Magnetically Coupled Rodless Cylinder
Slider Type: Slide Bearing
Series CY1S
ø6, ø10, ø15, ø20, ø25, ø32, ø40

How to Order

Without auto switch CY1S 25 H — 300 ☐

With auto switch CDY1S 25 H — 300 ☐ — J79W ☐

With switch rail

Slider type (Slide bearing)

Bore size

6	6 mm	**25**	25 mm
10	10 mm	**32**	32 mm
15	15 mm	**40**	40 mm
20	20 mm		

Magnetic holding force
Refer to "Magnetic Holding Force" on page 8-15-47.

Standard stroke
Refer to "Standard Stroke" on page 8-15-47.

Adjustment type

Nil	With adjusting bolt
B	With shock absorbers (2 pcs.)
BS	With shock absorber (With plate A) ∗ Installed on Side A at time of shipment.

Auto switch

Nil	Without auto switch

∗ For the applicable auto switch model, refer to the table below.
∗ Auto switches are shipped together, (but not assembled).

Number of auto switches

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

Applicable Auto Switch/Refer to page 8-30-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage DC	Load voltage DC	Load voltage AC	Auto switch model: Perpendicular	Auto switch model: In-line	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	None (N)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	—	**A76H**	●	●	—	—	—	IC circuit	—
				2-wire	—	—	200V	**A72**	**A72H**	●	●	—	—	—	—	Relay, PLC
					24 V	12 V	100 V	**A73**	**A73H**	●	●	●	—	—		
		Connector					—	**A73C**	—	●	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet				—	—	**A79W**	—	●	●	—	—	—		
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	**F7NV**	**F79**	●	●	○	—	○	IC circuit	Relay, PLC
				3-wire (PNP)				**F7PV**	**F7P**	●	●	○	—	○		
				2-wire		12 V		**F7BV**	**J79**	●	●	○	—	○	—	
		Connector						**J79C**	—	●	●	●	●	—		
	Diagnostic indication (2-color indication)	Grommet		3-wire (NPN)		5 V, 12 V		**F7NWV**	**F79W**	●	●	○	—	○	IC circuit	
				3-wire (PNP)				—	**F7PW**	●	●	○	—	○		
				2-wire		12 V		**F7BWV**	**J79W**	●	●	○	—	○	—	
	Water resistant (2-color indication)							—	**F7BA**	—	●	○	—	○		
								F7BAV	—	—	●	○	—	—		
	With diagnostic output (2-color indication)			4-wire (NPN)		5 V, 12 V		—	**F79F**	●	●	○	—	○	IC circuit	

∗ Lead wire length symbols: 0.5 m····· Nil (Example) A73C
3 m····· L (Example) A73CL
5 m····· Z (Example) A73CZ
None····· N (Example) A73CN

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

• Since there are other applicable auto switches than listed, refer to page 8-15-56 for details.
• For details about auto switches with pre-wire connector, refer to page 8-30-52.

Load can be directly mounted
Strokes available up to 1500 mm
Long life with no external leakage
With auto switches and shock absorbers

Model

Type	Bearing type	Model	Bore size (mm)	Auto switch model	Adjustment type
Slider type	Slide bearing	**CY1S**	6, 10, 15, 20, 25, 32, 40	D-A7/A8 D-F7/J7	With adjusting bolt With shock absorber

Specifications

Fluid	Air
Proof pressure	1.05 MPa
Maximum operating pressure	0.7 MPa
Minimum operating pressure	0.18 MPa
Ambient and fluid temperature	–10 to 60°C
Piston speed *	50 to 400 mm/s
Cushion	Rubber bumper on both ends
Lubrication	Non-lube
Stroke length tolerance	0 to 250 st: $^{+1.0}_{0}$, 251 to 1000 st: $^{+1.4}_{0}$, 1001 st and up: $^{+1.8}_{0}$
Mounting orientation	Free

* In the case of setting an auto switch (CDY1S) at the intermediate position, the maximum piston speed is subject to restrict for detection upon the response time of a load (Relays, Sequence controller, etc.)

Made to Order Specifications (For details, refer to page 8-31-1.)

Symbol	Specifications
-XB9	Low speed cylinder (10 to 50 mm/s)
-XB13	Low speed cylinder (5 to 50 mm/s)
-XC18	NPT finish piping port
-X116	Hydro specifications rodless cylinder
-X168	Helical insert thread specifications
-X210	Non-lubricated exterior specifications
-X211	CY series mounting dimensions
-X322	Outside of cylinder tube with hard chrome plated
-X324	Oil-free exterior (With dust seal)
-X431	Auto switch rails on both side faces (with 2 pcs.)

Standard Stroke

Bore size (mm)	Standard stroke (mm)	Maximum manufacturable stroke (mm)
6	50, 100, 150, 200	300
10	50, 100, 150, 200, 250, 300	500
15	50, 100, 150, 200, 250, 300, 350 400, 450, 500	750
20	100, 150, 200, 250, 300, 350 400, 450, 500, 600, 700, 800	1000
25		1500
32		
40	100, 150, 200, 250, 300, 350 400, 450, 500, 600, 700, 800 900, 1000	1500

Principal Parts Material

Description	Material	Note
Plate A, B	Aluminum alloy	Hard anodized
Cylinder tube	Stainless steel	—
Guide shaft A, B	Carbon steel	Hard chrome plated
Magnet	Rare earth magnet	—
Slide block	Aluminum alloy	Hard anodized

Magnetic Holding Force (N)

Bore size (mm)		**6**	**10**	**15**	**20**	**25**	**32**	**40**
Holding force	Type H	19.6	53.9	137	231	363	588	922
	Type L	—	—	81.4	154	221	358	569

Amount of Adjustment for Adjusting Bolt and Shock Absorber

Bore size (mm)	Amount of adjustment (both ends) by adjusting bolt (mm)	Amount of adjustment by shock absorber (mm)	
		Plate A side	Plate B side
6	12	17	11
10	11	14	6
15	7	14	4
20	11	36	27
25	10	12	3
32	11	33	23
40	9	32	17

* Since the cylinder is in an intermediate stop condition when stroke adjustment is performed, use caution regarding the operating pressure and the kinetic energy of the load.

