Magnetically Coupled Rodless Cylinder
High Precision Guide Type
Series CY1H
ø10, ø15, ø20, ø25, ø32

How to Order

CY1H [ ] **25** — **300** [ ] — **Y7BW** [ ]

High precision guide type

Guide

Symbol \ Bore size (mm)		10	15	20	25	32
Nil	1 axis	●	●	●	●	—
T	2 axes	—	—	—	●	●

Bore size

10	10 mm
15	15 mm
20	20 mm
25	25 mm
32	32 mm

Standard stroke (mm)
Refer to "Standard Stroke" on page 8-15-69.

Adjustment type

Nil	With adjusting bolt
B	With shock absorbers (2 pcs.)
BS	With shock absorber (1 pc. on port side)

∗ The adjusting bolt is installed even when B or BS is selected. (Except ø10)

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 AC	Auto switch model Perpendicular	Auto switch model In-line	Lead wire length (m) ∗ 0.5 (Nil)	3 (L)	5 (Z)	Pre-wire connector	Applicable load	
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	—	Z76	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	—	Z73	●	●	●	—	—	Relay, PLC
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	Y69A	Y59A	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)				Y7PV	Y7P	●	●	○	○		
				2-wire		12 V		Y69B	Y59B	●	●	○	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5 V, 12 V		Y7NWV	Y7NW	●	●	○	○	IC circuit	
				3-wire (PNP)				Y7PWV	Y7PW	●	●	○	○		
				2-wire		12 V		Y7BWV	Y7BW	●	●	○	○	—	

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

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

• Since there are other applicable auto switches than listed, refer to page 8-15-80 for details.
• For details about auto switches with pre-wire connector, refer to page 8-30-52.

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

Symbol	Specifications
-X168	Helical insert thread specifications

Specifications

Bore size (mm)	10	15	20	25	32
Fluid	Air				
Action	Double acting				
Maximum operating pressure	0.7 MPa				
Minimum operating pressure	0.2 MPa				
Proof pressure	1.05 MPa				
Ambient and fluid temperature	–10 to 60°C				
Piston speed	70 to 1000 mm/s				
Cushion (External stopper)	Urethane bumpers on both ends (Standard), Shock absorber (Option)				
Lubrication	Non-lube				
Stroke length tolerance	0 to 1.8 mm				
Piping	Centralized piping type				
Piping port size	M5 x 0.8		Rc 1/8		

Standard Stroke

Bore size (mm)	Number of axes	Standard stroke (mm)	Maximum available stroke (mm) Note)
10	1 axis	100, 200, 300	500
15		100, 200, 300, 400, 500	750
20		100, 200, 300, 400, 500, 600	1000
25		100, 200, 300, 400, 500, 600, 800	1200
25	2 axes	100, 200, 300, 400, 500, 600, 800, 1000	
32			1500

Note) Please contact SMC if it is used by exceeding the maximum stroke length.

Magnetic Holding Force

Bore size (mm)	10	15	20	25	32
Holding force (N)	53.9	137	231	363	588

Theoretical Output

(N)

Bore size (mm)	Piston area (mm^2)	Operating pressure (MPa)					
		0.2	0.3	0.4	0.5	0.6	0.7
10	78	15	23	31	39	46	54
15	176	35	52	70	88	105	123
20	314	62	94	125	157	188	219
25	490	98	147	196	245	294	343
32	804	161	241	322	402	483	563

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

Weight

(kg)

Model	Standard stroke (mm)							
	100	200	300	400	500	600	800	1000
CY1H10	1.0	1.3	1.6	—	—	—	—	—
CY1H15	2.2	2.7	3.2	3.6	4.1	—	—	—
CY1H20	3.0	3.5	4.0	4.4	4.9	5.4	—	—
CY1H25	4.6	5.3	6.0	6.6	7.3	8.0	9.4	—
CY1HT25	5.1	6.2	7.3	8.3	9.4	10.4	12.5	14.6
CY1HT32	8.4	9.6	10.7	11.9	13.0	14.2	16.5	18.8

Shock Absorber Specifications

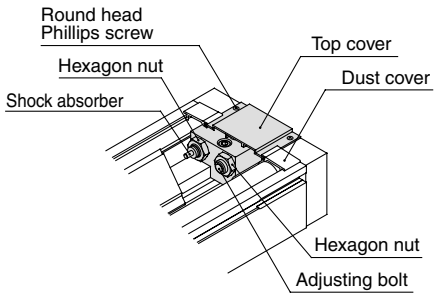
For detailed specifications about shock absorber, refer to “Series RB” of Best Pneumatics Vol. 10.

Applicable cylinder size (mm)		10	15	20	25	32
Shock absorber model		RB0805	RB0806	RB1006	RB1411	RB2015
Maximum energy absorption (J)		0.98	2.94	3.92	14.7	58.8
Weight equivalent to impact object		* Select a model from data link page for Shock Absorber (Series RB).				
Stroke absorption (mm)		5	6	6	11	15
Collision speed (m/s)*		0.05 to 5				
Max. operating frequency (cycle/min)		80		70	45	25
Spring force (N)	Extended	1.96		4.22	6.86	8.34
	Retracted	3.83	22	6.18	15.30	20.50
Weight (g)		15		25	65	150

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

Stroke Adjustment Method

Loosen the round head Phillips Screws, and remove the top cover and dust covers (4 pcs.).



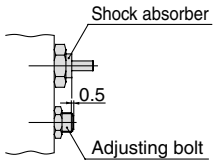
Loosen the hexagon nut, adjust the stroke with a hexagon wrench from the plate side, and secure by retightening the hexagon nut. When there is a shock absorber, loosenthe hexagon nut, adjust the stroke, and then retighten the hexagon nut.
Adjustment should be performed to make effective use of the shock absorber's absorption capacity, with its position relative to the adjustment bolt as shown in the figure to the right.

⚠ Caution

If the effective stroke of the shock absorber is shortened by the stroke adjustment, its absorption capacity will be drastically reduced. Therefore, the adjusting bolt should be secured at a position where it projects about 0.5 mm farther than the shock absorber.

Lock Nut Tightening Torque (N·m)

Model	For shock absorber	Adjusting bolt
CY1H10	1.67	1.67
CY1H15		
CY1H20	3.14	
CY1H25	10.8	3.14
CY1HT25		
CY1HT32	23.5	



After completing the above adjustment, replace the top cover and dust covers back into place.
The round head Phillips screws for securing the top cover should be tightened with a torque of 0.58 N·m.

⚠ Precautions

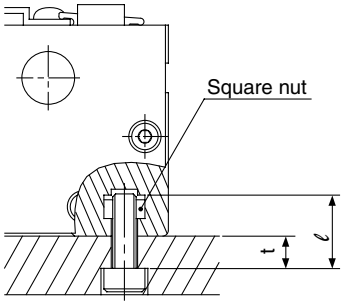
Be sure to read before handling. Refer to pages 8-34-3 to 8-34-6 for Safety Instructions and Actuator Precautions.

