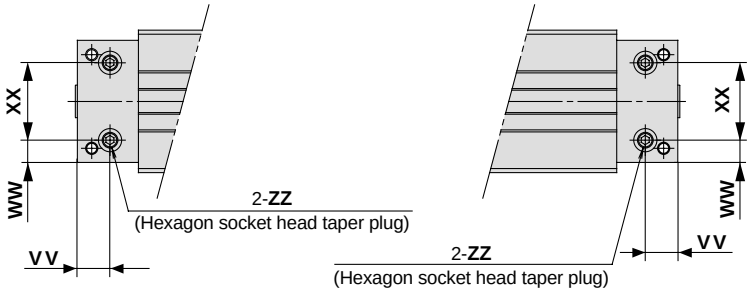
MY1C Bore size **G—** Stroke

Refer to page 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping and for the stroke adjusting unit are identical to the standard type dimensions.
Refer to pages 48 and 49 for details regarding dimensions, etc.



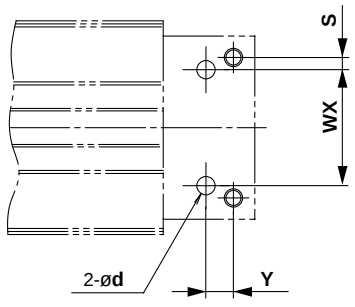
For MY1C50, 63

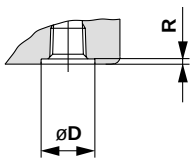




Model	G	GA	GB	NC	P	PP	QQ	RR	SS	TT	UU	VV	WW	XX	ZZ
MY1C25G	16	—	24.5	21	Rc 1/8	13	16	19	3.5	15.5	16	16	11	38	Rc 1/16
MY1C32G	19	—	30	26	Rc 1/8	18	16	24	4	21	16	19	13	48	Rc 1/16
MY1C40G	23	—	36.5	32	Rc 1/4	16.5	26	25.5	10.5	22.5	24.5	23	20	54	Rc 1/8
MY1C50G	27	25	37.5	43.5	Rc 3/8	26	28	35	10	35	24	28	22	74	Rc 1/4
MY1C63G	29.5	27.5	39.5	60	Rc 3/8	42	30	49	13	43	28	30	25	92	Rc 1/4

"P" indicates cylinder supply ports.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom

(Machine the mounting side to the dimensions below.)

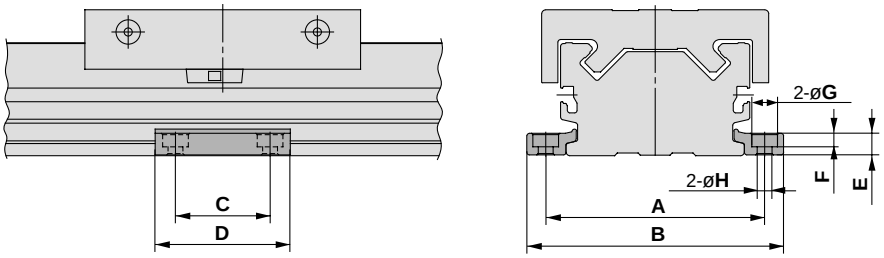
Model	WX	Y	S	d	D	R	Applicable O-ring
MY1C25G	38	9	4	6	11.4	1.1	C9
MY1C32G	48	11	6			1.1	
MY1C40G	54	14	9	8	13.4	1.1	C11.2
MY1C50G	74	18	8	10	17.5	1.1	C15
MY1C63G	92	18	9	10	17.5	1.1	

MY1C Bore size G —— SMY1C Bore size, #2 (#2 + #8)

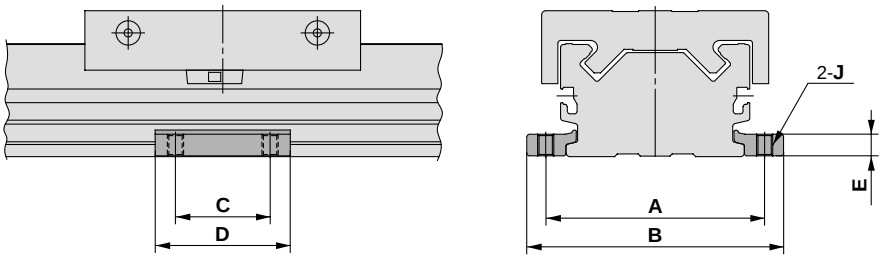
Side Support / Dimensions (mm)

1 in = 25.4 mm

Side support A
MY-S A



Side support B
MY-S B



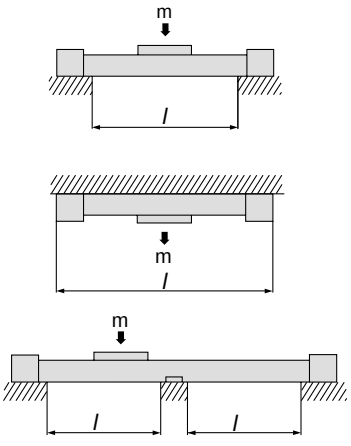
Model	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S16$^{A}_{B}$	MY1C16	61	71.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20$^{A}_{B}$	MY1C20	67	79.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S25$^{A}_{B}$	MY1C25	81	95	35	50	8	5	9.5	5.5	M6 x 1
MY-S32$^{A}_{B}$	MY1C32	100	118	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S40$^{A}_{B}$	MY1C40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

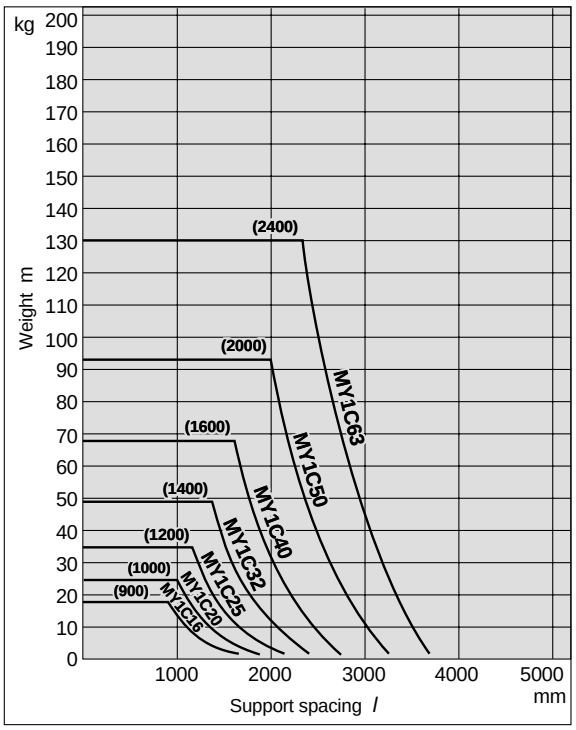
CAD

- Side support A
  MY-S16A —— SMY1C16, #5 (#1 + #5 + #7)
  For ø20 to ø63
  MY-S (Bore size) A —— SMY1C (Bore size), #6(#1 + #6 + #8)
- Side support B
  MY-S16B —— SMY1C16, #6 (#1 + #6 + #7)
  For ø20 to ø63
  MY-S (Bore size) B —— SMY1C (Bore size), #7 (#1 + #7 + #8)

Guide for Using Side Supports

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.



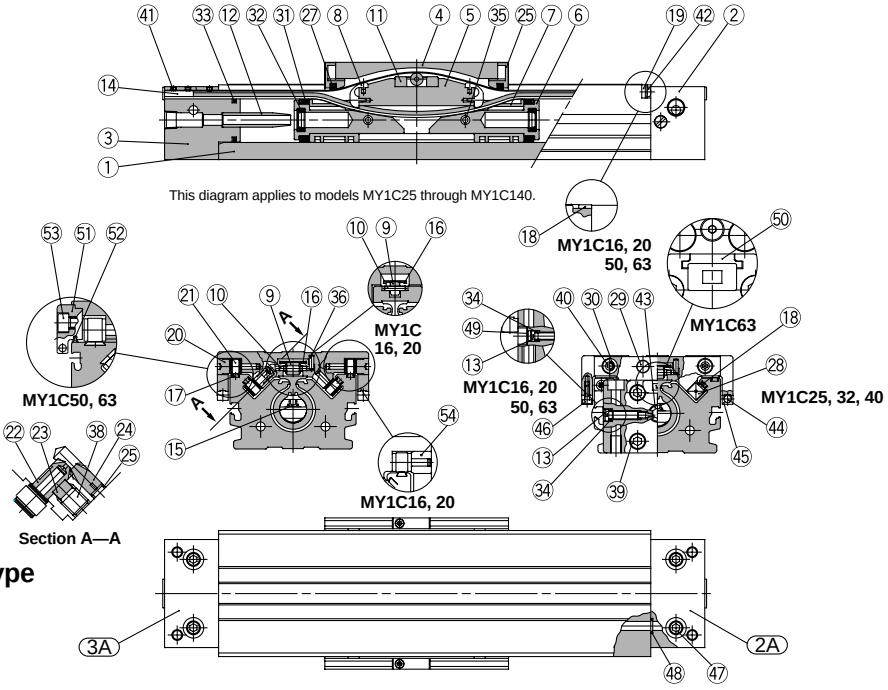


⚠ Caution

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.

Construction

Standard type



Centralized piping type

Parts list

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover R**	Aluminum alloy	Hard anodized
2A	**Head cover WR**	Aluminum alloy	Hard anodized
3	**Head cover L**	Aluminum alloy	Hard anodized
3A	**Head cover WL**	Aluminum alloy	Hard anodized
4	**Slide table**	Aluminum alloy	Electroless nickel plated Hard anodized (ø50, ø63)
5	**Piston yoke**	Aluminum alloy	Chromated
6	**Piston**	Aluminum 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**	Brass	
13	**Cushion needle**	Rolled steel	Nickel plated
14	**Belt clamp**	Special resin	
17	**Rail**	Hard steel wire material	
18	**End spacer**	Special resin	
19	**End clamp**	Stainless steel	Rubber lining (ø25 to ø40)
20	**Cam follower cap**	Special resin	
21	**Cam follower**	—	
22	**Eccentric gear**	Stainless steel	
23	**Gear bracket**	Carbon steel	Black zinc chromated

Parts list

No.	Description	Material	Note
24	**Adjustment gear**	Stainless steel	
25	**Retaining ring**	Stainless steel	
26	**End cover**	Special resin	
28	**Backup plate**	Special resin	(ø25 to ø40)
29	**Stopper**	Carbon steel	Nickel plated
30	**Spacer**	Stainless steel	
35	**Spring pin**	Carbon tool steel	Black zinc chromated
36	**Parallel pin**	Stainless steel	(Except ø16, ø20)
38	**Hexagon socket head set screw**	Chrome molybdenum steel	Black zinc chromated
39	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
40	**Hexagon socket head button bolt**	Chrome molybdenum steel	Nickel plated
41	**Hexagon socket head set screw**	Chrome molybdenum steel	Black zinc chromated/Nickel plated
42	**Round head Phillips screw**	Chrome molybdenum steel	Nickel plated
43	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
44	**Magnet**	Rare earth magnet	
45	**Magnet holder**	Special resin	(Except ø50, ø63)
46	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated (except ø50, ø63)
47	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
49	**Type CR retaining ring**	Spring steel	(Except ø25 to ø40)
50	**Head plate**	Aluminum alloy	Hard anodized
51	**Side cover**	Aluminum alloy	Hard anodized
52	**Side scraper**	Special resin	(ø50, ø63)
53	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated (ø50, ø63)
54	**Bushing**	Aluminum alloy	Hard anodized (ø16, ø20)

Seal list

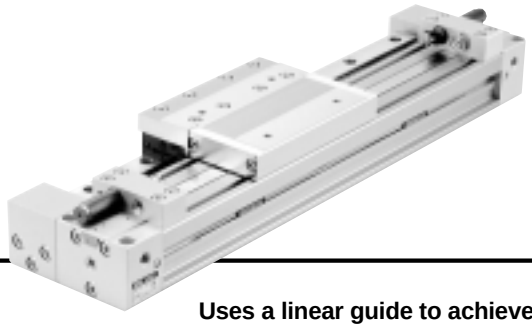
No.	Description	Material	Qty.	MY1C16	MY1C20	MY1C25	MY1C32	MY1C40	MY1C50	MY1C63
15	**Seal belt**	Special resin	1	MY16-16A-Stroke	MY20-16A-Stroke	MY25-16A-Stroke	MY32-16A-Stroke	MY40-16A-Stroke	MY50-16A-Stroke	MY63-16A-Stroke
16 Note)	**Dust seal band**	Stainless steel	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke	MY50-16B-Stroke	MY63-16B-Stroke
27	**Scraper**	NBR	2	MYM16-15AK0500	MYM20-15AK0501	MYM25-15AA5903	MYM32-15AA5904	MYM40-15AA5905	MYM50-15AK0502	MYM63-15AK0503
31	**Piston seal**	NBR	2	GMY16	GMY20	GMY25	GMY32	GMY40	GMY50	GMY63
32	**Cushion seal**	NBR	2	MYB16-15-A7163	MYB20-15-A7164	RCS-8	RCS-10	RCS-12	MC-16	MC-20
33	**Tube gasket**	NBR	2	P12	P16	TMY-25	TMY-32	TMY-40	P44	P53
34	**O-ring**	NBR	2	ø4 x ø1.8 x ø1.1	ø5.1 x ø3 x ø1.05	ø7.15 x ø3.75 x ø1.7	ø8.3 x ø4.5 x ø1.9	C-4	C-4	C-4
48	**O-ring**	NBR	4	ø7 x ø4 x ø1.5	ø7 x ø4 x ø1.5	C-6	C-7	C-9	C-11.2	C-14

Note) Two types of dust seal band are available. Verify the type to use, since the part number varies depending on the treatment of the hexagon socket head set screw ㊶.
(A) Black zinc chromated⟶MY□□-16B-Stroke (B) Nickel plated⟶MY□□-16BW-Stroke

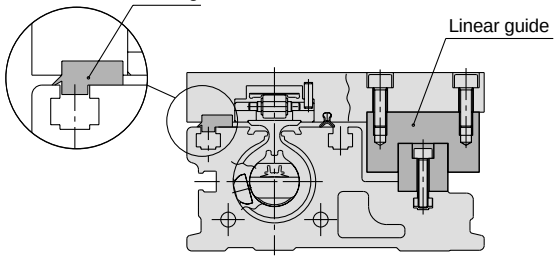
Series MY1H

High Precision Guide Type

ø10, ø16, ø20, ø25, ø32, ø40



Uses a linear guide to achieve high linearity and high repeatability



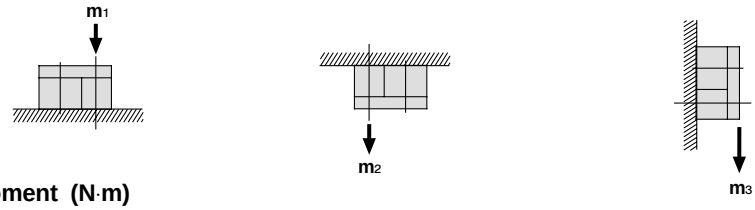
End lock type capable of holding a position at the stroke end (except bore size ø10)

Maximum Allowable Moment/Maximum Allowable Load

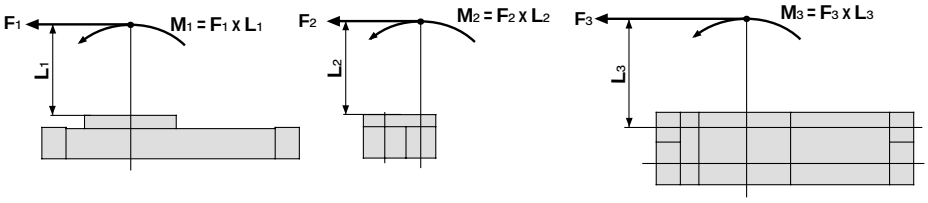
Model	Bore size (mm)	Max. allowable moment (N·m)			Max. allowable load (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1H	10	0.8	1.1	0.8	6.1	6.1	6.1
	16	3.7	4.9	3.7	10.8	10.8	10.8
	20	11	16	11	17.6	17.6	17.6
	25	23	26	23	27.5	27.5	27.5
	32	39	50	39	39.2	39.2	39.2
	40	50	50	39	50	50	50

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.

Load (kg)



Moment (N·m)



<Calculation of guide load factor>

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

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

Sum of guide load factors

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

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

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

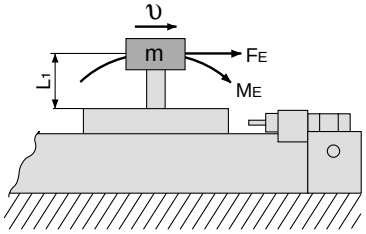
- m : Load mass (kg)
- F : Load (N)
- F_E : Load equivalent to impact (at impact with stopper) (N)
- υa : Average speed (mm/s)
- M : Static moment (N·m)
- υ : Impact speed (mm/s)
- L_1 : Distance to the load's center of gravity (m)
- M_E : Dynamic moment (N·m)
- g : Gravitational acceleration (9.8m/s²)

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

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

Note 4) $\frac{1.4}{100}\upsilon a$ is a dimensionless coefficient for calculating impact force.

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



3. Refer to pages 58 and 59 for detailed selection procedures.

Maximum allowable moment

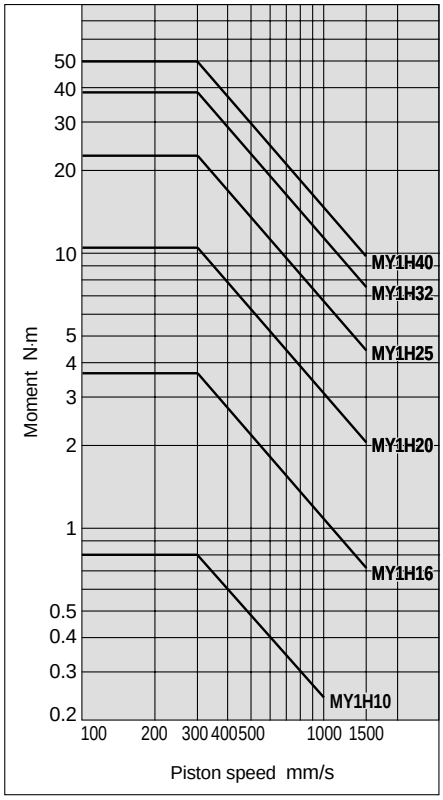
Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

Note:
1 N·m = 0.7375 ft·lb
1 kg = 2.2046 lb
1 in = 25.4 mm

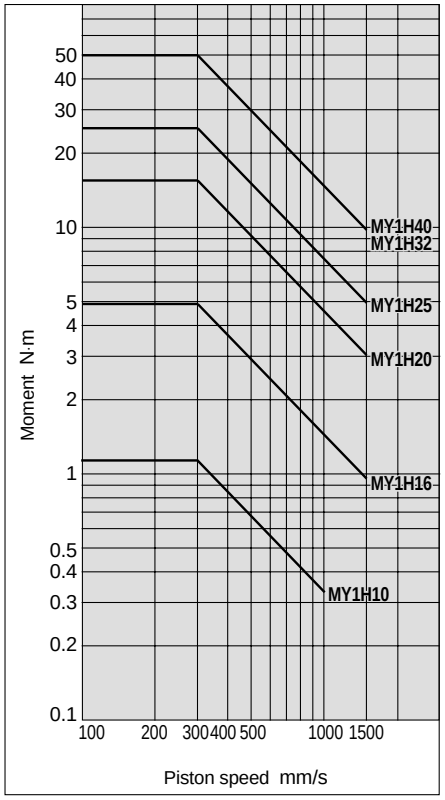
Maximum allowable load

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.

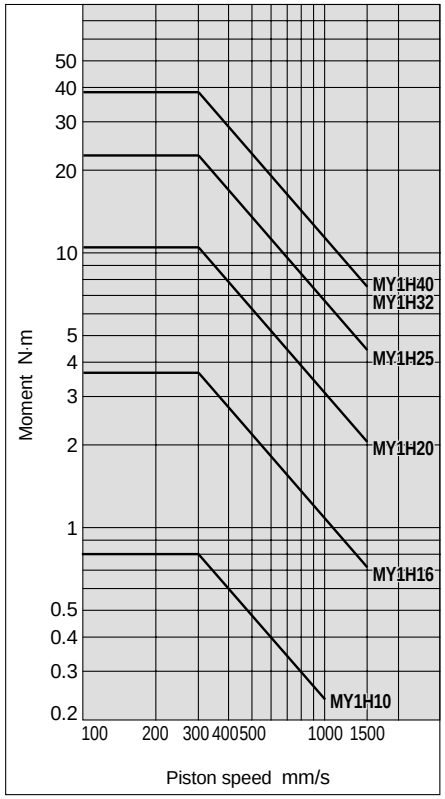
MY1H/M1



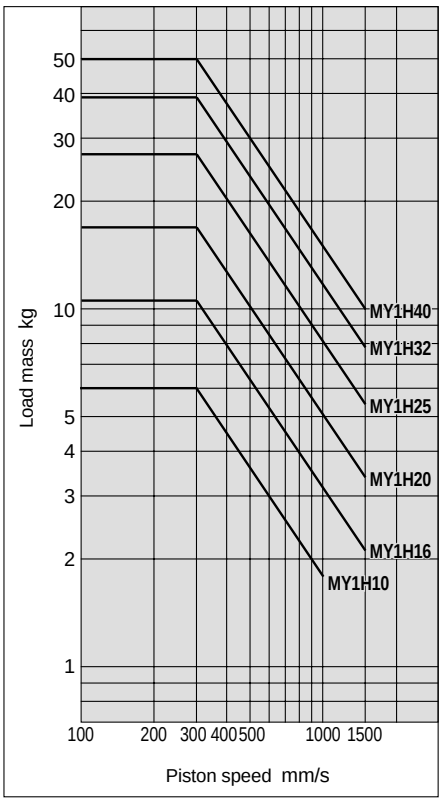
MY1H/M2



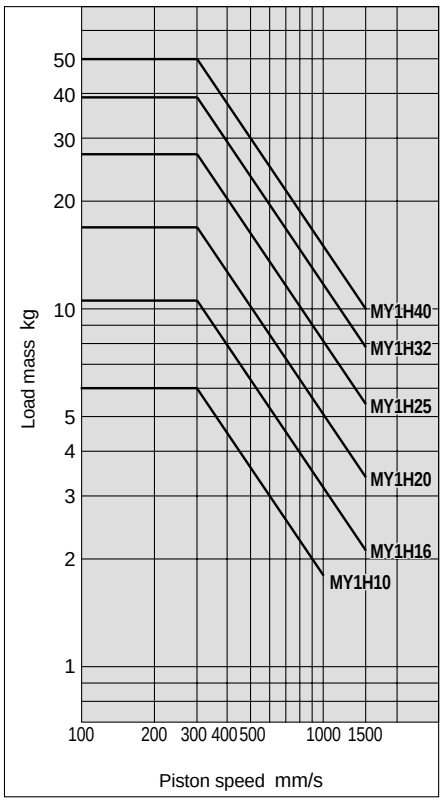
MY1H/M3



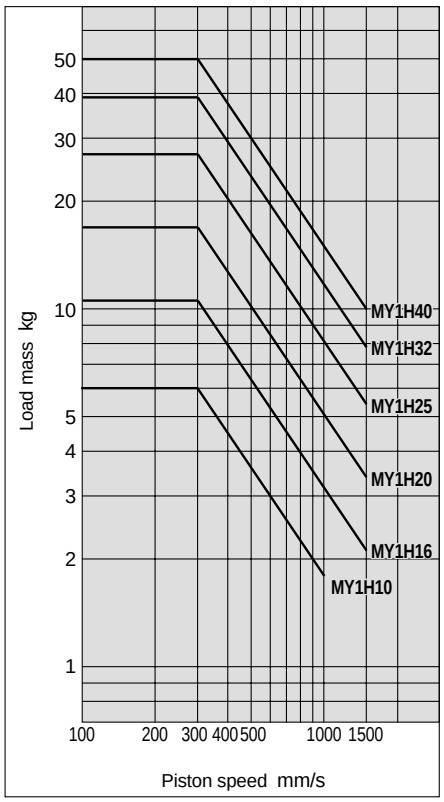
MY1H/m1



MY1H/m2



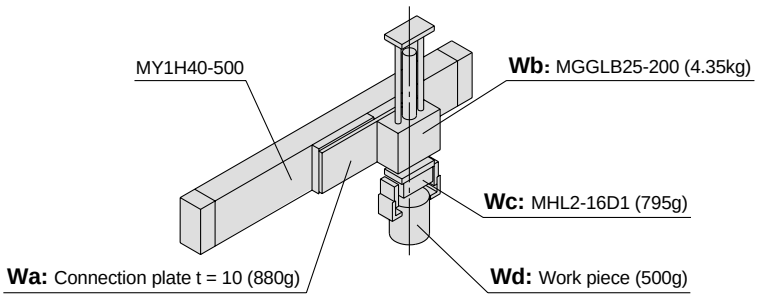
MY1H/m3



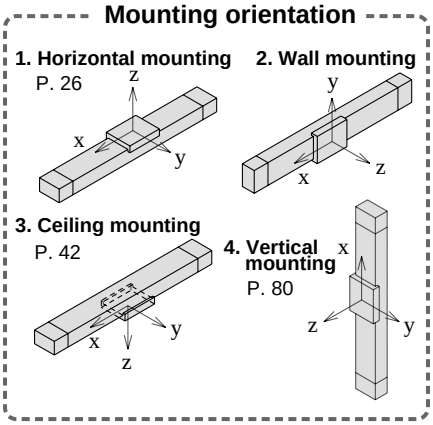
Calculation of Guide Load Factor

1 Operating conditions

Cylinder …..... **MY1H40-500**
Average operating speed υa … **300mm/s**
Mounting orientation …..…..... **Wall mounting**

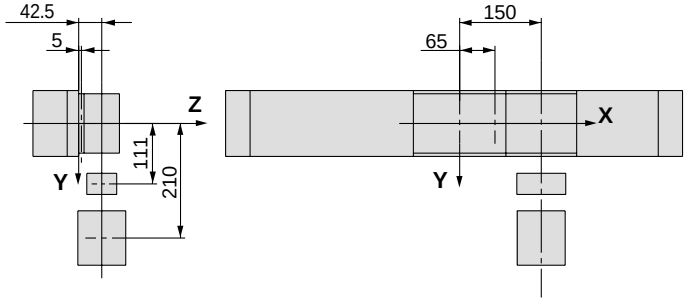


Mounting orientation



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

2 Load blocking



Mass and center of gravity for each work piece

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

n = a, b, c, d

3 Composite center of gravity calculation

$m_3 = \Sigma m_n$
$= 0.88 + 4.35 + 0.795 + 0.5 =$ **6.525kg**

$X = \frac{1}{m_3} \times \Sigma (m_n \times x_n)$
$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) =$ **138.5mm**

$Y = \frac{1}{m_3} \times \Sigma (m_n \times y_n)$
$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) =$ **29.6mm**

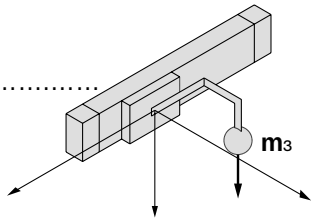
$Z = \frac{1}{m_3} \times \Sigma (m_n \times z_n)$
$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) =$ **37.4mm**

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 $\alpha_1 = m_3 / m_3$ max = 6.525/30 = **0.13**

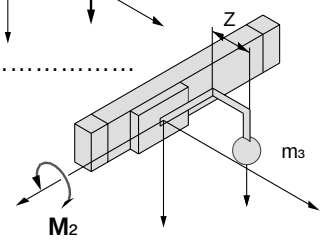


M_2: Moment

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

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

Load factor $\alpha_2 = M_2 / M_2$ max = 2.39/50 = **0.05**

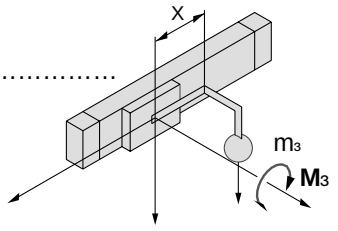


M_3: Moment

M_3 max (from 3 of graph MY1H/M3) = 38.7 (N·m) ……

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

Load factor $\alpha_3 = M_3/M_3$ max = 8.86/38.7 = **0.23**



5 Calculation of load factor for dynamic moment

Equivalent load F_E at impact

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

M_{1E}: Moment

M_{1E} max (from 4 of graph MY1H/M_1 where 1.4υa = 420mm/s) = 35.9 (N·m) ……

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

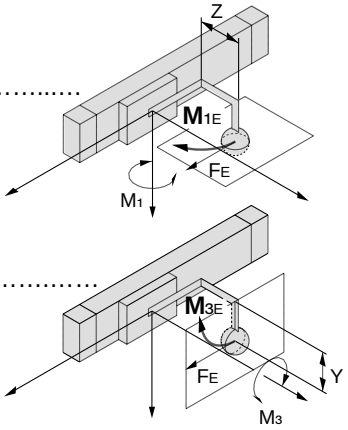
Load factor $\alpha_4 = M_{1E}/M_{1E}$ max = 3.35/35.9 = **0.09**

M_{3E}: Moment

M_{3E} max (from 5 of graph MY1H/M3 where 1.4υa = 420mm/s) = 27.6 (N·m) ……

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

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



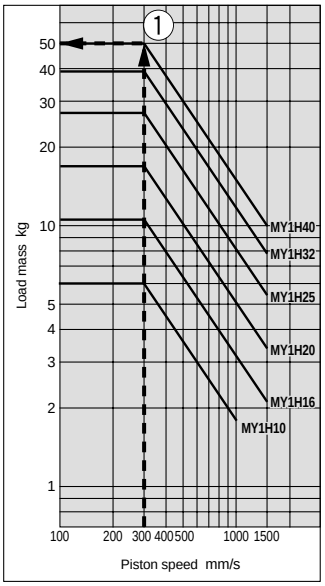
6 Sum and examination of guide load factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 + \alpha_5 = 0.60 \leq 1$

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

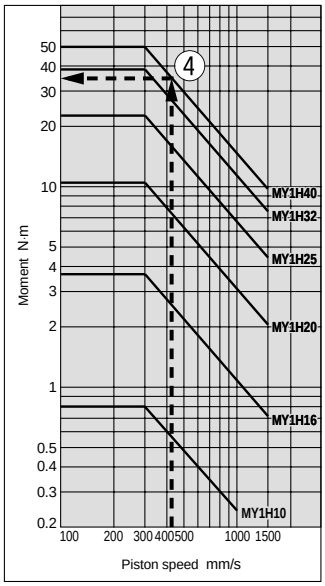
Load mass

MY1H/m_3

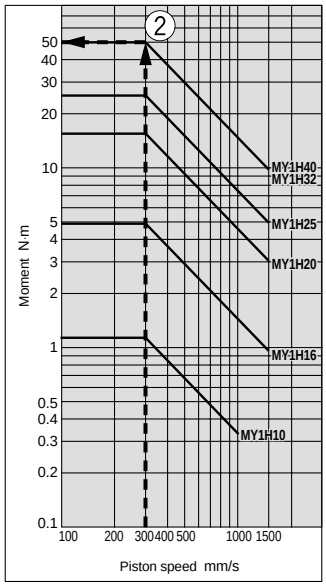


Allowable moment

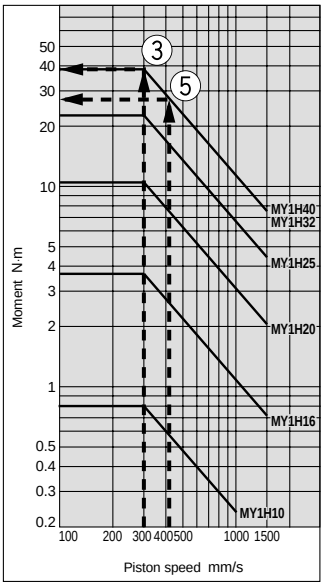
MY1H/M_1



MY1H/M_2



MY1H/M_3



How to Order

High Precision Guide Type

MY1H **25** □ — **300** □ □ □ — **Z73** □

High precision guide type

Bore size

10	10mm
16	16mm
20	20mm
25	25mm
32	32mm
40	40mm

Piping

Nil	Standard type
G	Centralized piping type

Note) For ø10, only G is available.