Weight

(kg)

Number of magnets \ Bore size (mm)		**6**	**10**	**15**	**20**	**25**	**32**	**40**
Basic weight	**CY1S□H**	0.27	0.48	0.91	1.48	1.84	3.63	4.02
	CY1S□L	—	—	0.85	1.37	1.75	3.48	3.84
Additional weight per each 50 mm of stroke		0.044	0.074	0.104	0.138	0.172	0.267	0.406

Calculation
(Example) CY1S32H-500
• Basic weight ····· 3.63 kg • Additional weight ····· 0.267/50 st
• Cylinder stroke ····· 500 st 3.63 + 0.267 x 500 ÷ 50 = 6.3 kg

With shock absorber

For details regarding Series CY1S with shock absorber, refer to page 8-15-55.

⚠ Precautions

Be sure to read before handling. Refer to pages 8-34-3 to 8-34-6 for Safety Instructions and Actuator Precautions.

Operation

⚠ Warning

1. Be aware of the space between the plates and the slide block.
Take sufficient care to avoid getting your hands or fingers caught when the cylinder is operated.

2. Do not apply a load to a cylinder which is greater than the allowable value stated in the "Model Selection" pages.

Mounting

⚠ Caution

1. Avoid operation with the external slider fixed to the mounting surface.
The cylinder should be operated with the plates fixed to the mounting surface.

2. Perform mounting so that the external slider will operate through the entire stroke at the minimum operating pressure.
If the mounting surface is not flat, the guides will be warped, increasing the minimum operating pressure and causing premature wear of the bearings. Therefore, mounting should be performed so that the external slider will operate through the entire stroke at the minimum operating pressure. A mounting surface with a high degree of flatness is desirable, but in cases where this is not possible, adjust with shims, etc.

Disassembly and Maintenance

⚠ Warning

1. Use caution as the attractive force of the magnets is very strong.
When removing the external slider and piston slider from the cylinder tube for maintenance, etc., handle with caution, since the magnets installed in each slider have a very strong attractive force.

⚠ Caution

1. Use caution when removing the external slider, as the piston slider will be directly attracted to it.
When removing the external slider or piston slider from the cylinder tube, first force the sliders out of their magnetically coupled positions, and then remove them individually when there is no longer any holding force. If they are removed while still magnetically coupled, they will be directly attracted to one another and will not come apart.

2. Since the magnetic holding force can be changed (for example, from CY1S25L to CY1S25H), please contact SMC if this is necessary.

3. Do not disassemble the magnetic components (piston slider, external slider).
This can cause a loss of holding force and malfunction.

4. When disassembling to replace the seals and wear ring, refer to the separate disassembly instructions.

5. Use caution to the direction of the external slider and the piston slider.
Since the external slider and piston slider are directional for ø6, ø10 and holding force type L, refer to the figures below when performing disassembly or maintenance. Put the external slider and piston slider together, and insert the piston slider into the cylinder tube so that they will have the correct positional relationship as shown in Fig. (1). If they align as shown in Fig. (2), insert the piston slider after turning it around 180°. If the direction is not correct, it will be impossible to obtain the specified holding force.

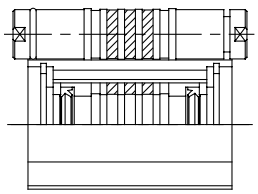


Fig. (1) Correct position

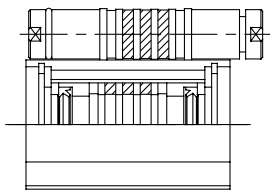


Fig. (2) Incorrect position

Example of ø15 with holding force type L

Model Selection 1

E: Kinetic energy of load (J)

$$E = \frac{W}{2} \cdot \left(\frac{V}{1000}\right)^2$$

Es: Allowable kinetic energy for intermediate stop using an air pressure circuit (J)
Ps: Operating pressure limit for intermediate stop using an external stopper, etc. (MPa)
Pv: Maximum operating pressure for vertical operation (MPa)
WA: Allowable load weight based on these operating conditions (kg)
Wv: Allowable load weight for vertical operation (kg)
σ: Stroke coefficient

$$\sigma = \frac{\text{Load weight within stroke}}{\text{Maximum load weight}}$$

Operating Conditions

- **W**: Load weight (kg)
- **V**: Speed (mm/s)
- **P**: Operating pressure (MPa)
- Stroke (mm)
- **Lo**: Distance from slide block mounting surface to workpiece center of gravity (cm)
- Mode of operation (Horizontal, Inclined, Vertical)

Mode of operation

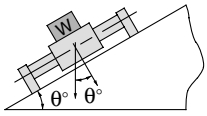
Horizontal operation / Inclined operation / Vertical operation (Note 1)

First tentative bore size determination

$$\text{øD} \geq 2.8 \times \sqrt{\frac{W}{P}}$$

First tentative bore size determination

$$\text{øD} \geq 5.0 \times \sqrt{\frac{0.3 \times W\cos\theta + W\sin\theta}{P}}$$



Inclined operation

First tentative bore size determination

$$\text{øD} \geq 5.0 \times \sqrt{\frac{0.3 \times W + W}{P}}$$

Review of load weight and operating pressure

Determination of allowable load weight & pressure

$W > Wv$, $P > Pv$ → (For vertical operation, refer to page 8-15-50.)

$W \leq Wv$, $P \leq Pv$

(For method to find σ, refer to page 8-15-50.)

Calculate stroke coefficient (σ) with stroke and tentatively determined bore size

$$\sigma = \frac{\text{Load weight in stroke}}{\text{Maximum load weight}}$$

Select an example calculation for allowable weight based on cylinder mounting orientation.

