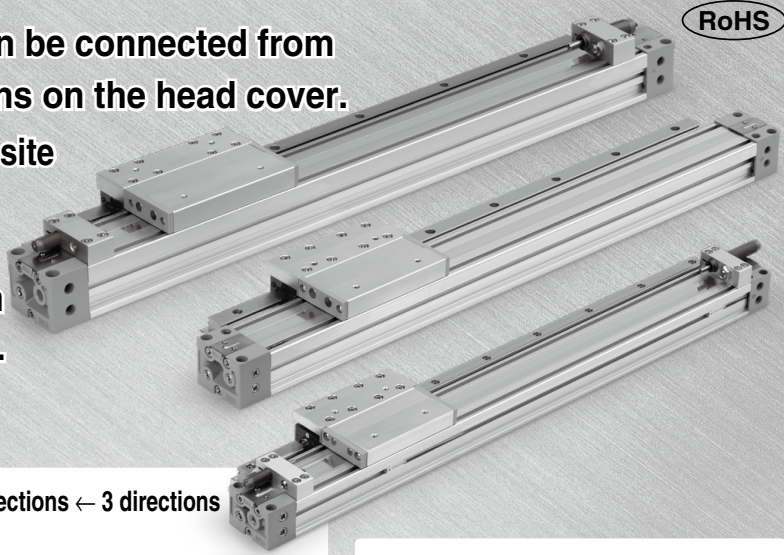
Mechanically Jointed Rodless Cylinder

MY1H Series

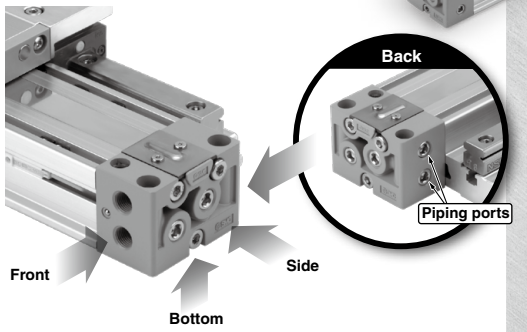
Linear Guide Type: ø25, ø32, ø40

RoHS

- **Piping can be connected from 4 directions on the head cover.**
- **Allows on-site piping to suit the installation conditions.**

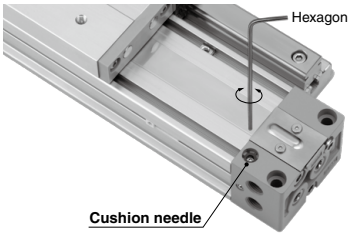


Piping from 4 directions ← 3 directions



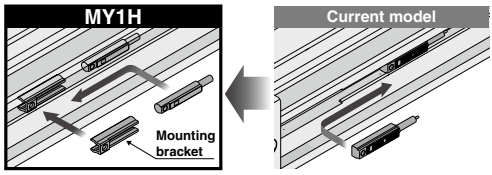
Easy adjustment of cushion needle

Adjustment is easier by changing the cushion needle adjustment from side to top.



Auto switch can be mounted in any desired position. (D-M9□, D-A9□)

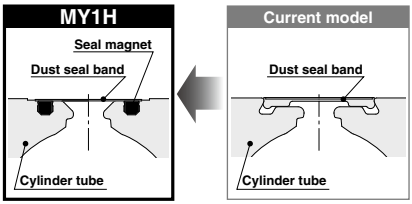
- The auto switch can be fixed in any desired position with a mounting bracket.
- This reduces man-hours for mounting.



Insert it at the notch and slide it along the mounting groove.

New dust seal band improves life.

- The current groove mounting is changed to a magnetically sealed type.
- This means the dust seal band is always in contact with the cylinder, which reduces ingress of foreign matter, improving the life of the cylinder.



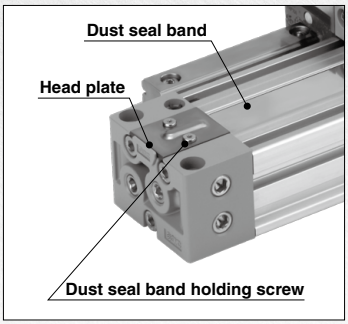
The mounting and performance are the same as before, but the weight is reduced.

- **Weight is reduced by the die cast head cover and removal of guide cover.**

Bore size (mm)	MY1H	Reduction rate	Current model
25	2.17 kg	6%	2.31 kg
32	4.37 kg	6%	4.65 kg
40	5.84 kg	8%	6.37 kg

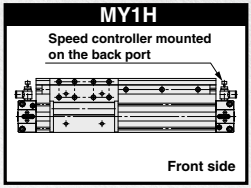
Maintenance of dust seal band improved

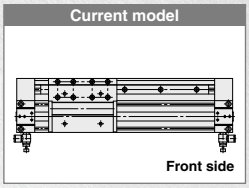
- **No need to select the dust seal band from two types.**
- **The dust seal band can be removed by loosening two holding screws (on one side).**

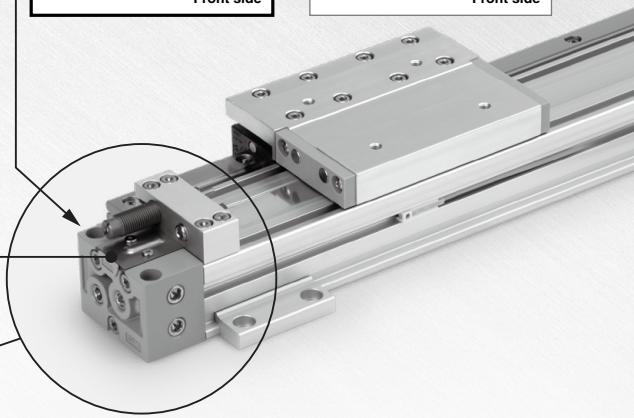


Space saving achieved by piping on the back

When a speed controller is mounted, the cylinder installation area can be reduced significantly.



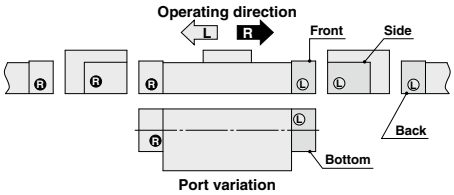




Improvement of port variations

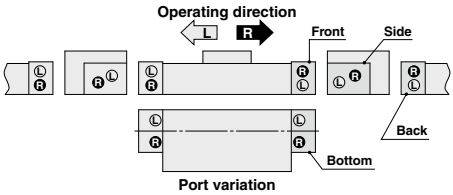
With addition of the back port, piping can be connected to suit the installation conditions.

Standard piping type



R and L can be mounted in any desired position.

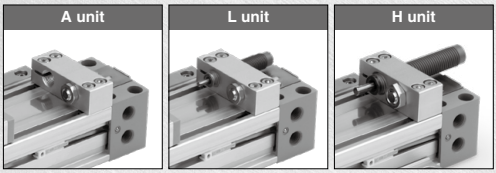
Centralized piping type



R and L can be mounted in any desired position.

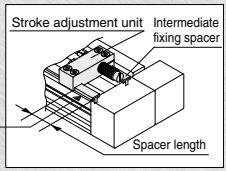
Stroke Adjustment Unit

• With adjustment bolt • With low/high load shock absorber + adjustment bolt (L/H unit)



Intermediate fixing spacer as standard

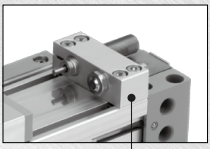
Fixture can be selected to hold the stroke adjustment unit at the intermediate stroke position.



Improved shock-less characteristics when a workpiece is stopped

Soft type of shock absorber can be selected for the stroke adjustment unit. (Made to Order: -XB22)

The cross section of the liquid passage is changed in proportion to the stroke by a unique mechanism. This allows a smooth absorption process.

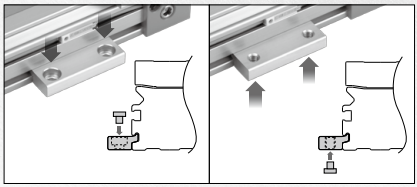


Improvement of positioning accuracy

Uses a linear guide to achieve high repeatability.

Side Support

Prevents deflection of the cylinder tube at a long stroke.