Mounting

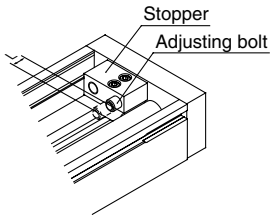
⚠ Caution

1. **The interior is protected to a certain extent by the top cover, however, when performing maintenance, etc., take care not to cause scratches or other damage to the cylinder tube, slide table or linear guide by striking them or placing objects on them.**
   Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation.
2. **Because the slider is supported by precision bearings, take care not to apply strong impacts or excessive moments to the table when loading a workpiece.**
3. **Mounting of the cylinder body**
   The body is mounted using the square nuts, which are included,in the two T-slots on the bottom of the body. Refer to the table below for mounting bolt dimensions and tightening torque.

Model		CY1H10	CY1H15	CY1H20	CY1H25	CY1HT25	CY1HT32
Bolt dimensions	Thread size	M4 x 0.7	M5 x 0.8		M6 x 1.0		M8 x 1.25
	Dimension t	ℓ-7	ℓ-8	ℓ-8	ℓ-9		ℓ-12
Tightening torque	N·m	1.37	2.65		4.4		13.2



4. **Stroke adjustment**
   Stroke adjustment on one side of 15 mm (CY1H10/15/20) or 30 mm (CY1HT25, CY1HT25, CY1HT32) can be performed with the adjusting bolt, but when the amount of adjustment exceeds 3 mm, the magnetic coupling may be broken depending on the operating conditions. Therefore, operation should confirm to the intermediate stop conditions on page 8-15-64. Moreover, the stroke should not be adjusted by moving the stopper, as this can cause damage to the cylinder.



(mm)

Model	Stroke adjustment range L
CY1H10, CY1H15, CY1H20	0 to 15
CY1H25, CY1HT25, CY1HT32	0 to 30

Operation

⚠ Caution

1. **The unit can be used with a direct load within the allowable range, but when connecting to a load which has an external guide mechanism, careful alignment is necessary.**
   Since variation of the shaft center increases as the stroke becomes longer, a connection method should be devised which allows for this displacement.
2. **Since the guide is adjusted at the time of shipment, unintentional movement of the adjustment setting should be avoided.**
3. **This unit can be operated without lubrication.**
   If lubrication is performed, use turbine oil Class 1 (with no additives), ISO VG32. (Machine oil and spindle oil cannot be used.)
4. **Please contact SMC before operating in an environment where there will be contact with cutting chips, dust (paper debris, lint, etc.) or cutting oil (gas oil, water, warm water, etc.).**
5. **Do not operate with the magnetic coupling out of position.**
   In case the magnetic coupling is out of position, push the external slider back into the correct position by hand at the end of the stroke (or correct the piston slider with air pressure).
6. **Do not disassemble the magnetic components (piston slider, external slider).**
   This can cause a loss of holding power and malfunction.

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)
Wv: Allowable load weight for vertical operation (kg)
α: Load factor

$$\sum\alpha = \frac{\text{Load weight (W)}}{\text{Max. load weight (Wmax)}} + \frac{\text{Static moment (M)}}{\text{Allowable static moment (Mmax)}} + \frac{\text{Dynamic moment (Me)}}{\text{Allowable dynamic moment (Memax)}}$$

Operating Conditions

- **W**: Load weight (kg)
- **V**: Speed (mm/s)
- **P**: Operating pressure (MPa)
- Stroke (mm)
- Position of workpiece center of gravity (m)
- Mode of operation (Horizontal, Inclined, Vertical)

Mode of operation

Horizontal operation

Inclined operation

Vertical operation Note 1)

Review of load weight and operating pressure

First tentative bore size determination

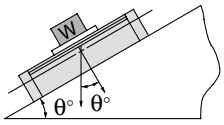
$$\text{øD} \geq 1.6 \times \sqrt{\frac{W}{P}}$$

First tentative bore size determination

$$\text{øD} \geq 5.0 \times \sqrt{\frac{0.1 \times W\cos\theta + W\sin\theta}{P}}$$

First tentative bore size determination

$$\text{øD} \geq 5.0 \times \sqrt{\frac{0.1 \times W + W}{P}}$$



Inclined operation

Determination of allowable load weight & pressure

W > Wv
P > Pv

(For vertical operation, refer to page 8-15-74.)

W ≤ Wv
P ≤ Pv

(Refer to page 8-15-72.)

Determination of load factor (Σα)

Review of operating conditions Σα > 1

$$\sum\alpha = \frac{\text{Load weight (W)}}{\text{Max. load weight (Wmax)}} + \frac{\text{Static moment (M)}}{\text{Allowable static moment (Mmax)}} + \frac{\text{Dynamic moment (Me)}}{\text{Allowable dynamic moment (Memax)}}$$

Σα ≤ 1

Intermediate stop? Note 1)

Yes

Intermediate stopping method

Stop with external stopper

Stop with air pressure circuit

(For intermediate stops, refer to page 8-15-74.)

None

Determination of kinetic energy of load (E)

E > Es

Review of larger bore size

E ≤ Es

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

Bore size determination

Note 2)

Consider made-to-order products, depending on an operating condition.

(Refer to page 8-31-1.)

Model selected

Determination of pressure (P) when making intermediate stop

P > Ps

P ≤ Ps

(For intermediate stops, refer to page 8-15-74.)

Review of larger bore size and operating pressure

Note 1) This cylinder cannot perform an interm ediate stop using an pneumatic 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.

Series CY1L
Model Selection 2

Caution on Design (1)

The maximum load weight and allowable moment will differ depending on the workpiece mounting method, cylinder mounting orientation and piston speed. A determination of usability is performed based on the operating limit values in the graphs with respect to operating conditions, but the total ($\Sigma\alpha n$) of the load factors (αn) for each weight and moment should not exceed 1.

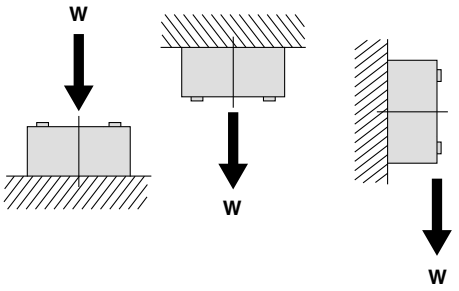
$$\Sigma\alpha n = \frac{\text{Load weight (W)}}{\text{Maximum load weight (Wmax)}} + \frac{\text{Static moment (M)}}{\text{Allowable static moment (Mmax)}} + \frac{\text{Dynamic moment (Me)}}{\text{Allowable dynamic moment (Memax)}} \leq 1$$

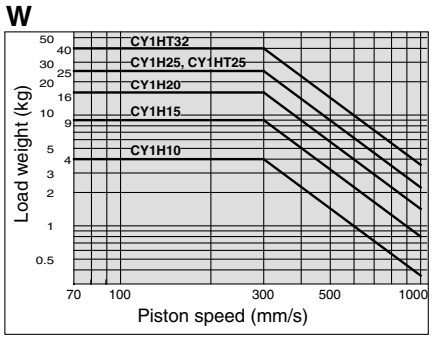
Wmax, Mmax and Memax values are according to **graph (1), (2) and (3)** below.