(Refer to pages 8-15-50 to 51.)

Calculate (W_A) from the formula for the tentatively determined bore size

$W > W_A$ → Review of bore size, stroke and Lo

$W \leq W_A$

Review with magnet holding force (H)

Intermediate stop? (Note 1)

Yes → Intermediate stopping method

Stop with external stopper

Stop with air pressure circuit → (For intermediate stops, refer to page 8-15-52.)

None

Determination of kinetic energy of load (E)

$E > Es$ → Tentative determination of L type

$$E = \frac{W}{2} \cdot \left(\frac{V}{1000}\right)^2$$

$E \leq Es$ → Bore size determination

Determination of pressure (P) when making intermediate stop

$P > Ps$ → Tentative determination of L type

$P \leq Ps$ → $E > Es$

(For intermediate stops, refer to page 8-15-52.)

Tentative determination of H type

Review of larger bore size / Tentative determination of H type

Bore size determination

Consider made-to-order products, depending on an operating condition. (Note 2)

(Refer to page 8-31-1.)

Model selected

Note 1) This cylinder cannot perform an intermediate stop using an air pressure circuit in vertical operation.In this case, an intermediate stop can be performed only by using an external stopper, etc.

Note 2) Made-to-order products should be considered, too, depending on an operating environment, etc.

Model Selection 2

Caution on Design (1)

How to Find σ when Selecting the Allowable Load Weight

Since the maximum load weight with respect to the cylinder stroke changes as shown in the table below, σ should be considered as a coefficient determined in accordance with each stroke.

Example) CY1S25□-650

(1) Maximum load weight = 20 kg

(2) Load weight for 650 st = 13.6 kg

(3) $\sigma = \frac{13.6}{20}$ = 0.68 is the result.

Calculation Formula for σ (σ ≤ 1)

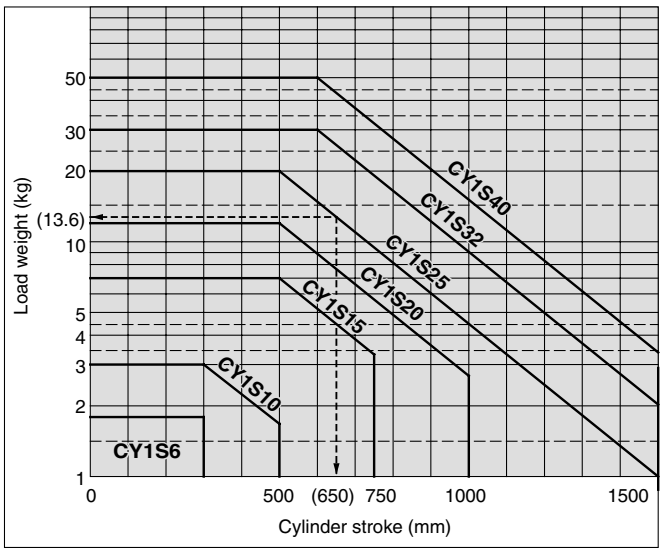
ST: Stroke (mm)

Model	CY1S6	CY1S10	CY1S15
σ =	1	$\frac{10^{(0.86 - 1.3 \times 10^{-3} \times ST)}}{3}$	$\frac{10^{(1.5 - 1.3 \times 10^{-3} \times ST)}}{7}$

Model	CY1S20	CY1S25	CY1S32
σ =	$\frac{10^{(1.71 - 1.3 \times 10^{-3} \times ST)}}{12}$	$\frac{10^{(1.98 - 1.3 \times 10^{-3} \times ST)}}{20}$	$\frac{10^{(2.26 - 1.3 \times 10^{-3} \times ST)}}{30}$

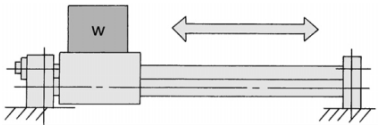
Model	CY1S40
σ =	$\frac{10^{(2.48 - 1.3 \times 10^{-3} \times ST)}}{50}$

Note) Calculate with σ = 1 for all applications up to ø10 – 300 mmST, ø15 – 500 mmST, ø20 – 500 mmST, ø25 – 500 mmST, ø32 – 600 mmST and ø40 – 600ST.



Example of Allowable Load Weight Calculation Based on Cylinder Mounting Orientation

1. Horizontal Operation (Floor mounting)

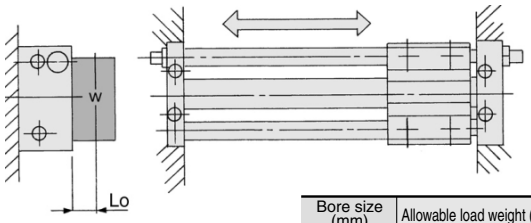


Maximum Load Weight (Center of slide block) (kg)

Bore size (mm)	6	10	15	20	25	32	40
Max. load weight (kg)	1.8	3	7	12	20	30	50
Stroke (Max)	Up to 300 st	Up to 300 st	Up to 500 st	Up to 500 st	Up to 500 st	Up to 600 st	Up to 600 st

The above maximum load weight values will change with the stroke length for each cylinder size, due to limitation from warping of the guide shafts. (Take note of the coefficient σ.) Moreover, depending on the operating direction, the allowable load weight may be different from the maximum load weight.