MY1 Series Variations

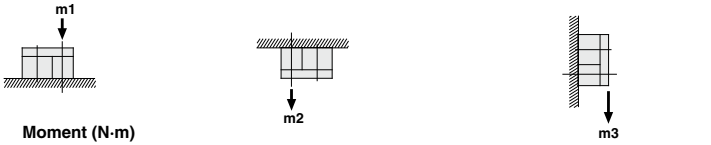
Series	Bore size (mm) 10	16	20	25	32	40	50	63	80	100	Page
MY1B	●	●	●	●	●	●					P.1188
MY1B		●	●	●	●	●	●	●	●	●	P.1233
MY1M		●	●	●	●	●	●	●			P.1257
MY1C		●	●	●	●	●	●	●			P.1277
MY1H				●	●	●					P.1201
MY1H End lock				●	●	●					
MY1H	●	●	●								P.1297
MY1H End lock		●	●								
MY1HT							●	●			P.1319
MY1□W		●	●	●	●	●	●	●			P.1339

Maximum Allowable Moment/Maximum Load Mass

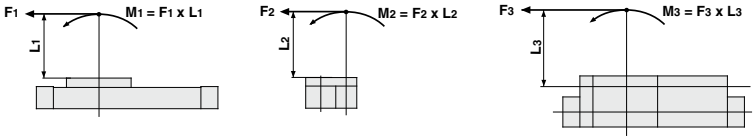
Model	Bore size (mm)	Maximum allowable moment (N·m)			Maximum load mass (kg)		
		M_1	M_2	M_3	m_1	m_2	m_3
MY1H	25	23	26	23	27.5	27.5	27.5
	32	39	50	39	39.2	39.2	39.2
	40	50	50	39	50	50	50

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

Load mass (kg)



Moment (N·m)



Calculation of Guide Load Factor

1) Maximum load mass (1), static moment (2), and dynamic moment (3) (at the time of impact with stopper) must be examined for the selection calculations.
   * To evaluate, use υa (average speed) for (1) and (2), and υ (collision speed $\upsilon = 1.4\upsilon a$) for (3). Calculate m max for (1) from the maximum load mass graph (m_1, m_2, m_3) and M max for (2) and (3) from the maximum allowable moment graph (M_1, M_2, M_3).

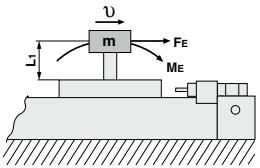
Sum of guide load factors

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

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

2) Reference formula [Dynamic moment at the time of 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 the time of impact with stopper) (N)
- υa: Average speed (mm/s)
- **M** : Static moment (N·m)
- υ : Collision speed (mm/s)
- L_1 : Distance to the load center of gravity (m)
- M_E: Dynamic moment (N·m)
- δ : Bumper coefficient
  With air cushion = 1/100
  With shock absorber = 1/100
- **g** : Gravitational acceleration (9.8 m/s²)



$\upsilon = 1.4\upsilon a$ (mm/s) $\quad F_E = 1.4\upsilon a \cdot \delta \cdot m \cdot g$ (Note 4)

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

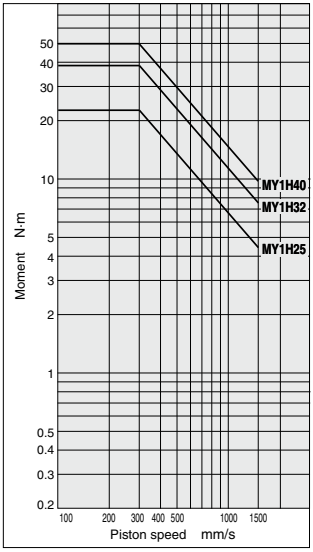
Note 4) $1.4\upsilon a\delta$ is a dimensionless coefficient for calculating impact force.
Note 5) Average load coefficient ($=\frac{1}{3}$): For averaging the maximum load moment at the time of impact with stopper according to service life calculations.

3) For detailed selection procedures, refer to Front matter 1206 and 1207.

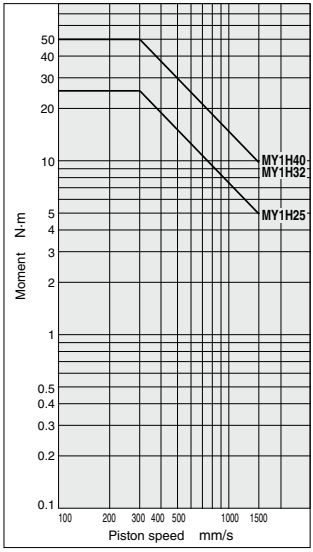
Maximum Allowable Moment

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

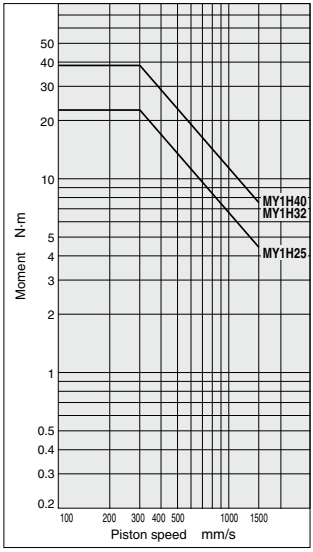
MY1H/M_1



MY1H/M_2



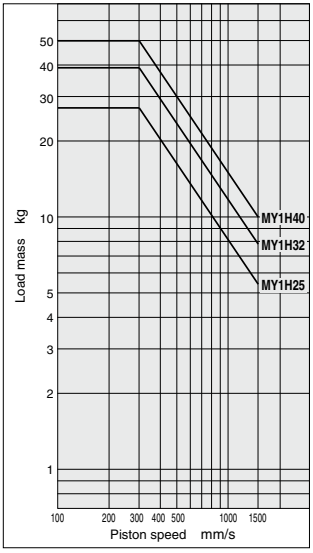
MY1H/M_3



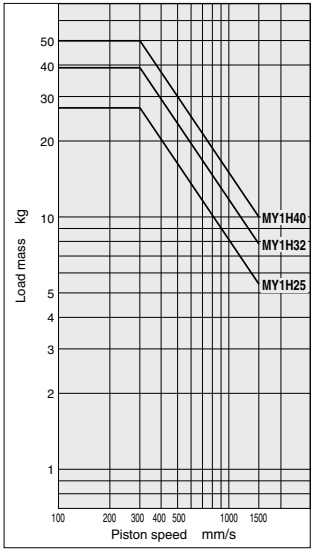
Maximum Load Mass

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

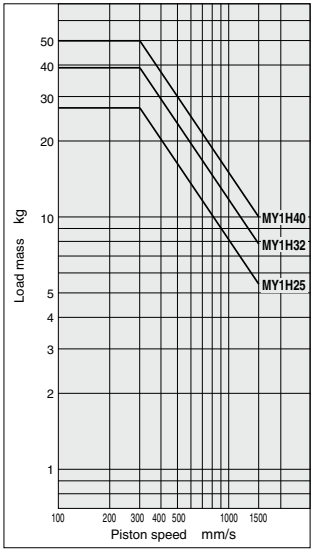
MY1H/m_1



MY1H/m_2



MY1H/m_3



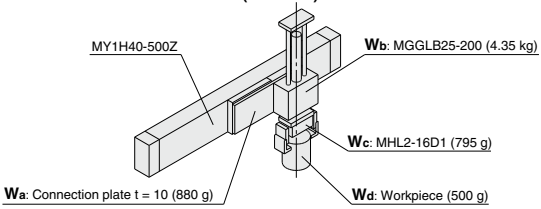
MY1H Series
Model Selection

The following is the steps for selecting the most suitable MY1H series to your application.

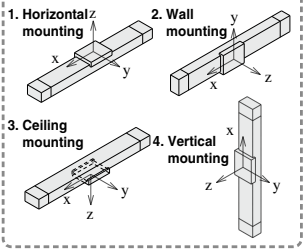
Calculation of Guide Load Factor

1. Operating Conditions

Cylinder ····· MY1H40-500Z
Average operating speed υa ··· 300 mm/s
Mounting orientation ····· Wall mounting
Cushion ····· Air cushion (δ = 1/100)

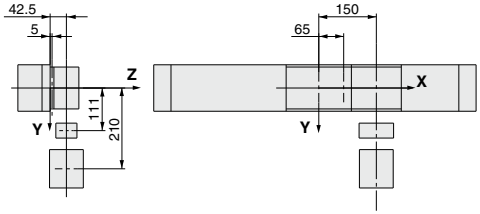


Mounting Orientation



Refer to page 1230 for wall mounting, ceiling mounting and vertical mounting types.