Load Weight

Maximum Load Weight (kg)

Model	W_{max}
CY1H10	4.0
CY1H15	9.0
CY1H20	16.0
CY1H25	25.0
CY1HT25	
CY1HT32	40.0



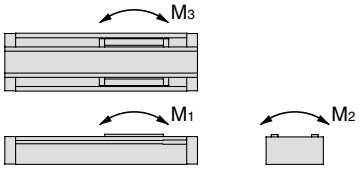


Graph (1)

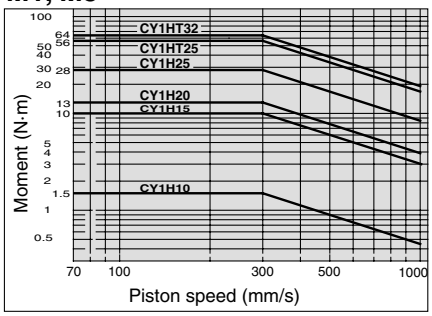
Moment

Allowable Moment (Static moment/Dynamic moment) (N·m)

Model	M1	M2	M3	Model	M1	M2	M3
CY1H10	1.5	2.5	1.5	**CY1H25**	28	26	28
CY1H15	10	16	10	**CY1HT25**	56	85	56
CY1H20	13	16	13	**CY1HT32**	64	96	64

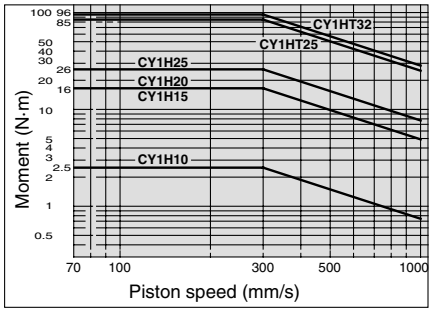


M1, M3



Graph (2)

M2

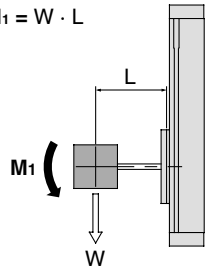


Graph (3)

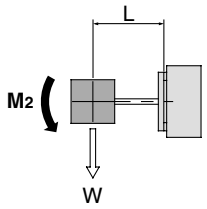
Static Moment

Moment generated by the workpiece weight even when the cylinder is stopped

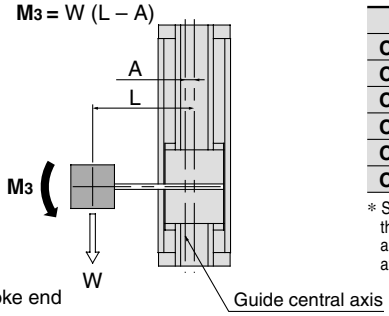
■ **Pitch moment**
M_1 = W · L



■ **Roll moment**
M_2 = W · L



■ **Yaw moment**
M_3 = W (L – A)



(mm)

Model	A
CY1H10	15
CY1H15	17.5
CY1H20	19.5
CY1H25	23.5
CY1HT25	0*
CY1HT32	0*

* Since there are 2 guides, the guides' central axis and the cylinder's central axis are the same.

Dynamic Moment

Moment generated by the load equivalent to impact at the stroke end

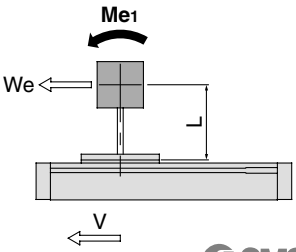
$We = \delta \cdot W \cdot V$

$V = 1.4\ Va$

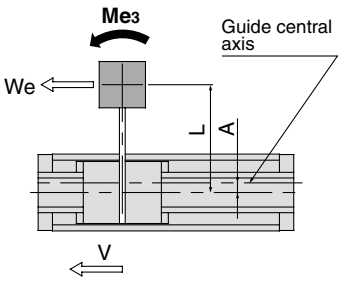
We: Load equivalent to impact [N]
δ: Bumper coefficient
With adjusting bolt (standard) = 4/100
With shock absorber = 1/100
W: Load weight [kg]
V: Collision speed [mm/s]
Va: Average speed [mm/s]

■ **Pitch moment**
Me_1 = 1/3*. We · L

* **Average load coefficient**



■ **Yaw moment**
Me_3 = 1/3*. We (L – A)



(mm)

Model	A
CY1H10	15
CY1H15	17.5
CY1H20	19.5
CY1H25	23.5
CY1HT25	0*
CY1HT32	0*

* Since there are 2 guides, the guides' central axis and the cylinder's central axis are the same.

Model Selection 3

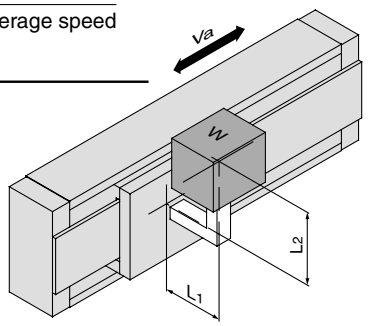
Selection Calculation

The selection calculation finds the load factors (αn) of the items below, where the total ($\Sigma \alpha n$) does not exceed 1.

$$\Sigma \alpha n = \alpha_1 + \alpha_2 + \alpha_3 \leq 1$$

Item	Load factor αn	Note
1. Max. load weight	α_1 = W/Wmax	Examine W. Wmax is the max. load weight for Va.
2. Static moment	α_2 = M/Mmax	Examine M_1, M_2, M_3. Mmax is the allowable moment for Va.
3. Dynamic moment	α_3 = Me/Memax	Examine Me_1, Me_3. Memax is the allowable moment for V.

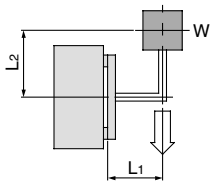
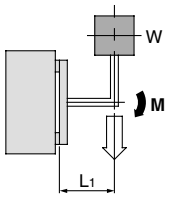
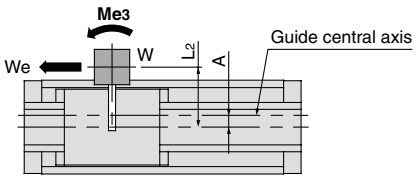
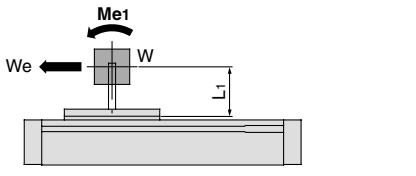
V: Collision speed Va: Average speed



Calculation Example

Operating Conditions

Cylinder: CY1H15
Cushion: Standard (Adjusting bolt)
Mounting: Horizontal wall mounting
Speed (average): Va = 300 [mm/s]
Load weight: W = 1 [kg] (excluding weight of arm section)
L_1 = 50 [mm]
L_2 = 50 [mm]