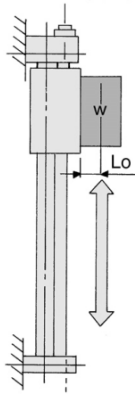
2. Horizontal Operation (Wall mounting)



Lo: Distance from mounting surface to load center of gravity (cm)

Bore size (mm)	Allowable load weight (W_A) (kg)
6	$\frac{\sigma \cdot 5.44}{7 + 2Lo}$
10	$\frac{\sigma \cdot 12.0}{8.4 + 2Lo}$
15	$\frac{\sigma \cdot 36.4}{10.6 + 2Lo}$
20	$\frac{\sigma \cdot 74.4}{12 + 2Lo}$
25	$\frac{\sigma \cdot 140}{13.8 + 2Lo}$
32	$\frac{\sigma \cdot 258}{17 + 2Lo}$
40	$\frac{\sigma \cdot 520}{20.6 + 2Lo}$

3. Vertical Operation



Bore size (mm)	Allowable load weight (W_A) (kg)
6	$\frac{\sigma \cdot 1.33}{1.9 + Lo}$
10	$\frac{\sigma \cdot 4.16}{2.2 + Lo}$
15	$\frac{\sigma \cdot 13.23}{2.7 + Lo}$
20	$\frac{\sigma \cdot 26.8}{2.9 + Lo}$
25	$\frac{\sigma \cdot 44.0}{3.4 + Lo}$
32	$\frac{\sigma \cdot 88.2}{4.2 + Lo}$
40	$\frac{\sigma \cdot 167.8}{5.1 + Lo}$

Lo: Distance from mounting surface to load center of gravity (cm)

Note) A safety factor for drop prevention has been taken into account.

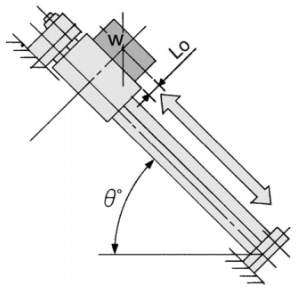
Note) Operating pressure should be equal to or less than the maximum operating pressure in the article, "Vertical Operation" listed on page 8-15-52.

Model Selection 3

Caution on Design (2)

Example of Allowable Load Weight Calculation Based on Cylinder Mounting Orientation

4. Inclined Operation (In operating direction)



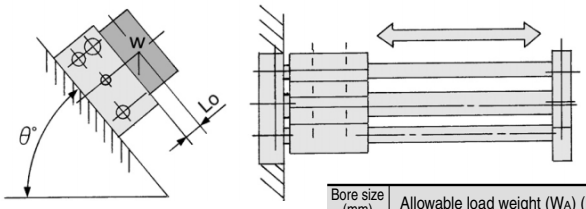
Angle	to 45°	to 60°	to 75°	to 90°
k	1	0.9	0.8	0.7

Angle coefficient (k): k = [to 45° (= θ)] = 1, [to 60°] = 0.9, [to 75°] = 0.8, [to 90°] = 0.7

Lo: Distance from mounting surface to load center of gravity (cm)

Bore size (mm)	Allowable load weight (W_A) (kg)
6	$\frac{\sigma \cdot 5.1\ K}{3\cos\theta + 2\ (1.9 + Lo)\ \sin\theta}$
10	$\frac{\sigma \cdot 10.5\ K}{3.5\cos\theta + 2\ (2.2 + Lo)\ \sin\theta}$
15	$\frac{\sigma \cdot 35\ K}{5\cos\theta + 2\ (2.7 + Lo)\ \sin\theta}$
20	$\frac{\sigma \cdot 72\ K}{6\cos\theta + 2\ (2.9 + Lo)\ \sin\theta}$
25	$\frac{\sigma \cdot 120\ K}{6\cos\theta + 2\ (3.4 + Lo)\ \sin\theta}$
32	$\frac{\sigma \cdot 210\ K}{7\cos\theta + 2\ (4.2 + Lo)\ \sin\theta}$
40	$\frac{\sigma \cdot 400\ K}{8\cos\theta + 2\ (5.1 + Lo)\ \sin\theta}$

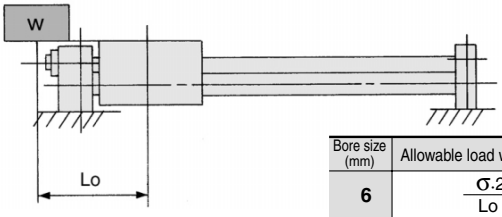
5. Inclined Operation (At a right angle to operating direction)



Lo: Distance from mounting surface to load center of gravity (cm)

Bore size (mm)	Allowable load weight (W_A) (kg)
6	$\frac{\sigma \cdot 5.44}{3.2 + 2\ (1.9 + Lo)\ \sin\theta}$
10	$\frac{\sigma \cdot 12.0}{4 + 2\ (2.2 + Lo)\ \sin\theta}$
15	$\frac{\sigma \cdot 36.4}{5.2 + 2\ (2.7 + Lo)\ \sin\theta}$
20	$\frac{\sigma \cdot 74.4}{6.2 + 2\ (2.9 + Lo)\ \sin\theta}$
25	$\frac{\sigma \cdot 140}{7 + 2\ (3.4 + Lo)\ \sin\theta}$
32	$\frac{\sigma \cdot 258}{8.6 + 2\ (4.2 + Lo)\ \sin\theta}$
40	$\frac{\sigma \cdot 520}{10.4 + 2\ (5.1 + Lo)\ \sin\theta}$

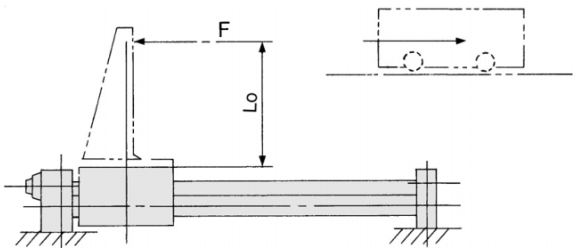
6. Load Center Offset in Operating Direction (Lo)



Lo: Distance from center of slide block to load's center of gravity (cm)

Bore size (mm)	Allowable load weight (W_A) (kg)
6	$\frac{\sigma \cdot 2.55}{Lo + 3}$
10	$\frac{\sigma \cdot 5.25}{Lo + 3.5}$
15	$\frac{\sigma \cdot 17.5}{Lo + 5.0}$
20	$\frac{\sigma \cdot 36}{Lo + 6.0}$
25	$\frac{\sigma \cdot 60}{Lo + 6.0}$
32	$\frac{\sigma \cdot 105}{Lo + 7.0}$
40	$\frac{\sigma \cdot 200}{Lo + 8.0}$