2. Load Blocking



Mass and Center of Gravity for Each Workpiece

Workpiece **Wn**	Mass **mn**	Center of gravity		
		X-axis **Xn**	Y-axis **Yn**	Z-axis **Zn**
Wa	0.88 kg	65 mm	0 mm	5 mm
Wb	4.35 kg	150 mm	0 mm	42.5 mm
Wc	0.795 kg	150 mm	111 mm	42.5 mm
Wd	0.5 kg	150 mm	210 mm	42.5 mm

n = a, b, c, d

3. Calculation of Composite Center of Gravity

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

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

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

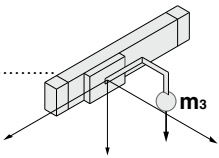
$\mathbf{Z} = \frac{1}{\mathbf{m_3}} \times \Sigma (\mathbf{m_n} \times \mathbf{z_n})$
$= \frac{1}{6.525}(0.88 \times 5 + 4.35 \times 42.5 + 0.795 \times 42.5 + 0.5 \times 42.5) =$ **37.4 mm**

4. Calculation of Load Factor for Static Load

m3: Mass

m3 max (from ① of graph MY1H/**m3**) = 50 (kg)·····

Load factor α_1 = **m3**/**m3 max** = 6.525/50 = **0.13**

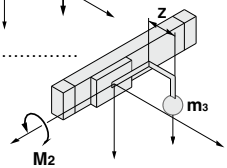


M2: Moment

M2 max (from ② of graph MY1H/**M2**) = 50 (N·m)·····

M2 = **m3** x **g** x **Z** = 6.525 x 9.8 x 37.4 x 10^{-3} = 2.39 (N·m)

Load factor α_2 = **M2**/**M2 max** = 2.39/50 = **0.05**

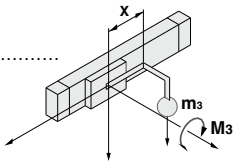


M3: Moment

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

M3 = **m3** x **g** x **X** = 6.525 x 9.8 x 138.5 x 10^{-3} = 8.86 (N·m)

Load factor α_3 = **M3/M3 max** = 8.86/38.7 = **0.23**



5. Calculation of Load Factor for Dynamic Moment

Equivalent load FE at impact

$F_E = 1.4\upsilon_a \times \delta \times m \times g = 1.4 \times 300 \times \frac{1}{100} \times 6.525 \times 9.8 = 268.6$ (N)

M1E: Moment

M1E max (from ④ of graph MY1H/**M1** where 1.4υ**a** = 420 mm/s) = 35.9 (N·m)……

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

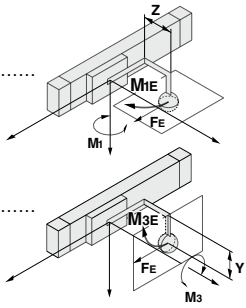
Load factor α_4 = **M1E/M1E max** = 3.35/35.9 = **0.09**

M3E: Moment

M3E max (from ⑤ of graph MY1H/**M3** where 1.4υ**a** = 420 mm/s) = 27.6 (N·m)……

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

Load factor α_5 = **M3E/M3E 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** ≤ **1**

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

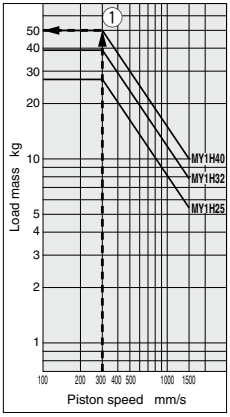
Select a shock absorber separately.

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

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

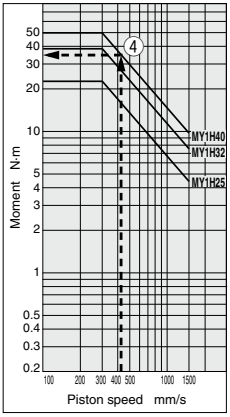
Load Mass

MY1H/m3

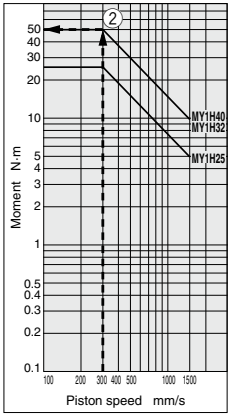


Allowable Moment

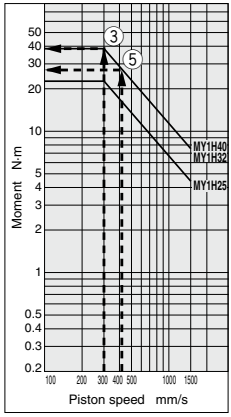
MY1H/M1



MY1H/M2



MY1H/M3



Mechanically Jointed Rodless Cylinder
Linear Guide Type
MY1H Series
ø25, ø32, ø40

RoHS

How to Order

Linear guide type **MY1H** **25** □ □ – **300** □ □ **Z** – **M9BW** □ – □

Linear guide type

Bore size

25	25 mm
32	32 mm
40	40 mm

Port thread type

Symbol	Type	Bore size
Nil	Rc	ø25, ø32, ø40
TN	NPT	
TF	G	

Piping

Nil	Standard type
G	Centralized piping type

Cylinder stroke (mm)

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

* Strokes are manufacturable in 1 mm 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 600 mm stroke, specify "-XB11" at the end of the part number. (Except ø10)

Stroke adjustment unit symbol
For stroke adjustment unit, refer to page 1209. Intermediate fixing spacer is not available for end lock mounting side.

End lock position

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

* For end lock positions, refer to page 1218.

Auto switch

Nil	Without auto switch (Built-in magnet)

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

Number of auto switches

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

Made to Order
Refer to page 1209 for details.

Applicable Auto Switches/Refer to pages 1575 to 1701 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) 0.5 (Nil)	1 (M)	3 (L)	5 (Z)	None (N)	Pre-wired connector	Applicable load	
Solid state auto switch	——	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	**M9NV**	**M9N**	●	●	●	○	○	○	IC circuit	Relay, PLC
				3-wire (PNP)			**M9PV**	**M9P**	●	●	●	○	○	○		
				2-wire	12 V		**M9BV**	**M9B**	●	●	●	○	○	○	—	
	Diagnostic indication (2-color indicator)			3-wire (NPN)	5 V, 12 V		**M9NWV**	**M9NW**	●	●	●	○	○	○	IC circuit	
				3-wire (PNP)			**M9PWV**	**M9PW**	●	●	●	○	○	○		
				2-wire	12 V		**M9BWV**	**M9BW**	●	●	●	○	○	○	—	
	Water resistant (2-color indicator)			3-wire (NPN)	5 V, 12 V		**M9NAV**[*1]	**M9NA**[*1]	○	○	●	○	—	○	IC circuit	
				3-wire (PNP)			**M9PAV**[*1]	**M9PA**[*1]	○	○	●	○	—	○		
				2-wire	12 V		**M9BAV**[*1]	**M9BA**[*1]	○	○	●	○	—	○	—	
Reed auto switch	——	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	**A96V**	**A96**	●	—	●	—	—	—	IC circuit	—
			No	2-wire	24 V	100 V	**A93V**[*2]	**A93**	●	●	●	●	—	—	—	Relay, PLC
						100 V or less	**A90V**	**A90**	●	—	●	—	—	—	IC circuit	

*1 Water resistant type auto switches can be mounted on the above models, but in such case SMC cannot guarantee water resistance. Please consult with SMC regarding water resistant types with the above model numbers.
*2 1 m type lead wire is only applicable to D-A93.

* Lead wire length symbols: 0.5 m ····· Nil (Example) M9NW
  1 m ····· M (Example) M9NWM
  3 m ····· L (Example) M9NWL
  5 m ····· Z (Example) M9NWZ
* Solid state auto switches marked with "○" are produced upon receipt of order.
* Mounting bracket (BMY3-016) is separately required to retrofit the above auto switches.

* There are other applicable auto switches other than listed above. For details, refer to page 1220.
* For details about auto switches with pre-wired connector, refer to pages 1648 and 1649.
* Auto switches are shipped together, (but not assembled). (For details about auto switch mounting, refer to page 1220.)

