

# Magnetically Coupled Rodless Cylinder Linear Guide Type

## Series **CY1H**

Single axis:  $\varnothing 10, \varnothing 15, \varnothing 20, \varnothing 25$ /Double axis:  $\varnothing 25, \varnothing 32$



### How to Order

**CY1H** [ ] **25** [ ] - **300** [ ] - **Y7BW** [ ] - [ ]

Linear guide type

Guide

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

Bore size

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

Port thread type

Symbol	Type	Bore size
Nil	M thread	$\varnothing 10, \varnothing 15$
	Rc	
TN	NPT	$\varnothing 20, \varnothing 25, \varnothing 32$
TF	G	

Standard stroke (mm)

Refer to "Standard Stroke" on page 1513.

Made to Order  
Refer to page 1513 for details.

Number of auto switches

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

Auto switch

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

\* For the applicable auto switch model, refer to the table below.

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  $\varnothing 10$ )

### Shock Absorbers

Model	Type	Bore size (mm)				
		10	15	20	25	32
CY1H	Standard (shock absorber Series RB)	RB0805	RB0806	RB1006	RB1411	—
	Shock absorber soft type Series RJ type (-XB22)	RJ0806H		RJ1007H	RJ1412H	—
CY1HT	Standard (shock absorber Series RB)	—	—	—	RB1411	RB2015
	Shock absorber soft type Series RJ type (-XB22)	—	—	—	RJ1412H	—

\* The shock absorber service life is different from that of the CY1H cylinder.

Refer to "Specific Product Precautions" for each shock absorber for the replacement period.

\* The shock absorber soft type Series RJ type (-XB22) is a made to order specification. For details, refer to page 1722.

### Applicable Auto Switches/Refer to pages 1559 to 1673 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Auto switch model		Lead wire length (m)*			Pre-wired connector	Applicable load	
					DC	AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)		IC circuit	Relay, PLC
							Perpendicular	In-line						
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	Y69A	Y59A	●	●	○	○	IC circuit	Relay, PLC
				3-wire (PNP)			12 V	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)			Y7PWW	Y7PW	●	●	○	○		
Water resistant (2-color indication)	2-wire	12 V	—	Y7BWW	Y7BW	●	●	○	○	—				
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	Z76	●	●	—	—	IC circuit	—
				2-wire	24 V	12 V	100 V	—	Z73	●	●	●	—	—
					5 V, 12 V	100 V or less	—	Z80	●	●	—	—	IC circuit	—

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

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

\* Lead wire length symbols: 0.5 m..... Nil (Example) Y7BW  
3 m..... L (Example) Y7BWL  
5 m..... Z (Example) Y7BWZ

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

• For details about auto switches with pre-wired connector, refer to pages 1626 and 1627.

• Normally closed (NC = b contact) solid state auto switches (D-Y7G/Y7H types) are also available. Refer to page 1579 for details.

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

**Symbol**

Rubber bumper  
(Magnet type)



Made to Order: Individual Specifications  
(For details, refer to pages 1522.)

Symbol	Specifications
-X168	Helical insert thread specifications

**Made to Order Specifications**

(For details, refer to pages 1699 and 1818.)

Symbol	Specifications
-XB10	Intermediate stroke (Using exclusive bolt)
-XB11	Long stroke
-XB22	Shock absorber soft type Series RJ type

**Theoretical Output**

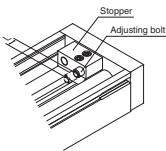
Bore size (mm)	Piston area (mm <sup>2</sup> )	Operating pressure (MPa)					
		0.2	0.3	0.4	0.5	0.6	0.7
10	78	15	23	31	39	46	54
15	176	35	52	70	88	105	123
20	314	62	94	125	157	188	219
25	490	98	147	196	245	294	343
32	804	161	241	322	402	483	563

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

**Amount of Adjustment by Adjusting Bolt**

Stroke adjustment on one side of 15 mm (CY1H10/15/20) or 30 mm (CY1H25, CY1HT25, CY1HT32) can be performed with the adjustment bolt, but when the amount of adjustment exceeds 3 mm, the magnetic coupling may be broken depending on the operating conditions. Therefore, operation should conform to the intermediate stop conditions on page 1511.

Do not adjust strokes by moving the stopper, as this can cause cylinder damage.