Stroke

Refer to the standard stroke table on page 61.

Stroke adjusting unit

Nil	Without adjusting unit
A	With adjusting bolt
L	With low load shock absorber + adjusting bolt
H	With high load shock absorber + adjusting bolt
AL	With one A unit and one L unit each
AH	With one A unit and one H unit each
LH	With one L unit and one H unit each

Shock absorbers for L and H units

Bore size (mm) / Unit type	10	16	20	25	32	40
L unit	—	RB0806		RB1007	RB1412	
H unit	RB0805	—	RB1007	RB1412	RB2015	

Note) MY1H16 is not available with H unit.
MY1H10 is not available with A and L units.

Note)

Stroke adjusting unit

Nil	Both ends
S	One end

Note) "S" is applicable for stroke adjusting units A, L and H.

End lock position

Nil	Without end lock
E	Right side
F	Left side
W	Both sides

∗ MY1H10 is not available with end lock.
∗ Refer to page 72 for end lock positions.

Auto switch type

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Applicable auto switches/ Refer to pages 96 through 108 for detailed auto switch specifications.

For **ø10, ø16, ø20**

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

∗ Lead wire length symbols: 0.5m…… Nil (Example) F9NW
3m…….. L F9NWL
5m…….. Z F9NWZ
∗∗ Solid state switches marked with a "○" symbol are produced upon receipt of order.

For **ø25, ø32, ø40,**

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch models: Electrical entry direction: Perpendicular	Auto switch models: Electrical entry direction: In-line	Lead wire length (m)∗: 0.5 (Nil)	Lead wire length (m)∗: 3 (L)	Lead wire length (m)∗: 5 (Z)	Applicable load	Applicable load
Reed switch	—	Grommet	Yes	3 wire (NPN equiv.)	—	5V	—	—	**Z76**	●	●	—	IC circuit	—
				2 wire	24V	12V	100V	—	**Z73**	●	●	●	—	Relay, PLC
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay, PLC
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○		
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—	
	Diagnostic indication (2 color indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit	
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○		
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—	

∗ Lead wire length symbols: 0.5m …… Nil (Example) Y59A
3m …….. L Y59AL
5m …….. Z Y59AZ
∗∗ Solid state switches marked with a "○" symbol are produced upon receipt of order.

Options

Sroke adjusting unit numbers

Bore size (mm) / Unit type	10	16	20
A unit	—	MYH-A16A	MYH-A20A
L unit	—	MYH-A16L	MYH-A20L
H unit	MYH-A10H	—	MYH-A20H

Bore size (mm) / Unit type	25	32	40
A unit	MYH-A25A	MYH-A32A	MYH-A40A
L unit	MYH-A25L	MYH-A32L	MYH-A40L
H unit	MYH-A25H	MYH-A32H	MYH-A40H

Side support numbers

Bore size (mm) / Type	10	16	20
Side support A	MY-S10A	MY-S16A	MY-S20A
Side support B	MY-S10B	MY-S16B	MY-S20B

Bore size (mm) / Type	25	32	40
Side support A	MY-S25A	MY-S32A	MY-S40A
Side support B	MY-S25B	MY-S32B	MY-S40B

Refer to page 73 for detailed information on dimensions, etc.

Symbol

Specifications

Bore size (mm)		10	16	20	25	32	40
Fluid		Air					
Action		Double acting					
Operating pressure range		0.2 to 0.8MPa (29 to 116 psi)	0.1 to 0.8MPa (14 to 116 psi)				
Proof pressure		1.2MPa (174 psi)					
Ambient and fluid temperature		5 to 60°C (41 to 140°F)					
Cushion		Rubber bumper	Air cushion				
Lubrication		Non-lube					
Stroke length tolerance		+1.8 0					
Port size	**Front/Side ports**	M5 x 0.8 (10-32 nominal)			Rc 1/8		Rc 1/4
	Bottom ports (centralized piping type only)		ø4		ø5	ø6	ø8

Stroke adjusting unit specifications

Bore size (mm)	10	16		20			25			32			40		
Unit symbol	H	A	L	A	L	H	A	L	H	A	L	H	A	L	H
Configuration and shock absorber	With RB 0805 + adjusting bolt	With adjusting bolt	With RB 0806 + adjusting bolt	With adjusting bolt	With RB 0806 + adjusting bolt	With RB 1007 + adjusting bolt	With adjusting bolt	With RB 1007 + adjusting bolt	With RB 1412 + adjusting bolt	With adjusting bolt	With RB 1412 + adjusting bolt	With RB 2015 + adjusting bolt	With adjusting bolt	With RB 1412 + adjusting bolt	With RB 2015 + adjusting bolt
Stroke fine adjusting range (mm)	0 to –10	0 to –5.6		0 to –6			0 to –11.5			0 to –12			0 to –16		
Stroke adjusting range	When exceeding the stroke fine adjusting range: Use order made specifications "-X416" and"-X417". (Refer to page 110 for details.)														

Shock absorber specifications

Model		RB 0805	RB 0806	RB 1007	RB 1412	RB 2015
Max. energy absorption J (ft·lb)		1.0 (0.73)	2.9 (2.1)	5.9 (4.4)	19.6 (14.5)	58.8 (43.4)
Stroke absorption mm (in)		5 (0.2)	6 (0.2)	7 (0.3)	12 (2.1)	15 (0.6)
Max. impact speed (mm/s)		1000 (39.4)	1500 (59.1)	1500 (59.1)	1500 (59.1)	1500 (59.1)
Max. operating frequency (cycle/min)		80	80	70	45	25
Spring force N (lbf)	**Extended**	1.96 (0.44)	1.96 (0.44)	4.22 (0.95)	6.86 (1.54)	8.34 (1.87)
	Compressed	3.83 (0.86)	4.22 (0.95)	6.86 (1.54)	15.98 (3.59)	20.50 (4.61)
Operating temperature range		5 to 60°C (41 to 140°F)				

Piston speed

Bore size (mm)		10	16 to 40
Without stroke adjusting unit		100 to 500mm/s	100 to 1000mm/s
Stroke adjusting unit	A unit	100 to 200mm/s	100 to 1000mm/s Note 1)
	L unit and H unit	100 to 1000mm/s	100 to 1500mm/s Note 2)

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

Note 2) For centralized piping, the piston speed is 100 to 1000mm per second.

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

Standard strokes

Bore size (mm)	Standard stroke (mm)*	Maximum manufacturable stroke (mm)
10, 16, 20	50, 100, 150, 200 250, 300, 350, 400 450, 500, 550, 600	1000
25, 32, 40		1500

* Strokes are manufacturable in 1mm increments, up to the maximum stroke. However, add "-XB10" to the end of the part number for non-standard strokes from 51 to 599. Also when exceeding a 600mm stroke, specify "-XB11" at the end of the model number. (except ø10)
Refer to the order made specifications on page 109.

Theoretical output

Unit: N

Bore size (mm)	Piston area (mm²)	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
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

1N = 0.2248lbf, 1MPa = 145 psi, 1mm² = 0.0016in²

Made To Order

Refer to page 109 regarding order made specifications for series MY1H.

Lock specifications

Bore size (mm)	16	20	25	32	40
Lock position	One side (selectable), Both sides				
Holding force (max.) N	110 (24.7)	170 (38.2)	270 (60.7)	450 (101.2)	700 (157.4)
Fine stroke adjustment range (mm)	0 to –5.6	0 to –6	0 to –11.5	0 to –12	0 to –16
Backlash	1mm or less				
Manual release	Possible (non-locking type)				

Weights

Unit: kg (lb)

Bore size (mm)	Basic weight	Additional weight per 50mm of stroke	Side support weight (per set)	Stroke adjusting unit weight (per unit)		
			Type A and B	A unit	L unit	H unit
10	0.26 (0.57)	0.08 (0.18)	0.003 (0.007)	—	—	0.02 (0.04)
16	0.74 (1.63)	0.14 (0.31)	0.01 (0.02)	0.02 (0.04)	0.04 (0.09)	—
20	1.35 (2.98)	0.25 (0.55)	0.02 (0.04)	0.03 (0.07)	0.05 (0.11)	0.07 (0.15)
25	2.31 (5.09)	0.30 (0.66)	0.02 (0.04)	0.04 (0.09)	0.07 (0.15)	0.11 (0.24)
32	4.65 (10.25)	0.46 (1.01)	0.04 (0.09)	0.08 (0.18)	0.14 (0.31)	0.23 (0.51)
40	6.37 (14.04)	0.55 (1.21)	0.08 (0.18)	0.12 (0.26)	0.19 (0.42)	0.28 (0.62)

Calculation method Example: **MY1H25-300A**

Basic weight 2.31kg
Additional weight ..... 0.30/50mm stroke
Weight of A unit..... 0.06kg

Cylinder stroke 300mm
2.31 + 0.30 x 300 ÷ 50 + 0.04 x 2 = Approx. 4.19kg

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

<Stroke adjusting unit with shock absorber>

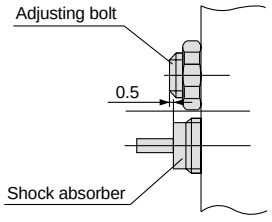
Use this unit when operating with a load or speed exceeding the air cushion limit line, or when cushioning is necessary because the cylinder stroke is outside of the effective air cushion stroke range due to stroke adjustment.

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

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

⚠ Caution

1. Refer to the diagram below when using the adjusting 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 0.5mm from the shock absorber.



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

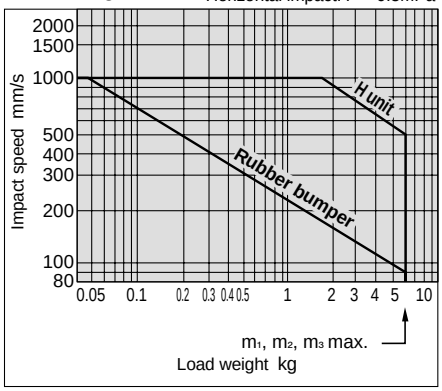
Air cushion stroke

Unit: mm

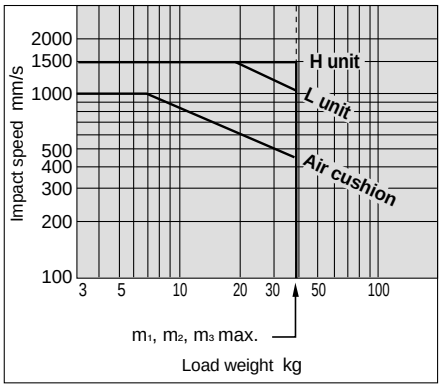
Bore size (mm)	Cushion stroke
16	12
20	15
25	15
32	19
40	24

Absorption capacity of rubber bumper, air cushion and stroke adjusting units

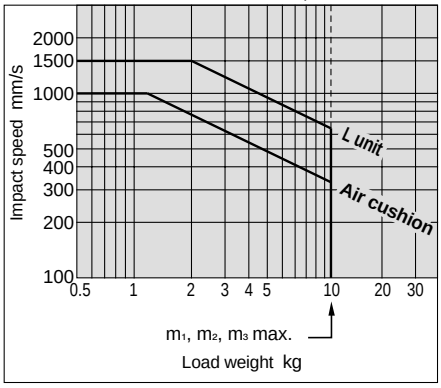
MY1H10 Horizontal impact: P = 0.5MPa



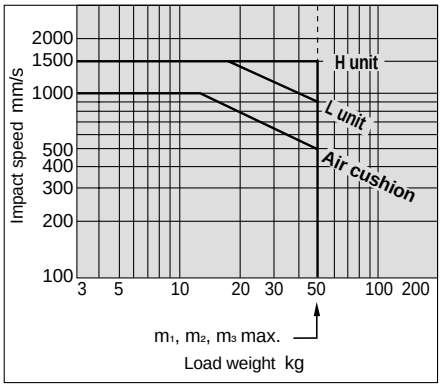
MY1H32 Horizontal impact: P = 0.5MPa



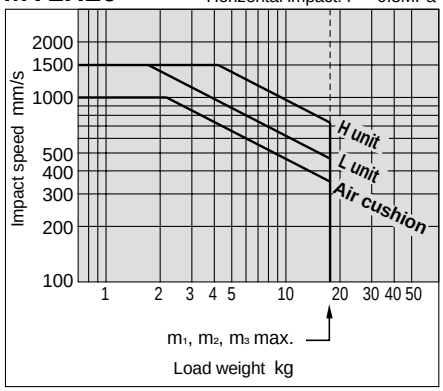
MY1H16 Horizontal impact: P = 0.5MPa



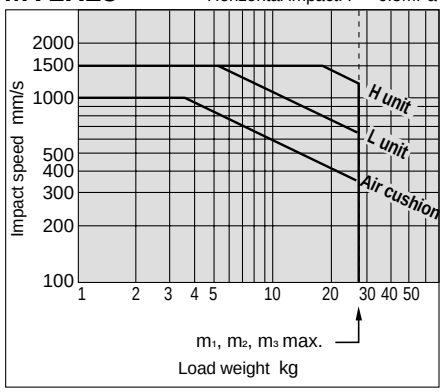
MY1H40 Horizontal impact: P = 0.5MPa



MY1H20 Horizontal impact: P = 0.5MPa



MY1H25 Horizontal impact: P = 0.5MPa



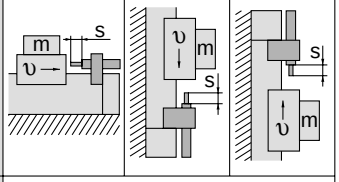
Stroke adjusting unit holding bolt tightening torque

Unit: N·m

Bore size (mm)	Tightening torque
10	Refer to page 64 for unit adjusting procedure.
16	0.6
20	1.5
25	1.5
32	3.0
40	5.0

Calculation of absorbed energy for stroke adjusting unit with shock absorber

Unit: N·m

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

Symbols

υ: Speed of impacting object (m/s)

m: Weight of impacting object (kg)

F: Cylinder thrust (N)

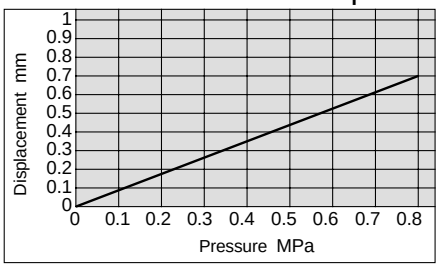
g: Gravitational acceleration (9.8m/s²)

s: Shock absorber stroke (m)

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

Rubber bumper (ø10 only)

Positive stroke from one end due to pressure



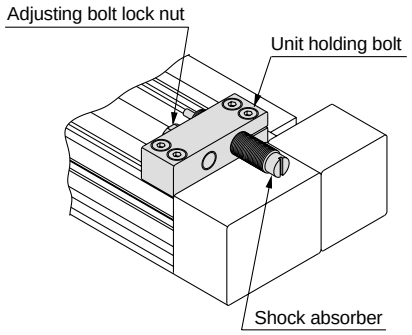
⚠ Specific Product Precautions

Be sure to read before handling.
Refer to pages 112 through 119 for safety instructions and common precautions.

⚠ Caution

Be careful not to get hands caught in the unit.

· When using a product with stroke adjusting 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 fastened by uniformly tightening the four unit holding bolts.

⚠ Caution

Do not operate with the stroke adjusting 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 this case, we recommend using the adjusting holder mounting brackets available with order made specifications - X 416 and - X 417. (Except ø10.)

For other lengths, consult SMC. (Refer to "Stroke adjusting unit holding bolt tightening torque".)

<Stroke adjustment with adjusting bolt>

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

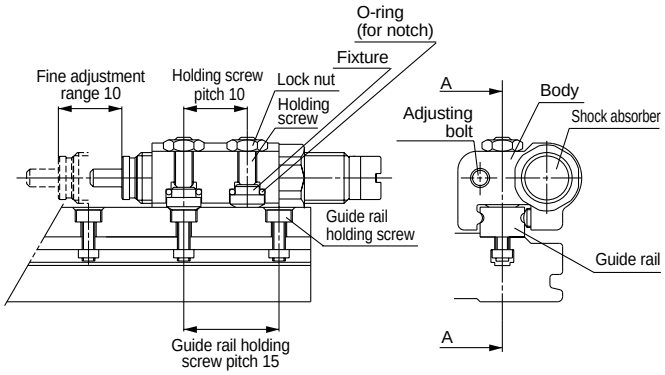
<Stroke adjustment with shock absorber>

Loosen the two unit holding bolts on the shock absorber side, turn the shock absorber and adjust the stroke. Then, uniformly tighten the unit holding bolts to secure the shock absorber.

Take care not to over-tighten the holding bolts. (Except ø16 and ø20) (Refer to "Stroke adjusting unit holding bolt tightening torque".)

⚠ Caution

To adjust the stroke adjusting unit of the MY1H10, follow the procedure shown below.



Section A-A

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 5mm and 10mm.)
3. Tighten the holding screw to 0.3N·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 0.6N·m.
5. Make fine adjustments with the adjusting bolt and shock absorber.

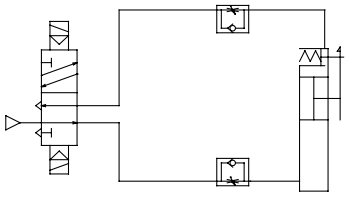
⚠ Specific Product Precautions

With End Locks

Recommended Pneumatic Circuits

⚠ 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 center 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 synchronized cylinders.

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

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

It may not be possible to release the lock with 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. Apply pressure of at least 0.15MPa to the port on the lock mechanism side. This is necessary to release the lock.

Exhaust Speed

⚠ Caution

1. Locking will occur automatically if the pressure applied to the port on the lock mechanism side falls to 0.05MPa or less. In 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, note that the exhaust speed will be reduced and 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.

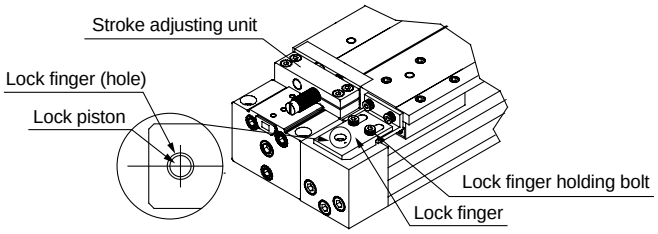
Adjusting the End Lock Mechanism

⚠ 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 adjusting unit has been adjusted. The adjusting bolt and shock absorber of the stroke adjusting 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 center of the lock piston with the center 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.

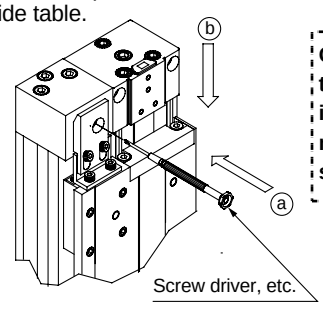
Manual Release

⚠ Caution

1. When manually releasing the end lock, be sure to release the pressure.

If the end lock is released while pressure remains, unexpected lurching may damage work pieces, etc.

2. Perform manual release of the end lock mechanism as follows. Push the lock piston down with a screw driver, etc., and move the slide table.



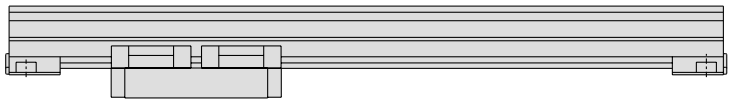
Other handling precautions regarding mounting, piping, and environment are the same as the standard series.

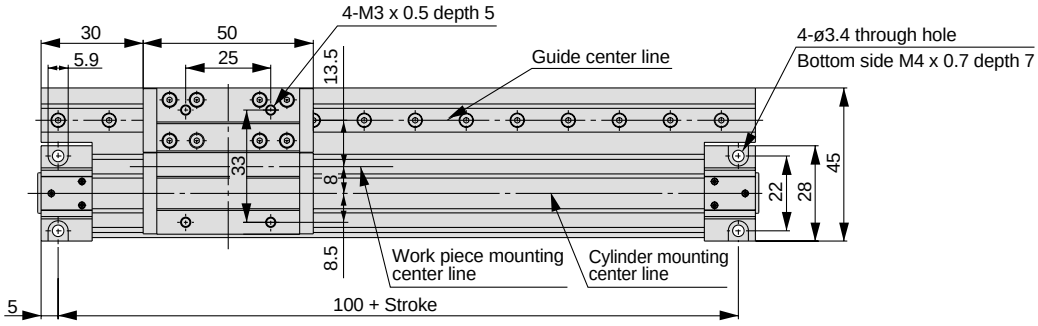
Centralized Piping Type / Dimensions (mm) ø10

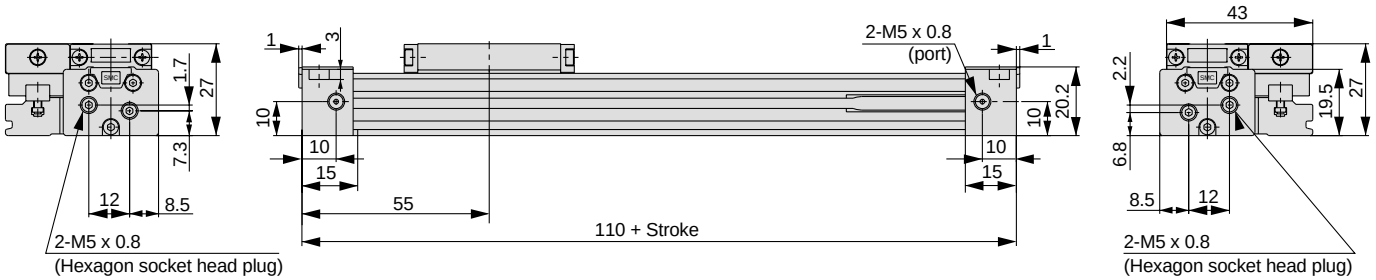
MY1H10G— Stroke

1 in = 25.4 mm

[Refer to page 120 regarding centralized piping port variations.]