Specifications

Bore size (mm)		25	32	40
Fluid		Air		
Action		Double acting		
Operating pressure range		0.1 to 0.8 MPa		
Proof pressure		1.2 MPa		
Ambient and fluid temperature		5 to 60ºC		
Cushion		Air cushion		
Lubrication		Non-lube		
Stroke length tolerance		+1.8 0		
Piping port size	**Front/Side port**	Rc1/8		Rc1/4
	Bottom port	ø6		ø8

With end lock

Symbol
Air cushion

Lock Specifications

Bore size (mm)	25	32	40
Lock position	One end (Selectable), Both ends		
Holding force (Max.) (N)	270	450	700
Fine stroke adjustment range (mm)	0 to –11.5	0 to –12	0 to –16
Backlash	1 mm or less		
Manual release	Possible (Non-lock type)		

Made to Order

Made to Order: Individual Specifications
(For details, refer to page 1221.)

Symbol	Specifications
-X168	Helical insert thread

Made to Order

(For details, refer to pages 1703 to 1896.)

Symbol	Specifications
-XB10	Intermediate stroke (Using exclusive body)
-XB11	Long stroke
-XB22	Shock absorber/soft type RJ series mounted
-XC56	With knock pin holes

Piston Speed

Bore size (mm)		25 to 40
Without stroke adjustment unit		100 to 1000 mm/s
Stroke adjustment unit	**A unit**	100 to 1000 mm/s Note 1)
	L unit and H unit	100 to 1500 mm/s Note 2)

Note 1) Be aware that when the stroke adjustment range is increased with the adjustment bolt, the air cushion capacity decreases. Also, when exceeding the air cushion stroke ranges on page 1211, **the piston speed should be 100 to 200 mm/s.**
Note 2) The piston speed is 100 to 1000 mm/s for centralized piping.
Note 3) Use at a speed within the absorption capacity range. Refer to page 1211.

Stroke adjustment Unit Specifications

Bore size (mm)		25			32			40		
Unit symbol		**A**	**L**	**H**	**A**	**L**	**H**	**A**	**L**	**H**
Configuration Shock absorber model		With adjustment bolt	RB1007 + with adjustment bolt	RB1412 + with adjustment bolt	With adjustment bolt	RB1412 + with adjustment bolt	RB2015 + with adjustment bolt	With adjustment bolt	RB1412 + with adjustment bolt	RB2015 + with adjustment bolt
Stroke adjustment range by intermediate fixing spacer (mm)	**Without spacer**	0 to –11.5			0 to –12			0 to –16		
	With short spacer	–11.5 to –23			–12 to –24			–16 to –32		
	With long spacer	–23 to –34.5			–24 to –36			–32 to –48		

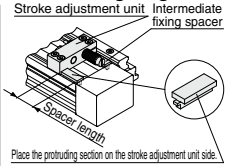
∗ Stroke adjustment range is applicable for one side when mounted on a cylinder.

Stroke Adjustment Unit Symbol

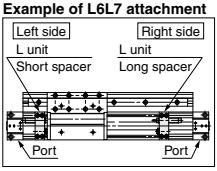
Left side stroke adjustment unit	Right side stroke adjustment unit: Without unit	A: With adjustment bolt	A: With short spacer	A: With long spacer	L: With low load shock absorber + adjustment bolt	L: With short spacer	L: With long spacer	H: With high load shock absorber + adjustment bolt	H: With short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

∗ Intermediate fixing spacer is not available for end lock mounting side.
∗ Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.

Stroke adjustment unit mounting diagram



Example of L6L7 attachment



Shock Absorber Model for L and H Units

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

∗ The shock absorber service life is different from that of the MY1H cylinder depending on operating conditions. Refer to the RB/RJ series Specific Product Precautions for the replacement period.
∗ Shock absorber/soft type RJ series mounted (-XB22) is made to order. For details, refer to page 1752.

Shock Absorber Specifications

Model		RB 1007	RB 1412	RB 2015
Max. absorbed energy (J)		5.9	19.6	58.8
Stroke absorption (mm)		7	12	15
Max. collision speed (mm/s)		1500	1500	1500
Max. operating frequency (cycle/min)		70	45	25
Spring force (N)	**Extended**	4.22	6.86	8.34
	Retracted	6.86	15.98	20.50
Operating temperature range (ºC)		5 to 60		

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

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
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

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

Weight

Unit: kg

Bore size (mm)	Basic weight	Additional weight per each 50 mm of stroke	Side support bracket weight (per set)	Stroke adjustment unit weight (per unit)		
			A/B type weight	A unit weight	L unit weight	H unit weight
25	2.17	0.30	0.02	0.04	0.07	0.11
32	4.37	0.46	0.04	0.08	0.14	0.23
40	5.84	0.55	0.08	0.12	0.19	0.28

Calculation: (Example) **MY1H25-300AZ**

Basic weight ..... 2.17 kg
Cylinder stroke ..... 300 mm stroke
Additional weight ..... 0.30 kg/50 mm stroke
A unit weight ..... 0.04 kg

2.17 + 0.30 x 300 ÷ 50 + 0.04 x 2 ≒ 4.05 kg

Options

Stroke Adjustment Unit/Part No.

MYH − A 25 L2 − 6N

Stroke adjustment unit

Bore size

25	25 mm
32	32 mm
40	40 mm

Unit type

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

Note) For details about adjustment range, refer to page 1209.

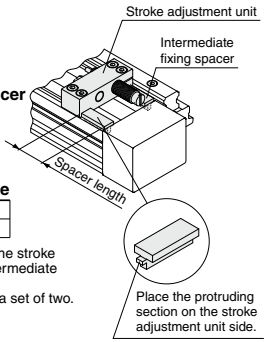
Intermediate fixing spacer

Nil	Without spacer
6□	Short spacer
7□	Long spacer

Spacer delivery type

Nil	Unit installed
N	Spacer only

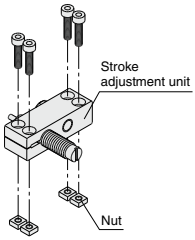
* Spacers are used to fix the stroke adjustment unit at an intermediate stroke position.
* Spacers are shipped for a set of two.



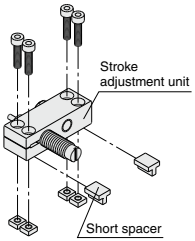
* When ordering the intermediate fixing spacer for the stroke adjustment unit, the intermediate fixing spacer is shipped together.

Component Parts

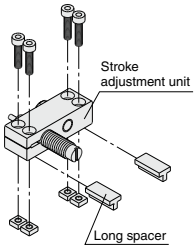
MYH-A25L2 (Without spacer)



MYH-A25L2-6 (With short spacer)

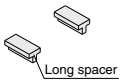


MYH-A25L2-7 (With long spacer)



MYH-A25L2-6N (Short spacer only)

MYH-A25L2-7N (Long spacer only)



* Nuts are equipped on the cylinder body.

Side Support/Part No.

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

For details about dimensions, etc., refer to page 1219.
Side supports consist of a set of right and left support.

Cushion Capacity

Cushion Selection

<Air cushion>
Air cushions are a standard feature on mechanically jointed rodless cylinders.
The air cushion mechanism is incorporated to prevent excessive impact of the piston with high kinetic energy at the stroke end. The purpose of air cushion, thus, is not to decelerate the piston near the stroke end.
The ranges of load and speed that air cushions can absorb are within the air cushion limit lines shown in the graphs.

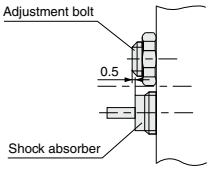
<Stroke adjustment unit with shock absorber>
Use this unit when operating with a load and speed exceeding the air cushion limit line, or when cushioning is required outside of the effective air cushion stroke range due to stroke adjustment.

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

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

⚠Caution

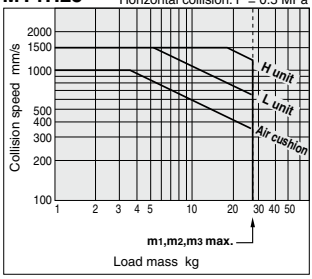
1. Refer to the below figure when using the adjustment bolt to perform stroke adjustment.
When the effective stroke of the shock absorber decreases as a result of stroke adjustment, the absorption capacity decreases dramatically.
Secure the adjustment bolt at the position where it protrudes approximately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



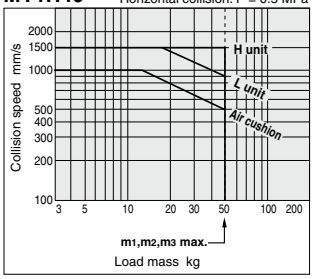
2. Do not use a shock absorber together with air cushion.