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

**Specifications**

Bore size (mm)	10	15	20	25	32
<b>Fluid</b>	Air				
<b>Action</b>	Double acting				
<b>Maximum operating pressure</b>	0.7 MPa				
<b>Minimum operating pressure</b>	0.2 MPa				
<b>Proof pressure</b>	1.05 MPa				
<b>Ambient and fluid temperature</b>	-10 to 60°C (No freezing)				
<b>Piston speed</b>	70 to 500 mm/s				
<b>Cushion (External stopper)</b>	Urethane bumpers on both ends (Standard), Shock absorber (Option)				
<b>Lubrication</b>	Not required (Non-lube)				
<b>Stroke length tolerance</b>	0 to 1.8 mm				
<b>Holding force (N)</b>	53.9	137	231	363	588
<b>Piping</b>	Centralized piping type				
<b>Piping port size</b>	M5 x 0.8		Rc 1/8		

**Standard Stroke**

Bore size (mm)	Number of axes	Standard stroke (mm) Note)	Maximum available stroke (mm)
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 axis	100, 200, 300, 400, 500, 600, 800, 1000	
32		1500	

Note) Strokes are manufacturable in 1 mm increments up to the maximum strokes. Suffix "XB10" to the end of the part number for intermediate strokes excluding standard strokes and "XB11" for strokes exceeding standard strokes up to the manufacturable maximum strokes.

**Weight**

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**

Refer to the Series RB in Best Pneumatics No. 3 for the details on shock absorbers.

Applicable cylinder size (mm)	10	15	20	25	32	
<b>Shock absorber model</b>	RB0805	RB0806	RB1006	RB1411	RB2015	
<b>Maximum energy absorption (J)</b>	0.98	2.94	3.92	14.7	58.8	
<b>Stroke absorption (mm)</b>	5	6	6	11	15	
<b>Collision speed (m/s) *</b>	0.05 to 5					
<b>Max. operating frequency (cycle/min)</b>	80		70	45	25	
<b>Spring force (N)</b>	<b>Extended</b>		1.96	4.22	6.86	8.34
	<b>Retracted</b>		3.83	22	6.18	15.30
<b>Weight (g)</b>	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.

The shock absorber service life is different from that of the CY1H cylinder. Refer to the Specific Product Precautions for the replacement period.

CY3B  
CY3R

CY1S  
-Z

CY1L

CY1H

CY1F

CYP

D-□

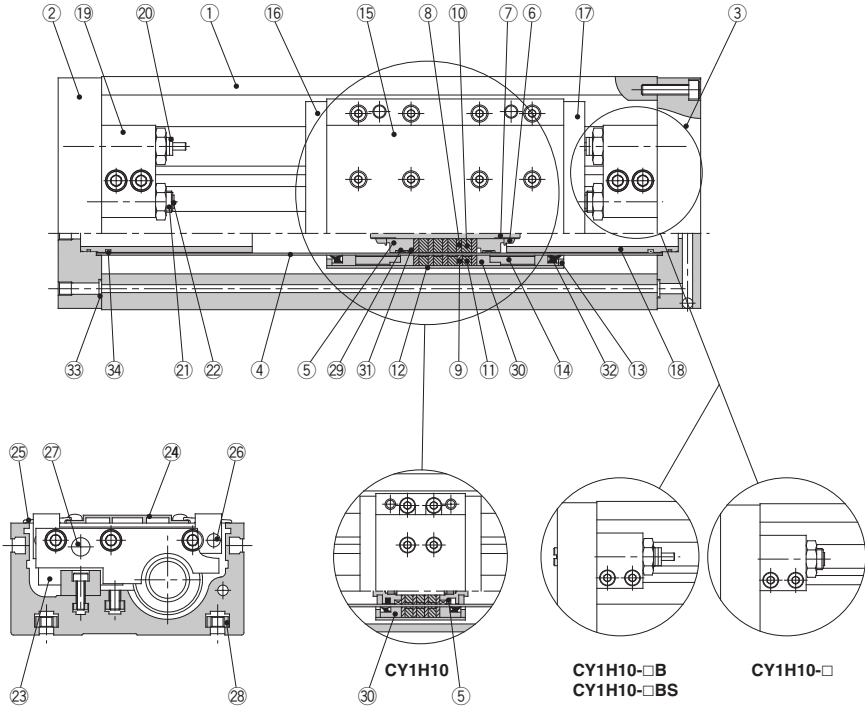
-X□

Technical data

# Series CY1H

## Construction

### Single axis type / CY1H



#### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Anodized
2	Plate A	Aluminum alloy	Anodized
3	Plate B	Aluminum alloy	Anodized
4	Cylinder tube	Stainless steel	
5	Piston	Aluminum alloy	Chromated
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	—	
11	Magnet B	—	
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	Anodized
16	Side plate A	Aluminum alloy	Anodized
17	Side plate B	Aluminum alloy	Anodized
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	Anodized
25	Dust cover	Special resin	
26	Magnet (For auto switch)	—	

No.	Description	Material	Note
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	

Note) 4 square nuts for body mounting are included regardless of strokes.