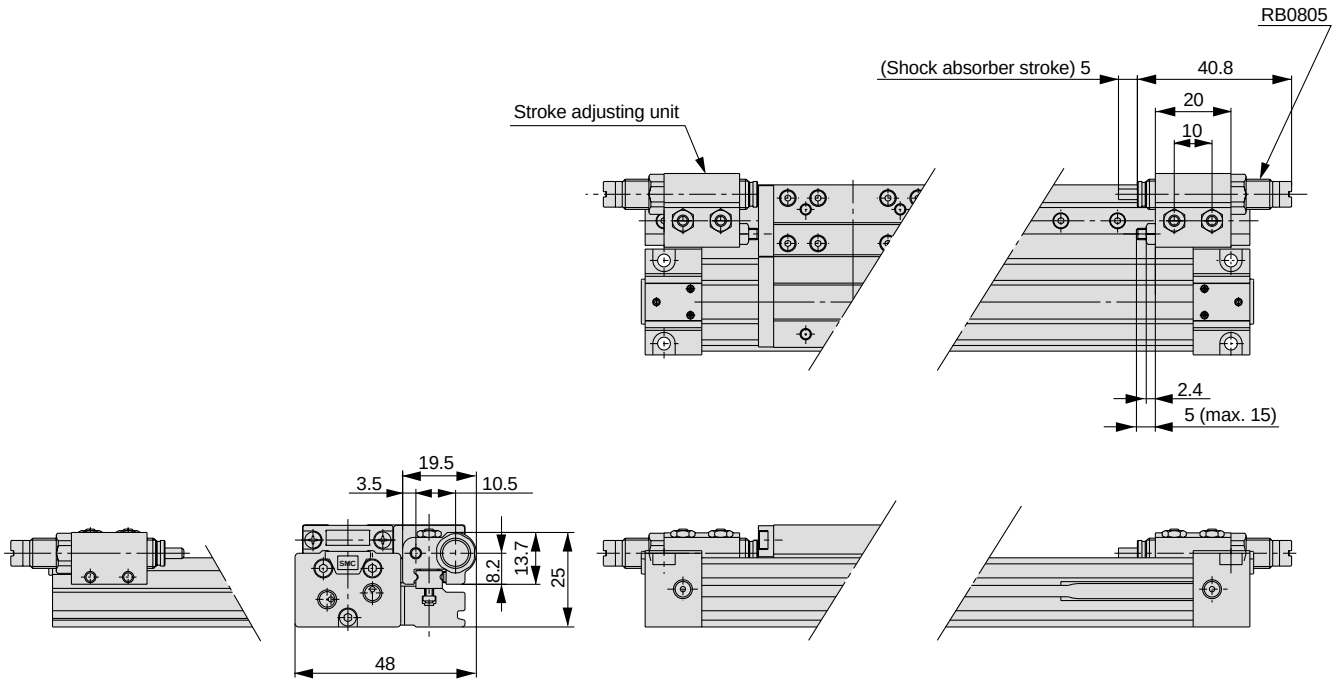


1 in = 25.4 mm

Stroke adjusting unit

Shock absorber + Adjusting bolt

MY1H10G — Stroke H

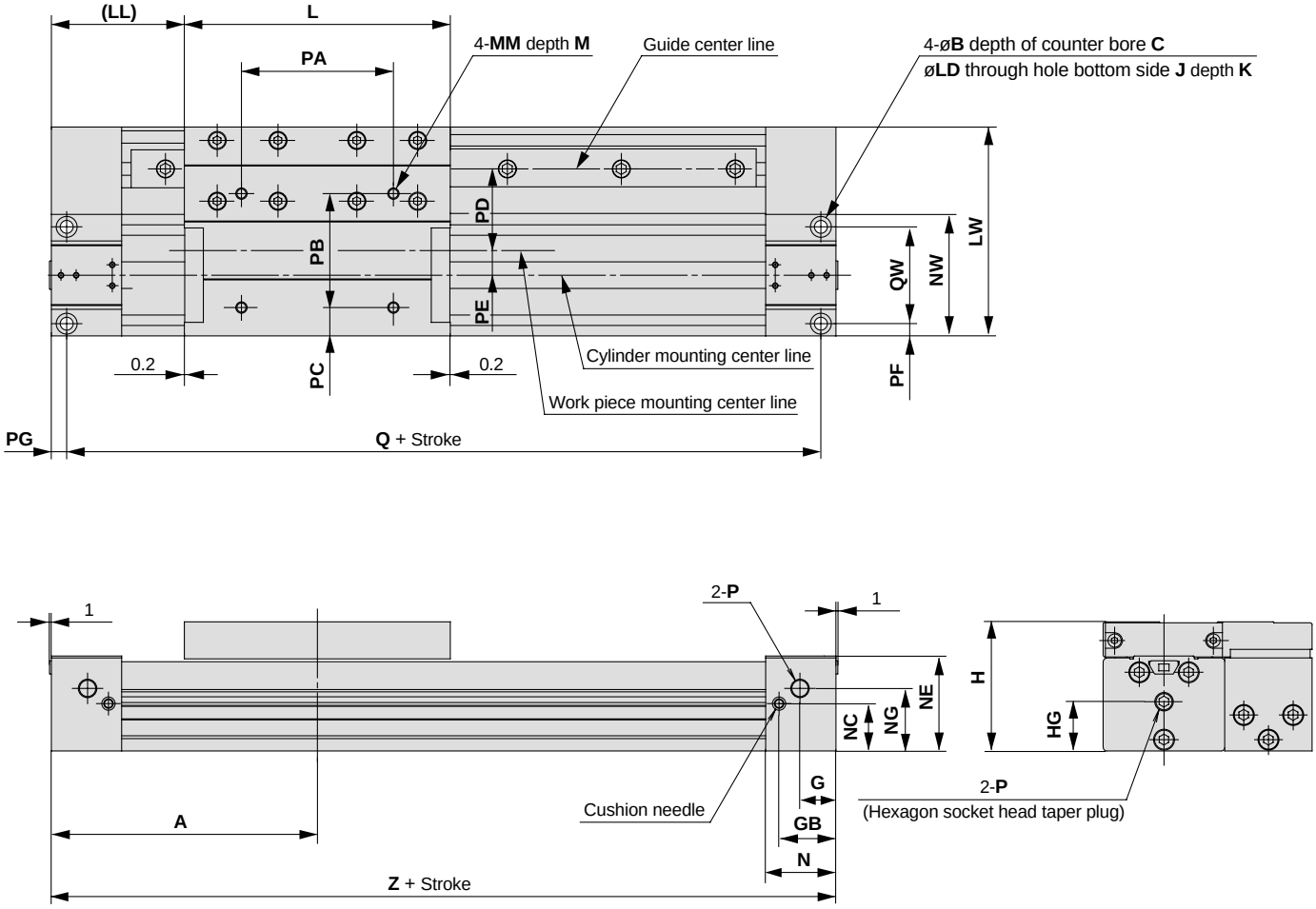


Standard Type / Dimensions (mm) ø16 to ø40

CAD

MY1H Bore size — Stroke

1 in = 25.4 mm



Model	A	B	C	G	GB	H	HG	J	K	L	LD	(LL)	LW	M	MM	N
MY1H16	80	6	3.5	9	17	40	13.5	M5 x 0.8	10	80	3.5	40	60	7	M4 x 0.7	20
MY1H20	100	7.5	4.5	12.5	20.5	46	17.5	M6 x 1	12	100	4.5	50	78	8	M5 x 0.8	25
MY1H25	110	9	5.5	16	24.5	54	21	M6 x 1	9.5	114	5.6	53	90	9	M5 x 0.8	30
MY1H32	140	11	6.6	19	30	68	26	M8 x 1.25	16	140	6.8	70	110	13	M6 x 1	37
MY1H40	170	14	8.5	23	36.5	84	33.5	M10 x 1.5	15	170	8.6	85	121	13	M6 x 1	45

Model	NC	NE	NG	NW	P	PA	PB	PC	PD	(PE)	PF	PG	Q	QW	Z
MY1H16	13.5	27.8	13.5	37	M5 x 0.8	40	40	7.5	21	9	3.5	3.5	153	30	160
MY1H20	17.5	34	17.5	45	M5 x 0.8	50	40	14.5	27	12	4.5	4.5	191	36	200
MY1H25	20	40.5	28	53	Rc 1/8	60	50	14.5	32	13	5.5	7	206	42	220
MY1H32	25	50	33	64	Rc 1/8	80	60	15	42	13	6.5	8	264	51	280
MY1H40	30.5	63	42.5	75	Rc 1/4	100	80	20.5	37.5	23	8	9	322	59	340

"P" indicates cylinder supply ports. ∗ The plug for MY1H16/20-P is a hexagon socket head plug.

CAD MY1H16 —— SMY1H16, #1 (#1 + #7)

For ø20 to ø40

MY1H Bore size —— SMY1H Bore size , #1 (#1 + #8)

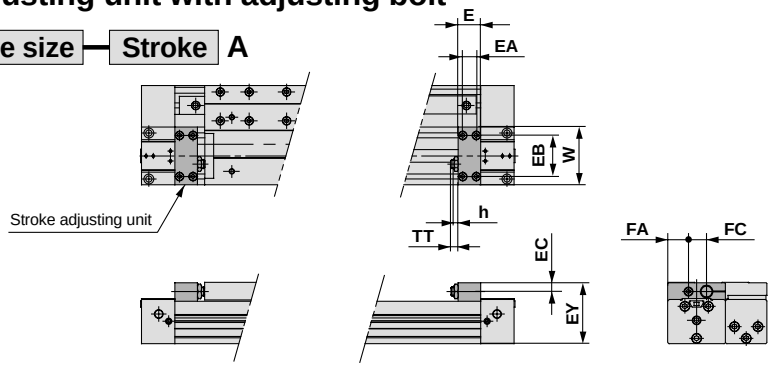
CAD

Dimensions (mm)

Stroke adjusting unit with adjusting bolt

1 in = 25.4 mm

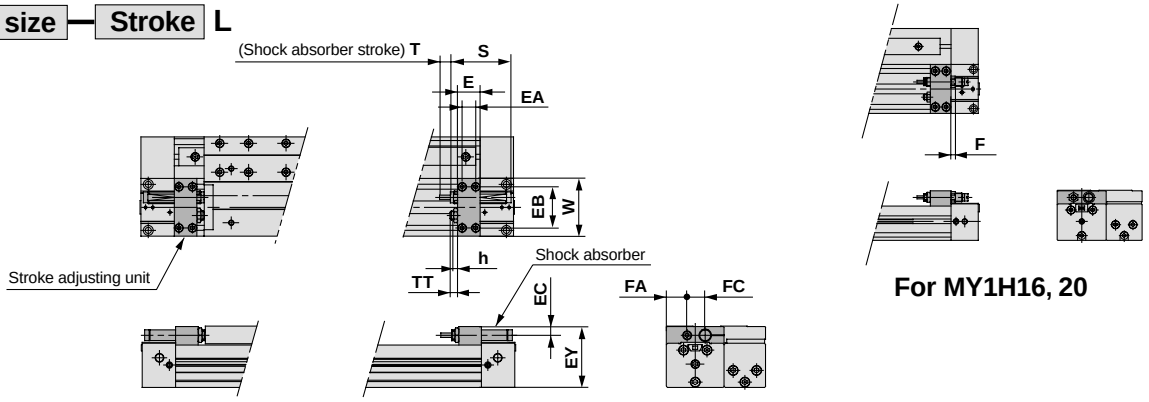
MY1H Bore size — Stroke A



Model	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
MY1H25	18	9	40	7.5	53.5	20	17	3.5	5 (max. 16.5)	53
MY1H32	25	14	45.6	9.5	67.5	23	20	4.5	8 (max. 20)	64
MY1H40	31	19	55	11	82	24.5	26	4.5	9 (max. 25)	75

Low load shock absorber + Adjusting bolt

MY1H Bore size — Stroke L

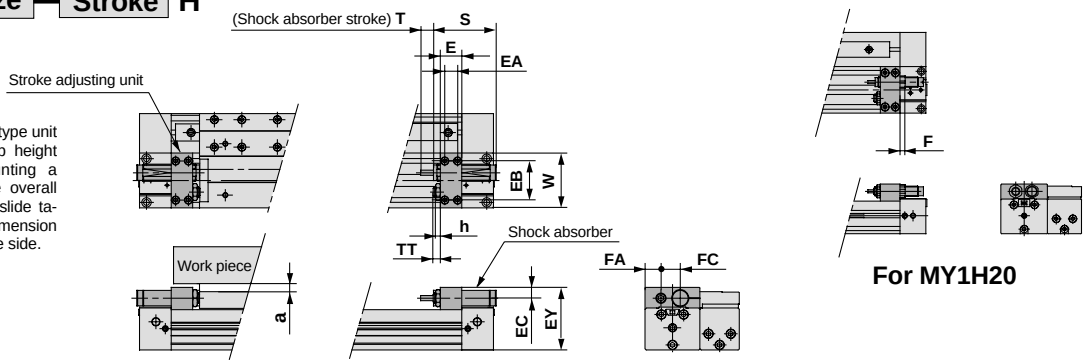


Model	E	EA	EB	EC	EY	F	FA	FC	h	S	T	TT	W	Shock absorber model
MY1H16	14.6	7	28	5.8	39.5	4	11.5	13	3.6	40.8	6	5.4 (max. 11)	37	RB0806
MY1H20	19	10	33	5.8	45.5	4	15	14	3.6	40.8	6	6 (max. 12)	45	RB0806
MY1H25	18	9	40	7.5	53.5	—	20	17	3.5	46.7	7	5 (max. 16.5)	53	RB1007
MY1H32	25	14	45.6	9.5	67.5	—	23	20	4.5	67.3	12	8 (max. 20)	64	RB1412
MY1H40	31	19	55	11	82	—	24.5	26	4.5	67.3	12	9 (max. 25)	75	RB1412

High load shock absorber + Adjusting bolt

MY1H 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 work piece side.



Model	E	EA	EB	EC	EY	F	FA	FC	h	S	T	TT	W	Shock absorber model	a
MY1H20	19	10	33	7.7	49.5	5	14.3	15.7	3.5	46.7	7	6 (max. 12)	45	RB1007	4
MY1H25	18	9	40	9	57	—	18	17.5	4.5	67.3	12	5 (max. 16.5)	53	RB1412	3.5
MY1H32	25	14	45.6	12.4	73	—	18.5	22.5	5.5	73.2	15	8 (max. 20)	64	RB2015	5.5
MY1H40	31	19	55	12.4	86	—	26.5	22	5.5	73.2	15	9 (max. 25)	75	RB2015	2.5

CAD

- Stroke adjusting unit
  With adjusting bolt
  MY1H16 —— SMY1H16, #3 (#1 + #3 + #7)
  For ø20 to ø40
  MY1H (Bore size) —— SMY1H (Bore size), #3 (#1 + #3 + #8)

- Low load shock absorber + Adjusting bolt
  MY1H16 —— SMY1H16, #4 (#1 + #4 + #7)
  For ø20 to ø40
  MY1H (Bore size) —— SMY1H (Bore size), #4 (#1 + #4 + #8)

- High load shock absorber + Adjusting bolt
  MY1H (Bore size) —— SMY1H (Bore size), #5 (#1 + #5 + #8)

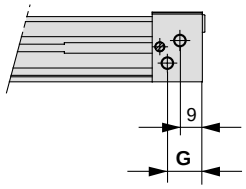
Centralized Piping Type / Dimensions (mm) ø16, ø20

CAD

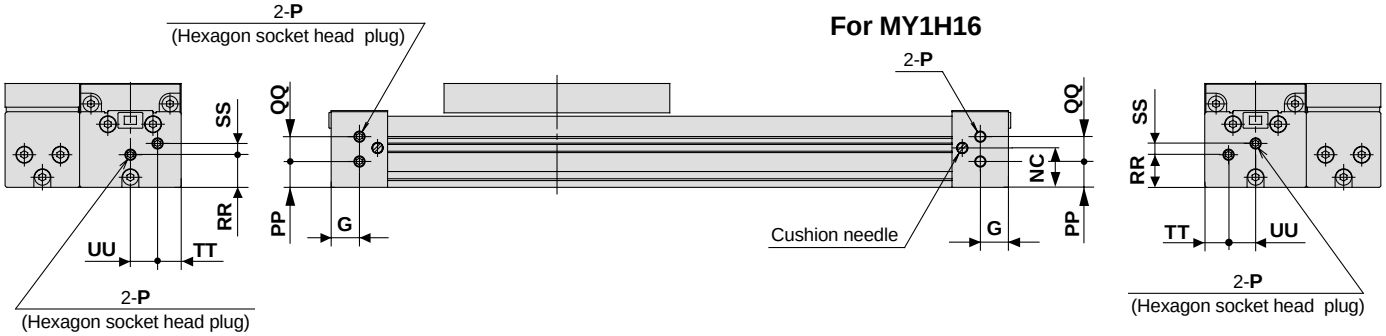
1 in = 25.4 mm

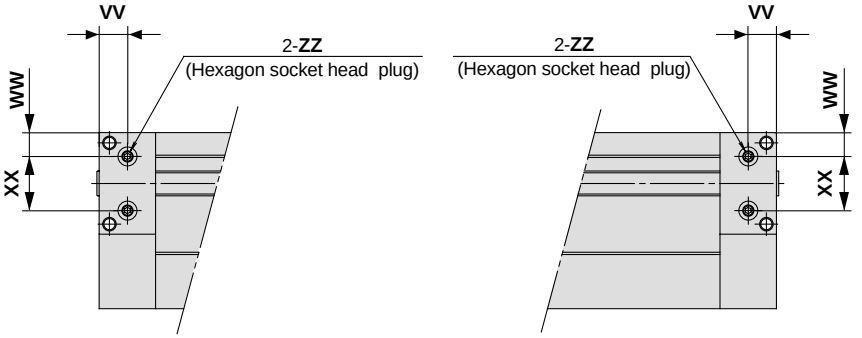
MY1H Bore size **G** — Stroke

Refer to page 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping and for the stroke adjusting unit are identical to the standard type dimensions.
Refer to pages 68 and 69 for details regarding dimensions, etc.



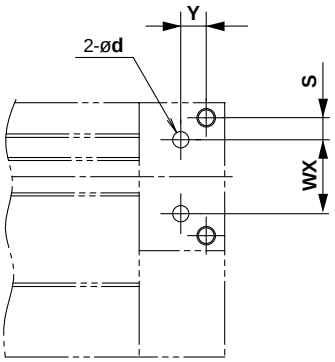
For MY1H16

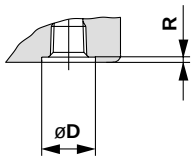




Model	G	NC	P	PP	QQ	RR	SS	TT	UU	V V	WW	XX	ZZ
MY1H16G	14	14	M5 x 0.8	7.5	9	11	3	9	10.5	10	7.5	22	M5 x 0.8
MY1H20G	12.5	17.5	M5 x 0.8	11.5	11	14.5	5	10.5	12	12.5	10.5	24	M5 x 0.8

"P" indicates cylinder supply ports.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom

(Machine the mounting side to the dimensions below.)

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1H16G	22	6.5	4	4	8.4	1.1	C6
MY1H20G	24	8	6	4	8.4	1.1	

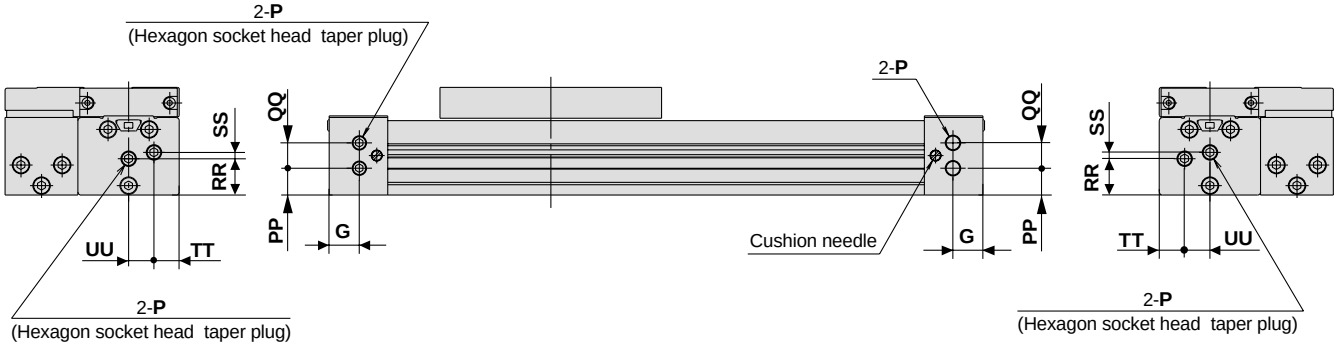
CAD MY1H16G —— SMY1H16, #2 (#2+#7)
MY1H20G —— SMY1H20, #2 (#2+#8)

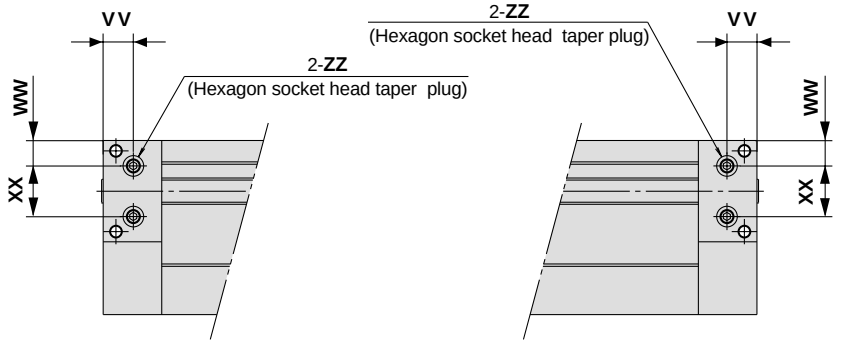
Centralized Piping Type / Dimensions (mm) ø25 to ø40

MY1H Bore size **G** — Stroke

1 in = 25.4 mm

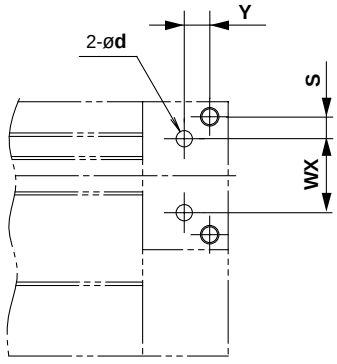
Refer to page 120 regarding centralized piping port variations.
Dimensions for types other than centralized piping and for the stroke adjusting unit are identical to the standard type dimensions.
Refer to pages 68 and 69 for details regarding dimensions, etc.

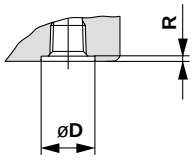




Model	G	P	PP	QQ	RR	SS	TT	UU	VV	WW	XX	ZZ
MY1H25G	16	Rc 1/8	12	16	16	6	14.5	15	16	12.5	28	Rc 1/16
MY1H32G	19	Rc 1/8	17	16	23	4	16	16	19	16	32	Rc 1/16
MY1H40G	23	Rc 1/4	18.5	24	27	10.5	20	22	23	19.5	36	Rc 1/8

"P" indicates cylinder supply ports.





Bottom side (ZZ) piping (applicable O-ring)

Hole sizes for centralized piping on the bottom

(Machine the mounting side to the dimensions below.)

Model	WX	Y	S	d	D	R	Applicable O-ring
MY1H25G	28	9	7	6	11.4	1.1	C9
MY1H32G	32	11	9.5	6	11.4	1.1	
MY1H40G	36	14	11.5	8	13.4	1.1	C11.2

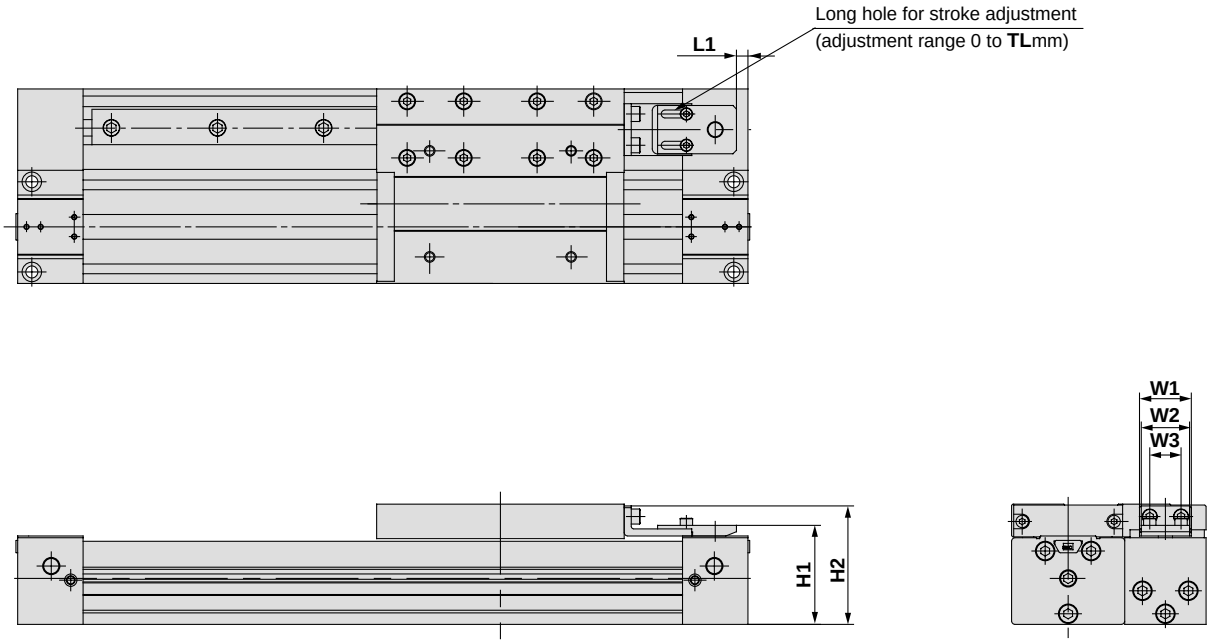
CAD MY1H Bore size G —— SMY1H Bore size, #2 (#2 + #8)

End Lock / Dimensions (mm) ø16 to ø40

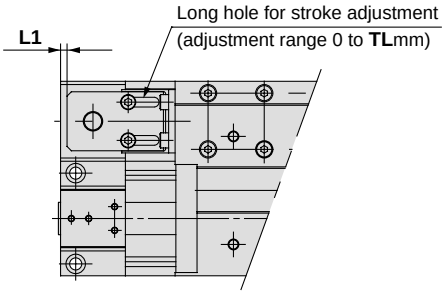
1 in = 25.4 mm

For MY1H - E (right side)

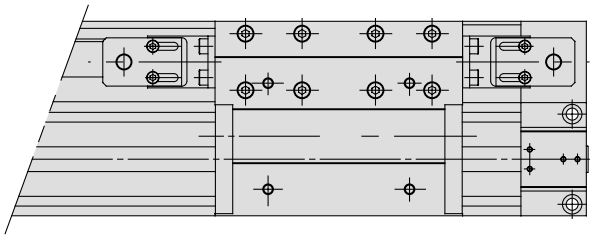
Dimensions for types other than end lock are identical to the standard type dimensions.
Refer to page 68 for details regarding dimensions, etc.



For MY1H - F (left side)



For MY1H - W (both sides)



Dimensions (mm)

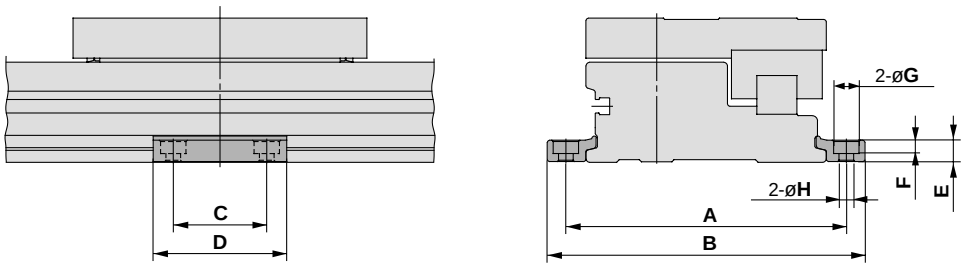
Model	H1	H2	L1	TL	W1	W2	W3
MY1H16	39.2	33	0.5	5.6	18	16	10.4
MY1H20	45.7	39.5	3	6	18	16	10.4
MY1H25	53.5	46	3	11.5	29.3	27.3	17.7
MY1H32	67	56	6.5	12	29.3	27.3	17.7
MY1H40	83	68.5	10.5	16	38	35	24.4

"P" indicates cylinder supply ports.
∗ The plug for MY1H16/20-P is a hexagon socket head plug.

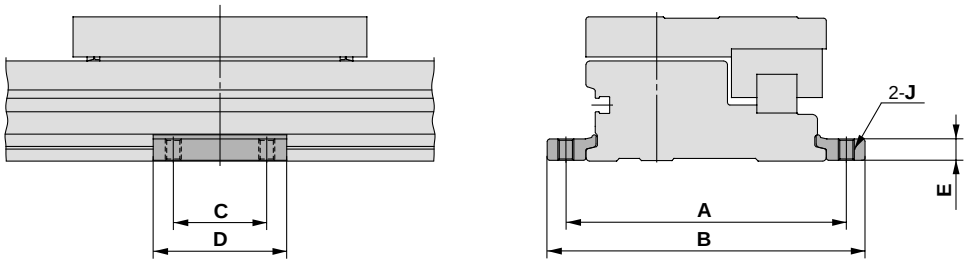
Side Support / Dimensions (mm)

1 in = 25.4 mm

Side support A
MY-S A



Side support B
MY-S B



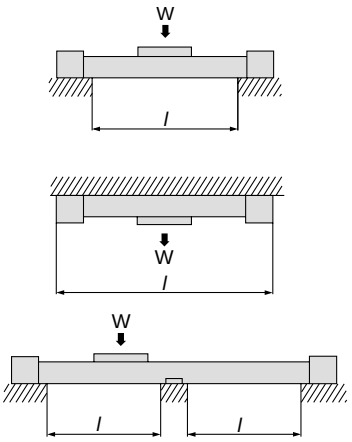
Model	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S10$^{A}_{B}$	**MY1H10**	53	61.6	12	21	3.6	1.8	6.5	3.4	M4 x 0.7
MY-S16$^{A}_{B}$	**MY1H16**	71	81.6	15	26	4.9	3	6.5	3.4	M4 x 0.7
MY-S20$^{A}_{B}$	**MY1H20**	91	103.6	25	38	6.4	4	8	4.5	M5 x 0.8
MY-S25$^{A}_{B}$	**MY1H25**	105	119	35	50	8	5	9.5	5.5	M6 x 1
MY-S32$^{A}_{B}$	**MY1H32**	130	148	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S40$^{A}_{B}$	**MY1H40**	145	167	55	80	14.8	8.5	14	9	M10 x 1.5

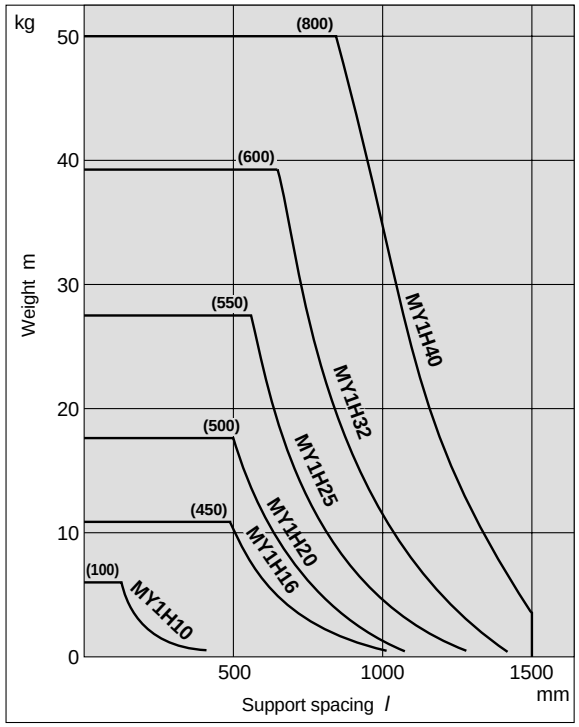
CAD

- Side support A
  MY-S16A —— SMY1H16, #5 (#1 + #5 + #7)
  For ø20 to ø40
  MY-S (Bore size) A —— SMY1H (Bore size), #6 (#1 + #6 + #8)
- Side support B
  MY-S16B —— SMY1H16, #6 (#1 + #6 + #7)
  For ø20 to ø40
  MY-S (Bore size) B —— SMY1H (Bore size), #7 (#1 + #7 + #8)

Guide for Using Side Supports

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.