Absorption Capacity of Air Cushion and Stroke Adjustment Units

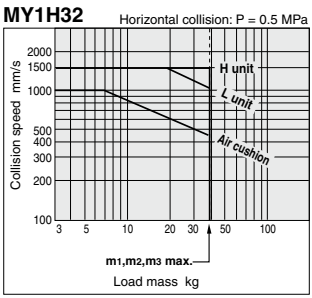
MY1H25 Horizontal collision: P = 0.5 MPa



MY1H40 Horizontal collision: P = 0.5 MPa



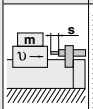
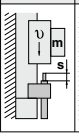
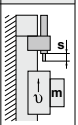
MY1H32 Horizontal collision: P = 0.5 MPa



Air Cushion Stroke Unit: mm

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

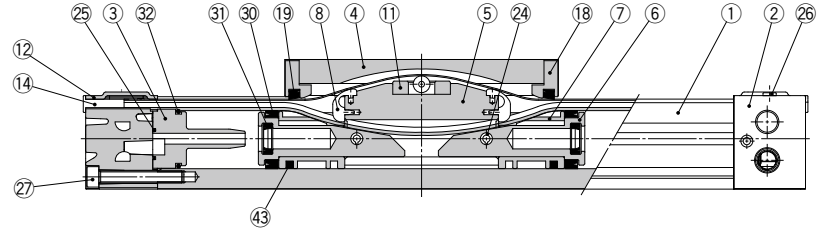
Calculation of Absorbed Energy for Stroke Adjustment Unit with Shock Absorber Unit: N·m

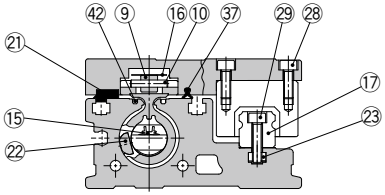
	Horizontal collision	Vertical collision (Downward)	Vertical collision (Upward)
Type of impact			
Kinetic energy **E1**	$\frac{1}{2}m\cdot\upsilon^2$		
Thrust energy **E2**	**F·s**	**F·s + m·g·s**	**F·s – m·g·s**
Absorbed energy **E**	**E1 + E2**		

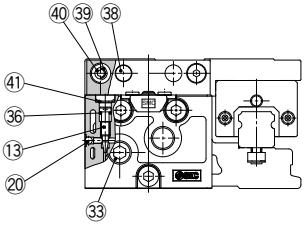
Symbols
υ: Speed of impact object (m/s)
F: Cylinder thrust (N)
s: Shock absorber stroke (m)
m: Mass of impact object (kg)
g: Gravitational acceleration (9.8 m/s²)
Note) The speed of the impact object is measured at the time of impact with the shock absorber.

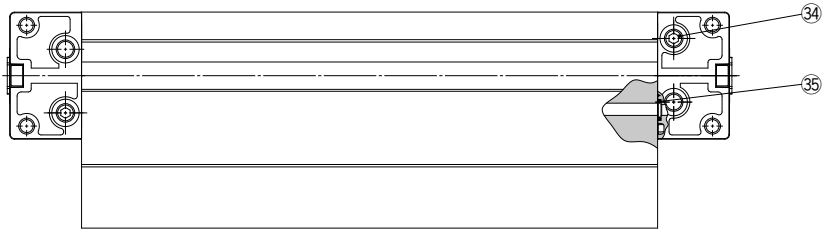
Construction

Standard type









Component Parts

No.	Description	Material	Note
1	**Cylinder tube**	Aluminum alloy	Hard anodized
2	**Head cover**	Aluminum alloy	Painted
3	**Cushion boss**	Special resin	
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	**Parallel pin**	Stainless steel	
11	**Coupler**	Sintered iron material	
12	**Head plate**	Stainless steel	
13	**Cushion needle**	Rolled steel	Nickel plated
14	**Belt clamp**	Special resin	
17	**Guide**	—	
18	**End cover**	Special resin	
20	**Steel ball**	Carbon tool steel	
21	**Bearing**	Special resin	
22	**Magnet**	Rare earth magnet	
23	**Square nut**	Carbon steel	Chromated
24	**Spring pin**	Bearing steel	
26	**Thin head screw**	Chromium molybdenum steel	Chromated
27	**Hexagon socket head cap screw**	Chromium molybdenum steel	Chromated
28	**Hexagon socket head cap screw**	Chromium molybdenum steel	Chromated
29	**Hexagon socket head cap screw**	Chromium molybdenum steel	Chromated
33	**Hexagon socket head taper plug**	Carbon steel	Chromated (Centralized piping: 10 pcs.)
34	**Hexagon socket head taper plug**	Carbon steel	Chromated (Centralized piping: 4 pcs.)
38	**Stopper**	Carbon steel	
39	**Spacer**	Stainless steel	
40	**Hexagon socket button head screw**	Chromium molybdenum steel	Chromated
41	**CR retaining ring**	Spring steel	
42	**Seal magnet**	Rubber magnet	
43	**Lube retainer**	Special resin	

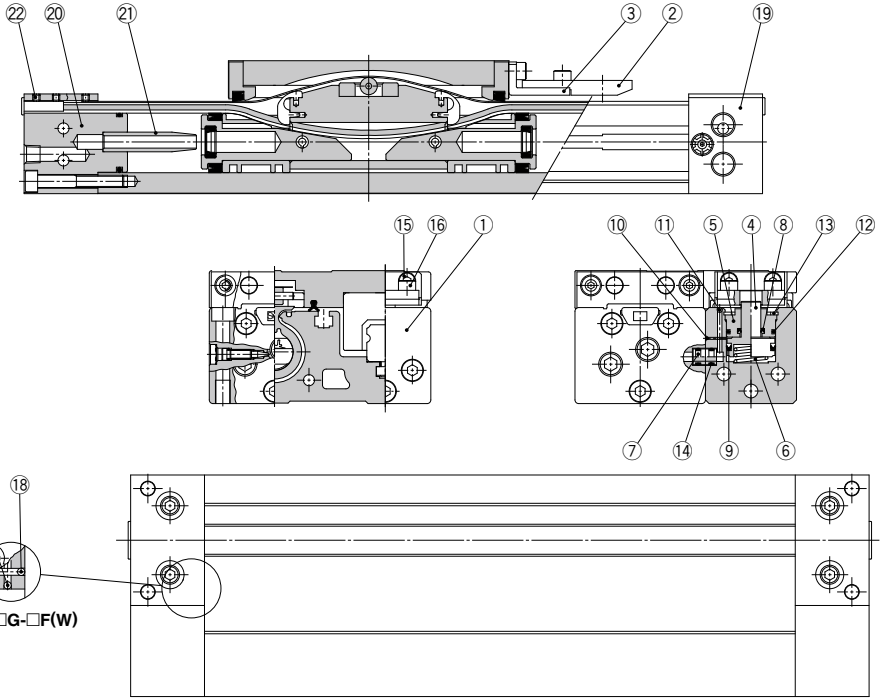
Replacement Parts: Seal Kit

No.	Description	Material	Qty.	MY1H25	MY1H32	MY1H40
15	**Seal belt**	Urethane	1	MY25-16C-Stroke	MY32-16C-Stroke	MY40-16C-Stroke
16	**Dust seal band**	Stainless steel	1	MY1B25-16B-Stroke	MY1B32-16B-Stroke	MY1B40-16B-Stroke
25	**Cushion boss gasket**	NBR	2	MYB25-16GA5900	MYB32-16GA5901	MYB40-16GA5902
36	**O-ring**	NBR	2	KA00311 (ø5.1 x ø3 x ø1.05)	KA00320 (ø7.15 x ø3.75 x ø1.7)	KA00320 (ø7.15 x ø3.75 x ø1.7)
37	**Side scraper**	Special resin	2	MYH25-15BK2902B	MYH32-15BK2903B	MYH40-15BK2904B
19	**Scraper**	NBR	2	MY1H25-PS	MY1H32-PS	MY1H40-PS
30	**Piston seal**	NBR	2			
31	**Cushion seal**	NBR	2			
32	**Tube gasket**	NBR	2			
35	**O-ring**	NBR	2			

∗ Seal kit includes ⑲, ㉚, ㉛, ㉜ and ㉟. Order the seal kit based on each bore size.
∗ Seal kit includes a grease pack (10 g). When ⑮ or ⑯ is shipped independently, a grease pack (20 g) is included.
Order with the following part number when only the grease pack is needed.
Grease pack part number: GR-S-010 (10 g), **GR-S-020** (20 g)