Item	Load factor αn	Note
1. Maximum load weight 	α_1 = W/Wmax = 1/9 **= 0.111**	Examine W. Find the value of Wmax when Va = 300 mm/s from Graph (1).
2. Static moment 	$M_2 = W \cdot L_1$ = 10 x 0.05 = 0.5 [N·m] $\alpha_2 = M_2/M_{2max}$ = 0.5/16 **= 0.031** W = 1 [kg] = 10 [N]	Examine M_2. Since M_1 & M_3 are not generated, investigation is unnecessary. Find the value M_{2max} when V = 1.4 and Va = 300 mm/s from Graph (3).
3. Dynamic moment 	From V = 1.4 Va $We = \delta \cdot W \cdot V$ = 4/100 · 10 · 1.4 · 300 = 168 [N] $Me_3 = 1/3 \cdot We\ (L_2 - A)$ = 1/3 · 168 · 0.032 = 1.8 [N·m] $\alpha_3 = Me_3/Me_{3max}$ = 1.8/7.2 **= 0.250**	Examine Me_3. Find the load equivalent to impact We. Damper coefficient δ = 4/100 (urethane damper) Find the value of Me_{3max} when V = 1.4 and Va = 420 mm/s from Graph (2).
	$Me_1 = 1/3 \cdot We \cdot L_1$ = 1/3 · 168 · 0.05 = 2.8 [N·m] $\alpha_4 = Me_1/Me_{1max}$ = 2.8/7.2 **= 0.389**	Examine Me_1. From above, We = 168 Find the value of Me_{3max} when V = 1.4 and Va = 420 mm/s from Graph (2).

$\Sigma \alpha n = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4$
= 0.111 + 0.031 + 0.250 + 0.389
= 0.781
Can be used based on $\Sigma \alpha n = 0.781 \leq 1$

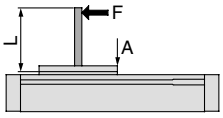
Model Selection 4

Caution on Design (2)

Table Deflection

Table Displacement due to Pitch Moment Load

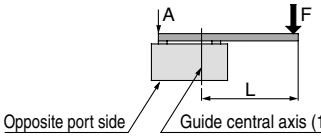
Displacement of Section A when force acts on Section F



$M_1 = F \times L$

Table Displacement due to Roll Moment Load

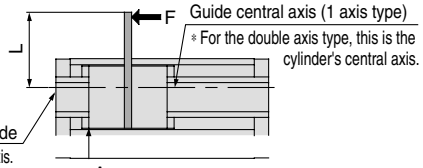
Displacement of Section A when force acts on Section F



$M_2 = F \times L$

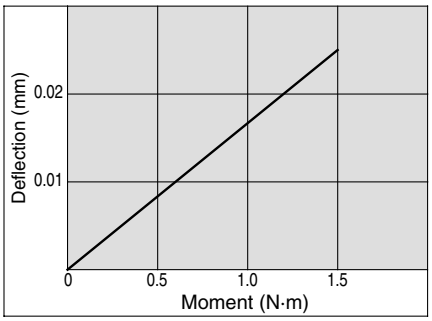
Table Displacement due to Yaw Moment Load

Displacement of Section A when force acts on Section F

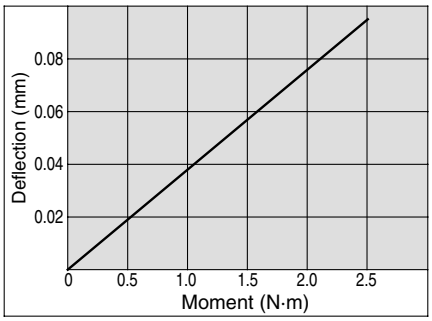


$M_3 = F \times L$

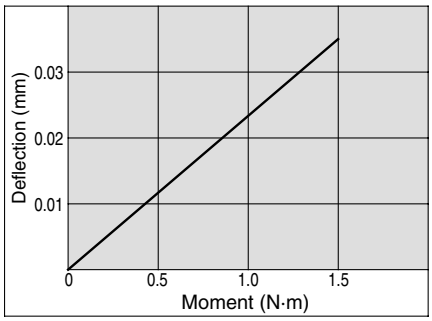
CY1H10



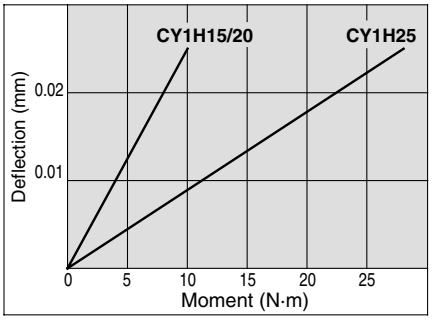
CY1H10



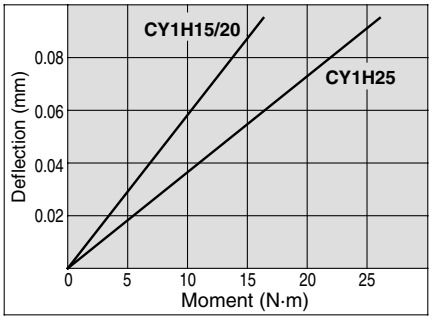
CY1H10



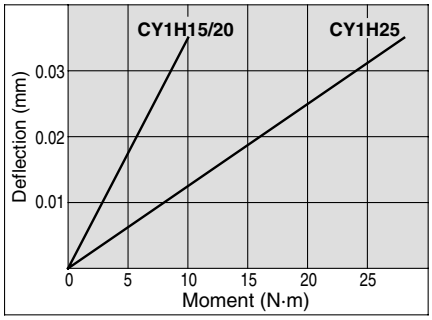
CY1H15/20/25



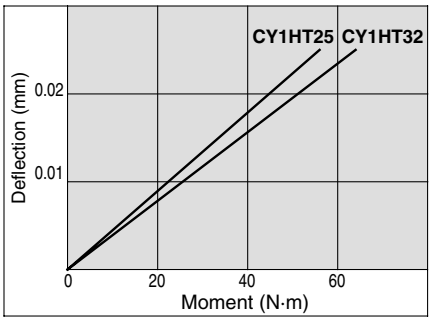
CY1H15/20/25



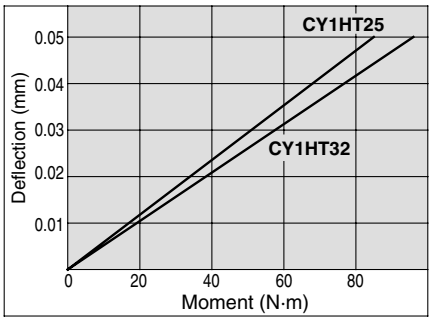
CY1H15/20/25



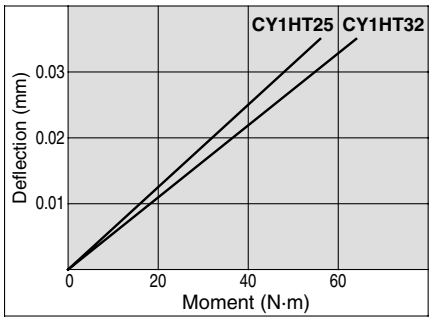
CY1HT25/32



CY1HT25/32



CY1HT25/32



Vertical Operation

When using in vertical operation, prevention of workpiece dropping due to breaking of the magnetic coupling should be considered. The allowable load mass and maximum operating pressure should be as shown in the table below.