#### Replacement Parts: Seal Kit

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

Note 1) Seal kit includes 29 to 34. Order the seal kit, based on each bore size.

Note 2) For replacement of the  $\phi$ 10 wear ring A, contact SMC or your nearest sales representative.

\* Seal kit includes a grease pack ( $\phi$ 10: 5 and 10 g,  $\phi$ 15 to  $\phi$ 25: 10 g).

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

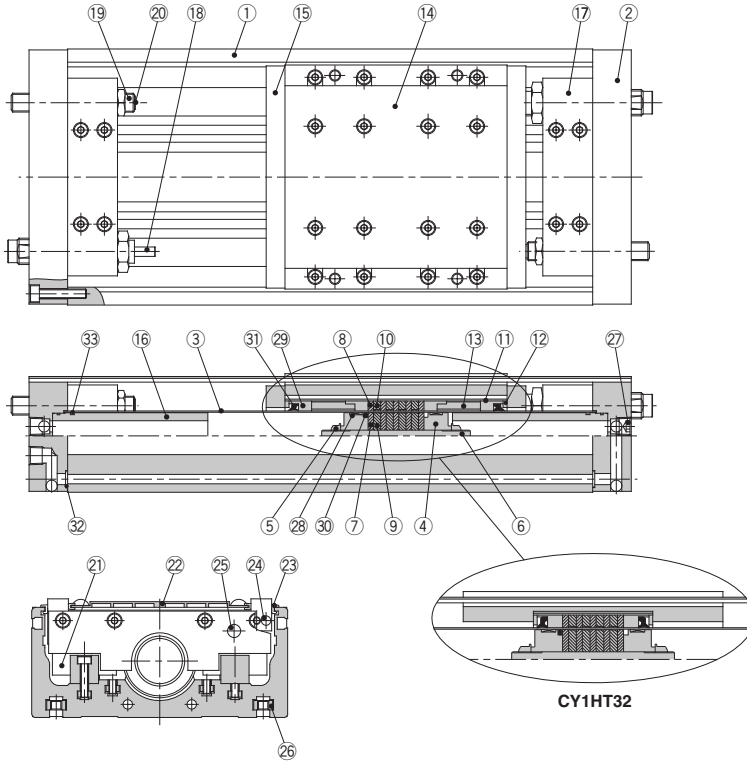
**Grease pack part no. for  $\phi$ 10: GR-F-005 (5 g) for external sliding parts,**

**GR-S-010 (10 g) for tube interior**

**Grease pack part no. for  $\phi$ 15 to  $\phi$ 25: GR-S-010 (10 g)**

**Construction**

**Double axis type / CY1HT**



**Component Parts**

No.	Description	Material	Material
1	Body	Aluminum alloy	Anodized
2	Plate	Aluminum alloy	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	—	
10	Magnet B	—	
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	Anodized
15	Side plate	Aluminum alloy	Anodized (Except CY1HT32)
16	Internal stopper	Aluminum alloy	Anodized
17	Stopper	Aluminum alloy	Anodized
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	Anodized
23	Dust cover	Special resin	
24	Magnet (For auto switch)	—	
25	Parallel pin	Stainless steel	

No.	Description	Material	Material
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	

Note) 4 square nuts for body mounting are included regardless of strokes.

**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.  
 \* Seal kit includes a grease pack (10 g).  
 Order with the following part number when only the grease pack is needed.  
**Grease pack part no.: GR-S-010 (10 g)**