Construction

End lock



Component Parts

No.	Description	Material	Note
1	**Locking body**	Aluminum alloy	Painted
2	**Lock finger**	Carbon steel	After quenching, nickel plated
3	**Lock finger bracket**	Rolled steel	Nickel plated
4	**Lock piston**	Carbon tool steel	After quenching, electroless nickel plated
5	**Rod cover**	Aluminum alloy	Hard anodized
6	**Return spring**	Spring steel	Zinc chromated
7	**Bypass pipe**	Aluminum alloy	Hard anodized
10	**Steel ball**	High carbon chromium bearing steel	
11	**Steel ball**	High carbon chromium bearing steel	
13	**Inverted internal retaining ring**	Carbon tool steel	Nickel plated
15	**Hexagon socket head cap screw**	Chromium molybdenum steel	Chromated
16	**Hexagon socket head cap screw**	Chromium molybdenum steel	Chromated
17	**Steel ball**	High carbon chromium bearing steel	
18	**Steel ball**	High carbon chromium bearing steel	
19	**Head cover WR**	Aluminum alloy	Painted
20	**Head cover WL**	Aluminum alloy	Painted
21	**Cushion ring**	Aluminum alloy	
22	**Hexagon socket head set screw**	Chromium molybdenum steel	Chromated

Replacement Parts: Seal Kit

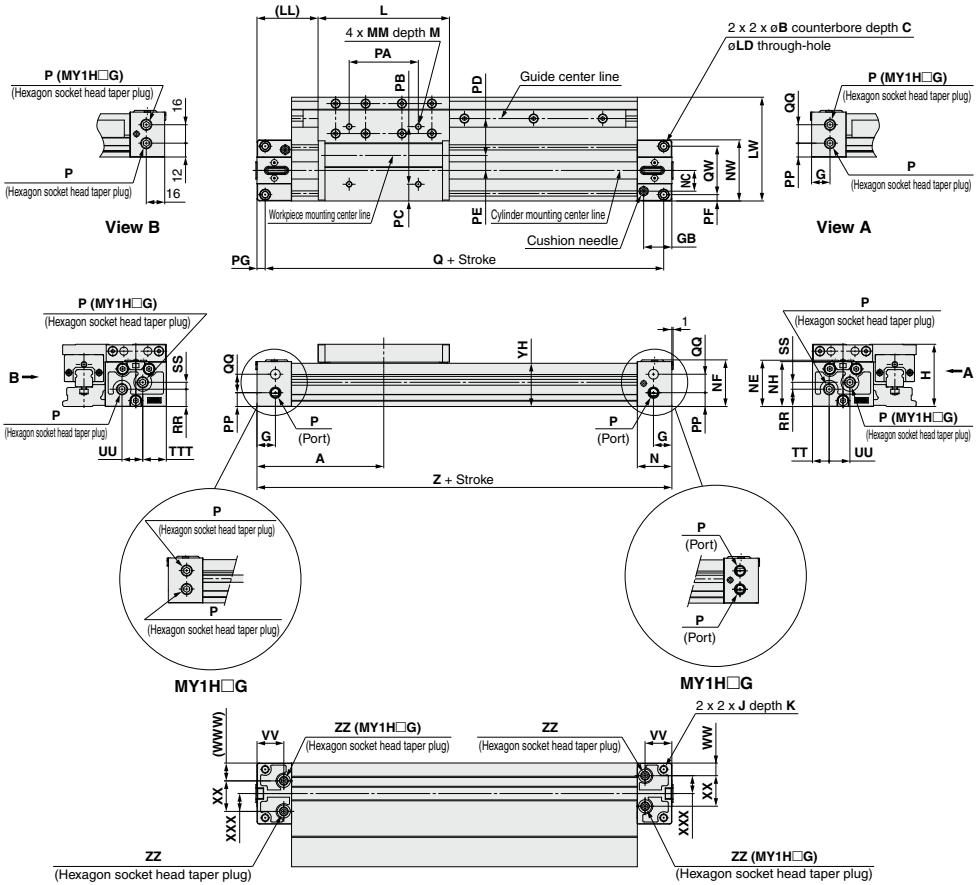
No.	Description	Material	Qty.	MY1H25	MY1H32	MY1H40
8	**Rod seal**	NBR	1	KB00267	KB00267	KB00267
9	**Piston seal**	NBR	1	KB00217	KB00217	KB00217
12	**O-ring**	NBR	1	KB00037	KB00037	KB00037
14	**O-ring**	NBR	2	KA00048	KA00048	KA00048

∗ Since the seal kit does not include a grease pack, order it separately.
Grease pack part no.: GR-S-010 (10 g)

Standard Type/Centralized Piping Type

Regarding centralized piping port variations, refer to page 1222.

MY1H25□/32□/40□ – Stroke Z



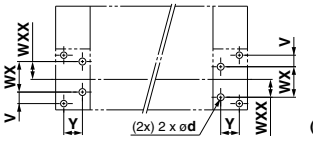
Standard piping/Centralized piping

Model	A	B	C	G	GB	H	J	K	L	LD	LL	LW	M	MM	N	NC	NE	NF	NH	NW	P	PA	PB	PC
MY1H25	110	9	5.5	16	24.5	54	M6 x 1	9.5	114	5.6	53	90	9	M5 x 0.8	30	18	40.2	40.5	39	53	Rc1/8	60	50	14.5
MY1H32	140	11	6.6	19	28.5	68	M8 x 1.25	16	140	6.8	70	110	13	M6 x 1	37	22	50.2	50	49	64	Rc1/8	80	60	15
MY1H40	170	14	8.5	23	35	84	M10 x 1.5	15	170	8.6	85	121	13	M6 x 1	45	26.5	62.7	62	61.5	75	Rc1/4	100	80	20.5

Model	PD	PE	PF	PG	PP	Q	QW	RR	TT	TTT	VV	WW	WWW	XXX	YH	Z	ZZ
MY1H25	32	13	5.5	7	12	206	42	15	14.5	20.5	23.3	11	15.5	15.5	37.5	220	Rc1/16
MY1H32	42	13	6.5	8	16	264	51	16	16	16	28.5	12	12	20	47	280	Rc1/16
MY1H40	37.5	23	8	9	18.5	322	59	23.5	20	20	35	14	14	23.5	59.5	340	Rc1/8

Centralized piping (mm)

Model	QQ	SS	UU	XX
MY1H25	16	6	18	26.5
MY1H32	16	11	32	40
MY1H40	24	12	35	47



Bottom ported (Applicable O-ring)

∗ This figure shows the recommended machining dimensions of the mounting surface when viewed from the cylinder side.
∗ Values inside the parentheses are those for **MY1H□G**.

Hole Size for Centralized Piping on the Bottom (Machine the mounting side to the dimensions below.)

Standard piping/Centralized piping (mm)

Model	WXX	Y	d	D	R	Applicable O-ring
MY1H25	15.5	16.2	6	11.4	1.1	C9
MY1H32	20	20.4	6	11.4	1.1	
MY1H40	23.5	25.9	8	13.4	1.1	C11.2

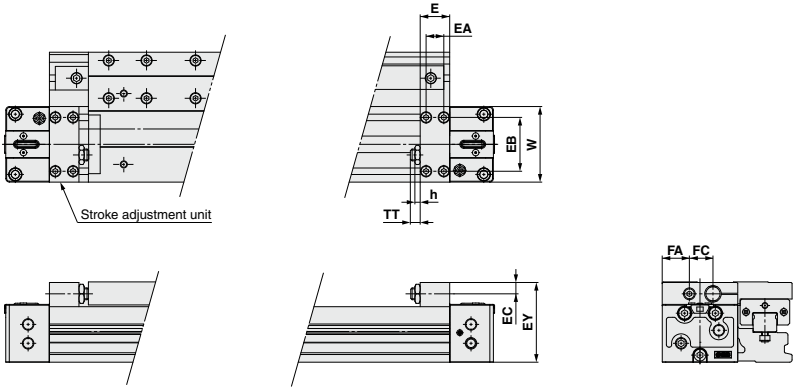
Centralized piping (mm)