7. Horizontal Operation (Pushing load, Pusher)

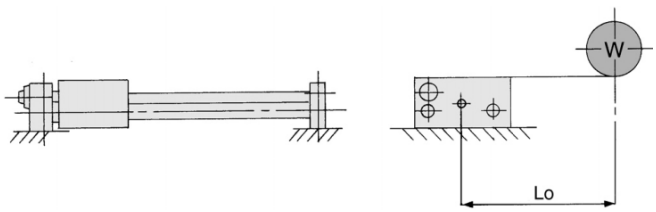


F: Drive (from slide block to position Lo) resistance force (kg)
Lo: Distance from mounting surface to load center of gravity (cm)

Bore size (mm)	6	10	15	20
Allowable load weight (W_A) (kg)	$\frac{\sigma \cdot 2.55}{1.9 + Lo}$	$\frac{\sigma \cdot 5.25}{2.2 + Lo}$	$\frac{\sigma \cdot 17.5}{2.7 + Lo}$	$\frac{\sigma \cdot 36}{2.9 + Lo}$

Bore size (mm)	25	32	40
Allowable load weight (W_A) (kg)	$\frac{\sigma \cdot 60}{3.4 + Lo}$	$\frac{\sigma \cdot 105}{4.2 + Lo}$	$\frac{\sigma \cdot 200}{5.1 + Lo}$

8. Horizontal Operation (Load, Lateral offset Lo)



Lo: Distance from mounting surface to load center of gravity (cm)

Bore size (mm)	6	10	15	20
Allowable load weight (W_A) (kg)	$\frac{\sigma \cdot 3.80}{3.2 + Lo}$	$\frac{\sigma \cdot 8.40}{4 + Lo}$	$\frac{\sigma \cdot 25.48}{5.2 + Lo}$	$\frac{\sigma \cdot 52.1}{6.2 + Lo}$

Bore size (mm)	25	32	40
Allowable load weight (W_A) (kg)	$\frac{\sigma \cdot 98}{7.0 + Lo}$	$\frac{\sigma \cdot 180}{8.6 + Lo}$	$\frac{\sigma \cdot 364}{10.4 + Lo}$

Model Selection 4

Caution on Design (3)

Vertical Operation

When operating a load vertically, it should be operated within the allowable load weights and maximum operating pressures shown in the table below. Use caution, as operating above the prescribed values may lead to dropping of the load.

Bore size (mm)	Model	Allowable load weight (Wv) (kg)	Maximum operating pressure (Pv) (MPa)
6	**CY1S6H**	1.0	0.55
10	**CY1S10H**	2.7	0.55
15	**CY1S15H**	7.0	0.65
	CY1S15L	4.1	0.40
20	**CY1S20H**	11.0	0.65
	CY1S20L	7.0	0.40
25	**CY1S25H**	18.5	0.65
	CY1S25L	11.2	0.40
32	**CY1S32H**	30.0	0.65
	CY1S32L	18.2	0.40
40	**CY1S40H**	47.0	0.65
	CY1S40L	29.0	0.40

Note) Use caution, since the magnetic coupling may be dislocated if it is used over the maximum operating pressure.

Intermediate Stop

1) Intermediate stopping of load with an external stopper, etc.

When stopping a load in mid-stroke using an external stopper (adjusting bolt, etc.), operate within the operating pressure limits shown in the table below. Use caution, as operation at a pressure exceeding these limits can result in breaking of the magnetic coupling.

Bore size (mm)	Model	Operating pressure limit for intermediate stop (Ps) (MPa)
6	**CY1S6H**	0.55
10	**CY1S10H**	0.55
15	**CY1S15H**	0.65
	CY1S15L	0.40
20	**CY1S20H**	0.65
	CY1S20L	0.40
25	**CY1S25H**	0.65
	CY1S25L	0.40
32	**CY1S32H**	0.65
	CY1S32L	0.40
40	**CY1S40H**	0.65
	CY1S40L	0.40

2) Intermediate stopping of load with an air pressure circuit

When stopping a load using an air pressure circuit, operate at or below the kinetic energy shown in the table below. Use caution, as operation when exceeding the allowable value can result in breaking of the magnetic coupling.