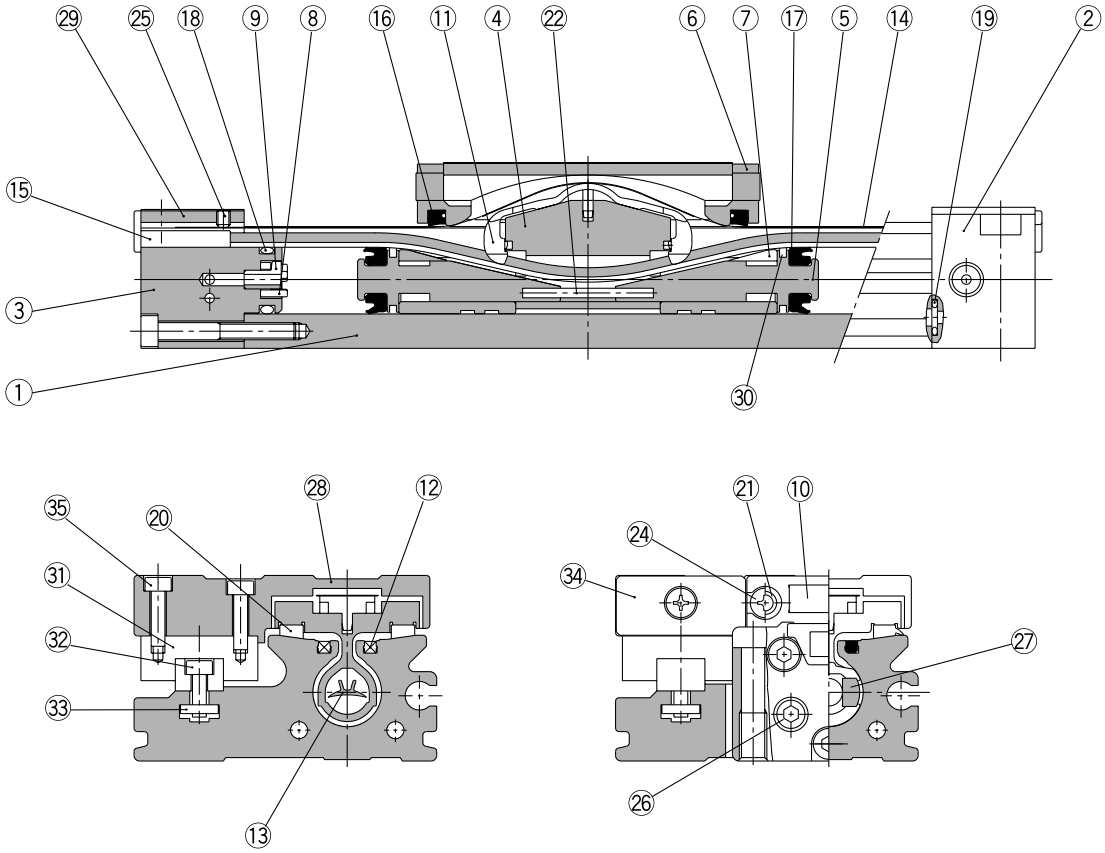


⚠ Caution

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.

Construction

Centralized piping type/MY1H10G



Parts list

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover WR**	Aluminum alloy	Hard anodized
3	**Head cover WL**	Aluminum alloy	Hard anodized
4	**Piston yoke**	Aluminum alloy	Hard anodized
5	**Piston**	Aluminum 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**	Chrome molybdenum steel	Nickel plated

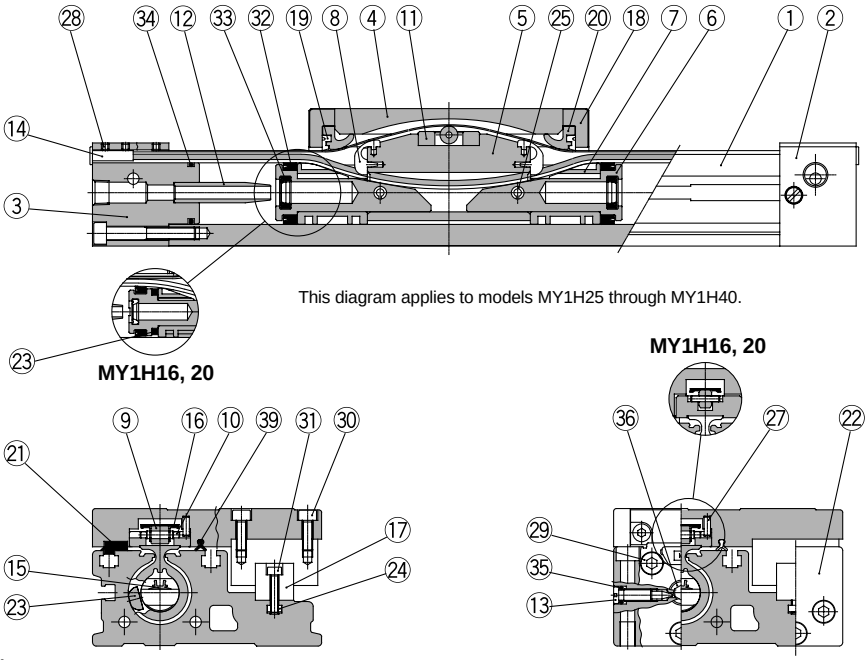
Parts list

No.	Description	Material	Note
22	**Spring pin**	Stainless steel	
23	**Hexagon socket head cap screw**	Chrome 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**	Rare earth magnet	
28	**Slide Table**	Aluminum alloy	Hard anodized
29	**Head plate**	Stainless steel	
30	**Felt**	Felt	
31	**Linear guide**	—	
32	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
33	**Square nut**	Carbon steel	Nickel plated
34	**Stopper plate**	Carbon steel	Nickel plated
35	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated

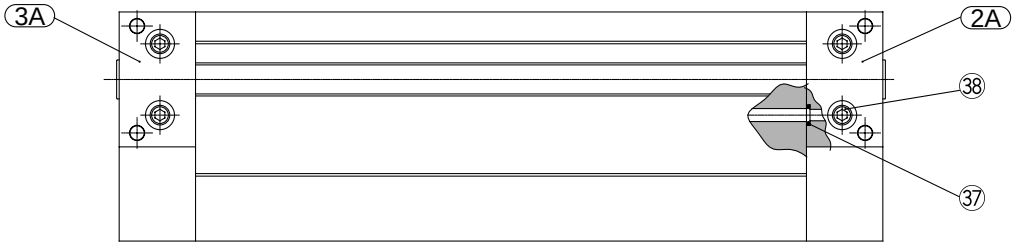
Seal list

No.	Description	Material	Qty.	**MY1B10**
13	**Seal belt**	Special resin	1	MY10-16A-stroke
14	**Dust seal band**	Stainless steel	1	MY10-16B-stroke
16	**Scraper**	NBR	2	MYB10-15AR0597
17	**Piston seal**	NBR	2	GMY10
18	**Tube gasket**	NBR	2	P7
19	**O-ring**	NBR	4	ø5.33 x ø3.05 x ø1.14

Standard type



Centralized piping type



Parts list

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover R**	Aluminum alloy	Hard anodized
2A	**Head cover WR**	Aluminum alloy	Hard anodized
3	**Head cover L**	Aluminum alloy	Hard anodized
3A	**Head cover WL**	Aluminum alloy	Hard anodized
4	**Slide table**	Aluminum alloy	Hard anodized
5	**Piston yoke**	Aluminum alloy	Chromated
6	**Piston**	Aluminum 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**	Brass	
13	**Cushion needle**	Rolled steel	Nickel plated
14	**Belt clamp**	Special resin	

Parts list

No.	Description	Material	Note
17	**Guide**	—	
18	**End cover**	Chrome molybdenum steel	Nickel plated
20	**Backup plate**	Special resin	
21	**Bearing**	Special resin	
22	**Guide cover**	Aluminum alloy	Hard anodized
23	**Magnet**	Rare earth magnet	
24	**Square nut**	Carbon steel	Nickel plated
25	**Spring pin**	Carbon tool steel	Black zinc chromated
27	**Parallel pin**	Stainless steel	(except ø16, ø20)
28	**Hexagon socket head set screw**	Chrome molybdenum steel	Black zinc chromated/Nickel plated
29	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
30	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
31	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
36	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
38	**Hexagon socket head taper plug**	Carbon steel	Nickel plated
39	**Side scraper**	Special resin	

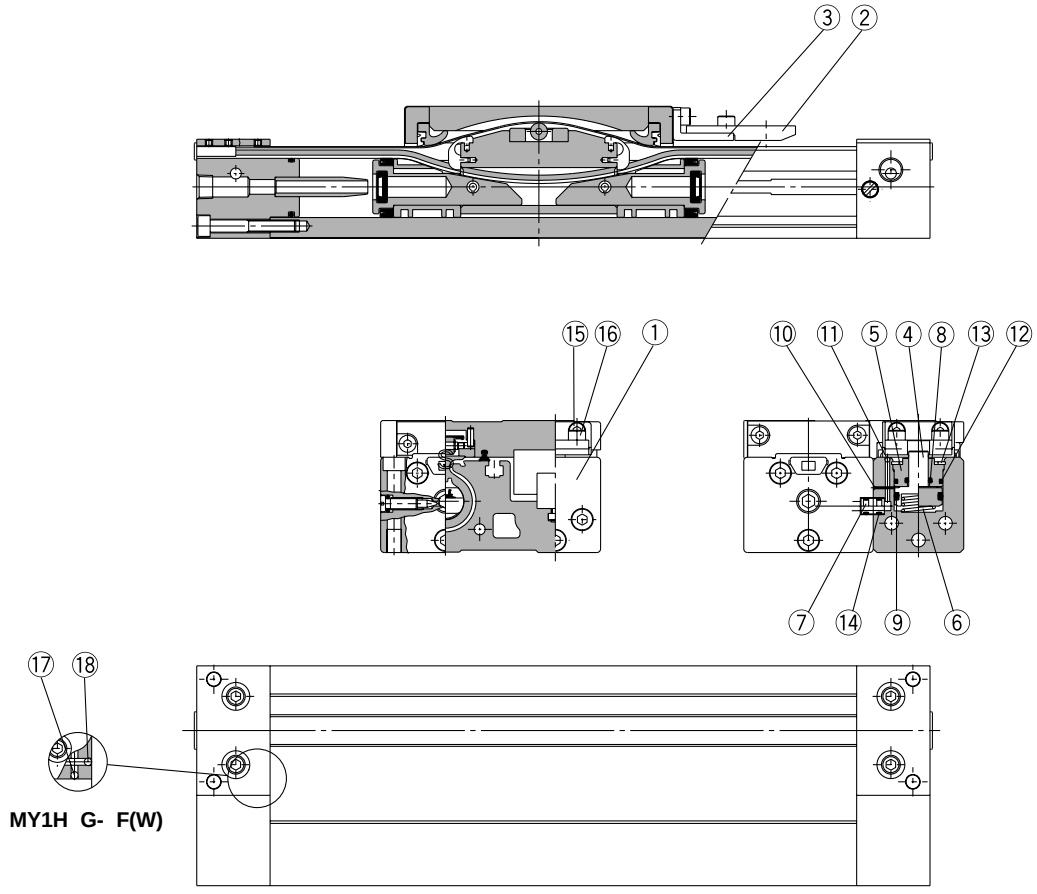
Seal list

No.	Description	Material	Qty.	MY1H16	MY1H20	MY1H25	MY1H32	MY1H40
15	**Seal belt**	Special resin	1	MY16-16A-Stroke	MY20-16A-Stroke	MY25-16A-Stroke	MY32-16A-Stroke	MY40-16A-Stroke
16 Note)	**Dust seal band**	Stainless steel	1	MY16-16B-Stroke	MY20-16B-Stroke	MY25-16B-Stroke	MY32-16B-Stroke	MY40-16B-Stroke
19	**Scraper**	NBR	2	MYH16-15AK2900	CYP025-15A29721	CYP032-15A29722	CYP040-15A29723	CYP40-15A29723
32	**Piston seal**	NBR	2	GMY16	GMY20	GMY25	GMY32	GMY40
33	**Cushion seal**	NBR	2	MYB16-15-A7163	MYB20-15-A7164	RCS-8	RCS-10	RCS-12
34	**Tube gasket**	NBR	2	P12	P16	TMY-25	TMY-32	TMY-40
35	**O-ring**	NBR	2	ø4 x ø1.8 x ø1.1	ø5.1 x ø3 x ø1.05	ø7.15 x ø3.75 x ø1.7	ø7.15 x ø3.75 x ø1.7	ø8.3 x ø4.5 x ø1.9
37	**O-ring**	NBR	4	ø6.2 x ø3 x ø1.6	ø7 x ø4 x ø1.5	P-5	P-6	C-9

Note) Two types of dust seal band 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

Construction

With end lock



Parts list

No.	Description	Material	Note
1	**Lock body**	Aluminum alloy	Hard anodized
2	**Lock finger**	Carbon tool steel	Nickel plated
3	**Lock finger bracket**	Carbon steel	Nickel plated
4	**Lock piston**	Carbon tool steel	Electroless nickel plated
5	**Rod cover**	Aluminum alloy	Hard anodized
6	**Return spring**	Spring steel	Zinc chromated
7	**Bypass pipe**	Aluminum alloy	Hard anodized
10	**Steel ball**	High carbon chrome bearing steel	
11	**Steel ball**	High carbon chrome bearing steel	
13	**Round R type retainer**	Carbon tool steel	Nickel plated
15	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
16	**Hexagon socket head cap screw**	Chrome molybdenum steel	Nickel plated
17	**Steel ball**	High carbon chrome bearing steel	
18	**Steel ball**	High carbon chrome bearing steel	

Seal list

No.	Description	Material	Qty.	MY1H16	MY1H20	MY1H25	MY1H32	MY1H40
8	**Rod seal**	NBR	1	DYR-4	DYR-4	DYR8K	DYR8K	DYR8K
9	**Piston seal**	NBR	1	DYP-12	DYP-12	DYP-20	DYP-20	DYP-20
12	**O-ring**	NBR	1	C-9	C-9	C-18	C-18	C-18
14	**O-ring**	NBR	2	ø5.5 x ø3.5 x ø1.0	ø5.5 x ø3.5 x ø1.0	C-5	C-5	C-5

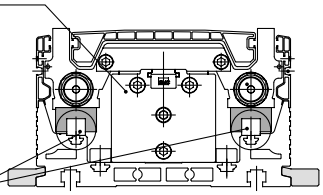
Series MY1HT

High Rigidity/ High Precision Guide Type

ø50, ø63

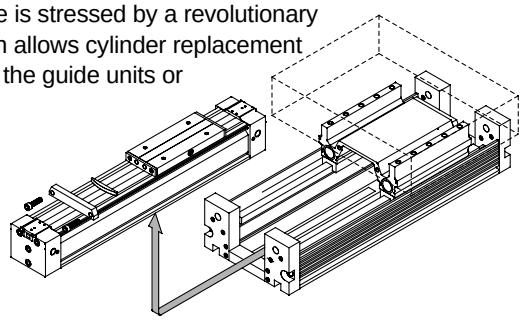
The use of two linear guides allows a maximum load of 320kg. (ø63)

Rodless cylinder
MY1BH



2 linear guides

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

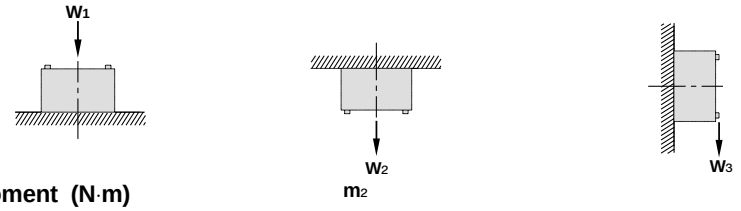


Maximum Allowable Moment/Maximum Allowable Load

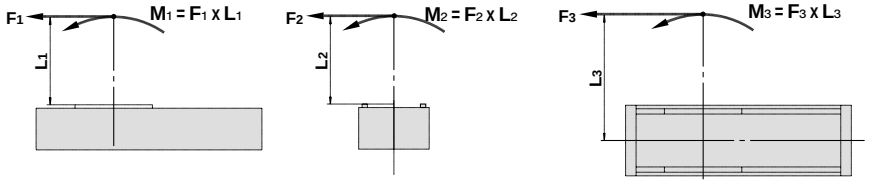
Model	Bore size (mm)	Max. allowable moment (N·m)			Max. allowable load (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1HT	50	140	180	140	200	140	200
	63	240	300	240	320	220	320

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.

Load (kg)



Moment (N·m)



<Calculation of guide load factor>

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

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

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

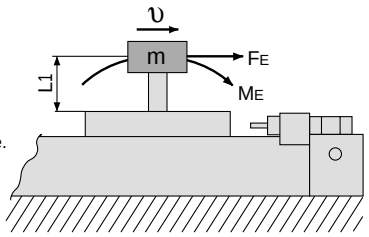
Note 1) Moment caused by the load, etc., with cylinder in resting condition.
Note 2) Moment caused by the impact load equivalent at the stroke end (at the time of impact with stopper).
Note 3) Depending on the shape of the work piece, multiple moments may occur. When this happens, the sum of the load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

2. Reference formulae [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_E : Load equivalent to impact (at impact with stopper) (N)
υa: Average speed (mm/s)
M : Static moment (N·m)
υ : Impact speed (mm/s)
L_1 : Distance to the load's center of gravity (m)
M_E: Dynamic moment (N·m)
g : Gravitational acceleration (9.8m/s²)

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

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



Note 4) $\frac{1.4}{100}\upsilon a$ is a dimensionless coefficient for calculating impact force.

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

3. Refer to pages 80 and 81 for detailed selection procedures.

Maximum allowable moment

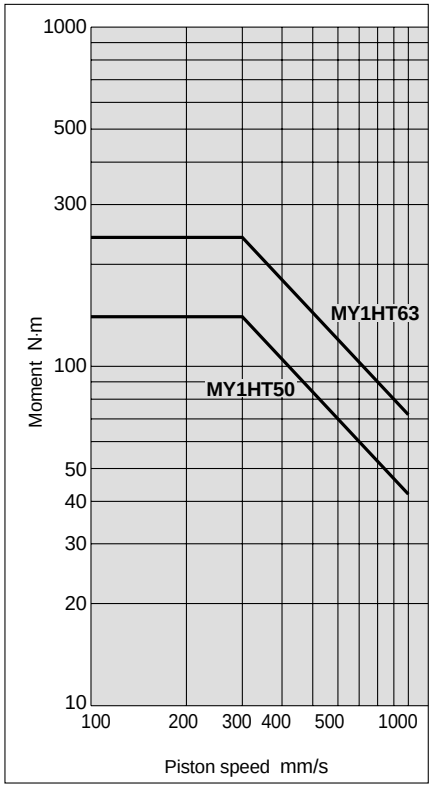
Select the moment from within the range of operating limits shown in the graphs. Note that the maximum allowable load value may sometimes be exceeded even within the operating limits shown in the graphs. Therefore, also check the allowable load for the selected conditions.

Note:
1 N·m = 0.7375 ft·lb
1 kg = 2.2046 lb
1 in = 25.4 mm

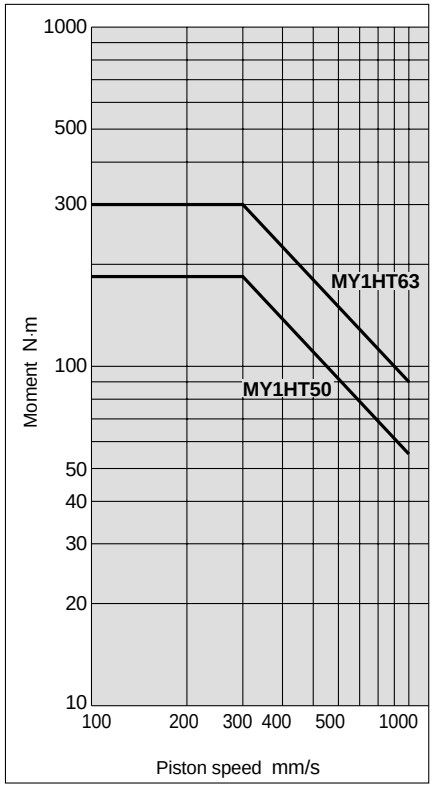
Maximum allowable load

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.

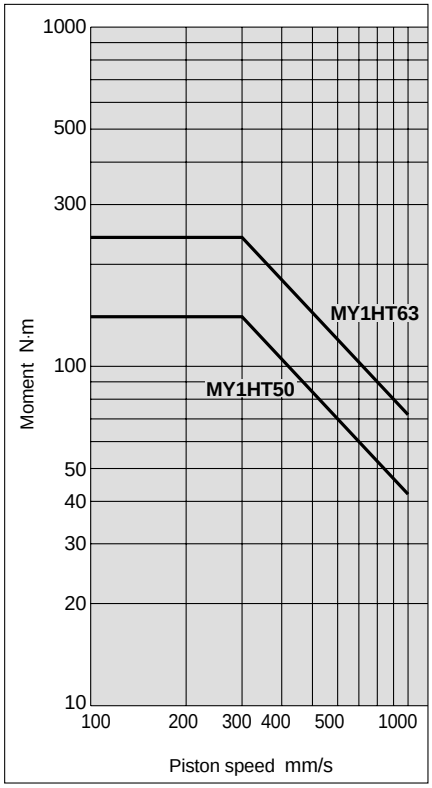
MY1HT/M1



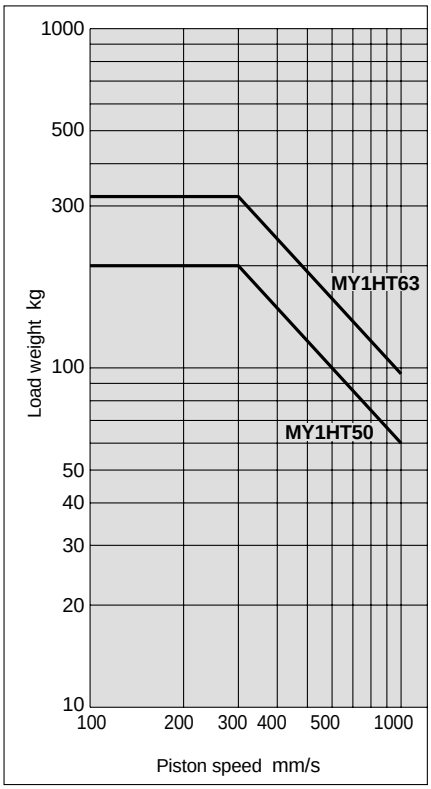
MY1HT/M2



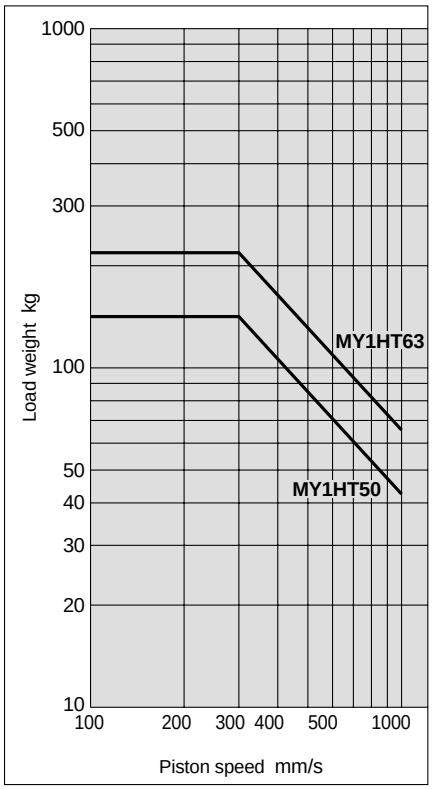
MY1HT/M3



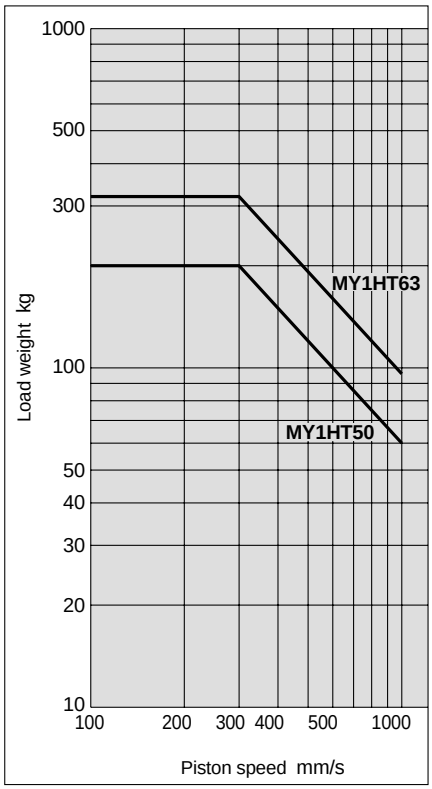
MY1HT/m1



MY1HT/m2



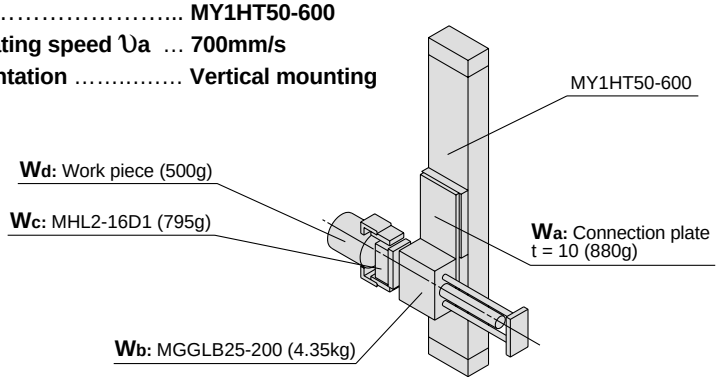
MY1HT/m3



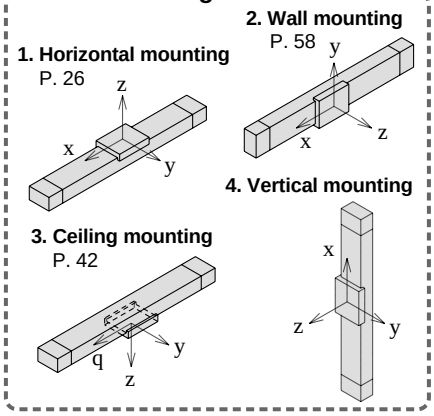
Calculation of Guide Load Factor

1 Operating conditions

Cylinder **MY1HT50-600**
Average operating speed υ**a** ... **700mm/s**
Mounting orientation ..... **Vertical mounting**

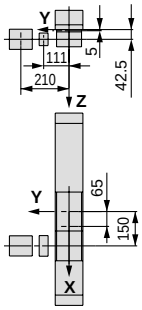


Mounting orientation



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

2 Load blocking



Mass and center of gravity for each work piece

Work piece no. Wn	Mass m	Center of gravity		
		X-axis Xn	Y-axis Yn	Z-axis Zn
Wa	0.88kg	65mm	0mm	5mm
Wb	4.35kg	150mm	0mm	42.5mm
Wc	0.795kg	150mm	111mm	42.5mm
Wd	0.5kg	150mm	210mm	42.5mm

n = a, b, c, d

3 Composite center of gravity calculation

$m_4 = \Sigma m_n$
$= 0.88 + 4.35 + 0.795 + 0.5 =$ **6.525kg**

$X = \frac{1}{m_4} \times \Sigma (m_n \times x_n)$
$= \frac{1}{6.525} (0.88 \times 65 + 4.35 \times 150 + 0.795 \times 150 + 0.5 \times 150) =$ **138.5mm**

$Y = \frac{1}{m_4} \times \Sigma (m_n \times y_n)$
$= \frac{1}{6.525} (0.88 \times 0 + 4.35 \times 0 + 0.795 \times 111 + 0.5 \times 210) =$ **29.6mm**

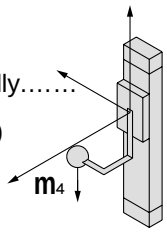
$Z = \frac{1}{m_4} \times \Sigma (m_n \times z_n)$
$= \frac{1}{6.525} (0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) =$ **37.4mm**

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.)

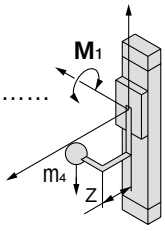


M_1: Moment

M_1 max (from 1 of graph MY1MHT/M_1) = 60 (N·m) .....