Model	WX	V
MY1H25	26.5	10
MY1H32	40	5.5
MY1H40	47	6

Stroke Adjustment Unit

With adjustment bolt

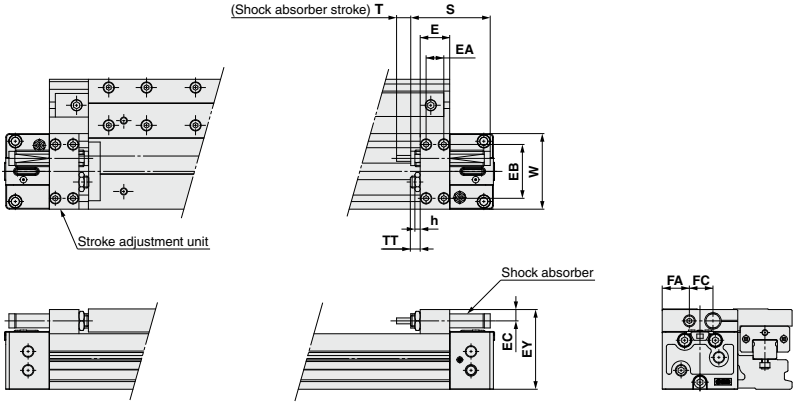
MY1H Bore size □ – Stroke AZ



Applicable cylinder	E	EA	EB	EC	EY	FA	FC	h	TT	W
MY1H25	18	9	40	7.5	53.5	16	21	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

With low load shock absorber + adjustment bolt

MY1H Bore size □ – Stroke LZ



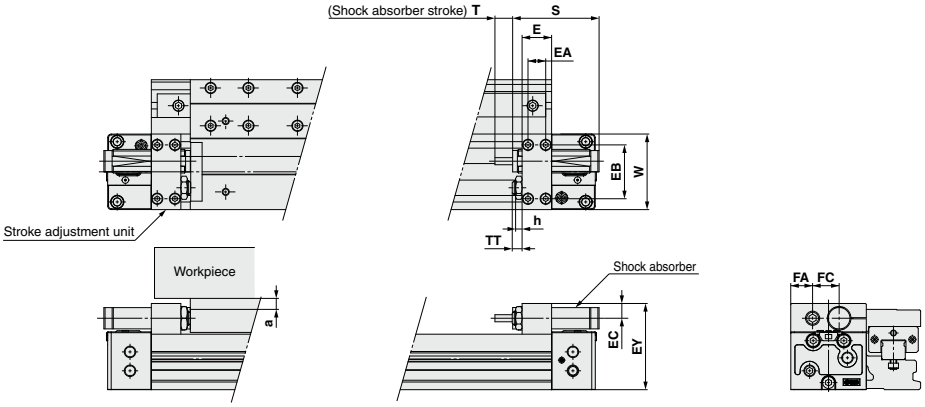
(mm)

Applicable cylinder	E	EA	EB	EC	EY	F	FA	FC	h	S	T	TT	W	Shock absorber model
MY1H25	18	9	40	7.5	53.5	—	16	21	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

Stroke Adjustment Unit

With high load shock absorber + adjustment bolt

MY1H Bore size □ – Stroke HZ

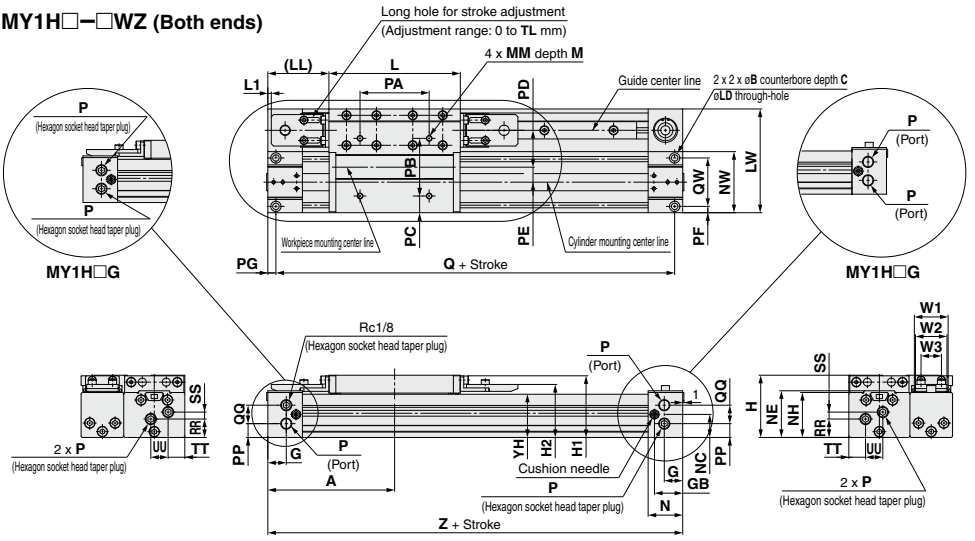


∗ Since the EY dimension of H unit is greater than the table top height (H dimension), when a workpiece exceeding the overall length (L dimension) of the slide table is mounted, allow a clearance of size "**a**" or larger at the workpiece side.

Applicable cylinder	E	EA	EB	EC	EY	F	FA	FC	h	S	T	TT	W	Shock absorber model	a
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

With End Lock

MY1H□–□WZ (Both ends)



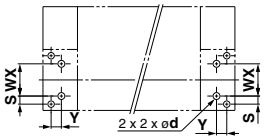
Standard piping/Centralized piping

Model	A	B	C	G	GB	H	J	K	L	LD	LL	LW	M	MM	N	NC	NE	NH	NW	P	PA	PB	PC	PD
MY1H25	110	9	5.5	16	24.5	54	M6 x 1	9.5	114	5.6	53	90	9	M5 x 0.8	30	20	40.5	39	53	Rc1/8	60	50	14.5	32
MY1H32	140	11	6.6	19	28.5	68	M8 x 1.25	16	140	6.8	70	110	13	M6 x 1	37	25	50	49	64	Rc1/8	80	60	15	42
MY1H40	170	14	8.5	23	35	84	M10 x 1.5	15	170	8.6	85	121	13	M6 x 1	45	30.5	63	61.5	75	Rc1/4	100	80	20.5	37.5

Model	PE	PF	PG	PP	Q	QW	RR	SS	TT	UU	VV	WW	XX	YH	Z	ZZ
MY1H25	13	5.5	7	12	206	42	16	6	14.5	15	16	12.5	28	37.5	220	Rc1/16
MY1H32	13	6.5	8	17	264	51	23	4	16	16	19	16	32	47	280	Rc1/16
MY1H40	23	8	9	8.5	322	59	27	10.5	20	22	23	19.5	36	59.5	340	Rc1/8

End lock mechanism (Standard piping/Centralized piping) (mm)

Model	H1	H2	L1	TL	W1	W2	W3
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



Bottom ported
(Applicable O-ring)

∗ This figure shows the recommended machining dimensions of the mounting surface when viewed from the cylinder side.

Hole Size for Centralized Piping on the Bottom

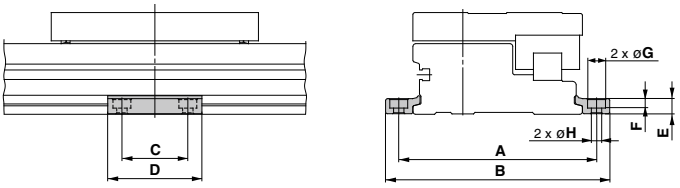
(Machine the mounting side to the dimensions below.)

Standard piping/Centralized piping

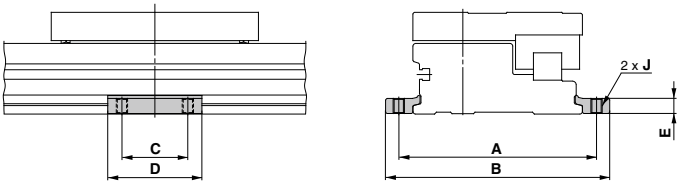
Model	WX	Y	S	d	D	R	Applicable O-ring
MY1H25	28	9	7	6	11.4	1.1	C9
MY1H32	32	11	9.5	6	11.4	1.1	
MY1H40	36	14	11.5	8	13.4	1.1	C11.2

Side Support

Side support A
MY-S□A



Side support B
MY-S□B



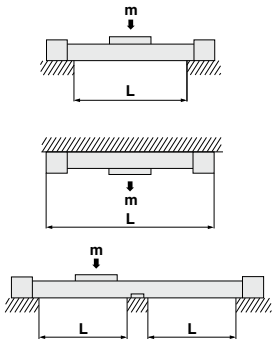
(mm)

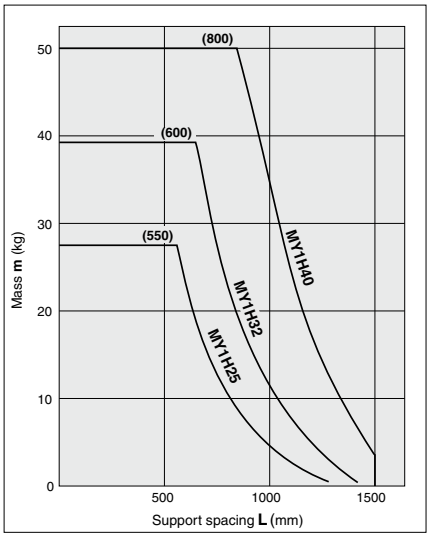
Part no.	Applicable cylinder	A	B	C	D	E	F	G	H	J
MY-S25$^{A}_{B}$	MY1H25	105	119	35	50	8	5	9.5	5.5	M6 x 1
MY-S32$^{A}_{B}$	MY1H32	130	148	45	64	11.7	6	11	6.6	M8 x 1.25
MY-S40$^{A}_{B}$	MY1H40	145	167	55	80	14.8	8.5	14	9	M10 x 1.5

∗ Side supports consist of a set of right and left supports.