CY3B  
CY3R

CY1S  
-Z

CY1L

CY1H

CY1F

CYP

D-□

-X□

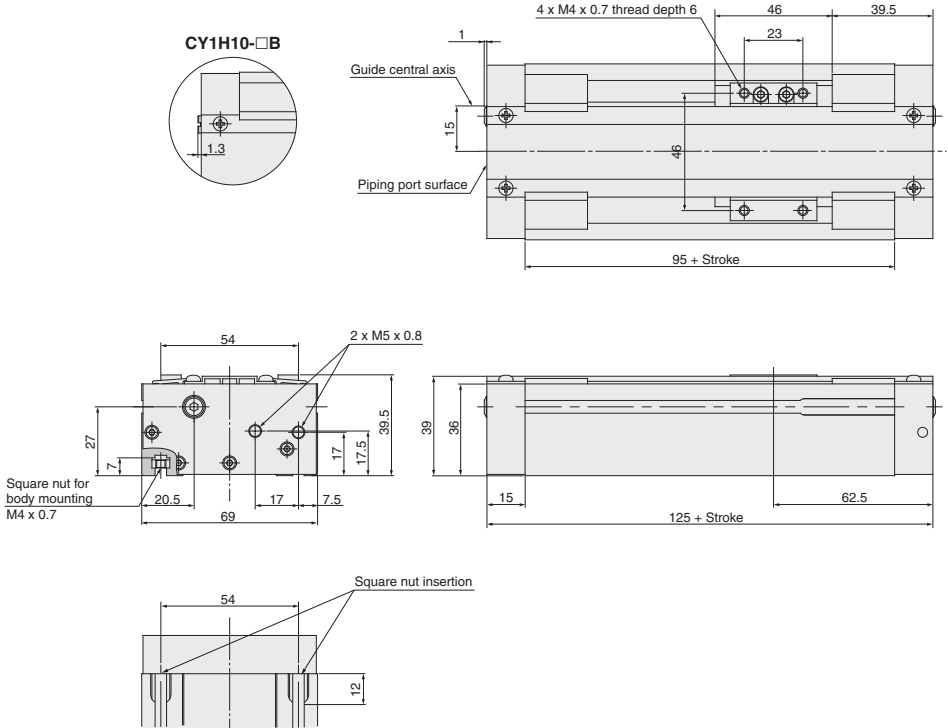
Technical data

# Series **CY1H**

## Dimensions

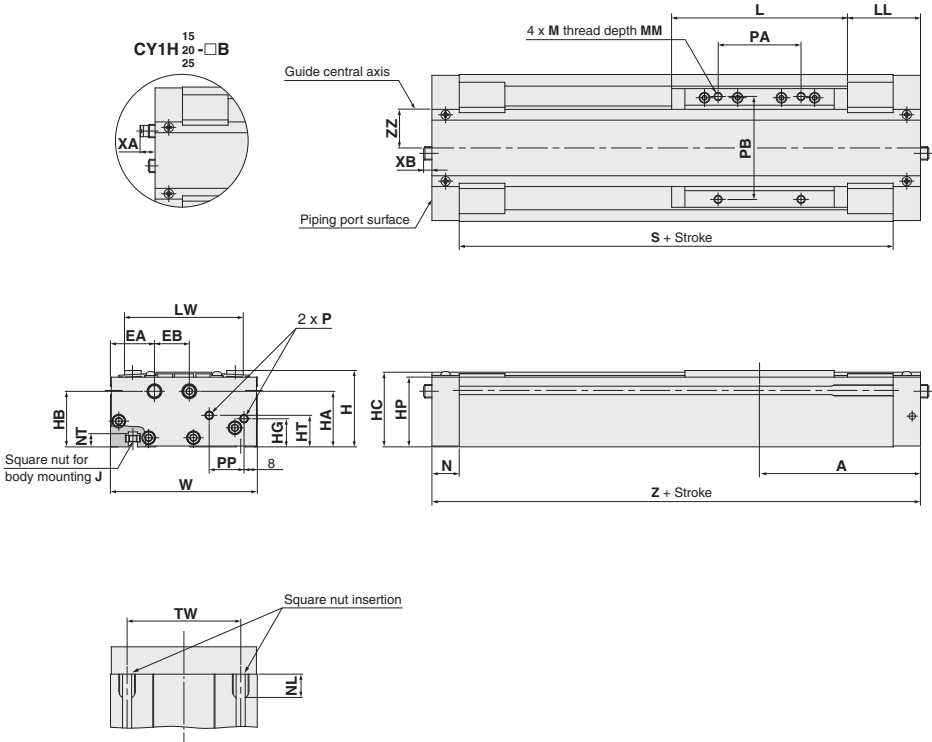
### Single axis type / $\varnothing 10$

#### CY1H10



**Dimensions**

**Single axis type /  $\varnothing 15, \varnothing 20, \varnothing 25$**   
**CY1H15/20/25**



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

(mm)

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	Rc1/8	50	65	23	169	70	92.5	—	—	205	19.5
CY1H25	Rc1/8	65	75	27	209	75	103	11.3	9.5	250	23.5