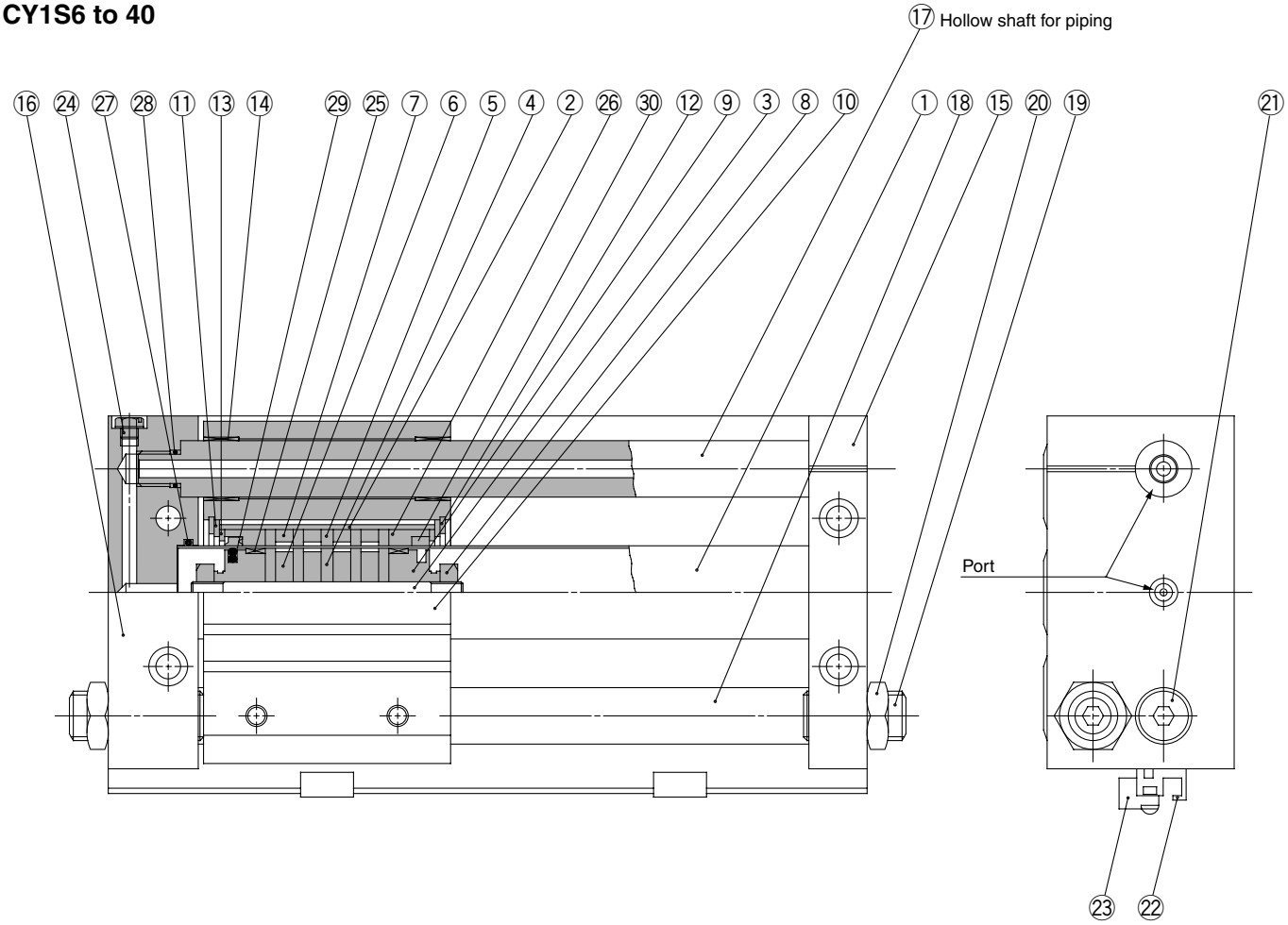
(Reference values)

Bore size (mm)	Model	Allowable kinetic energy for intermediate stop (Es) (J)
6	**CY1S6H**	0.007
10	**CY1S10H**	0.03
15	**CY1S15H**	0.13
	CY1S15L	0.076
20	**CY1S20H**	0.24
	CY1S20L	0.16
25	**CY1S25H**	0.45
	CY1S25L	0.27
32	**CY1S32H**	0.88
	CY1S32L	0.53
40	**CY1S40H**	1.53
	CY1S40L	0.95

Construction

Slider type/Slide bearing

CY1S6 to 40



Component Parts

No.	Description	Material	Note
①	Cylinder tube	Stainless steel	
②	External slider tube	Aluminum alloy	
④	Shaft	Stainless steel	
⑤	Piston side yoke	Rolled steel	Zinc chromated
⑥	External slider side yoke	Rolled steel	Zinc chromated
⑦	Magnet A	Rare earth magnet	
⑧	Magnet B	Rare earth magnet	
⑨	Piston nut	Carbon steel	Zinc chromated
⑩	Piston	Aluminum alloy Note)	Chromated
⑩	Slide block	Aluminum alloy	Hard anodized
⑪	Slider spacer	Rolled steel	Nickel plated
⑫	Snap ring	Carbon tool steel	Nickel plated
⑬	Spacer	Rolled steel	Nickel plated
⑭	Bushing	Oil retaining bearing material	
⑮	Plate A	Aluminum alloy	Hard anodized
⑯	Plate B	Aluminum alloy	Hard anodized
⑰	Guide shaft A	Carbon steel	Hard chrome plated
⑱	Guide shaft B	Carbon steel	Hard chrome plated
⑲	Adjusting bolt	Chromium molybdenum steel	
⑳	Hexagon nut	Carbon steel	
㉑	Hexagon socket head cap screw	Chromium molybdenum steel	Nickel plated
㉒	Switch mounting rail	Aluminum alloy	

Note) Brass for ø6, ø10 and ø15

No.	Description	Material	Note
㉓	Auto switch	—	
㉔	Plug	Brass	
㉕*	Wear ring A	Special resin	
㉖*	Wear ring B	Special resin	
㉗*	Cylinder tube gasket	NBR	
㉘*	Guide shaft gasket	NBR	
㉙*	Piston seal	NBR	
㉚*	Scraper	NBR	