$M_1 = m_4 \times g \times Z = 6.525 \times 9.8 \times 37.4 \times 10^{-3} = 2.39$ (N·m)

Load factor $\alpha_1 = M_2/M_2$ max = 2.39/60 = **0.04**

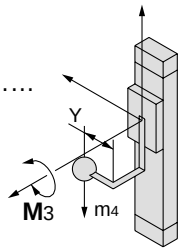


M_3: Moment

M_3 max (from 2 of graph MY1HT/M_3) = 60 (N·m) ……

$M_3 = m_4 \times g \times Y = 6.525 \times 9.8 \times 29.6 \times 10^{-3} = 1.89$ (N·m)

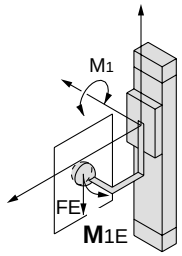
Load factor $\alpha_2 = M_3/M_3$ max = 1.89/60 = **0.03**



5 Calculation of load factor for dynamic moment

Equivalent load at impact F_E

$$F_E = \frac{1.4}{100} \times \upsilon a \times g \times m = \frac{1.4}{100} \times 700 \times 9.8 \times 6.525 = 626.7 \text{ (N)}$$



M_{1E}: Moment

M_{1E} max (from 3 of graph MY1HT/M_1 where 1.4υa = 980mm/s) = 42.9 (N·m) ……

$$M_{1E} = \frac{1}{3} \times F_E \times Z = \frac{1}{3} \times 626.7 \times 37.4 \times 10^{-3} = 7.82 \text{ (N·m)}$$

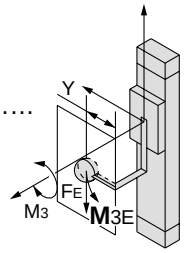
Load factor $\alpha_3 = M_{1E}/M_{1E}$ max = 7.82/42.9 = **0.18**

M_{3E}: Moment

M_{3E} max (from 4 of graph MY1HT/M_3 where 1.4υa = 980mm/s) = 42.9 (N·m) ……

$$M_{3E} = \frac{1}{3} \times F_E \times Y = \frac{1}{3} \times 626.7 \times 29.6 \times 10^{-3} = 6.19 \text{ (N·m)}$$

Load factor $\alpha_4 = M_{3E}/M_{3E}$ max = 6.19/42.9 = **0.14**



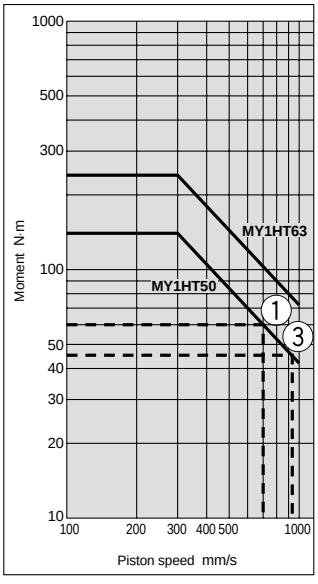
5 Sum and examination of guide load factors

$\Sigma\alpha = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 = 0.39 \leq 1$

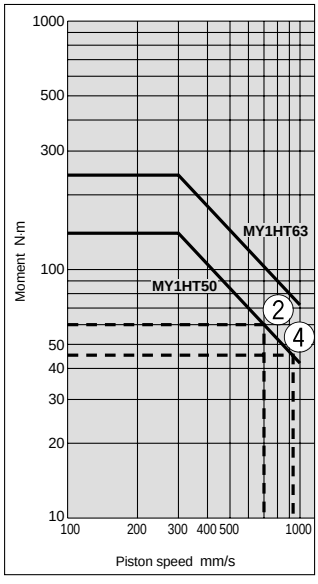
The above calculation is within the allowable value and the selected model can be used.
Select a separate shock absorber.
In an actual calculation, when the sum of guide load factors $\Sigma\alpha$ in the formula above is more than 1, consider decreasing the speed, increasing the bore size, or changing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

Allowable moment

MY1HT/m_1



MY1HT/M_3



How to Order

High Rigidity High Precision Guide Type

MY1HT **50** **□** — **400** **L** — **Z73** **□**

High rigidity/High precision guide type (2 linear guides)

Cylinder bore size

50	50mm
63	63mm

Piping

Nil	Standard type
G	Centralized piping type

Auto switch type

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Stroke
Refer to the standard stroke table.

Stroke adjusting unit

L	One shock absorber at each stroke end
H	Two shock absorbers at each stroke end
LH	One shock absorber at one end, two shock absorbers at one end

Options

Stroke adjusting unit numbers

Bore size (mm)	**50**	**63**
Unit type	MYT-A50L	MYT-A63L

Side support numbers

Type \ Bore size (mm)	**50**	**63**
Side support A	MY-S63A	
Side support B	MY-S63B	

Refer to page 88 for detailed information on dimensions, etc.

Applicable auto switches/

Refer to pages 96 through 108 for detailed auto switch specifications.

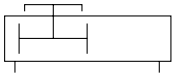
Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch models		Lead wire length (m)∗			Applicable load	
					DC		AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)		
								Perpendicular	In-line					
Reed switch	—	Grommet	Yes	3 wire (NPN equiv.)	—	5V	—	—	**Z76**	●	●	—	IC circuit	—
				2 wire	24V	12V	100V	—	**Z73**	●	●	●	—	Relay, PLC
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit	
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay, PLC
				3 wire (PNP)				**Y7PV**	**Y7P**	●	●	○		
				2 wire		12V		**Y69B**	**Y59B**	●	●	○	—	
	Diagnostic Indication (2 color indicator)			3 wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit	
				3 wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○		
				2 wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—	

∗ Lead wire length symbols: 0.5m …….. Nil (Example) Y59A
3m …….. L Y59AL
5m …….. Z Y59AZ

∗ Solid state switches marked with a "○" symbol are produced upon receipt of order.
Note) Separate switch spacers (MB-32-36-L8509) are required for retrofitting of auto switches.

Specifications

Symbol



Bore size (mm)		50	63
Fluid		Air	
Action		Double acting	
Operating pressure range		0.1 to 0.8MPa (14 to 116 psi)	
Proof pressure		1.2MPa (174 psi)	
Ambient and fluid temperature		5 to 60°C (41 to 140°F)	
Piston speed		100 to 1000mm/s (3.9 to 39.4 in/s)	
Cushion		Double side shock absorber (standard)	
Lubrication		Non-lube	
Stroke length tolerance		2700 or less $^{+1.8}_{0}$, 2701 to 5000 $^{+2.8}_{0}$	
Port size	**Side port**	Rc 3/8	

Note) Use at a speed within the absorption capacity. Refer to page 84.

Stroke Adjusting Unit Specifications

Applicable bore size (mm)	50		63	
Unit symbol, contents	L	H	L	H
	RB2015 and adjusting bolt: 1 set each	RB2015 and adjusting bolt: 2 sets each	RB2725 and adjusting bolt: 1 set each	RB2725 and adjusting bolt: 2 sets each
Stroke fine adjusting range (mm)	0 to –60		0 to –85	
Stroke adjusting range	Refer to page 85 for adjustment method.			

Shock absorber model		RB2015 x 1 pc.	RB2015 x 2 pcs.	RB2725 x 1 pc.	RB2725 x 2 pcs.
Max. energy absorption J (ft·lb)		58.8 (43.4)	88.2 (65.0)	147 (108.4)	220.5 (162.6)
Stroke absorption mm (in)		15 (0.6)	15 (0.6)	25 (1.0)	25 (1.0)
Max. impact speed mm/s (in/s)		1000 (39.4)		1000 (39.4)	
Max. operating frequency (cycles/min)		25	25	10	10
Spring force N (lb_f)	**Extended**	8.34 (1.87)	16.68 (3.75)	8.83 (1.98)	17.66 (3.97)
	Compressed	20.50 (4.61)	41.00 (19.22)	20.01 (4.50)	40.02 (9.00)
Operating temperature range		5 to 60°C (41 to 140°F)			

Note) Maximum energy absorption for 2 pcs. is calculated by multiplying the value for 1 pc. by 1.5.

Theoretical Output

Unit: N

Bore size (mm)	Piston area (mm^2)	Operating pressure (MPa)						
		0.2	0.3	0.4	0.5	0.6	0.7	0.8
50	1962	392	588	784	981	1177	1373	1569
63	3115	623	934	1246	1557	1869	2180	2492

Note: 1N = 0.02248lb_f
1MPa = 145 psi
1mm^2 = 0.0016in^2

Made To Order

Refer to page 109 regarding order made specifications for series MY1H.

Standard Strokes

Bore size (mm)	Standard stroke (mm)*	Max. manufacturable stroke (mm)
50, 63	200, 400, 600, 800, 1000, 1500, 2000	5000

Note) Strokes other than standard are produced after receipt of order.

Weights

Unit: kg (lb

Bore size (mm)	Basic weight	Additional weight per 25mm of stroke	Side support weight (per set)	Stroke adjusting unit weight		
			Type A and B	L unit	LH unit	H unit
50	30.62 (67.5)	0.87 (1.92)	0.17 (0.37)	0.62 (1.37)	0.93 (2.10)	1.24 (2.73)
63	41.69 (91.9)	1.13 (2.49)	0.17 (0.37)	1.08 (2.38)	1.62 (3.57)	2.16 (4.76)

Calculation method Example: **MY1HT50-400L**

Basic weight 30.62kg
Additional weight ..... 0.87/25mm stroke
L unit weight 0.62kg
Cylinder stroke 400mm
30.62 + 0.87 x 400 ÷ 25 + 0.62 x 2 = approx. 45.8

Cushion Capacity

Cushion Selection

<Stroke adjusting unit with built-in shock absorber>

L unit

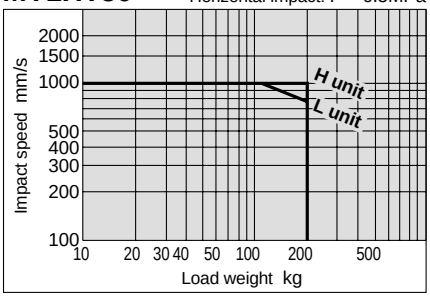
Use this unit when cushioning is necessary outside the air cushion stroke range even if the load and speed are within the air cushion limit line, or when the cylinder is operated in a load and speed range above the air cushion limit line and below the L unit limit line.

H unit

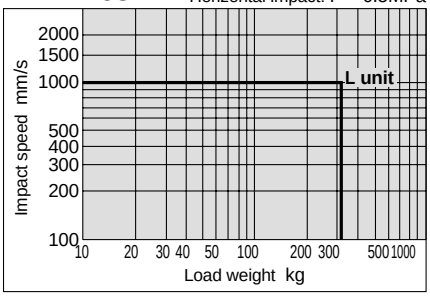
Use this unit when the cylinder is operated in a load and speed range above the L unit limit line and below the H unit limit line.

Stroke Adjusting Unit Absorption Capacity

MY1HT50 Horizontal impact: P = 0.5MPa



MY1HT63 Horizontal impact: P = 0.5MPa



Stopper Bolt Holding Screw Tightening Torque

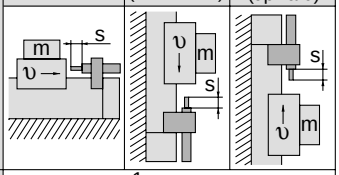
Stopper bolt holding screw tightening torque

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

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

Symbols

υ: Speed of impacting object (m/s)
m: Weight of impacting object (kg)
F: Cylinder thrust (N)
g: Gravitational acceleration (9.8m/s²)
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

Be sure to read before handling. Refer to pages 112 through 119 for safety instructions and common 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 center 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.

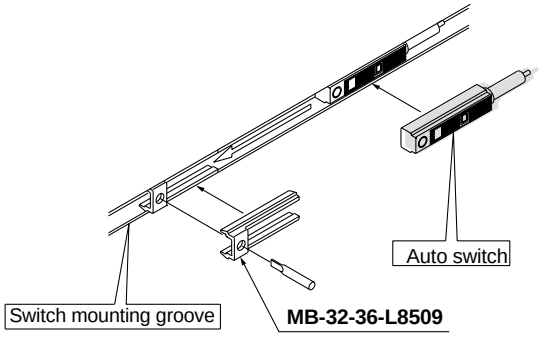
Under operating conditions which create negative pressure inside the cylinder due to external forces or inertial forces, note that air leakage may occur due to separation of the seal belt.

Auto Switch Mounting

⚠ Caution

1. Insert the auto switch into the cylinder's switch mounting groove, then slide it sideways in the direction shown below and place it inside the switch spacer (with the spacer positioned over it).

2. Use a flat head watchmakers screw driver to fasten the switch, tightening with a torque of 0.05 to 0.1N·m. As a rule, it should be turned about 90° past the point at which tightening can be felt.



Stroke Adjustment

⚠ Caution

1. 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 screw driver.
2. 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.
3. 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.

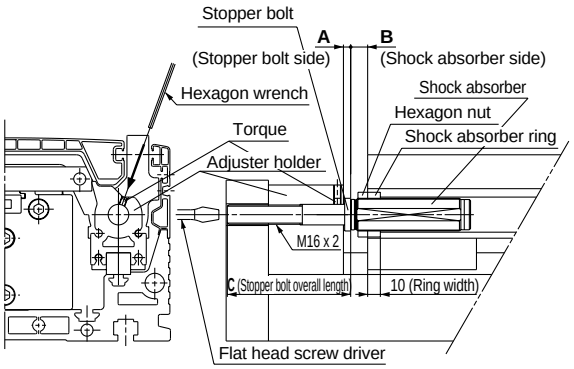


Figure 1. Stroke adjusting section detail

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

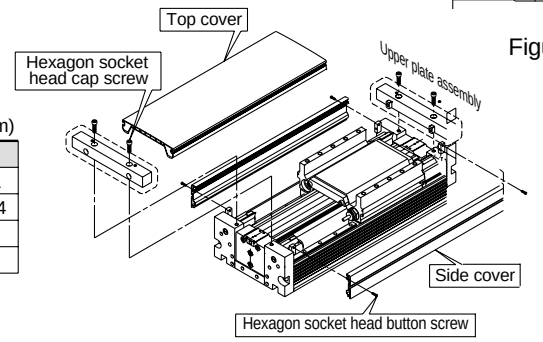


Figure 2. Cover installation and removal

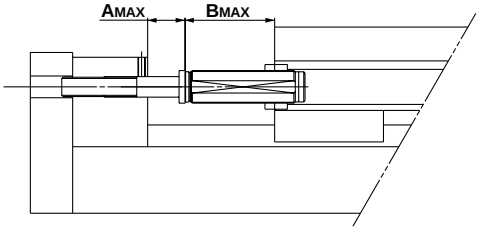


Figure 3. Maximum stroke adjustment detail

Disassembly and Assembly Procedure

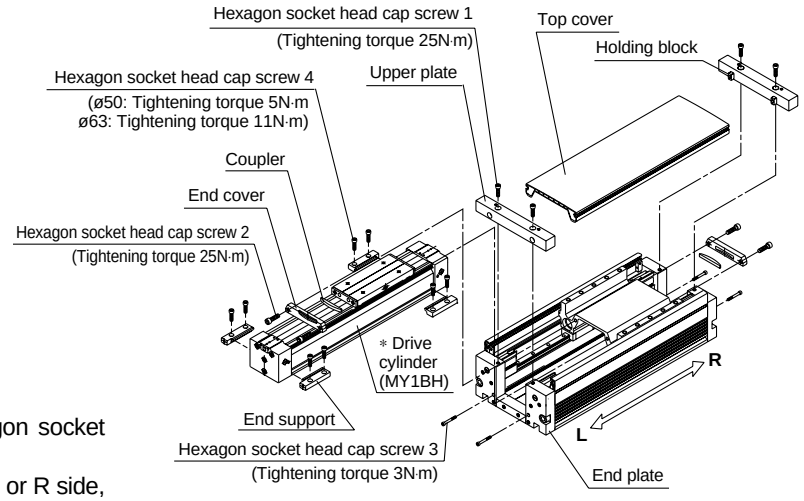
⚠ Caution

Disassembly procedure

1. Remove the hexagon socket head cap screws 1, and remove the upper plates.
2. Remove the top cover.
3. Remove the hexagon socket head cap screws 2, and remove the end covers and couplers.
4. Remove the hexagon socket head cap screws 3.
5. Remove the hexagon socket head cap screws 4, and remove the end supports.
6. Remover the cylinder.

Assembly procedure

1. Insert the MY1BH cylinder.
2. Temporarily fasten the end supports with the hexagon socket head cap screws 4.
3. With two hexagon socket head cap screws 3 on the L or R side, pull the end support and the cylinder.
4. 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.)
5. Re-tighten the hexagon socket head cap screws 4.



6. Fasten the end cover with the hexagon socket head cap screws 2, while making sure that the coupler is in the right direction.
7. Place the top cover on the body.
8. Insert the holding blocks into the top cover and fasten the upper plates with the hexagon socket head cap screws 1.

∗ Drive Cylinder (Series MY1BH)

Since series MY1BH is a drive cylinder for series MY1HT, its construction is different from series MY1B.
Do not use series MY1B as a drive cylinder, because it will cause damage.

How to order

High rigidity High precision guide type	MY1HT	50	□	300	L	Z73	□	
Drive cylinder	MY1BH	50	□	300				

Stroke (mm)

Bore size

50	50mm
63	63mm

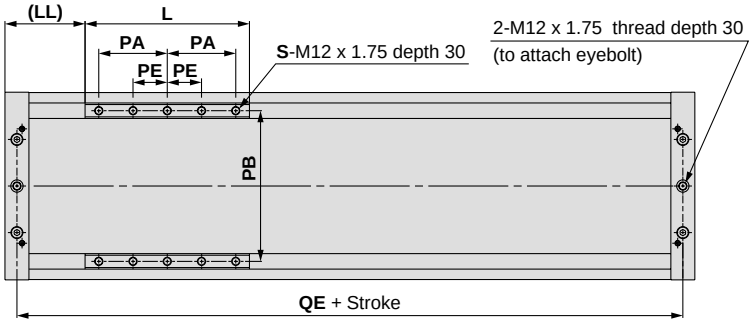
Piping

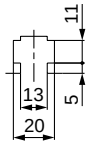
Nil	Standard type
G	Centralized piping type

Standard Type / Dimensions ø50, ø63

MY1HT **Bore size** — **Stroke** **L**

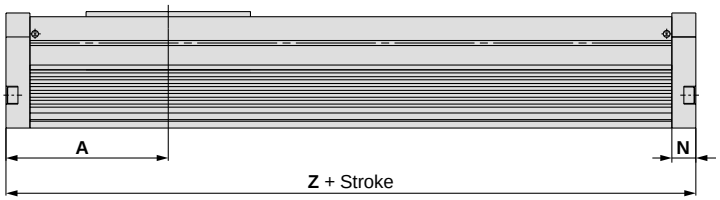
1 in = 25.4 mm

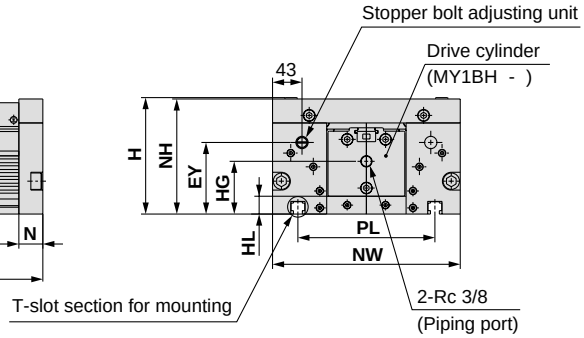




Applicable nut JIS B1163
Square nut M12

Dimensions of T-slot for mounting





Model	A	EY	H	HG	HL	L	LL	N	NH	NW	PA	PB	PE
MY1HT50	207	97.5	145	63	23	210	102	30	143	254	90	200	—
MY1HT63	237	104.5	170	77	26	240	117	35	168	274	100	220	50

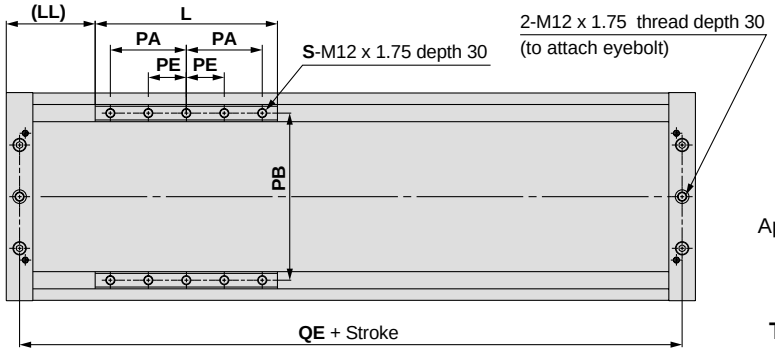
Model	PL	QE	S	Z
MY1HT50	180	384	6	414
MY1HT63	200	439	10	474

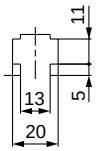
Centralized Piping Type / Dimensions (mm) ø50, ø63

MY1HT **Bore size** **G** — **Stroke** **L**

1 in = 25.4 mm

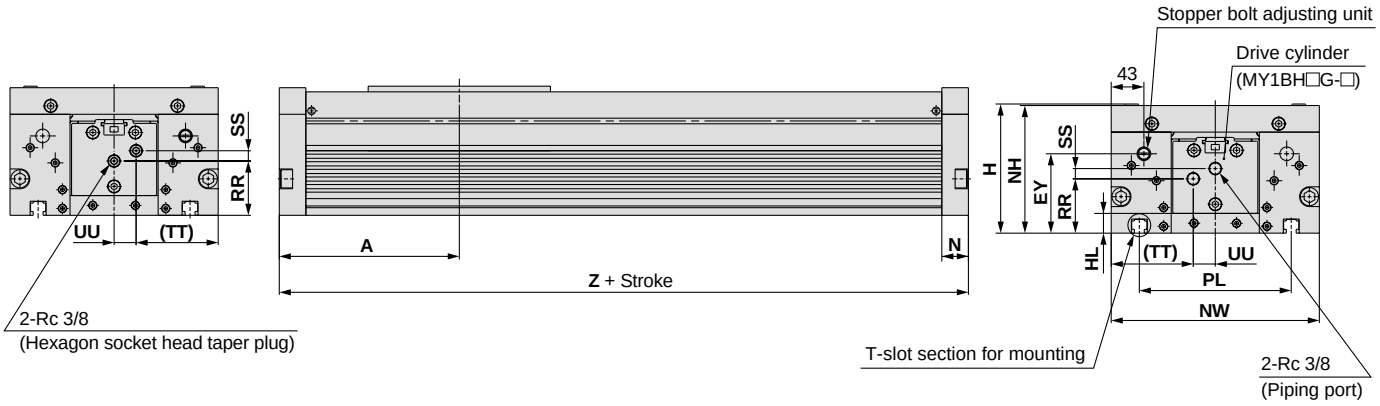
(Refer to page 120 regarding centralized piping port variations.)





Applicable nut JIS B1163
Square nut M12

Dimensions of T-slot for mounting



Model	A	EY	H	HL	L	LL	N	NH	NW	PA	PB	PE
MY1HT50	207	97.5	145	23	210	102	30	143	254	90	200	—
MY1HT63	237	104.5	170	26	240	117	35	168	274	100	220	50

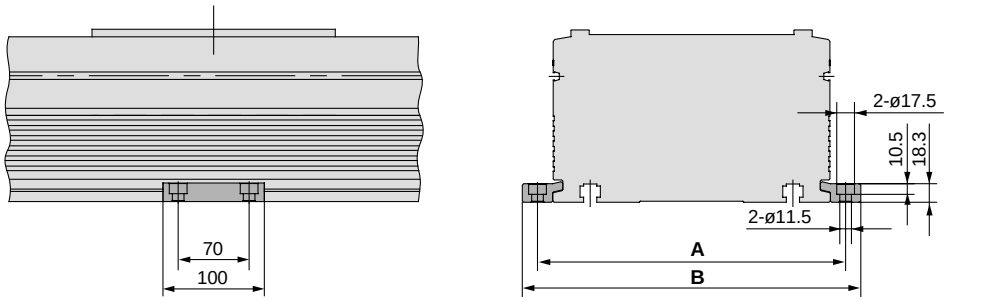
Model	PL	QE	S	Z	RR	SS	TT	UU
MY1HT50	180	384	6	414	57	10	103.5	23.5
MY1HT63	200	439	10	474	71.5	13.5	108	29

Note) For centralized piping specifications, the drive cylinder has centralized piping specifications (MY1BH□G-□).

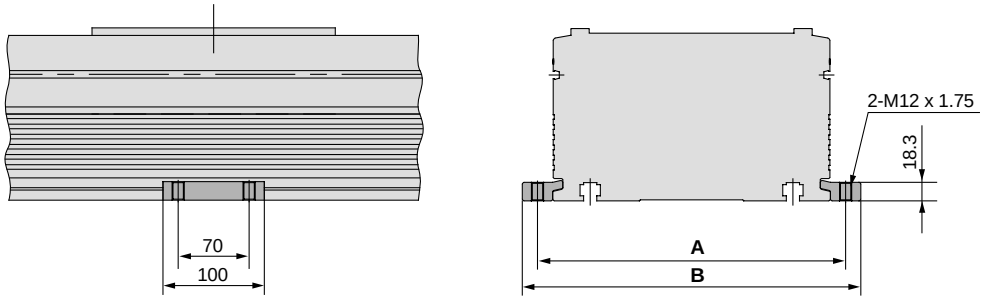
Side Support / Dimensions (mm)

1 in = 25.4 mm

Side support A
MY-S63A



Side support B
MY-S63B

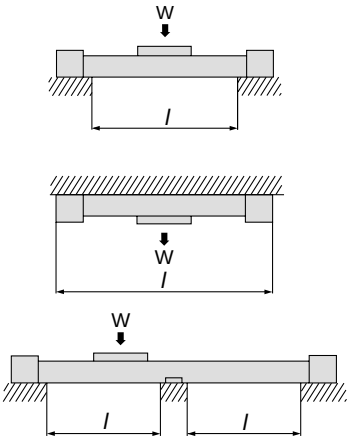


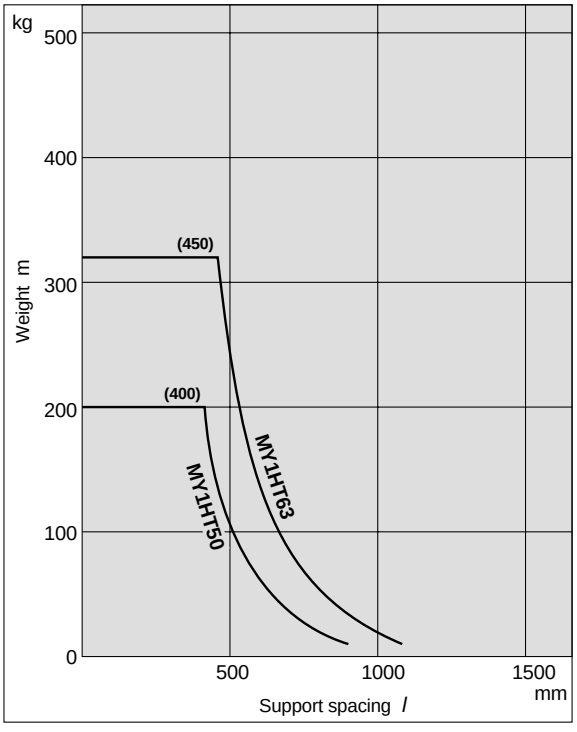
Dimensions (mm)

Model	Applicable cylinder	A	B
MY-S63$^{A}_{B}$	**MY1HT50**	284	314
	MY1HT63	304	334

Guide for Using Side Supports

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.



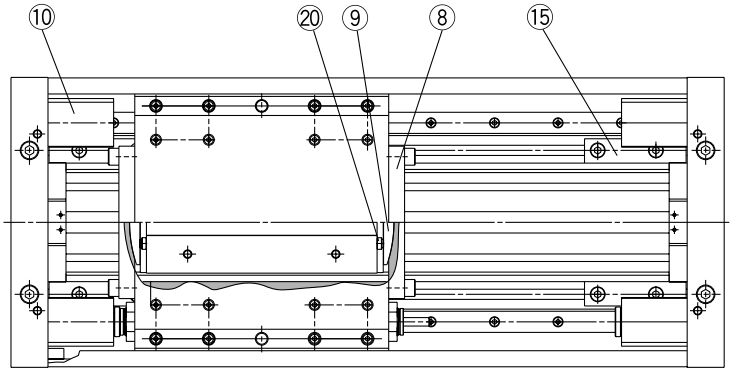


⚠ Caution

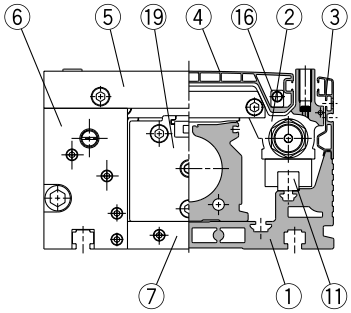
1. If the cylinder mounting surfaces are not measured accurately, using a side support may cause poor operation. Therefore, be sure to level the cylinder tube when mounting. Also, for long stroke operation involving vibration and impact, use of a side support is recommended even if the spacing value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

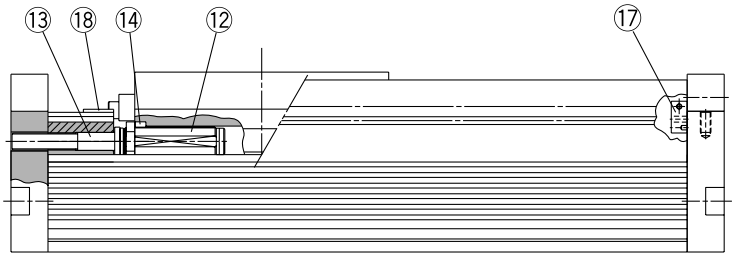
Construction

Standard type



Note) With top cover removed



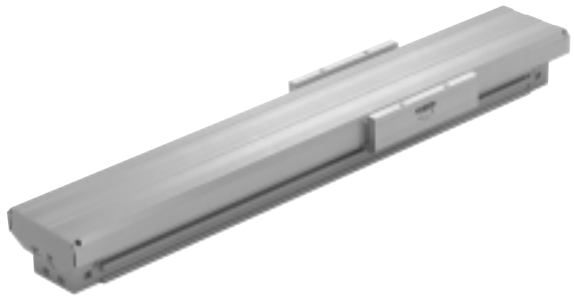


Note) With top cover removed

Parts list

No.	Description	Material	Note
1	**Guide frame**	Aluminum alloy	Hard anodized
2	**Slide table**	Aluminum alloy	Hard anodized
3	**Side cover**	Aluminum alloy	Hard anodized
4	**Top cover**	Aluminum alloy	Hard anodized
5	**Upper plate**	Aluminum alloy	Hard anodized
6	**End plate**	Aluminum alloy	Hard anodized
7	**Bottom plate**	Aluminum alloy	Hard anodized
8	**End Cover**	Aluminum alloy	Chromated
9	**Coupler**	Aluminum alloy	Chromated
10	**Adjuster holder**	Aluminum alloy	Hard anodized
11	**Guide**	—	
12	**Shock absorber**	—	
13	**Stopper bolt**	Carbon steel	Nickel plated
14	**Absorber ring**	Rolled steel	Nickel plated
15	**End support**	Aluminum alloy	Hard anodized
16	**Top block**	Aluminum alloy	Chromated
17	**Side block**	Aluminum alloy	Chromated
18	**Slide plate**	Special resin	
19	**Rodless cylinder**	—	MY1BH
20	**Stopper**	Carbon steel	Nickel plated

Mechanically Jointed Rodless Cylinder With Protective Cover



Specifications

Bore size (mm)		16	20	25	32	40
Fluid		Air				
Action		Double acting				
Operating pressure range	MY1MW	0.15 to 0.8MPa (22 to 116 psi)				
	MY1CW	0.1 to 0.8MPa (14 to 116 psi)				
Proof pressure		1.2MPa (174 psi)				
Ambient and fluid temperature		5 to 60°C (41 to 140°F)				
Cushion		Air cushion at both ends (standard)				
Lubrication		Non-lube				
Stroke length tolerance (mm)		1000 or less $^{+1.8}_{0}$ 1001 to 3000 $^{+2.8}_{0}$	2700 or less $^{+1.8}_{0}$, 2701 to 5000 $^{+2.8}_{0}$			
Port size	Front, Side ports	M5 x 0.8		Rc 1/8		Rc 1/4
	Bottom ports (centralized piping type only)	ø4		ø5	ø6	ø8

Note 1) When operating with air cushion only, do not allow the piston speed to exceed 1000mm/sec. Also, with centralized piping, the piston speed is between 100 to 1000mm/sec.