- CY3B
- CY3R
- CY1S
- Z
- CY1L
- CY1H
- CY1F
- CYP

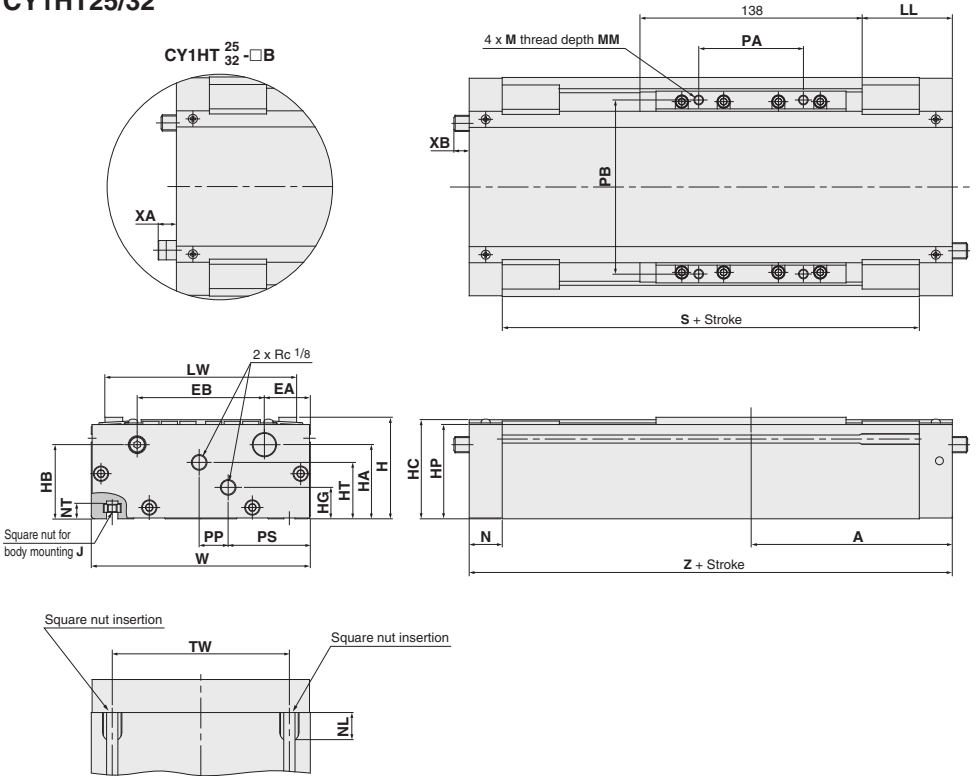
- D-□
- X□
- Technical data

# Series CY1H

## Dimensions

### Double axis type: / $\varnothing 25$ , $\varnothing 32$

#### CY1HT25/32



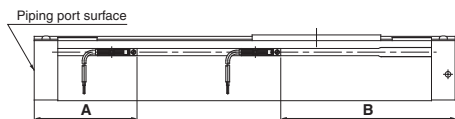
Model	A	EA	EB	H	HA	HB	HC	HG	HP	HT	J	LL	LW	M	MM	N	NL	NT	PA
CY1HT25	125	28.5	79	63	46	46	61.5	19.5	58.5	35	M6 x 1.0	56	119	M6 x 1.0	10	20.5	18	9	65
CY1HT32	132.5	30	90	75	52.5	57.5	72.5	25	69.5	43	M8 x 1.25	63.5	130	M8 x 1.25	12	23	22.5	12	66

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

# Series CY1H Auto Switch Mounting

## Proper Auto Switch Mounting Position (Detection at stroke end)



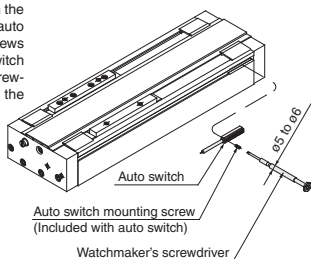
Cylinder model	Applicable auto switch	
	D-Z7□ / Z80 / Y5□ / Y6□ / Y7□	
	A	B
CY1H10	65.5	59.5
CY1H15	72	122
CY1H20	77.5	127.5
CY1H25	86	164
CY1HT25	86	164
CY1HT32	82	183

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

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

## Mounting of Auto Switch

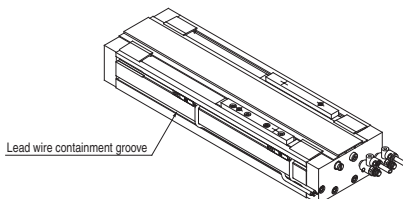
To install the auto switch, insert the auto switch into the installation groove of the cylinder from the direction shown in the drawing on the right, and tighten the auto switch mounting screws attached to the auto switch with a watchmaker's screwdriver after setting the mounting position.