Model	Allowable load weight (Wv) (kg)	Maximum operating pressure Pv (MPa)
CY1H10	2.7	0.55
CY1H15	7.0	0.65
CY1H20	11.0	0.65
CY1H25	18.5	0.65
CY1HT25	18.5	0.65
CY1HT32	30.0	0.65

Intermediate Stop

(1) Intermediate Stopping of Load with External Stopper, etc.

When stopping a load in mid-stroke using an external stopper, etc.,operate within the operating pressure limits shown in the table below. The magnetic coupling will break if operated at a pressure exceeding these limits.

Model	Operating pressure limit for intermediate stop Ps (MPa)
CY1H10	0.55
CY1H15	0.65
CY1H20	0.65
CY1H25	0.65
CY1HT25	0.65
CY1HT32	0.65

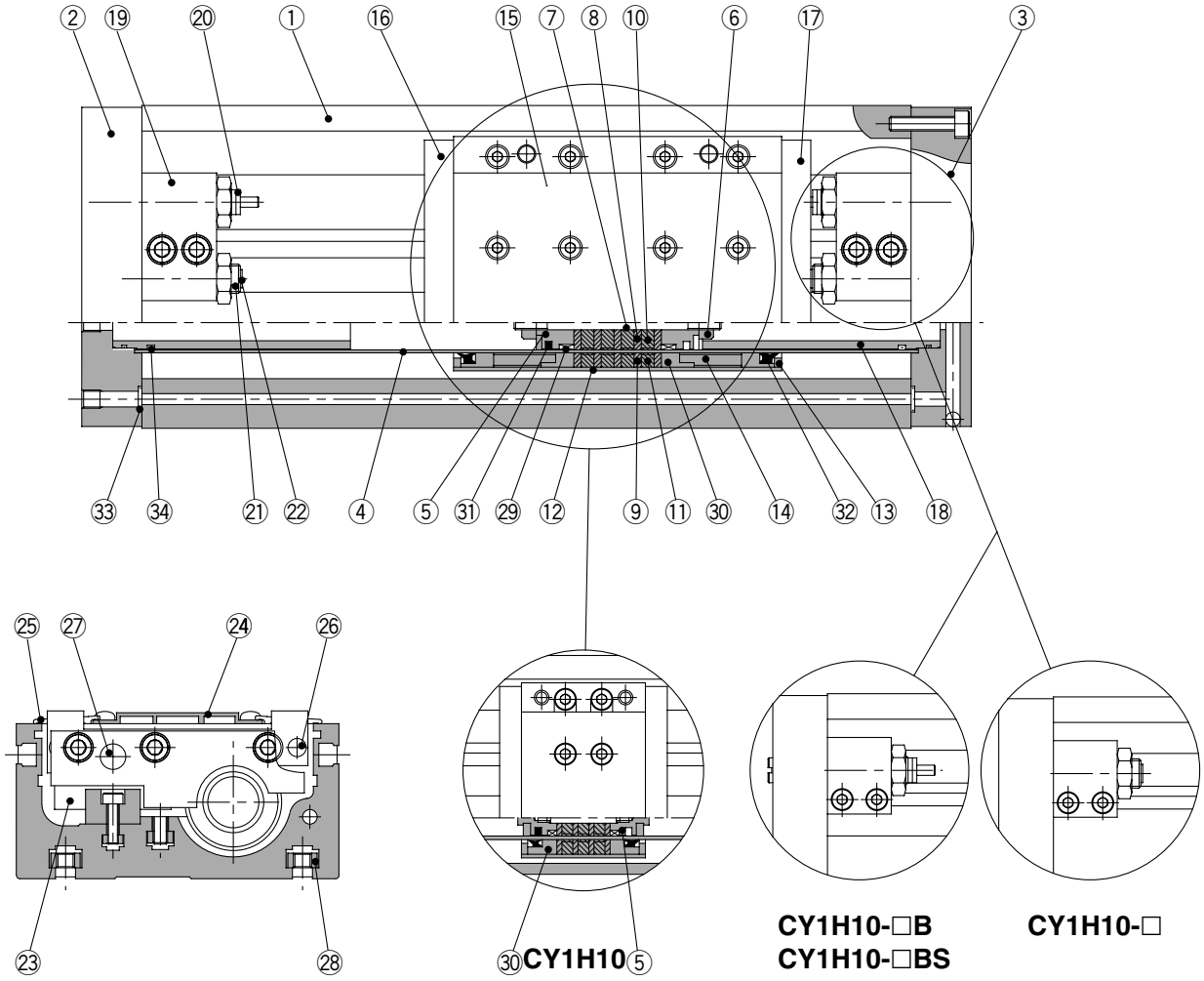
(2) Intermediate Stopping of Load with Air Pressure Circuit

When stopping a load using an air pressure circuit/operate at or below the kinetic energy shown in the table below. The magnetic coupling will break if the allowable value is exceeded.

Model	Allowable kinetic energy for intermediate stop Es (J)
CY1H10	0.03
CY1H15	0.13
CY1H20	0.24
CY1H25	0.45
CY1HT25	0.45
CY1HT32	0.88

Construction

Single axis type: CY1H



Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Plate A	Aluminum alloy	Hard anodized
③	Plate B	Aluminum alloy	Hard anodized
④	Cylinder tube	Stainless steel	
⑤	Piston	Brass	Electroless nickel plated (CY1H10/15)
		Aluminum alloy	Chromated (CY1H20/25)
⑥	Piston nut	Carbon steel	Zinc chromated (Except CY1H10/15)
⑦	Shaft	Stainless steel	
⑧	Piston side yoke	Rolled steel plate	Zinc chromated
⑨	External slider side yoke	Rolled steel plate	Zinc chromated
⑩	Magnet A	Rare earth magnet	
⑪	Magnet B	Rare earth magnet	
⑫	External slider tube	Aluminum alloy	
⑬	Spacer	Rolled steel plate	Nickel plated
⑭	Space ring	Aluminum alloy	Chromated (Except CY1H10)
⑮	Slide table	Aluminum alloy	Hard anodized
⑯	Side plate A	Aluminum alloy	Hard anodized
⑰	Side plate B	Aluminum alloy	Hard anodized

No.	Description	Material	Note
⑱	Internal stopper	Aluminum alloy	Anodized
⑲	Stopper	Aluminum alloy	Anodized
⑳	Shock absorber	—	Series RB
㉑	Adjusting bolt	Chrome molybdenum steel	Nickel plated
㉒	Adjusting bumper	Urethane rubber	
㉓	Linear guide	—	
㉔	Top cover	Aluminum alloy	Hard anodized
㉕	Dust cover	Special resin	
㉖	Magnet (For auto switch)	Rare earth magnet	
㉗	Parallel pin	Carbon steel	Nickel plated
㉘	Square nut for body mounting	Carbon steel	Nickel plated
㉙*	Wear ring A	Special resin	
㉚*	Wear ring B	Special resin	
㉛*	Piston seal	NBR	
㉜*	Scraper	NBR	
㉝*	O-ring	NBR	
㉞*	O-ring	NBR	