Piston speed

Bore size (mm)		16 to 63
Without stroke adjusting unit		100 to 1000mm/s
Stroke adjusting unit	A unit	100 to 1000mm/s Note 1)
	L unit	100 to 1500mm/s Note 2)

Note 1) Note that when the stroke adjustment allowance due to the adjusting screw becomes large, the air cushion capacity decreases. Also, in the range exceeding the air cushion stroke, the operating speed is between 100 to 200mm/s.

Note 2) With centralized piping, the piston speed is between 100 to 1000mm/sec.

Standard strokes

Bore size (mm)	Standard stroke (mm)*	Max. manufacturable stroke (mm)
16, 20, 25, 32, 40	100, 200, 300, 400, 500, 600, 700, 800 900, 1000, 1200, 1400, 1600, 1800, 2000	3000

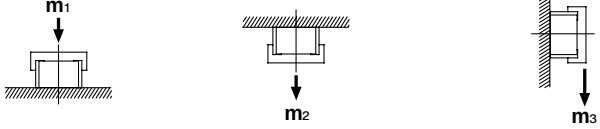
* Strokes can be manufactured in 1mm increments up to the maximum stroke. However, when exceeding a 2000mm stroke, indicate "-XB11" at the end of the part number.

Maximum allowable moment and load weight

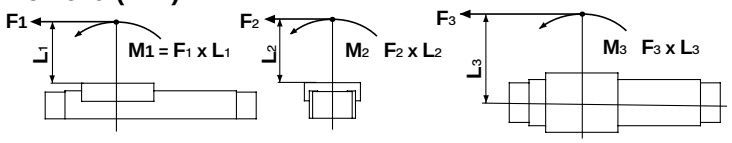
Model	Bore size (mm)	Max. allowable moment (N·m)			Max. load weight (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1MW	16	6	3	1	18	7	2.1
	20	10	5	1.7	26	10	3
	25	15	9	2.4	38	15	4.5
	32	30	15	5	57	23	6.6
	40	59	24	8	84	33	10
MY1CW	16	6	3	2	18	7	2.1
	20	10	5	3	25	10	3
	25	15	8.5	5	35	14	4.2
	32	30	14	10	49	21	6
	40	60	23	20	68	30	8.2

The above values indicate the maximum values for allowable moment and load weight. Refer to the base cylinder series MY1 for maximum allowable moment and load weight according to piston speed.

Load weight (kg)



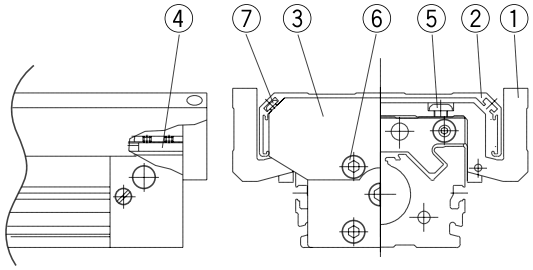
Moment (N·m)



Cover unit part nos. (MY1MW, MY1CW common)

Bore size (mm)	Part no.
16	MYMW — 16 — Stroke
20	MYMW — 20 — Stroke
25	MYMW — 25 — Stroke
32	MYMW — 32 — Stroke
40	MYMW — 40 — Stroke

Note 1) A set of the parts below are included in each part number.



Parts list

No.	Description	Material
1	Slide table	Aluminum alloy
2	Cover	Aluminum alloy
3	End plate	Aluminum alloy
4	Belt clamp	Special resin
5	Hexagon socket head button bolt	Chrome molybdenum steel
6	Hexagon socket head cap screw	Chrome molybdenum steel
7	Hexagon socket head button bolt	Chrome molybdenum steel

Note:
1 N·m = 0.7375 ft·lb
1 kg = 2.2046 lb
1 in = 25.4 mm

How to Order

MY1 M W 25 □ — 300 □ □ — A93 □

Guide type

M	Slide bearing type
C	Cam follower guide type

With protective cover

Cylinder bore size

16	16mm
20	20mm
25	25mm
32	32mm
40	40mm

Piping

Nil	Standard type
G	Centralized piping type

Stroke

Refer to the standard stroke table.

Stroke adjusting unit

Nil	Without stroke adjusting unit
A	With adjusting bolt
L	With low load shock absorber + adjusting bolt
AL	A unit, L unit, 1 pc. each

Number of stroke adjusting units

Nil	2 pcs.
S	1 pc.

Auto switch type

Nil	Without auto switch

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

Number of auto switches

Nil	2 pcs.
S	1 pc.
n	"n" pcs.

Applicable auto switches / Refer to pages 96 through 108 for detailed Auto Switch Specifications

For Ø16, Ø20

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

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

∗ Solid state auto switches marked with a "○" symbol are produced upon receipt of order.

For Ø25, Ø32, Ø40

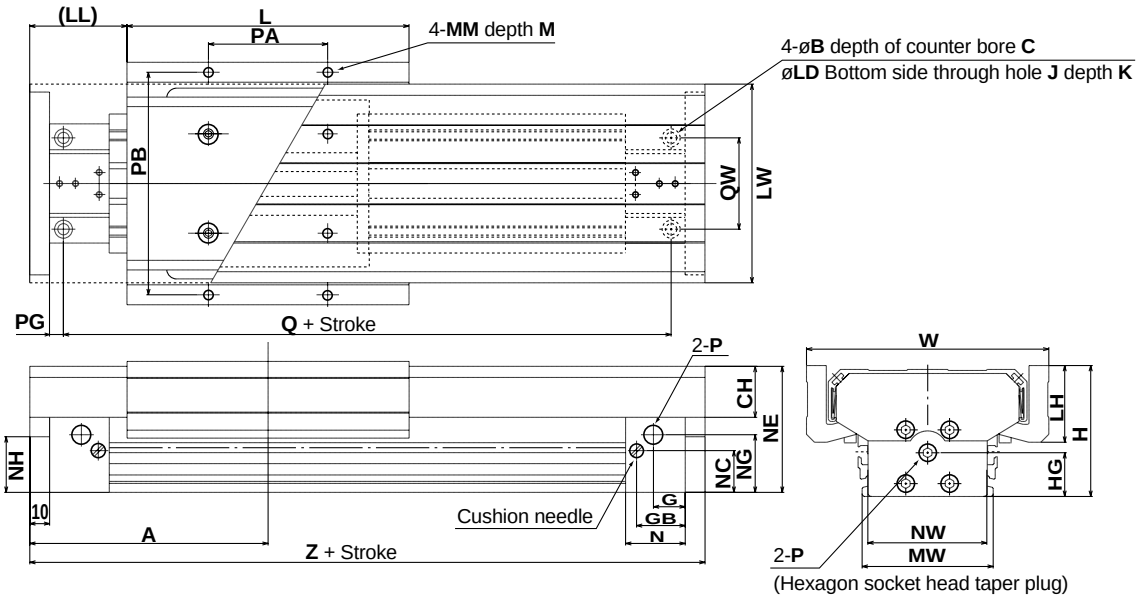
Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage DC	Load voltage AC	Auto switch part no. Electrical entry direction: Perpendicular	Auto switch part no. Electrical entry direction: In-line	Lead wire length (m)∗ 0.5 (Nil)	3 (L)	5 (Z)
Reed switch	—	Grommet	Yes	3 wire	— 5V	—	—	**Z76**	●	●	—
				2 wire	24V 12V	100V	—	**Z73**	●	●	●
			No		5V 12V	100V or less	—	**Z80**	●	●	—
Solid state switch	—	Grommet	Yes	3 wire (NPN)	24V 5V 12V	—	**Y69A**	**Y59A**	●	●	○
				3 wire (PNP)			**Y7PV**	**Y7P**	●	●	○
				2 wire	12V		**Y69B**	**Y59B**	●	●	○
	Diagnostic indication (2 color indicator)			3 wire (NPN)	5V 12V		**Y7NWV**	**Y7NW**	●	●	○
				3 wire (PNP)			**Y7PWV**	**Y7PW**	●	●	○
				2 wire	12V		**Y7BWV**	**Y7BW**	●	●	○
	Water resistant (2 color indicator)			2 wire			**Y7BAL**	—	●	●	○

∗ Lead wire length symbols 0.5m ..... Nil (Example) Y59A
3m ..... L Y59AL
5m ..... Z Y59AZ

Dimensions/Standard Type ø16 to ø40

1 in = 25.4 mm

MY1 $^{M}_{C}$ W Bore size — Stroke



(mm)

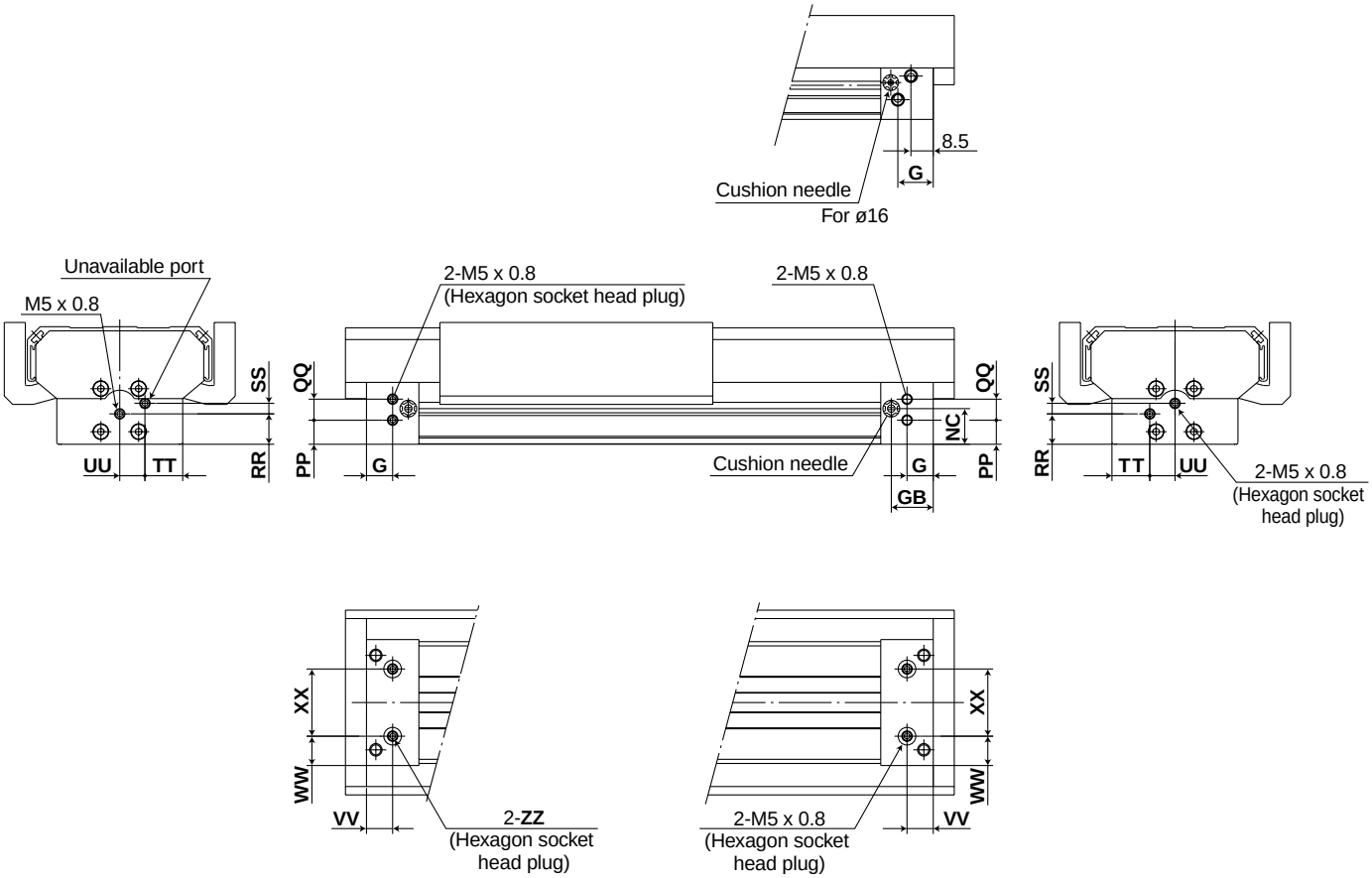
Bore size (mm)	A	B	C	CH	G	GB	H	HG	J	K	L	LD	LH	LL	LW	M	MM	MW	N	NC	NE	NG
16	90	6	3.5	25	8.5	16.2	52	13.5	M5 x 0.8	10	110	3.6	38	35	84	6	M4 x 0.7	—	20	13.5	49.5	13.5
20	110	7.5	4.5	26	10.5	20	58	17	M6 x 1	12	130	4.8	39	45	88	7.5	M5 x 0.8	—	25	17	55.5	17
25	120	9	5.5	25.7	16	24.5	66	22	M6 x 1	9.5	142	5.6	38.7	49	100	10	M5 x 0.8	66	30	21	63.5	29
32	150	11	6.5	31.5	19	30	82	27	M8 x 1.25	16	172	6.8	44.2	64	120	13	M6 x 1	80	37	26	79.5	34
40	180	14	8.5	34.8	23	36.5	98	34.5	M10 x 1.5	15	202	8.6	47.2	79	136	13	M6 x 1	96	45	32	95.5	42.5

Bore size (mm)	NH	NW	P	PA	PB	PG	Q	QW	W	Z
16	16.5	56	M5 x 0.8	40	94	3.5	153	48	102	180
20	21.7	60	M5 x 0.8	50	100	4.5	191	45	110	220
25	28	60	Rc1/8	60	112	7	206	46	122	240
32	36.5	74	Rc1/8	80	134	8	264	60	144	300
40	48	94	Rc1/4	100	150	9	322	72	160	360

Dimensions/Centralized Piping Type ø16, ø20

1 in = 25.4 mm

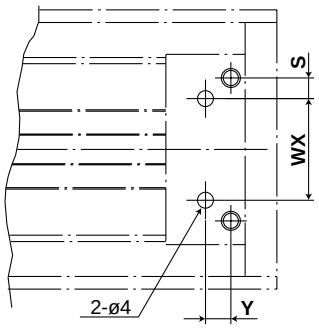
MY1$^{M}_{C}$ W Bore size **G** — Stroke

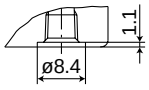


(mm)

Model	G	GB	NC	PP	QQ	RR	SS	TT	UU	VV	WW	XX
MY1 W16G	13.5	16.2	14	7.5	9	11	2.5	15	14	10	13	30
MY1 W20G	12.5	20	17	11.5	10	14.5	5	18	12	12.5	14	32

"P" indicates a cylinder supply port.





Bottom side (section **ZZ**) piping
(applicable O-ring)

Port sizes for bottom side centralized piping (mm)

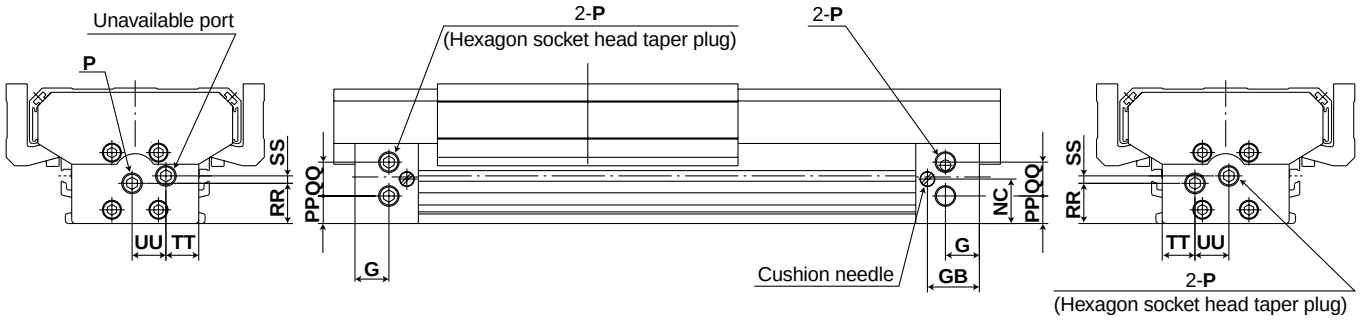
Model	WX	Y	S	Applicable gasket
MY1 W16G	30	6.5	9	C6
MY1 W20G	32	8	6.5	

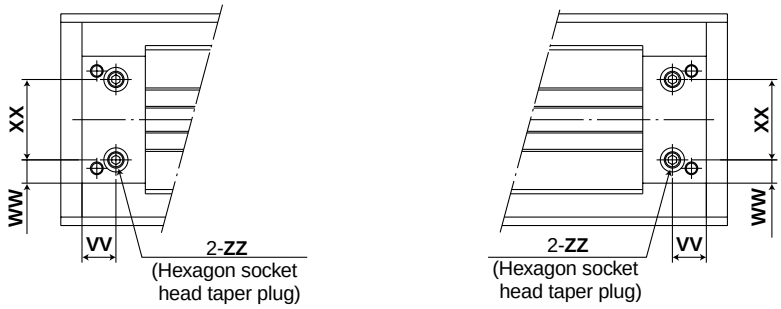
(Machine the mounting side according to the sizes above.)

Dimensions/Centralized Piping Type ø25, ø32, ø40

1 in = 25.4 mm

MY1 $^{M}_{C}$ W Bore size **G** — Stroke

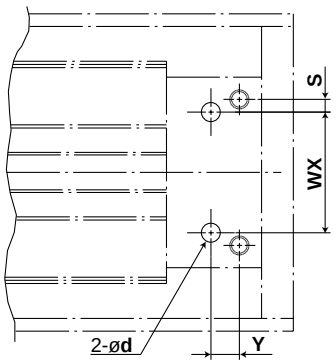


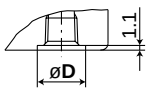


(mm)

Bore size (mm)	G	GB	NC	P	PP	QQ	RR	SS	TT	UU	VV	WW	XX	ZZ
25	16	24.5	21	Rc 1/8	13	16	19	3.5	15.5	16	16	11	38	Rc 1/16
32	19	30	26	Rc 1/8	18	16	24	4	21	16	19	13	48	Rc 1/16
40	23	36.5	32	Rc 1/4	16.5	26	25.5	10.5	22.5	24.5	23	20	54	Rc 1/8

"P" indicates a cylinder supply port.





Bottom side (section **ZZ**) piping
(applicable O-ring)

Port sizes for bottom side centralized piping (mm)

Bore size (mm)	WX	Y	S	d	D	Applicable gasket
25	38	9	4	6	11.4	C9
32	48	11	6			
40	54	14	9	8	13.4	C11.2

(Machine the mounting side according to the sizes above.)

⚠ Specific Product Precautions

Be sure to read before handling. Consult SMC when outside the specifications.

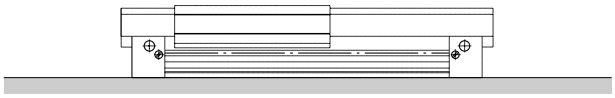
Mounting

⚠ Caution

1. To best utilize the effect of the cover, horizontal mounting is recommended.

- With the horizontal mounting (shown below), the entry of dirt and dust from the bottom of the cover is less than in other mounting orientations, making it more efficient.

Horizontal mounting



2. Do not apply strong impact or excessive moment to the slide table (slider).

- Since the slide table (slider) is supported by precision bearings (MY1C) and resin bearings (MY1M), do not subject it to strong impact or excessive moment when mounting work pieces.

3. 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 center axis increases as the stroke becomes longer, use a method of connection which can absorb the variations (floating mechanism).

Operating Environment

⚠ Caution

1. Note that floating particles such as paper dust and coolant mist may enter inside the cover.

- There is a space between the bottom of the cover and the cylinder tube. Therefore, in an environment with excessive water spray, oil spray, cutting dust, or floating particles, they may enter inside the cover and cause malfunction.

Handling

⚠ Caution

1. Do not inadvertently move the setting of the guide adjusting 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 adjusting unit.

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.

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-F9□**	Grommet (In-line)
	D-F9□V	Grommet (Perpendicular)
	D-F9□W	Grommet (2 color indicator, In-line)
	D-F9□WV	Grommet (2 color indicator, Perpendicular)
	D-Y59A, Y59B, Y7P	Grommet (In-line)
	D-Y69A, Y69B, Y7PV	Grommet (Perpendicular)
	D-Y7□W	Grommet (2 color indicator, In-line)
	D-Y7□WV	Grommet (2 color indicator, Perpendicular)

⚠ Specific product precautions

Be sure to read before handling.
Refer to pages 116 through 118 for auto switch common precautions.

D-A90(V), D-A93(V), D-A96(V)

Applicable cylinder series

	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	24V AC/DC or less	48V AC/DC or less	100V AC/DC or less
Maximum load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal voltage drop	1Ω or less (including lead wire length of 3m)		

D-A93, A93V, D-A96, A96V (with indicator light)

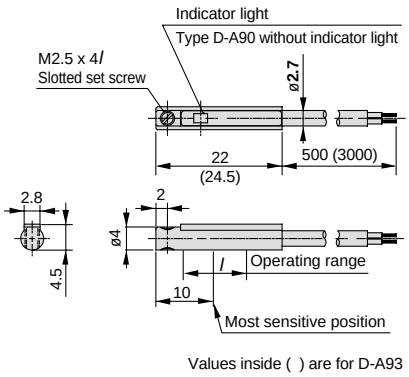
Auto switch part no.	D-A93		D-A93V		D-A96	D-A96V
Electrical entry direction	In-line		Perpendicular		In-line	Perpendicular
Applicable loads	Relay, PLC				IC circuit	
Load voltage	24VDC	100VAC	24VDC	100VAC	4 to 8VDC	
Load current range and max. load current	5 to 40mA	5 to 20mA	5 to 40mA	5 to 20mA	20mA	
Contact protection circuit	None					
Internal voltage drop	2.4V or less (to 20mA) 3V or less (to 40mA)		2.7V or less		0.8V or less	
Indicator light	Red LED lights up when ON					

- **Lead wires** ——— Heavy duty oil resistant vinyl cord, ø2.7, 0.5m
  D-A90(V), D-A93(V) 0.18mm² x 2 wire (Brown, Blue [Red, Black])
  D-A96(V) 0.15mm² x 3 wire (Brown, Black, Blue [Red, White, Black])
- **Insulation resistance** — 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** —— 1000VAC for 1min. (between lead wire and case)
- **Operating time** ——— 1.2ms • **Ambient temperature** —— –10 to 60°C (14 to 140°F)
- **Impact resistance** —— 300m/s² • **Leakage current** —— None
- **Enclosure** ———— IEC529 standard IP67, watertight (JISC0920)
- For a lead wire length of 3m, "L" is shown at the end of the part number. Example) D-A90L

Auto Switch Dimensions (mm)

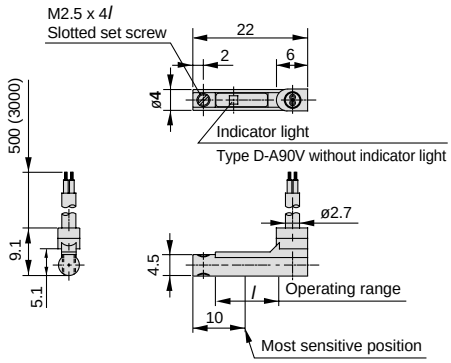
1 in = 25.4 mm

D-A90, D-A93, D-A96



Values inside ( ) are for D-A93

D-A90V, D-A93V, D-A96V



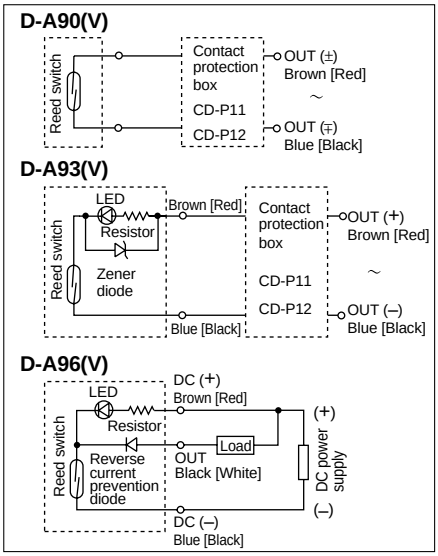
Auto switch weights

Unit: g (oz)

Model	Lead wire length 0.5m	Lead wire length 3m
D-A9/A9□V	8 (0.28)	41 (1.45)

Auto switch internal circuits

Lead wire colors 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 5m or more.
3. The load voltage is 100VAC.

A contact protection box should be used in any of the above situations.

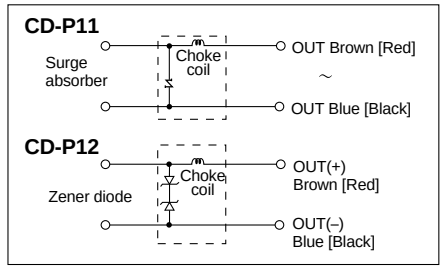
Contact protection box specifications

Part No.	CD-P11	CD-P12
Load voltage	100VAC	24VDC
Max. load current	25mA	50mA

∗ Lead wire lengths ..... Switch connection side 0.5m
Load connection side 0.5m

Contact protection box internal circuits

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

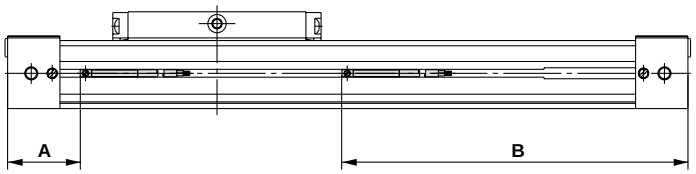


Auto Switch Mounting Positions/D-A9 (V) / Dimensions (mm)

1 in = 25.4 mm

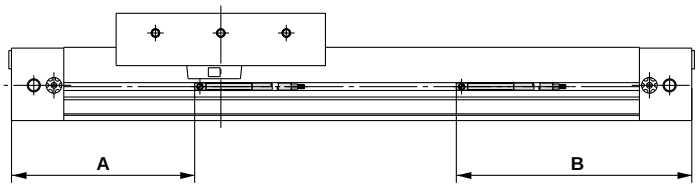
MY1B (Basic type)

Note) The operating range is a guide including hysteresis, but is not guaranteed. There may be large variations (as much as ±30%) depending on the ambient environment.