Replacement Parts: Seal Kit

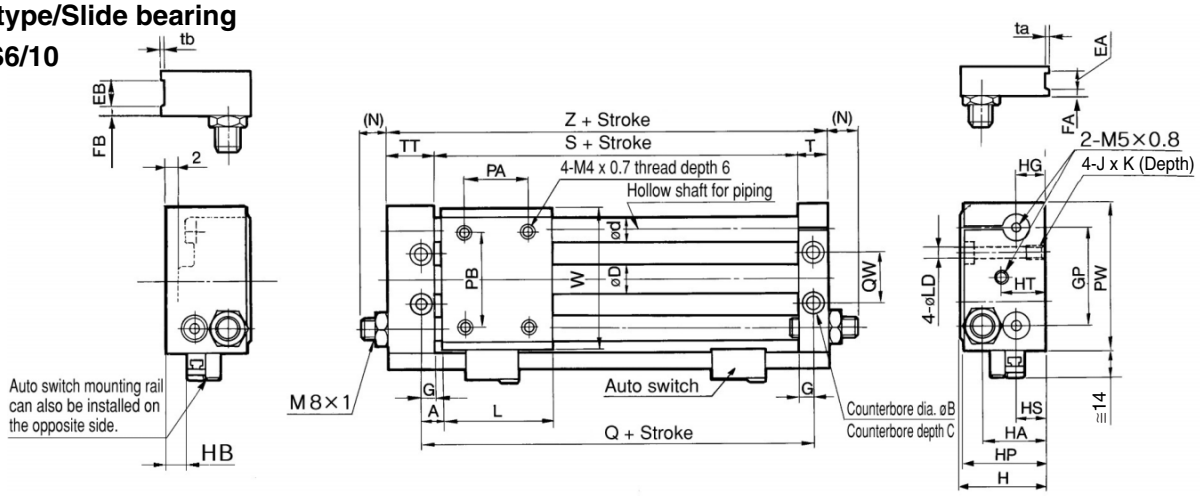
Bore size (mm)	Kit no.	Contents
6	CY1S6-PS-N	Set of nos. above ㉖, ㉗, ㉘ and ㉙
10	CY1S10-PS-N	Nos. above ㉕, ㉖, ㉗, ㉘, ㉙, ㉚
15	CY1S15-PS-N	
20	CY1S20-PS-N	
25	CY1S25-PS-N	
32	CY1S32-PS-N	
40	CY1S40-PS-N	

* Seal kit includes ㉖ to ㉙ for ø6. ㉕ to ㉚ are for ø10 to ø40. Order the seal kit, based on each bore size.

Dimensions

Slider type/Slide bearing

C□Y1S6/10



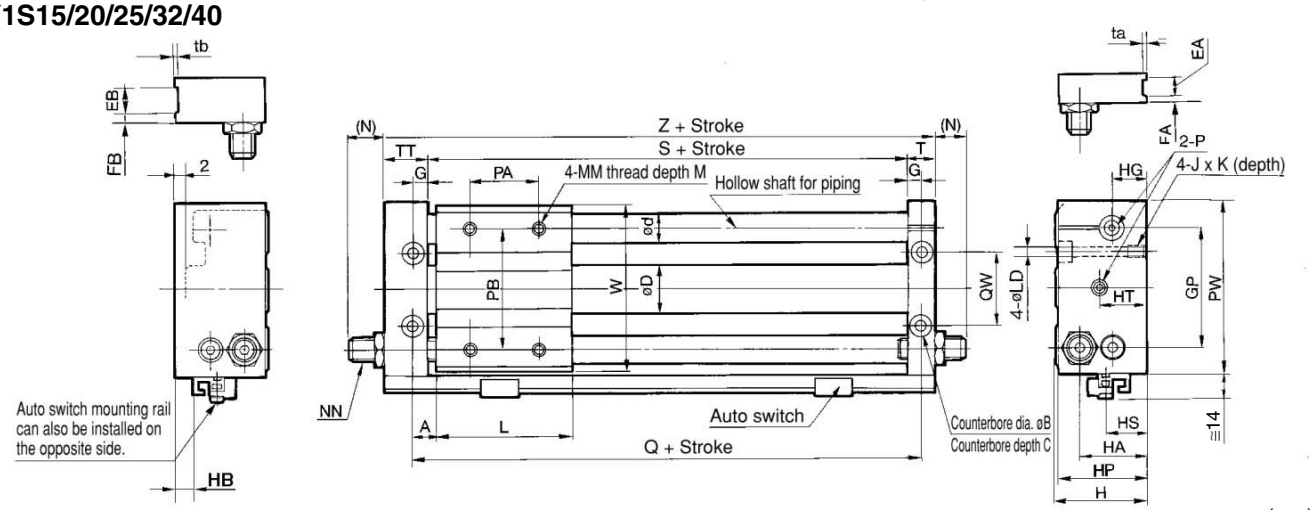
(mm)

Model	A	B	C	D	d	EA	EB	FA	FB	G	GP	H	HA	HB*	HG	HP	HS	HT
CY1S6 CDY1S6	6	6.5	3	7.6	8	—	—	—	—	5	32	27	19	4	8	26	8	17
CY1S10 CDY1S10	7.5	8	4	12	10	6	12	3	5	6.5	40	34	25.5	10	12	33	14	18

Model	J x K	L	LD	(N)	PA*	PB	PW	Q	QW	S	T	TT	ta	tb	W	Z
CY1S6 CDY1S6	M4 x 0.7 x 6.5	40	3.5	10	25	25	50	52	16	42	10	16	—	—	46	68
CY1S10 CDY1S10	M5 x 0.8 x 9.5	45	4.3	9.5	25	38	60	60	24	47	12.5	20.5	0.5	1.0	58	80

∗ PA dimensions are for split from center. HB dimensions are for CDY1S.

C□Y1S15/20/25/32/40



(mm)

Model	A	B	C	D	d	EA	EB	FA	FB	G	GP	H	HA	HB*	HG	HP	HS	HT	J x K	L
CY1S15 CDY1S15	7.5	9.5	5	16.6	12	6	13	3	6	6.5	52	40	29	1	13	39	15	21	M6 x 1.0 x 9.5	60
CY1S20 CDY1S20	10	9.5	5.2	21.6	16	—	—	—	—	8.5	62	46	36	4.5	17	45	25.5	20	M6 x 1.0 x 9.5	70
CY1S25 CDY1S25	10	11	6.5	26.4	16	8	14	4	7	8.5	70	54	40	9	20	53	23	20	M8 x 1.25 x 10	70
CY1S32 CDY1S32	12.5	14	8	33.6	20	8	16	5	7	9.5	86	66	46	13	24	64	27	24	M10 x 1.5 x 15	85
CY1S40 CDY1S40	12.5	14	8	41.6	25	10	20	5	10	10.5	104	76	57	17	25	74	31	25	M10 x 1.5 x 15	95