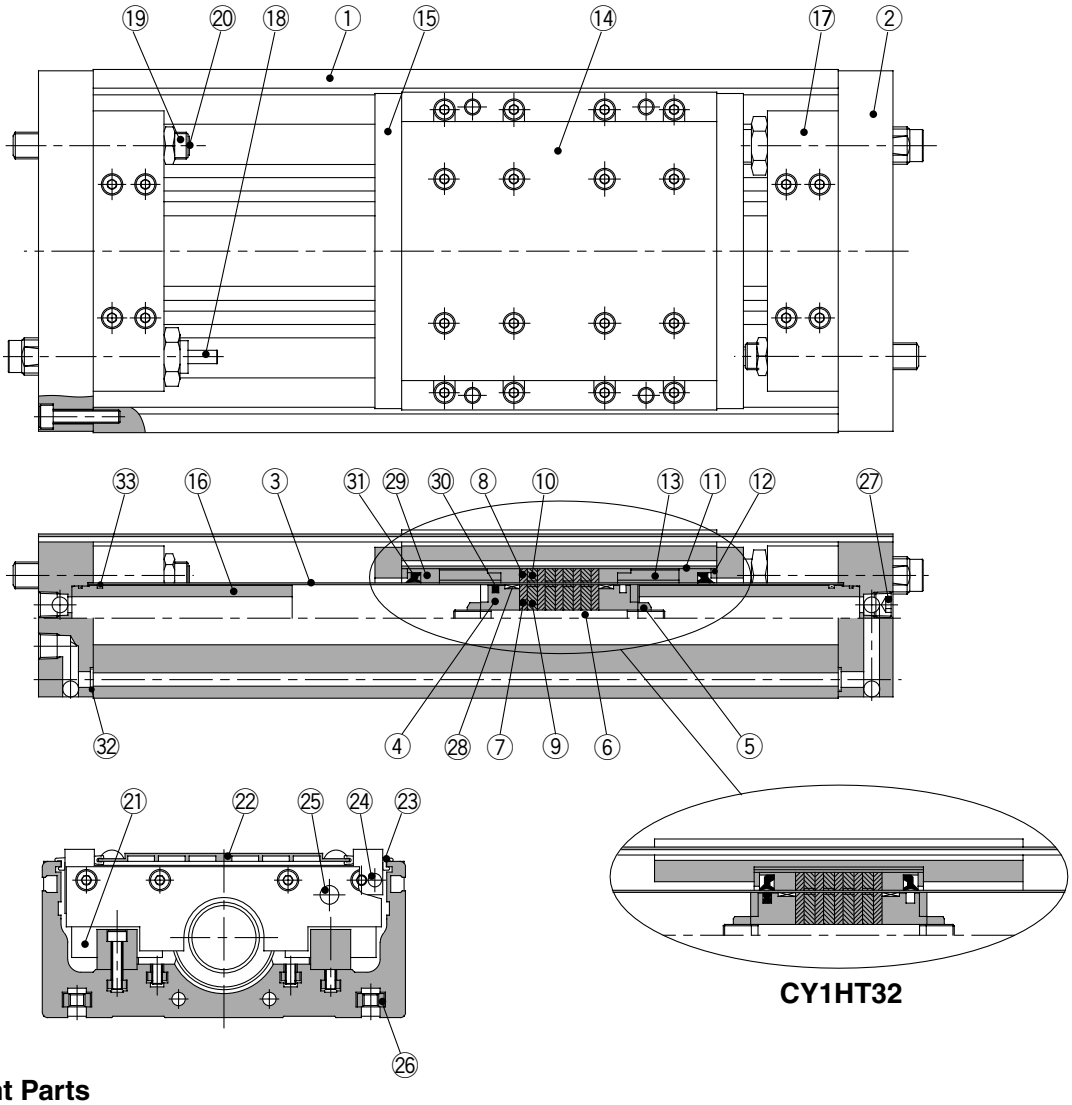
Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
10	CY1H10-PS	Set of the above nos. ㉙, ㉚, ㉛, ㉜, ㉝, ㉞
15	CY1H15-PS	
20	CY1H20-PS	
25	CY1H25-PS	

* Seal kit includes ㉙ to ㉞. Order the seal kit, based on each bore size.

Construction

Double axes type: CY1HT



Component Parts

No.	Description	Material	Note
①	Body	Aluminum alloy	Hard anodized
②	Plate	Aluminum alloy	Hard anodized
③	Cylinder tube	Stainless steel	
④	Piston	Aluminum alloy	Chromated
⑤	Piston nut	Carbon steel	Zinc chromated
⑥	Shaft	Stainless steel	
⑦	Piston side yoke	Rolled steel plate	Zinc chromated
⑧	External slider side yoke	Rolled steel plate	Zinc chromated
⑨	Magnet A	Rare earth magnet	
⑩	Magnet B	Rare earth magnet	
⑪	External slider tube	Aluminum alloy	
⑫	Spacer	Rolled steel plate	Nickel plated
⑬	Space ring	Aluminum alloy	Chromated (Except CY1HT32)
⑭	Slide table	Aluminum alloy	Hard anodized
⑮	Side plate	Aluminum alloy	Hard anodized (Except CY1HT32)
⑯	Internal stopper	Aluminum alloy	Anodized
⑰	Stopper	Aluminum alloy	Anodized

No.	Description	Material	Note
⑱	Shock absorber	—	Series RB
⑲	Adjusting bolt	Chrome molybdenum steel	Nickel plated
⑳	Adjusting bumper	Urethane rubber	
㉑	Linear guide	—	
㉒	Top cover	Aluminum alloy	Hard anodized
㉓	Dust cover	Special resin	
㉔	Magnet (For auto switch)	Rare earth magnet	
㉕	Parallel pin	Stainless steel	
㉖	Square nut for body mounting	Carbon steel	Nickel plated
㉗	Hexagon socket head taper plug	Carbon steel	Nickel plated
㉘*	Wear ring A	Special resin	
㉙*	Wear ring B	Special resin	
㉚*	Piston seal	NBR	
㉛*	Scraper	NBR	
㉜*	O-ring	NBR	
㉝*	O-ring	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.	Contents
25	CY1HT25-PS	Set of the above nos. ㉘, ㉙, ㉚, ㉛, ㉜, ㉝
32	CY1HT32-PS	

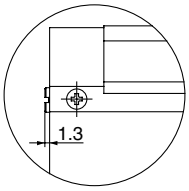
* Seal kit includes ㉘ to ㉝. Order the seal kit, based on each bore size.