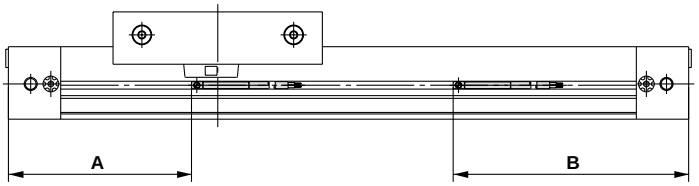
Mounting position	ø10	ø16	ø20
A	20	27	35
B	90	133	165
Operating range / Note)	6	6.5	8.5

MY1M (Slide bearing type)



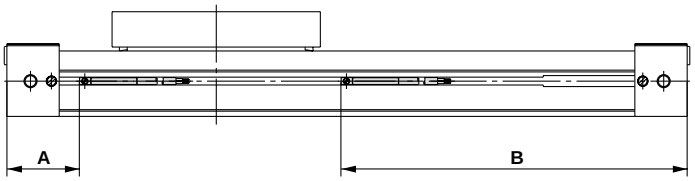
Mounting position	ø16	ø20
A	70	90
B	90	110
Operating range / Note)	11	7.5

MY1C (Cam follower guide type)



Mounting position	ø16	ø20
A	70	90
B	90	110
Operating range / Note)	11	7.5

MY1H (High precision guide type)



Mounting position	ø10	ø16	ø20
A	20	27	35
B	90	133	165
Operating range / Note)	11	6.5	8.5

D-Z73, D-Z76, D-Z80

Applicable cylinder series

	Bore size (mm) 16	20	25	32	40	50	63	80	100
MY1B (Basic)	●	●	●	●	●	●	●	●	●
MY1M (Slide bearing)			●	●	●	●	●	●	●
MY1C (Cam follower guide)			●	●	●	●	●	●	●
MY1H (High precision guide)			●	●	●				
MY1HT (High rigidity/ High precision guide)						●	●	●	●

Auto Switch Specifications

D-Z7m (with indicator light)

Auto switch part no.	D-Z73		D-Z76
Electrical entry direction	In-line		
Applicable load	Relay, PLC		IC circuit
Load voltage	24VDC	100VAC	4 to 8VDC
Load current range and max. load current	5 to 40mA	5 to 20mA	20mA
Contact protection circuit	None		
Internal voltage drop	2.4V or less (to 20mA)/3V or less (to 40mA)		0.8V 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	24V AC/DC or less	48V AC/DC or less	100V AC/DC or less
Maximum load current	50mA	40mA	20mA
Contact protection circuit	None		
Internal voltage drop	1Ω or less (including lead wire length of 3m)		

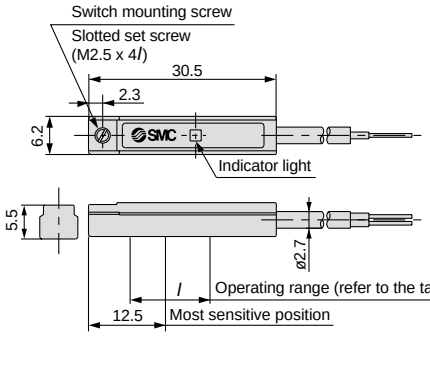
- **Leakage current** ——None
- **Operating time** —— 1.2ms
- **Lead wires** ——Heavy duty oil resistant vinyl cord, ø3.4, 0.2mm², 2 wire (Brown, Blue [Red, Black]), 3 wire (Brown, Black, Blue [Red, White, Black]), 0.5m* D-Z73 only ø2.7, 0.18mm², 2 wire)
- **Impact resistance** —— 300m/S²
- **Insulation resistance** —— 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** —— 1500VAC for 1min. (between lead wire and case)
- **Ambient temperature** ——10 to 60°C (14 to 140°F)
- **Enclosure** —— IEC529 standard IP67, watertight (JISC0920)

* For a lead wire length of 3m, "L" is shown at the end of the part number. Example) D-Z73L

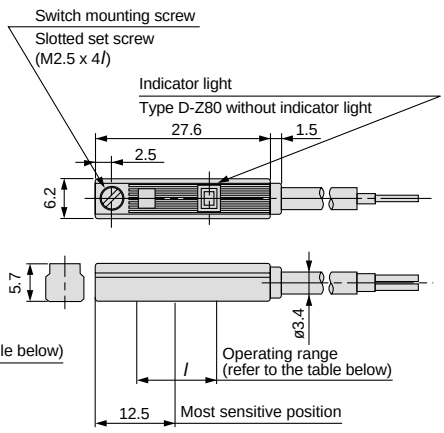
Auto Switch Dimensions (mm)

1 in = 25.4 mm

D-Z73



D-Z76, Z80



Bore size / Operating range	Bore size (mm) 180	200
Operating range l (mm)	15	15

Note) There is a guide including hystersis, but is not guaranteed.
There may be large variations (as much as ±30%) depending on the ambient environment.

Auto switch weights

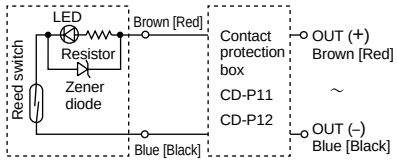
Unit: g (oz)

Model	Lead wire length 0.5m	Lead wire length 3m
D-Z73	7 (0.25)	31 (1.09)
D-Z76	10 (0.35)	55 (1.94)
D-Z80	9 (0.32)	49 (1.73)

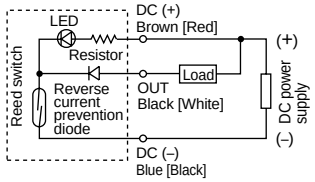
Auto switch internal circuits

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

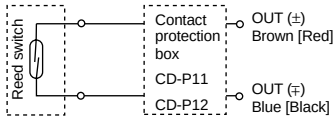
D-Z73



D-Z76



D-Z80



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 5m or more.
3. The load voltage is 100VAC.

A contact protection box should be used in any of the above situations.

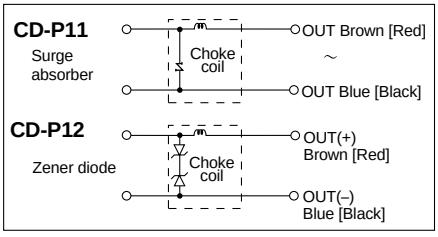
Contact protection box specifications

Part No.	CD-P11	CD-P12
Load voltage	100VAC	24VDC
Max. load current	25mA	50mA

D-280 type switches are 100VAC or less. Since there is no particular specified voltage, select a type based on the operating voltage.

Contact protection box internal circuits

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

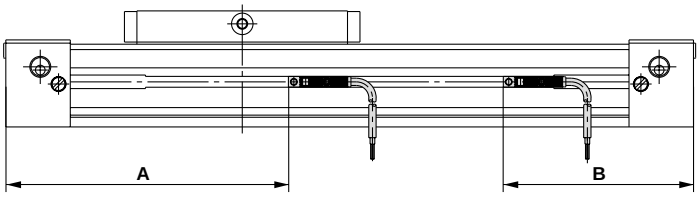


Auto Switch Mounting Positions/D-Z7 , D-Z80 / Dimensions (mm)

MY1B (Basic type)

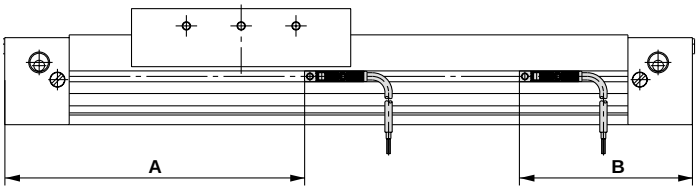
1 in = 25.4 mm

Note) The operating range is a guide including hysteresis, but is not guaranteed. There may be large variations (as much as ±30%) depending on the ambient environment.



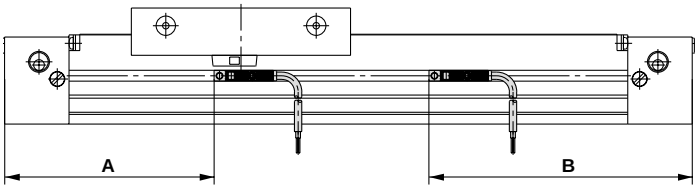
Mounting position	ø25	ø32	ø40	ø50	ø63	ø80	ø100
A	131.5	180	216	272.5	317.5	484.5	569.5
B	88.5	100	124	127.5	142.5	205.5	230.5
Operating range / Note)	8.5	11.5	11.5	11.5	11.5	11.5	11.5

MY1M (Slide bearing type)



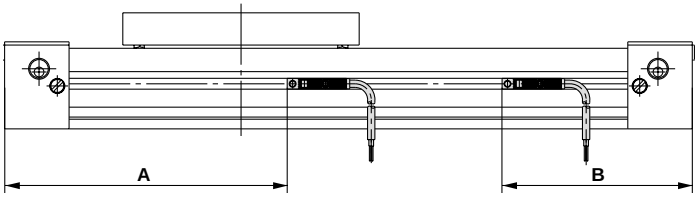
Mounting position	ø25	ø32	ø40	ø50	ø63
A	139.5	184.5	229.5	278.5	323.5
B	80.5	95.5	110.5	121.5	136.5
Operating range / Note)	12	12	12	11.5	11.5

MY1C (Cam follower guide type)



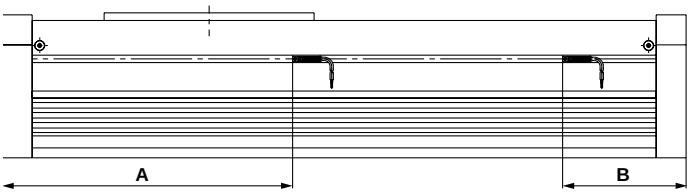
Mounting position	ø25	ø32	ø40	ø50	ø63
A	97.5	127.5	157.5	278.5	323.5
B	122.5	152.5	182.5	121.5	136.5
Operating range / Note)	12	12	12	11.5	11.5

MY1H (High precision guide type)



Mounting position	ø25	ø32	ø40
A	131.5	180	216
B	88.5	100	124
Operating range / Note)	8.5	11.5	11.5

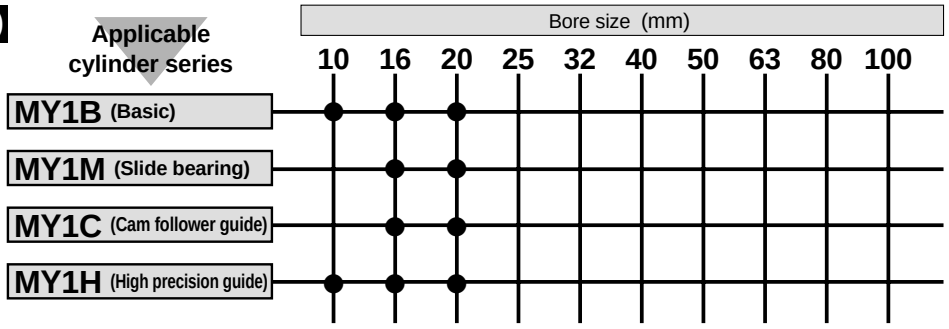
MY1HT (High rigidity/High precision guide type)



Mounting position	ø50	ø63
A	290.5	335.5
B	123.5	138.5
Operating range / Note)	11	11

D-F9N (V), D-F9P (V), D-F9B (V)

Applicable cylinder series



Auto Switch Specifications

D-F9□, D-F9□V (with indicator light)

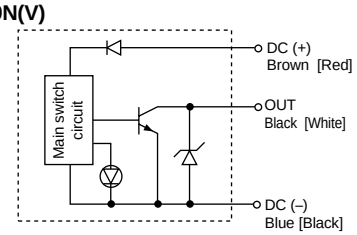
Auto switch part no.	D-F9N	D-F9NV	D-F9P	D-F9PV	D-F9B	D-F9BV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3 wire				2 wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24VDC Relay, PLC	
Power supply voltage	5, 12, 24VDC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

- **Lead wires** — Heavy duty oil resistant vinyl cord, ø2.7, 0.5m
  D-F9N(V), D-F9P(V) 0.15mm² x 3 wire (Brown,Black, Blue [Red, White, Black])
  D-F98(V) 0.18mm² x 2 wire (Brown, Blue [Red, Black])
- **Insulation resistance** — 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** — 1000VAC for 1min. (between lead wire and case)
- **Indicator light** — Lights up when ON
- **Ambient temperature** — –10 to 60°C (14 to 140°F)
- **Operating time** — 1ms or less
- **Impact resistance** — 1000m/s²
- **Enclosure** — IEC529 standard IP67, watertight (JISC0920)
- For a lead wire length of 3m, "L" is shown at the end of the part number. Example) D-F9NL

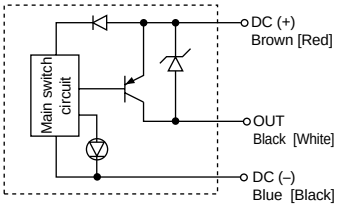
Auto switch internal circuits

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

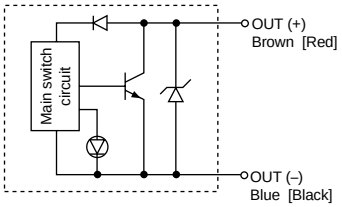
D-F9N(V)



D-F9P(V)



D-F9B(V)



Auto switch weights

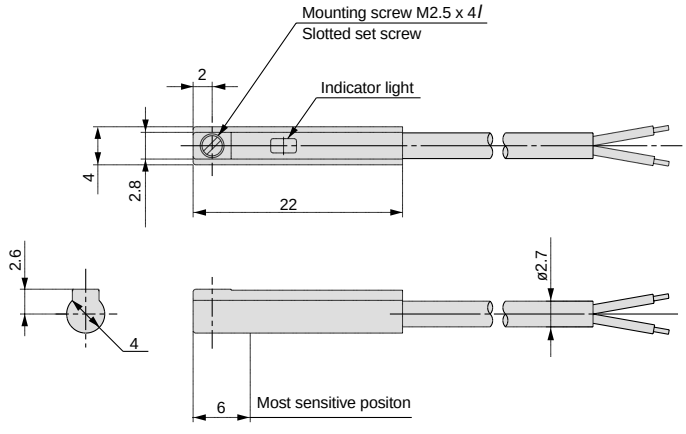
Unit: g (oz)

Model	D-F9N	D-F9P	D-F9B	D-F9NV	D-F9PV	D-F9BV
Lead wire length 0.5m	7 (0.25)	7 (0.25)	6 (0.21)	7 (0.25)	7 (0.25)	6 (0.21)
Lead wire length 3m	37 (1.31)	37 (1.31)	31 (1.09)	37 (1.31)	37 (1.31)	31 (1.31)

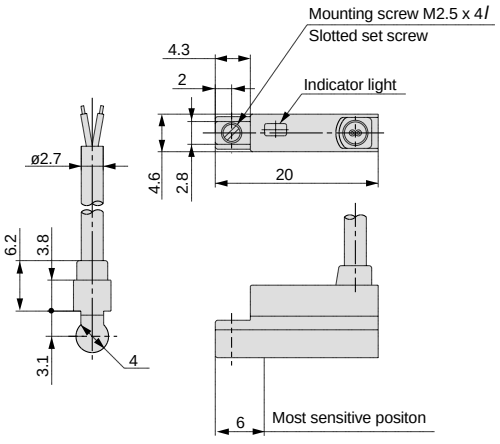
Auto Switch Dimensions (mm)

1 in = 25.4 mm

D-F9N, D-F9P, D-F9B



D-F9NV, D-F9PV, D-F9BV

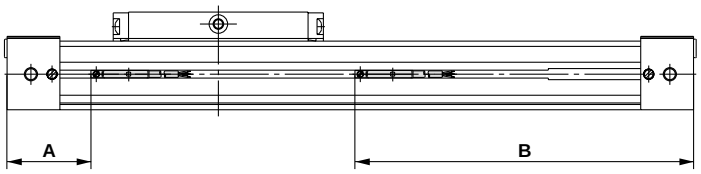


Auto Switch Mounting Positions/D-F9 , D-F9 V / Dimensions (mm)

MY1B (Basic type)

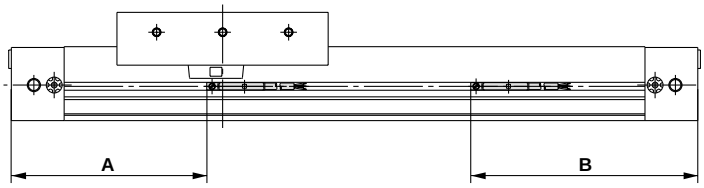
1 in = 25.4 mm

Note) The operating range is a guide including hysteresis, but is not guaranteed. There may be large variations (as much as ±30%) depending on the ambient environment.



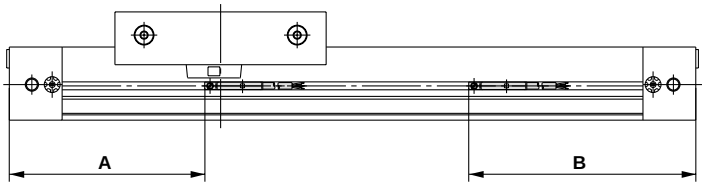
Mounting position	ø10	ø16	ø20
A	24	31	39
B	86	129	161
Operating range / Note)	3	4	5

MY1M (Slide bearing type)



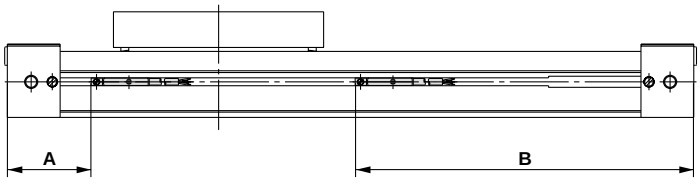
Mounting position	ø16	ø20
A	74	94
B	86	106
Operating range / Note)	8.5	6.5

MY1C (Cam follower guide type)



Mounting position	ø16	ø20
A	74	94
B	86	106
Operating range / Note)	8.5	6.5

MY1H (High precision guide type)



Mounting position	ø10	ø16	ø20
A	24	31	39
B	86	129	161
Operating range / Note)	3	4	5

D-F9NW(V), D-F9PW(V), D-F9BW(V)

Applicable cylinder series

	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-F9□W, D-F9□WV (with indicator light)

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

- **Lead wires** ——— Heavy duty oil resistant vinyl cord, ø2.7, 0.5m
  D-F9NW(V), D-F9PW(V) 0.15mm² x 3 wire (Brown, Black, Blue [Red, White, Black])
  D-F98W(V) 0.18mm² x 2 wire (Brown, Blue [Red, Black])
- **Insulation resistance** —— 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** ——— 1000VAC for 1min. (between lead wire and case)
- **Ambient temperature** —— –10 to 60°C (14 to 140°F)
- **Operating time** —— 1ms or less
- **Impact resistance** —— 1000m/s²
- **Enclosure** ——— IEC529 standard IP67, watertight (JISC0920)
- For a lead wire length of 3m, "L" is shown at the end of the part number. Example) D-F9NWL

Auto switch weights

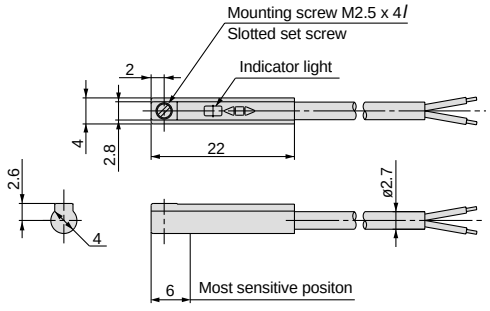
Unit: g (oz)

Model	D-F9NW	D-F9NWV	D-F9PW	D-F9PWV	D-F9BW	D-F9BWV
Lead wire length 0.5m	7 (0.25)	7 (0.25)	7 (0.25)	7 (0.25)	7 (0.25)	7 (0.25)
Lead wire length 3m	34 (1.20)	34 (1.20)	34 (1.20)	34 (1.20)	32 (1.13)	32 (1.13)

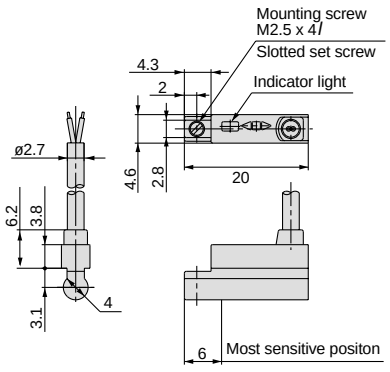
Auto Switch Dimensions (mm)

1 in = 25.4 mm

D-F9NW, D-F9PW, D-F9BW



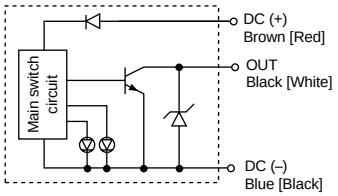
D-F9NWV, D-F9PWV, D-F9BWV



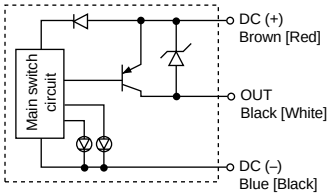
Auto switch internal circuits

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

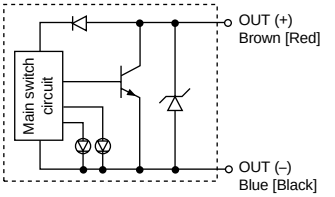
D-F9NW(V)



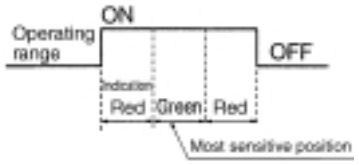
D-F9PW(V)



D-F9BW(V)



Indicator light/Display method

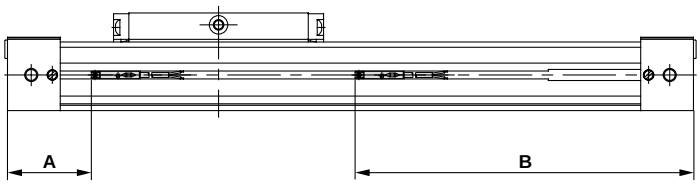


Auto Switch Mounting Positions/D-F9 W, D-F9 WV / Dimensions (mm)

MY1B (Basic type)

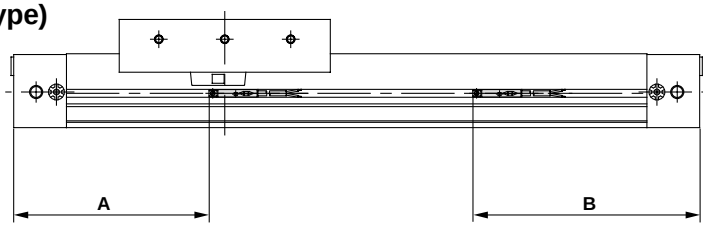
1 in = 25.4 mm

Note) The operating range is a guide including hysteresis, but is not guaranteed. There may be large variations (as much as ±30%) depending on the ambient environment.



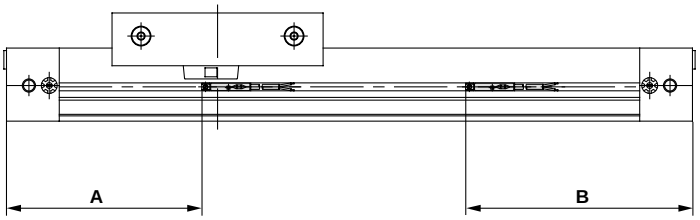
Mounting position	ø10	ø16	ø20
A	24	30	38
B	86	130	162
Operating range / Note)	3	4	5

MY1M (Slide bearing type)



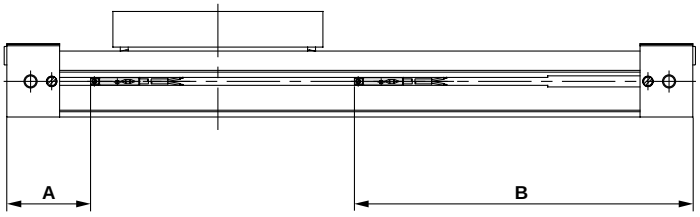
Mounting position	ø16	ø20
A	73	93
B	87	107
Operating range / Note)	8.5	6.5

MY1C (Cam follower guide type)



Mounting position	ø16	ø20
A	73	93
B	87	107
Operating range / Note)	8.5	6.5

MY1H (High precision guide type)



Mounting position	ø10	ø16	ø20
A	24	30	38
B	86	130	162
Operating range / Note)	3	4	5

D-Y59$^{A}_{B}$, D-Y69$^{A}_{B}$, D-Y7P(V)

Applicable cylinder series

	Bore size (mm)								
	16	20	25	32	40	50	63	80	100
MY1B (Basic)			●	●	●	●	●	●	●
MY1M (Slide bearing)			●	●	●	●	●		
MY1C (Cam follower guide)			●	●	●	●	●		
MY1H (High precision 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				24VDC Relay, PLC	
Power supply voltage	5, 12, 24VDC (4.5 to 28VDC)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4V or less	
Leakage current	100μA or less at 24VDC				0.8mA or less at 24DC	
Indicator light	Red LED lights up when ON					

- **Operating time** —— 1ms or less
- **Lead wires** —— Heavy duty oil resistant flexible vinyl cord, ø3.4, 0.15mm², 3 wire (Brown, Black, Blue [Red, White, Black]), 2 wire (Brown, Blue [Red, Black]) 0.5m*

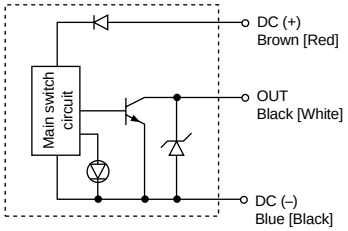
* For a lead wire length of 3m, "L" is shown at the end of the part number. Example) D-Y59AL

- **Impact resistance** —— 1000m/S²
- **Insulation resistance** — 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** —— 1000VAC for 1min. (between lead wire and case)
- **Ambient temperature** — –10 to 60°C (14 to 140°F)
- **Enclosure** —— IEC529 standard IP67, watertight (JISC0920)

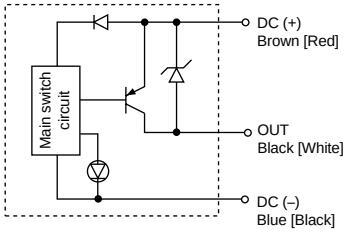
Auto switch internal circuits

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

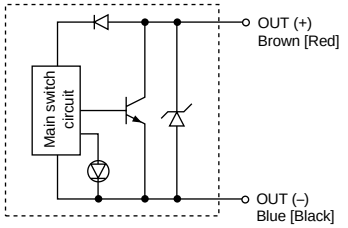
D-Y59A, D-Y69A



D-Y7P(V)



D-Y59B, D-Y69B



Auto switch weights

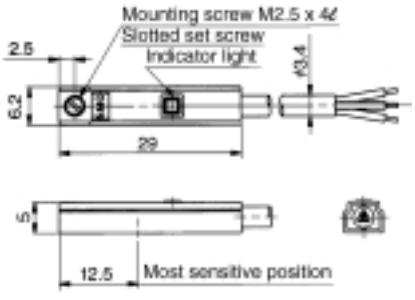
Unit: g (oz)

Model	Lead wire length 0.5m	Lead wire length 3m
D-Y59A, Y69A, Y7P, Y7PV	10 (0.35)	53 (1.87)
D-Y59B, Y69B	9 (0.32)	50 (1.77)

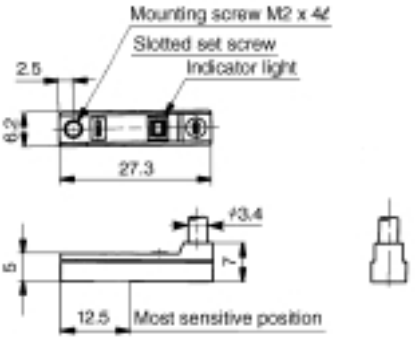
Auto Switch Dimensions (mm)

1 in = 25.4 mm

D-Y59A, D-Y7P, D-Y59B



D-Y69A, D-Y7PV, D-Y69B

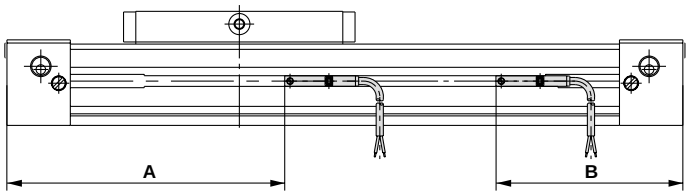


Auto Switch Mounting Positions/D-Y5, D-Y6, D-Y7P(V) / Dimensions (mm)

MY1B (Basic type)

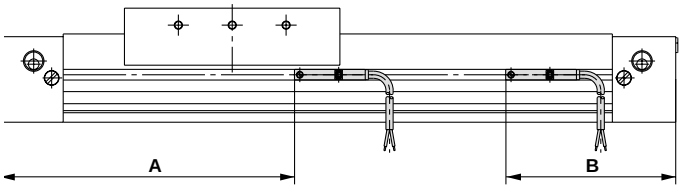
1 in = 25.4 mm

Note) The operating range is a guide including hysteresis, but is not guaranteed. There may be large variations (as much as ±30%) depending on the ambient environment.