Model	LD	M	MM	(N)	NN	P	PA*	PB	PW	Q	QW	S	T	TT	ta	tb	W	Z
CY1S15 CDY1S15	5.6	8	M5 x 0.8	7.5	M8 x 1.0	M5 x 0.8	30	50	75	75	30	62	12.5	22.5	0.5	1	72	97
CY1S20 CDY1S20	5.6	10	M6 x 1.0	9.5	M10 x 1	Rc 1/8	40	70	90	90	38	73	16.5	25.5	—	—	87	115
CY1S25 CDY1S25	7	10	M6 x 1.0	11	M14 x 1.5	Rc 1/8	40	70	100	90	42	73	16.5	25.5	0.5	1	97	115
CY1S32 CDY1S32	8.7	12	M8 x 1.25	11.5	M20 x 1.5	Rc 1/8	40	75	122	110	50	91	18.5	28.5	0.5	1	119	138
CY1S40 CDY1S40	8.7	12	M8 x 1.25	10.5	M20 x 1.5	Rc 1/4	65	105	145	120	64	99	20.5	35.5	1	1	142	155

∗ PA dimensions are for split from center. HB dimensions are for CDY1S.

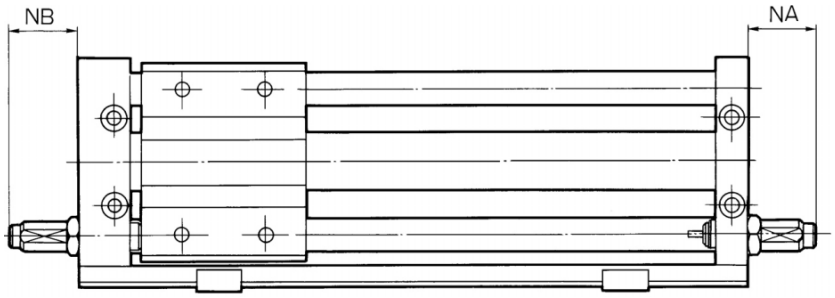
Shock Absorber Specifications/Series RB

For detailed specifications about shock absorber, refer to “Series RB” of Best Pneumatics Vol. 10.

Applicable rodless cylinder		CY1S 6 10 15	CY1S20	CY1S25	CY1S 32 40
Shock absorber model		**RB0805**	**RB1006**	**RB1411**	**RB2015**
Maximum energy absorption: (J)		0.98	3.92	14.7	58.8
Weight equivalent to impact object		∗ Select a model from data D of Shock Absorber (RB series) of Best Pneumatics Vol. 10.			
Stroke absorption: (mm)		5	6	11	15
Collision speed: (m/s)		0.05 to 5			
Max. operating frequency: (cycle/min) ∗		80	70	45	25
Ambient temperature range		–10 to 80°C			
Spring force: (N)	Extended	1.96	4.22	6.86	8.34
	Retracted	3.83	6.18	15.3	20.50

∗ It denotes the values at the maximum energy absorption per one cycle. Therefore, the operating frequency can be increased according to the energy absorption.

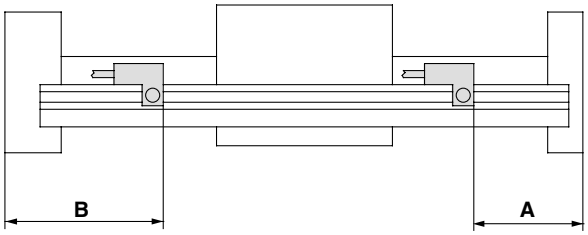
Dimensions: With Shock Absorber



(mm)

Model	Applicable shock absorber	NA	NB
C□Y1S6	**RB0805**	30	24
C□Y1S10		27	19
C□Y1S15		27	17
C□Y1S20	**RB1006**	29	20
C□Y1S25	**RB1411**	49	40
C□Y1S32	**RB2015**	52	42
C□Y1S40		51	36

Proper Auto Switch Mounting Position (Detection at stroke end)



Bore size (mm)	Applicable auto switch					
	D-A73/A80		D-A72/A7□H/A80H/A73C D-A80C/F7□/J79/F7□V/J79C D-F7□W/J79W/F7□WV D-F7BAL/F7BAVL, D-F79F		D-F7NTL	
	A	B	A	B	A	B
6	27.5	40.5	28	40	33	35
10	35	45	35.5	44.5	40.5	39.5
15	34.5	62.5	35	62	40	57
20	64	50	64.5	49.5	69.5	44.5
25	44	71	44.5	70.5	49.5	65.5
32	55	83	55.5	82.5	60.5	77.5
40	61	94	61.5	93.5	66.5	88.5

Note) 50 mm is the minimum stroke available with 2 auto switches mounted. In the case of a stroke less than this, please contact SMC.

Operating Range

Auto switch model	Bore size (mm)						
	6	10	15	20	25	32	40
D-A7□/A8□	6	6	6	6	6	6	6
D-F7□/J7□	3	3	4	3	3	3	3.5
D-F79F	4.5	4.5	4.5	4.5	4.5	4.5	4.5

∗ Since this is a guideline including hysteresis, not meant to be guaranteed.
(Assuming approximately ±30% dispersion)
There may be the case it will vary substantially depending on an ambient environment.

Other than the models listed in "How to Order", the following auto switches are applicable.
For detailed specifications, refer to page 8-30-1.

Type	Model	Electrical entry (Fetching direction)	Features
Reed switch	D-A80	Grommet (Perpendicular)	Without indicator light
	D-A80H	Grommet (In-line)	
	D-A80C	Connector (Perpendicular)	
Solid state switch	D-F7NTL	Grommet (In-line)	With timer

∗ With pre-wire connector is available for D-F7NTL type, too.
For details, refer to page 8-30-52.

Mounting of Auto Switch

When mounting an auto switch, the switch mounting screw should be screwed into a hexagon nut (M3 x 0.5) which has been inserted into the groove of the switch rail.
(Use a tightening torque of approximately 0.5 to 0.7 N·m.)