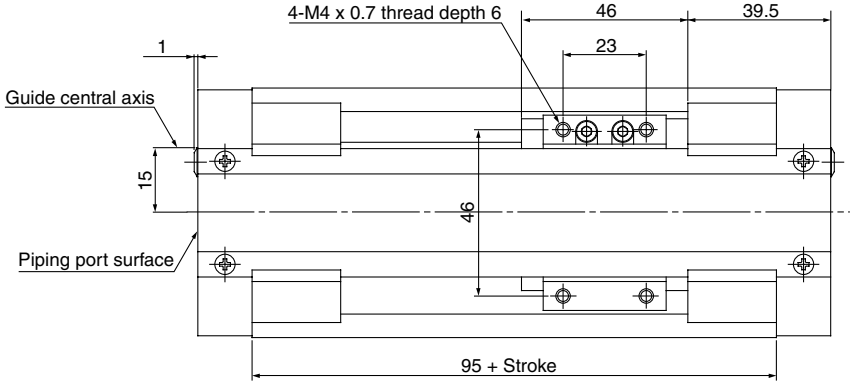
Dimensions

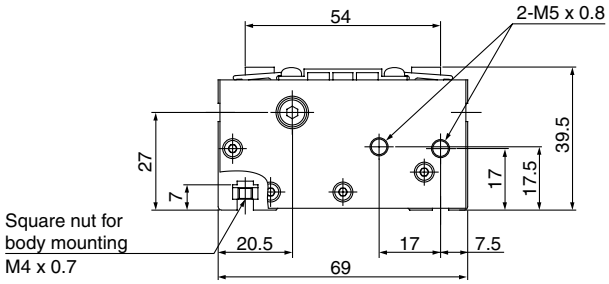
Single axis type: ø10

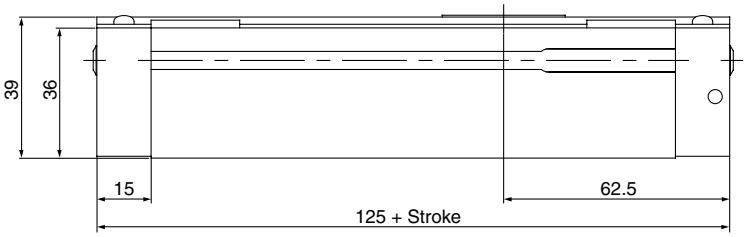
CY1H10

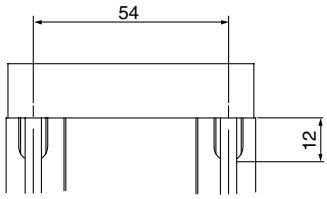
CY1H10-□B







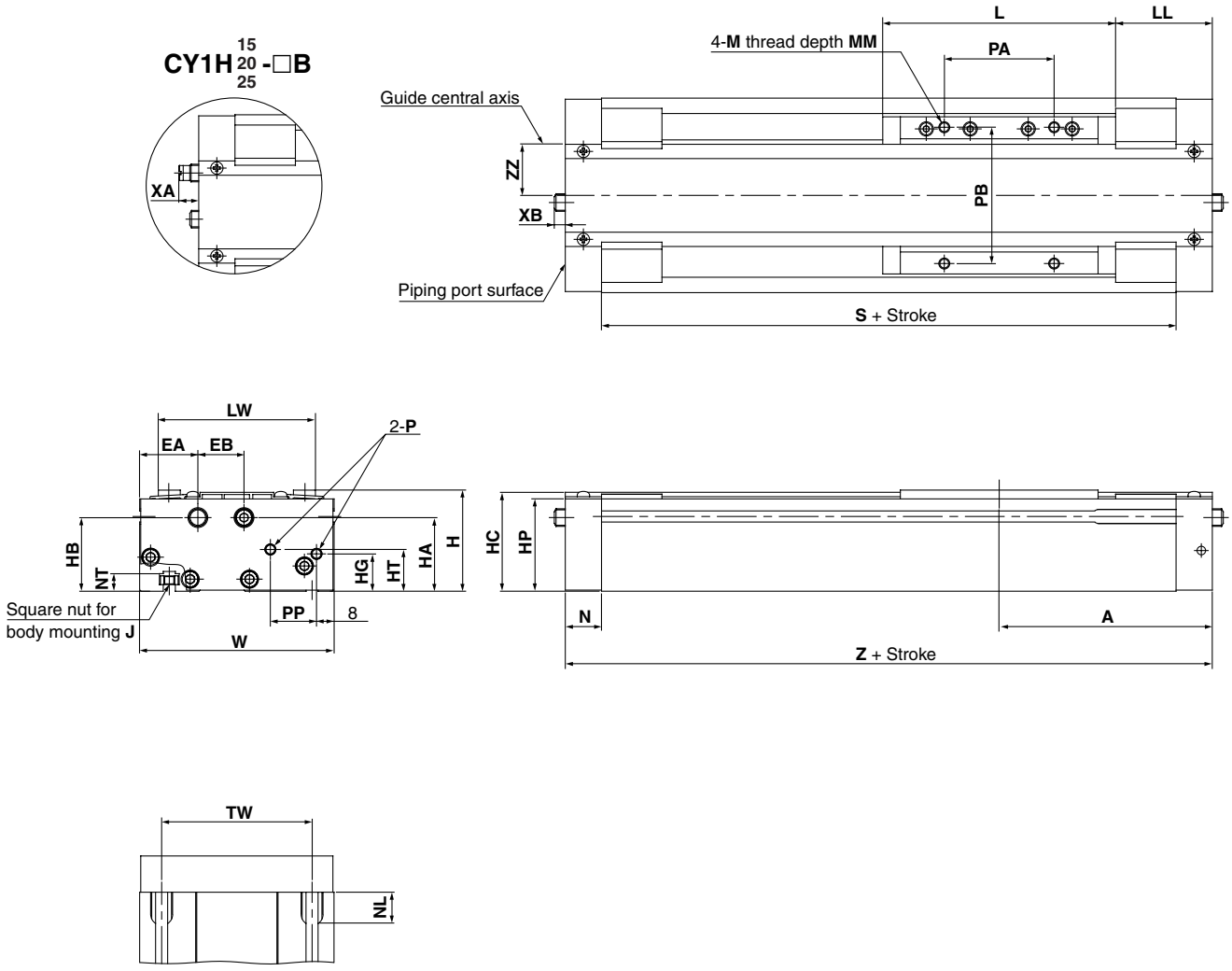




Dimensions

Single axis type: ø15, ø20, ø25

CY1H15/20/25



(mm)