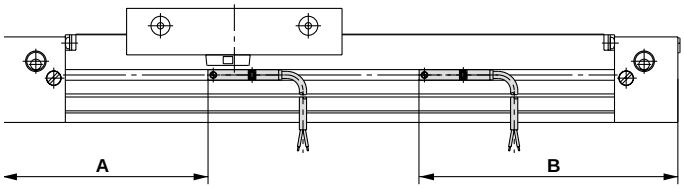
Mounting position	ø25	ø32	ø40	ø50	ø63	ø80	ø100
A	131.5	180	216	272.5	317.5	484.5	569.5
B	88.5	100	124	127.5	142.5	205.5	230.5
Operating range / Note)	6	9	10	3.5	3.5	3.5	3.5

MY1M (Slide bearing type)



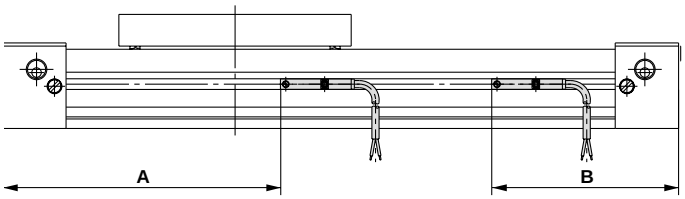
Mounting position	ø25	ø32	ø40	ø50	ø63
A	139.5	184.5	229.5	278.5	323.5
B	80.5	95.5	110.5	121.5	136.5
Operating range / Note)	5	5	5	5.5	5.5

MY1C (Cam follower guide type)



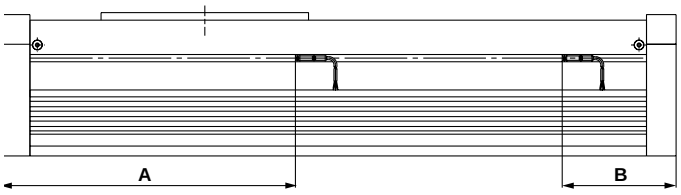
Mounting position	ø25	ø32	ø40	ø50	ø63
A	97.5	127.5	157.5	278.5	323.5
B	122.5	152.5	182.5	121.5	136.5
Operating range / Note)	5	5	5	5.5	5.5

MY1H (High precision guide type)



Mounting position	ø25	ø32	ø40
A	131.5	180	216
B	88.5	100	124
Operating range / Note)	6	9	10

MY1HT (High rigidity/High precision guide type)



Mounting position	ø50	ø63
A	290.5	335.5
B	123.5	138.5
Operating range / Note)	5	5

D-Y7NW(V), D-Y7PW(V), D-Y7BW(V)

Applicable cylinder series

	Bore size (mm)								
	16	20	25	32	40	50	63	80	100
MY1B (Basic)			●	●	●	●	●	●	●
MY1M (Slide bearing)			●	●	●	●	●		
MY1C (Cam follower guide)			●	●	●	●	●		
MY1H (High precision guide)			●	●	●				
MY1HT (High rigidty/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				24VDC Relay, PLC	
Power supply voltage	5,12, 24VDC (4.5 to 28VDC)				—	
Current consumption	10mA or less				—	
Load voltage	28VDC or less		—		24VDC (10 to 28VDC)	
Load current	40mA or less		80mA or less		5 to 40mA	
Internal voltage drop	1.5V or less (0.8V or less at 10mA load current)		0.8V or less		4 or less	
Leakage current	100μA or less at 24VDC				0.8mA or less at 24VDC	
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, ø3.4, 0.15mm², 3 wire (Brown,Black, Blue [Red, White, Black]), 2 wire (Brown, Blue [Red, Black]), 0.5m*
- **Impact resistance** — 1000m/s²
- **Insulation resistance** — 50MΩ or more at 500VDC (between lead wire and case)
- **Withstand voltage** — 1000VAC for 1min. (between lead wire and case)
- **Ambient temperature** — –10 to 60°C (14 to 140°F)
- **Enclosure** — IEC529 standard IP67, watertight (JISC0920)

* For a lead wire length of 3m, "L" is shown at the end of the part number. Example) D-Y7NWL

Auto switch weights

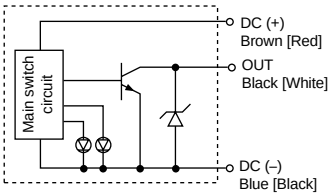
Unit: g (oz)

Model	Lead wire length 0.5m	Lead wire length 3m
D-Y7NW, Y7PW, Y7BW	10 (0.35)	53 (1.87)
D-Y7NWV, Y7PWV, Y7BWV	9 (0.32)	50 (1.77)

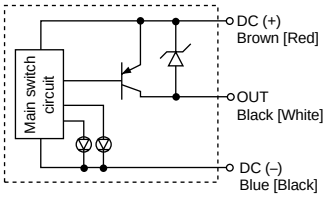
Auto switch internal circuits

Lead wire colors inside ( ) are those prior to conformity with IEC standards.

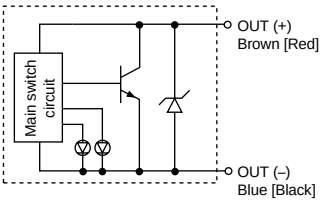
D-Y7NW(V)/3 wire NPN outout



D-Y7PW(V)/3 wire PNP outout



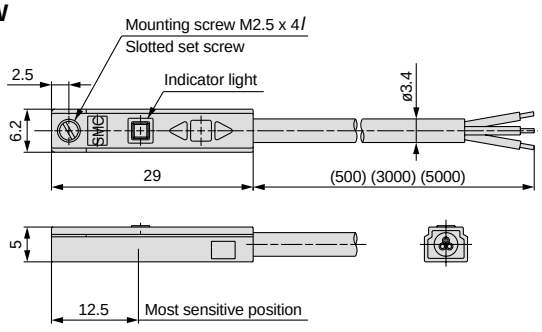
D-Y7BW(V)/2 wire



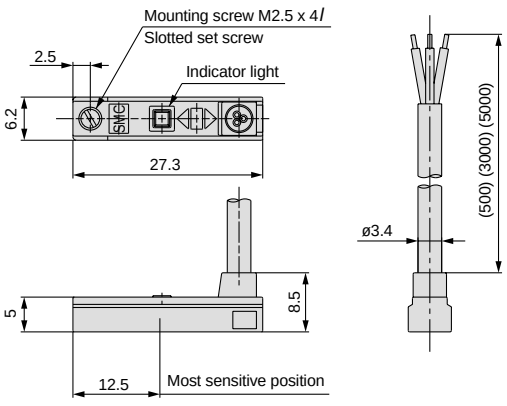
Auto Switch Dimensions (mm)

1 in = 25.4 mm

D-Y7□W



D-Y7□WV

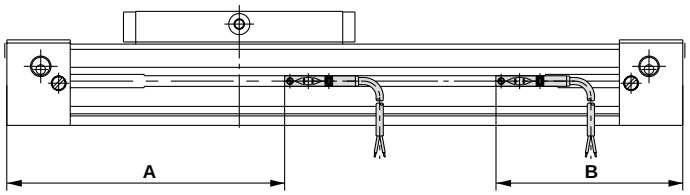


Auto Switch Mounting Positions/D-Y7 W, D-Y7 WV / Dimensions (mm)

MY1B (Basic type)

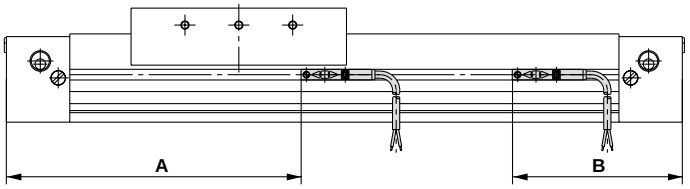
1 in = 25.4 mm

Note) The operating range is a guide including hysteresis, but is not guaranteed. There may be large variations (as much as ±30%) depending on the ambient environment.



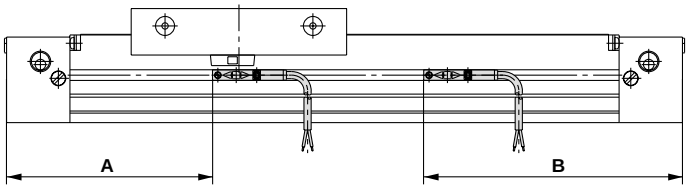
Mounting position	ø25	ø32	ø40	ø50	ø63	ø80	ø100
A	131.5	180	216	272.5	317.5	484.5	569.5
B	88.5	100	124	127.5	142.5	205.5	230.5
Operating range / Note)	6	9	10	3.5	3.5	3.5	3.5

MY1M (Slide bearing type)



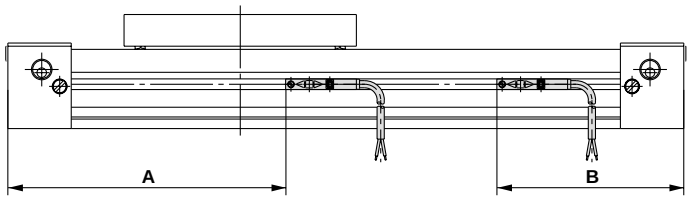
Mounting position	ø25	ø32	ø40	ø50	ø63
A	139.5	184.5	229.5	278.5	323.5
B	80.5	95.5	110.5	121.5	136.5
Operating range / Note)	5	5	5	5.5	5.5

MY1C (Cam follower guide type)



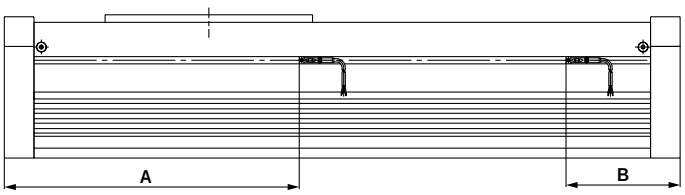
Mounting position	ø25	ø32	ø40	ø50	ø63
A	97.5	127.5	157.5	278.5	323.5
B	122.5	152.5	182.5	121.5	136.5
Operating range / Note)	5	5	5	5.5	5.5

MY1H (High precision guide type)



Mounting position	ø25	ø32	ø40
A	131.5	180	216
B	88.5	100	124
Operating range / Note)	6	9	10

MY1HT (High rigidity/High precision guide type)



Mounting position	ø50	ø63
A	290.5	335.5
B	123.5	138.5
Operating range / Note)	5	5

Order made application list

		Intermediate stroke XB10	Long stroke XB11	Helical insert threads X168	Dust seal band NBR XC67	Holder mounting bracket X416, X417	Copper-free 20-
MY1B	Basic type	Standard	●	●	●	●	●
MY1M	Slide bearing guide type	Standard	●	●	●	●	●
MY1C	Cam follower guide type	Standard	●	●	●	●	●
MY1H	High precision guide type	●	●	●	●	●	●
MY1HT	High rigidity/High precision guide type				●		●

1 Intermediate Stroke -XB10

Intermediate strokes are available within the standard stroke range. The stroke can be set in 1mm increments. Series other than MY1H are available with intermediate strokes as standard.

■ **Stroke range: 51 to 599mm**

MY1 H | Bore size | Stroke | Auto switch | Symbol | **-XB10**

Series/Bore size

		10	16	20	25	32	40
H	High precision guide type	(●)	●	●	●	●	●

(●) indicates available by special order.

Example) MY1H40G-599L-Z73-XB10

2 Long Stroke -XB11

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

■ **Stroke range: 2001 to 5000mm (ø10, ø16 are 2001 to 3000mm.)**

MY1 B | Bore size | Stroke | Auto switch | Symbol | **-XB11**

Series/Bore size

		10	16	20	25	32	40	50	63	80	100
B	Basic type	●	●	●	●	●	●	●	●	●	●
M	Slide bearing guide type		●	●	●	●	●	●	●		
C	Cam follower guide type		●	●	●	●	●	●	●		

Example) MY1B40G-4999L-Z73-XB11

■ **Stroke range: 601 to 1500mm (ø16, ø20 are 601 to 1000mm.)**

MY1 H | Bore size | Stroke | Auto switch | Symbol | **-XB11**

Series/Bore size

		10	16	20	25	32	40
H	High precision guide type	(●)	●	●	●	●	●

(●) indicates available by special order.

Example) MY1H40G-999L-Z73-XB11

3 Helical Insert Thread Specification -X168

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

MY1 B | Bore size | Stroke | Auto switch | Symbol | **-X168**

Series/Bore size

		10	16	20	25	32	40	50	63	80	100
B	Basic type	(●)	●	●	●	●	●	●	●	●	●
M	Slide bearing guide type		●	●	●	●	●	●	●		
C	Cam follower guide type		●	●	●	●	●	●	●		
H	High precision guide type	(●)	●	●	●	●	●				
HT	High rigidity/ High precision guide type							(●)	(●)		

(●) indicates available by special order.

Example) MY1B40G-300L-Z73-X168

4 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	Basic type	●	●	●	●	●	●	●	●	●	●
M	Slide bearing guide type		●	●	●	●	●	●	●		
C	Cam follower guide type		●	●	●	●	●	●	●		
H	High precision guide type		●	●	●	●	●				
HT	High rigidity/ High precision guide type							△	△		

Contact SMC for △. Furthermore, ø10, ø80 and ø100 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

Nil	Black zinc chromated
W	Nickel plated

Refer to "Dust seal band" in the construction figures of each series for details.

Example) MY25-16BNW-300

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

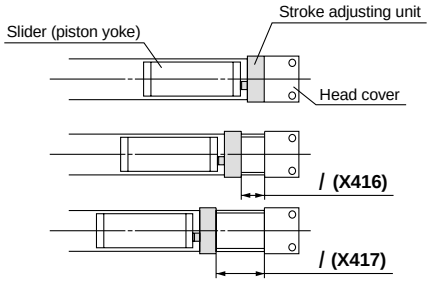
Holder mounting brackets are used to fasten the stroke adjusting unit at an intermediate stroke position.

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

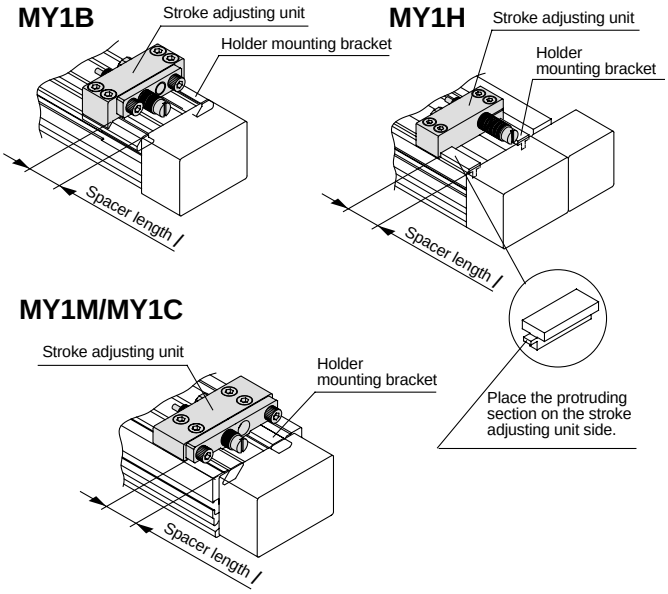
Fine stroke adjustment range

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

Bore size (mm)	-X416 (one side)					-X417 (one side)				
	Spacer length *l*	Adjustment range				Spacer length *l*	Adjustment range			
		MY1B	MY1M	MY1C	MY1H		MY1B	MY1M	MY1C	MY1H
16	5.6	–5.6 to –11.2				11.2	–11.2 to –16.8			
20	6	–6 to –12				12	–12 to –18			
25	11.5	–11.5 to –23				23	–23 to –34.5			
32	12	–12 to –24				24	–24 to –36			
40	16	–16 to –32				32	–32 to –48			
50	20	—	–20 to –40		—	40	—	–40 to –60		—
63	25	—	–25 to –50		—	50	—	–50 to –75		—



Holder Mounting Bracket Illustration



MY1 B Bore size – 300 L – X416 ☐

Combination symbol
Refer to the table below for applicable symbols.

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

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

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

Series/Bore size

B	Basic type
M	Slide bearing guide type
C	Cam follower guide type
H	High precision guide type

10 16 20 25 32 40 50 63 80 100

Stroke adjusting unit	Holder mounting bracket	Symbol	Mounting pcs.		Combination description
			X416	X417	
A, L, H, AS, LS, HS	**X416**	**Nil**	1		X416 on one side
A, L, H		**W**	2		X416 on both sides
		Z	1	1	X416 on one side, X417 on the other side
AL, AH		**A**	1		X416 on A unit side
AL, LH		**L**	1		X416 on L unit side
AH, LH		**H**	1		X416 on H unit side
AL, AH		**AZ**	1	1	X416 on A unit side, X417 on the other side
AL, LH		**LZ**	1	1	X416 on L unit side, X417 on the other side
AH, LH		**HZ**	1	1	X416 on H unit side, X417 on the other side
A, L, H, AS, LS, HS	**X417**	**Nil**		1	X417 on one side
A, L, H		**W**		2	X417 on both sides
AL, AH		**A**		1	X417 on A unit side
AL, LH		**L**		1	X417 on L unit side
AH, LH		**H**		1	X417 on H unit side

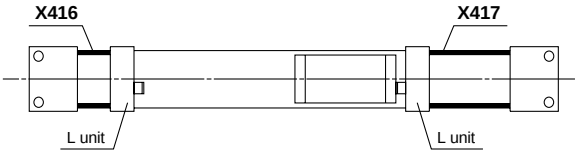
Note) For AS, LS and HS, the stroke adjusting unit is mounted on one side only.

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

Example

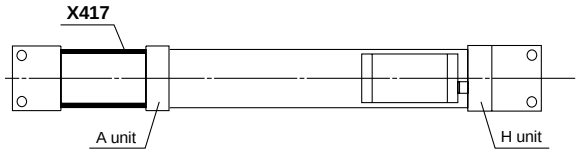
- **L units with one each of X416 and X417**

MY1B25G-300L-X416Z



- **A and H units, where X417 is mounted on A unit only and nothing on H unit**

MY1B25G-300AH-X417A



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

MYH-A16A – X417 ☐

Combination Symbol

Nil	Stroke adjusting unit	+	Holder mounting bracket
N	Holder mounting bracket only		

Holder mounting bracket

X416	Holder mounting bracket 1
X417	Holder mounting bracket 2

Stroke adjusting unit model

Note) Refer to the options table of "How to Order" for each series.

MY1B→ P. 6
MY1M→ P. 28
MY1C→ P. 44
MY1H→ P. 60

Example

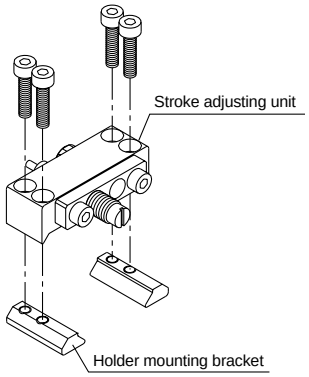
- **Stroke adjusting unit with holder mounting bracket**

MY-A25L-X416 (L unit for MY1B25 and X416 bracket)

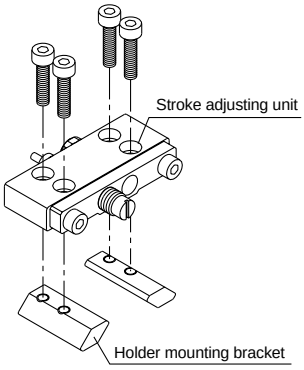
- **Holder mounting bracket only**

MY-A25L-X416N (X416 bracket for MY1B25 and L unit)

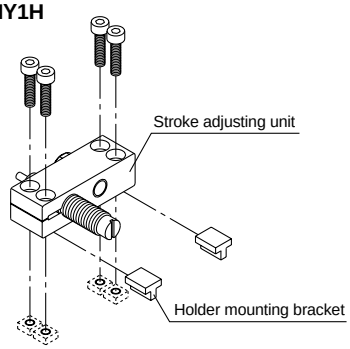
MY1B



MY1M/MY1C



MY1H



Note) For MY1H, the parts are packed together when shipped.

6 Copper-free Specification 20-

Copper-free compatible.

20 – MY1 B | Bore size | – | Stroke | – | Auto switch | Symbol

Series/Bore size

		10	16	20	25	32	40	50	63	80	100
B	Basic type	●	●	●	●	●	●	●	●	●	●
M	Slide bearing guide type			●	●	●	●	●	●		
C	Cam follower guide type			●	●	●	●	●	●		
H	High precision guide type	●	●	●	●	●	●				
HT	High rigidity/High precision guide type							●	●	●	●

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

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

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

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

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

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

⚠ Warning

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

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

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

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

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

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

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

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

Precautions on Design

⚠ Warning

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

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

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

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

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

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

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

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

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

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

6. Consider a possible loss of power source.

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

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

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

8. Consider emergency stops.

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

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

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

Selection

⚠ Warning

1. Confirm the specifications.

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

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

2. Intermediate stops

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

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

⚠ Caution

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

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

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

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

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

4. Provide intermediate supports for long stroke cylinders.

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

Mounting

⚠ Caution

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

The slide table (slider) is supported by precision bearings (MY1C, MY1H) or resin bearings (MY1B, MY1M). Therefore, do not apply strong impacts or excessive moment, etc., when mounting work pieces.

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

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

As the stroke becomes longer, variations in the center axis become larger. Consider using a connection method (floating mechanism) that is able to absorb these variations. Furthermore, use the special floating brackets (pages 18 to 20) which have been provided for series MY1B.

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

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

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

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

5. Instruction manual

The product should be mounted and operated after thoroughly reading the manual and understanding its contents.

Keep the instruction manual where it can be referred to as needed.

Piping

⚠ Caution

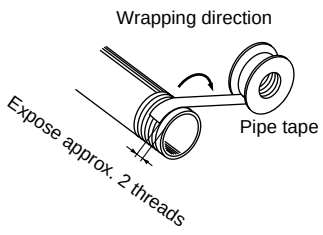
1. Preparation before piping

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

2. Wrapping of pipe tape

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

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



Cushion

⚠ Caution

1. Readjust with the cushion needle.

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

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

This can cause damage to seals.

Lubrication

⚠ Caution

1. Lubrication of non-lube type cylinder

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

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

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

Air Supply

⚠ Warning

1. Use clean air.

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

⚠ Caution

1. Install air filters.

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

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

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

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

Take measures to prevent freezing, since moisture in circuits can be frozen under 5°C, and this may cause damage to seals and lead to malfunction.

Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

Operating Environment

⚠ Warning

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

Refer to the construction drawings regarding cylinder materials.

2. Provide a cover or other protection in dusty locations or where water, oil, etc., splash on the equipment.

The cylinder may malfunction if operated in a location with a lot of dirt, water droplets, coolant or paper dust, etc. Provide a cover or other protective measure.

Maintenance

⚠ Warning

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

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

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

When equipment is removed, first check measures to prevent dropping of driven objects and run-away of equipment, etc. Then cut off the supply pressure and electric power, and exhaust all compressed air from the system.

When machinery is restarted, proceed with caution after confirming measures to prevent cylinder lurching.

⚠ Caution

1. Drain flushing

Remove drainage from air filters regularly.

(Refer to specifications.)

Design & Selection

⚠ Warning

1. Confirm the specifications.

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

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

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

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

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

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

4. Keep wiring as short as possible.

<Reed switch>

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

1) For an auto switch without a contact protection circuit, use a contact protection box when the wire length is 5m or longer.

2) Even if an auto switch has a built-in contact protection circuit, when the wiring is more than 30m long, it is not able to adequately absorb the rush current and its life may be reduced. It is again necessary to connect a contact protection box in order to extend its life. Please contact SMC in this case.

<Solid state switch>

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

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

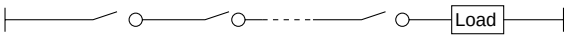
<Reed switch>

1) Switches with an indicator light (Except D-A96, A96V, D-Z76)

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

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

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



⚠ Warning

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

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

2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Model A90, A90V, D-Z80).

<Solid state switch>

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

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

6. Pay attention to leakage current.

<Solid state switch>

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

Operating current of load (OFF condition) > Leakage current

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

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

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

<Reed switch>

If driving a load such as a relay that generates a surge voltage, use a switch with a built-in contact protection circuit or use a contact protection box.

<Solid state switch>

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

8. Cautions for use in an interlock circuit

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

9. Ensure sufficient clearance for maintenance activities.

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

Mounting and Adjustment

⚠ Warning

1. Do not drop or bump.

Do not drop, bump or apply excessive impacts (300m/s² or more for reed switches and 1000m/s² or more for solid state switches) while handling.

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

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

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

3. Mount switches using the proper tightening torque.

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

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

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

Wiring

⚠ Warning

1. Avoid repeatedly bending or stretching lead wires.

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

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

<2 wire type>

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

3. Confirm proper insulation of wiring.

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

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

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

Wiring

⚠ Warning

5. Do not allow short circuit of loads.

<Reed switch>

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

<Solid state switch>

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

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

6. Avoid incorrect wiring.

<Reed switch>

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

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

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

   Applicable models: D-A93, A93V, D-Z73

2) However, in the case of a 2 color indicator type auto switch (D-A59W), note that the switch will be in a normally ON condition if connections are reversed.

<Solid state switch>

1) If connections are reversed on a 2 wire type switch, the switch will not be damaged if protected by a protection circuit, but the switch will be in a normally ON state. However, note that the switch will be damaged if reversed connections are made while the load is in a short circuited condition.

2) If connections are reversed (power supply line + and power supply line –) on a 3 wire type switch, the switch will be protected by a protection circuit. However, if the power supply line (+) is connected to the blue (black) wire and the power supply line (–) is connected to the black (white) wire, the switch will be damaged.

∗ Lead wire color changes

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

2 wire

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

3 wire

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

Solid state with diagnostic output

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

Solid state with latch type diagnostic output

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

Operating Environment

⚠ Warning

1. Never use in an atmosphere of explosive gases.

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

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

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

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

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

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

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

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

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

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

<Reed switch>

When excessive impact (300m/s² or more) is applied to a reed switch during operation, the contact will malfunction and generate or cut off a signal momentarily (1ms or less). Consult SMC regarding the need to use a solid state switch depending upon the environment.

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

<Solid state switch>

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

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

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

Maintenance

⚠ Warning

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

1) Securely tighten switch mounting screws.

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

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

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

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

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

Other

⚠ Warning

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

⚠ Caution

Mounting

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 center 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 (pages 18 to 20) 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

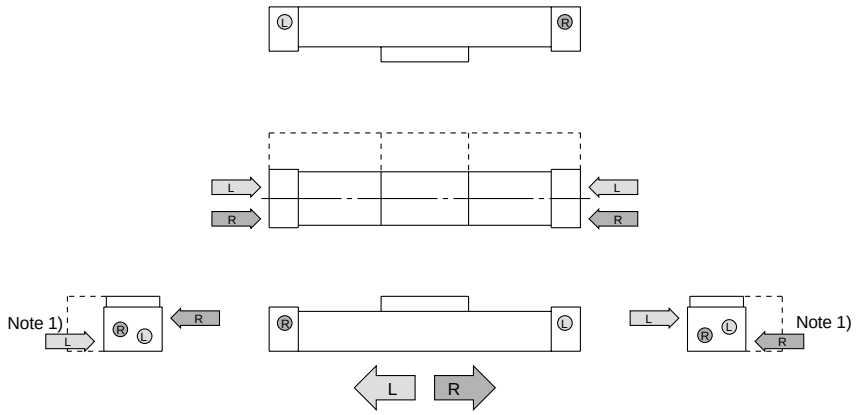
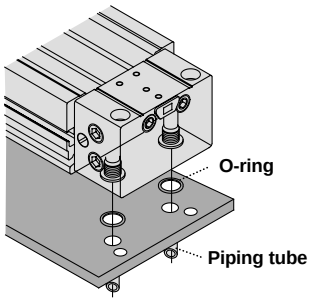
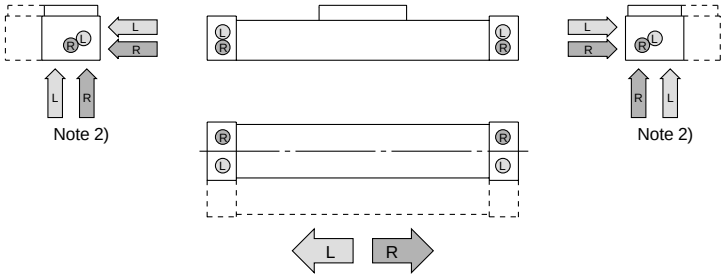
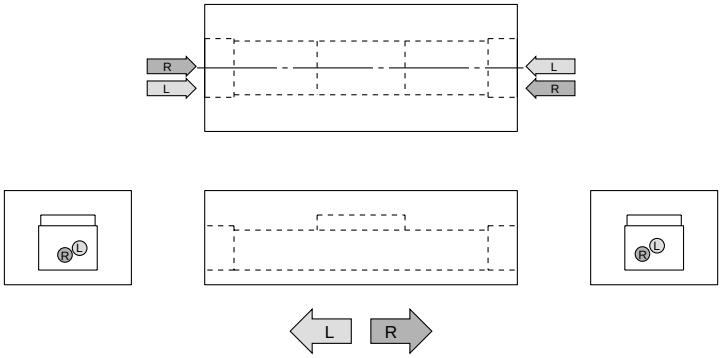
1. External air leakage may occur.

- 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

Centralized Piping Port Variations

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

Applicable cylinder	Port variations
MY1B10 **MY1H10** Note 1) These ports are not applicable to MY1H10.	 **Slide table operating direction**
MY1B16 to 100 **MY1M16 to 63** **MY1C16 to 63** **MY1H16 to 40**  Note 2) Refer to the above diagram for bottom piping.	 **Slide table operating direction**
MY1HT50, 63	 **Slide table operating direction**

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