Guide to Side Support Application

For long stroke operation, the cylinder tube may be deflected depending on its own weight and the load. 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 below graph.



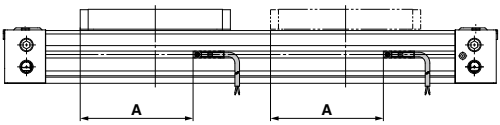


⚠Caution

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 it. Also, for long stroke operation involving vibration and impact, use of a side support is recommended.
2. Support brackets are not for mounting; use them solely for providing support.

Auto Switch Mounting

Auto Switch Proper Mounting Position



Auto Switch Proper Mounting Position (mm)

Auto switch model / Bore size	D-M9□ D-M9□V D-M9□W D-M9□WV D-M9□AL D-M9□AV	D-A9□ D-A9□V
	A	A
25	85	81
32	116.5	112.5
40	137.5	133.5

Note) Adjust the auto switch after confirming the operating conditions in the actual setting.

Operating Range

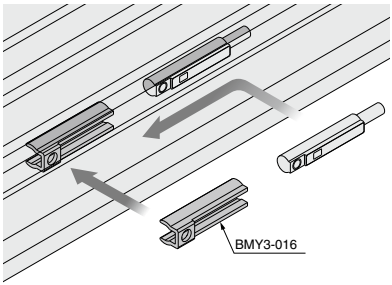
(mm)

Auto switch model	Bore size		
	25	32	40
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	5.0	5.5	5.5
D-A9□/A9□V	7.0	10.0	9.0

Note) Values which include hysteresis are for guideline purposes only, they are not a guarantee (assuming approximately ±30% dispersion) and may change substantially depending on the ambient environment.

Auto Switch Mounting Bracket/Part No.

Auto switch model	Bore size (mm)
	ø25 to ø40
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	BMY3-016



Other than the applicable auto switches listed in "How to Order", the following auto switches are mountable.

* Normally closed (NC = b contact) solid state auto switches (D-F9G/F9H) are also available. For details, refer to page 1593.
* With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1648 and 1649.

Made to Order: Individual Specifications

Please contact SMC for detailed dimensions, specifications and lead times.

Made to Order

Symbol

1 Helical Insert Thread -X168

Helical insert thread is used for the slide table mounting thread, the thread size is the same as the standard model.

MY1H [Bore size] – [Stroke] [ ] **Z** – [Auto switch] [Suffix] – **X168**

- [ ] : Stroke adjustment unit
- Bore size: Type/Bore size — H: Linear guide type — 25, 32, 40

Example) MY1H40G-200LZ-M9BW-X168

Specifications: Same as standard type

Specific Product Precautions 1

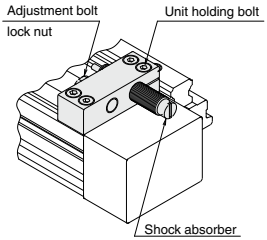
Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

Operating Precautions

⚠Caution

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

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



<Fastening of unit>
The unit can be secured by evenly tightening the four unit holding bolts.

Tightening Torque for Stroke Adjustment Unit Holding Bolts Unit: N·m

Bore size (mm)	Tightening torque
25	1.8
32	3.5
40	5.8

⚠Caution

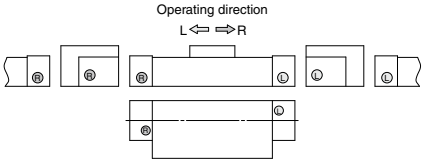
Do not operate with the stroke adjustment unit fixed in an intermediate position.
When the stroke adjustment unit is fixed in an intermediate position, slippage can occur depending on the amount of energy released at the time of an impact. In that case, use a short spacer or a long spacer.
For other lengths, please consult with SMC. (Refer to "Tightening Torque for Stroke Adjustment Unit Holding Bolts.")

<Adjustment bolt stroke adjustment>
Loosen the adjustment bolt lock nut, and adjust the stroke from the lock cover side using a hexagon wrench. Then, retighten the lock nut.

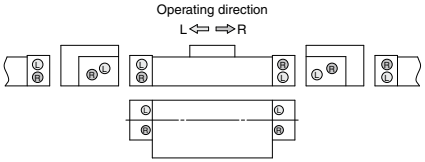
<Shock absorber stroke adjustment>
Loosen the two unit holding bolts at the shock absorber side, turn the shock absorber and adjust the stroke. Then, uniformly retighten the unit holding bolts to secure the shock absorber.

Port Variation

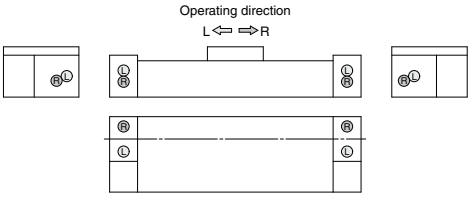
Standard piping type



Centralized piping type



End lock



MY1H Series
Specific Product Precautions 2

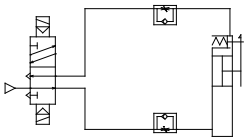
Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 12 for Actuator and Auto Switch Precautions.

With End Lock

Recommended Pneumatic Circuit

⚠ Caution

This is necessary for the correct locking and unlocking actions.



Operating Precautions

⚠ Caution

1. Do not use 3-position solenoid valves.

Avoid use in combination with 3-position solenoid valves (especially closed 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 "Lock Release.")

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

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

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

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

5. Do not operate multiple cylinders in synchronization.

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

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

Lock cannot be released occasionally by meter-in control.

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

If the cylinder piston does not reach the end of the stroke, locking and unlocking may not be possible. (Refer to "End Lock Mechanism Adjustment.")

Operating Pressure

⚠ Caution

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

Exhaust Speed

⚠ Caution

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

Relation to Cushion

⚠ Caution

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

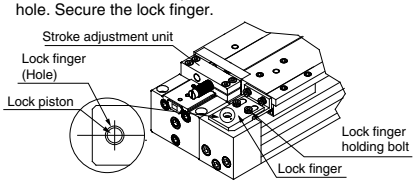
End Lock Mechanism Adjustment

⚠ Caution

1. The end lock mechanism is adjusted at the time of shipping. Therefore, adjustment for operation at the stroke end is unnecessary.

2. Adjust the end lock mechanism after the stroke adjustment unit has been adjusted. The adjustment bolt and shock absorber of the stroke adjustment unit must be adjusted and secured first. Locking and unlocking may not occur otherwise.

3. Perform fine adjustment of the end lock mechanism as follows. Loosen the lock finger holding bolts, and then adjust by aligning the center of the lock piston with the center of the lock finger hole. Secure the lock finger.



Lock Release

⚠ 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 "Recommended Pneumatic Circuit.") If the lock is released when the port on the side without the lock is in an exhaust state, and with a load applied to the lock unit, the lock unit may be subjected to an excessive force and be damaged.

Furthermore, sudden movement of the slide table is very dangerous.

Manual Release

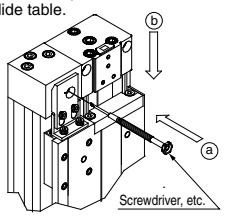
⚠ Caution

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

If it is unlocked while the air pressure still remains, it will lead to damage a workpiece, etc. due to unexpected lurching.

2. Perform manual release of the end lock mechanism as follows.

Push the lock piston down with a screwdriver, etc., and move the slide table.



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