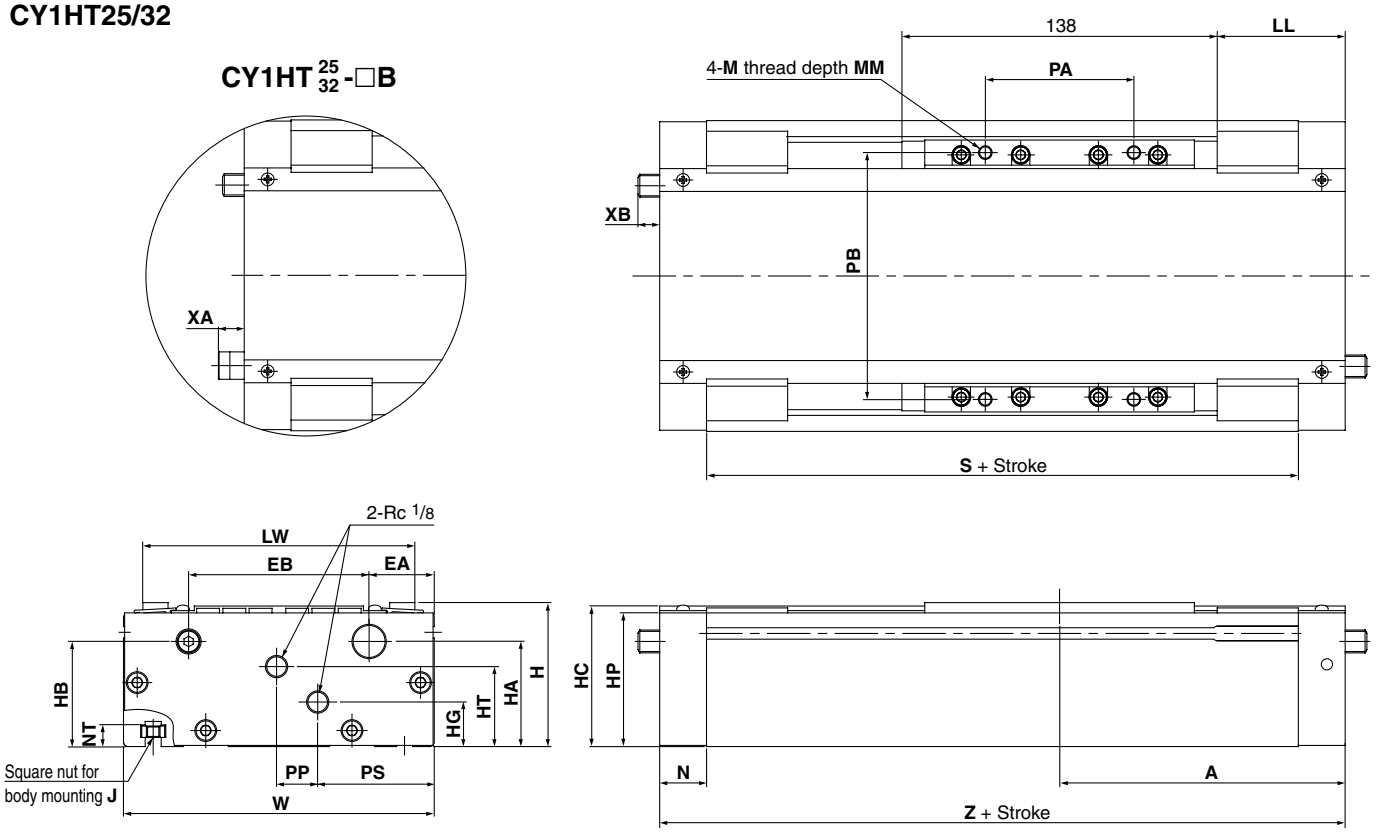
Model	A	EA	EB	H	HA	HB	HC	HG	HP	HT	J	L	LL	LW	M	MM	N	NL	NT
CY1H15	97	26.5	21	46	33.5	33.5	45	17	42	19	M5 x 0.8	106	44	71.5	M5 x 0.8	8	16.5	15	8
CY1H20	102.5	26.5	22	54	42.5	41.5	53	16	50	23.5	M5 x 0.8	108	48.5	75.5	M5 x 0.8	8	18	15	8
CY1H25	125	29	24	63	46	46	61.5	25	58.5	28	M6 x 1.0	138	56	86	M6 x 1.0	10	20.5	18	9

Model	P	PA	PB	PP	S	TW	W	XA	XB	Z	ZZ
CY1H15	M5 x 0.8	50	62	21	161	65	88.5	—	—	194	17.5
CY1H20	Rc 1/8	50	65	23	169	70	92.5	—	—	205	19.5
CY1H25	Rc 1/8	65	75	27	209	75	103	11.3	9.5	250	23.5

Double axes type: ø25, ø32

CY1HT25/32

CY1HT $\frac{25}{32}$-□B

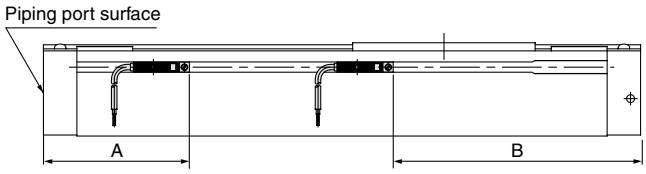


(mm)

Model	A	EA	EB	H	HA	HB	HC	HG	HP	HT	J	LL	LW	M	MM	N	NL	NT	PA
CY1HT25	125	28.5	79	63	46	46	61.5	19.5	58.5	35	M6 x 1.0	56	119	M6 x 1.0	10	20.5	18	9	65
CY1HT32	132.5	30	90	75	52.5	57.5	72.5	25	69.5	43	M8 x 1.25	63.5	130	M8 x 1.25	12	23	22.5	12	66

Model	PB	PP	PS	S	TW	W	XA	XB	Z
CY1HT25	108	18	51	209	110	136	11.3	9.5	250
CY1HT32	115	14	61	219	124	150	9.7	2	265

Proper Auto Switch Mounting Position (Detection at stroke end)



Cylinder model	Applicable auto switch D-Z7□/Z80/Y5□/Y6□/Y7□	
	A	B
CY1H10	65.5	59.5
CY1H15	72	122
CY1H20	77.5	127.5
CY1H25	86	164
CY1HT25	86	164
CY1HT32	82	183

∗ 50 mm is the minimum stroke available with 2 auto switches mounted. Please contact SMC in the case of a stroke less than this.

Operating Range

Cylinder model	Auto switch model	Bore size (mm)				
		10	15	20	25	32
CY1H	D-Z7□/Z80	8	6	6	6	—
	D-Y5□/Y6□/Y7□	6	5	5	5	—
CY1HT	D-Z7□/Z80	—	—	—	6	9
	D-Y5□/Y6□/Y7□	—	—	—	5	6

∗ Some switches cannot be mounted.
∗ 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.

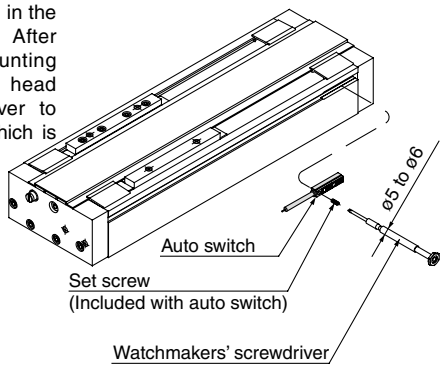
Other than the models listed in "How to Order", the following auto switches are applicable.
For detailed specifications, refer to page 8-30-1.

Type	Model	Electrical entry	Features
Reed switch	D-Z80	Grommet (In-line)	Without indicator light

∗ Normally closed (NC = b contact), solid state switch (D-Y7G/Y7H type) are also available. For details, refer to page 8-30-52.

Mounting of Auto Switch

When mounting auto switches, they should be inserted into the cylinder's switch groove from the direction shown in the drawing on the right. After setting in the mounting position, use a flat head watchmakers' screwdriver to tighten the set screw which is included.



Note) When tightening the auto switch set screw (included with auto switch), Use a watchmakers' screwdriver with a handle about 5 to 6 mm in diameter. Use a tightening torque of approximately 0.05 to 0.1 N·m.

Auto Switch Lead Wire Containment Groove

On models CY1H20 and CY1H25 a groove is provided on the side of the body (one side only) to contain auto switch lead wires. This should be used for management of wiring.