(Note) Use a watchmaker's screwdriver with a grip diameter of 5 to 6 mm to tighten the auto switch mounting screws (attached to the auto switch).  
The tightening torque should be 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.



## 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 auto switches cannot be mounted.

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

CY3B  
CY3R

CY1S  
-Z

CY1L

CY1H

CY1F

CYP

D-□

-X□

Technical  
data



# Series CY1L/H

## Made to Order: Individual Specifications

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



### Applicable Series

No.	Symbol	Specifications/Description	Slider type	
			Ball bushing type <b>CY1L</b>	High precision guide type <b>CY1H</b>
1	-X116	Hydro specifications	●(ø25 to ø40)	—
2	-X168	Helical insert thread specifications	●(ø20 to ø40)	●(ø20 to ø32)
3	-X322	Outside of cylinder tube with hard chrome plated	●(ø15 to ø40)	—
4	-X431	Auto switch rails on both side faces (With 2 pcs.)	●(ø6 to ø40)	—

### 1 Hydro Specifications **-X116**

This type is applicable for precision constant speed feed, intermediate stop and skip feed.

[Slider type]

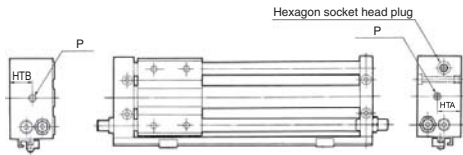


### Specifications

Type	Slider type
<b>Bore size</b>	Slider type CY1L25 to 40
<b>Fluid</b>	Turbine oil
<b>Piston speed</b>	15 to 300 mm/s

Note) Piping is from each plate on both sides.

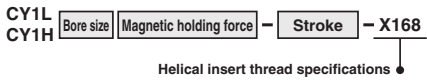
### Dimensions



(mm)				
Model	HTA	HTB	P	Throttle dia.
CY1L25	20	23	Rc 1/8	8.2
CY1L32	24	26.5	Rc 1/8	8.2
CY1L40	25	30.5	Rc 1/4	11

\* Dimensions other than the above are the same as the standard type.

### 2 Helical Insert Thread Specifications **-X168**

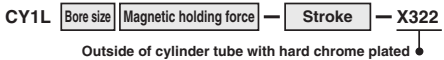


Helical insert thread is used for standard mounting thread.

### Specifications

Applicable Series	CY1L/CY1H
<b>Bore size</b>	CY1L: ø20 to ø40 CY1H: ø20 to ø32

### 3 Outside of Cylinder Tube with Hard Chrome Plated **-X322**



The cylinder tube outer circumference is plated with hard chrome, which further reduces bearing abrasion.

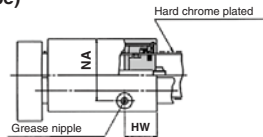
Note) The slider style (slide block) is provided with a greasing port.

### Specifications

Applicable Series	Bore size (mm)
CY1L	ø15 to ø40

### Construction/Dimensions

#### CY1L (Slider type)



Bore size (mm)	CY1L (mm)	
	NA	HW
15	33.0	37.5
20	38.0	43.0
25	43.0	43.0
32	50.0	50.0
40	61.0	68.0

**4 Auto Switch Rails on Both Side Faces (With 2 pcs.)**

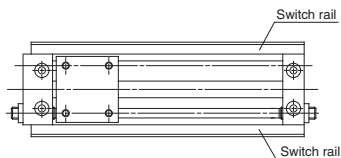
Symbol

**-X431**

CY1L Bore size Magnetic holding force — Stroke — **X431**

Auto switch rails on both side faces (With 2 pcs.) ●

This auto switch is effective in the case of short strokes.



**Specifications**

Applicable Series	<b>CY1L</b>
<b>Bore size</b>	ø6 to ø40

Bore size (mm)	Applicable stroke (mm)
<b>6</b>	20 to
<b>10</b>	25 to
<b>15</b>	
<b>20</b>	
<b>25</b>	
<b>32</b>	35 to
<b>40</b>	

CY3B  
CY3R

CY1S  
-Z

**CY1L**

**CY1H**

CY1F

**CYP**

**D**-□

**-X**□

Technical data