

Heavy Duty Stopper Cylinder **New**

Ø 50, Ø 63, Ø 80

RoHS

Weight

Reduced by up to **22%**

Cylinder tube

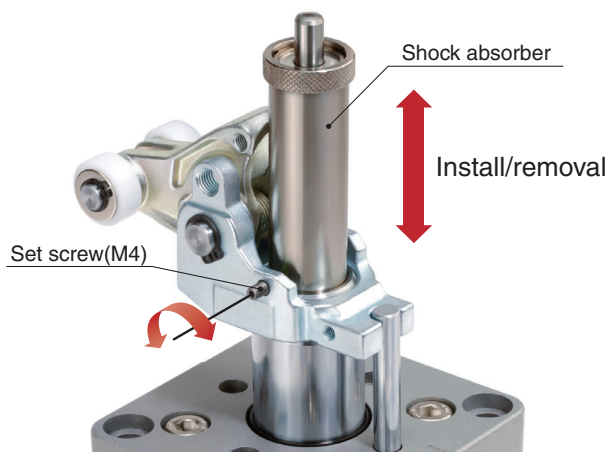
Shortened by up to **9 mm**

(RS2H63-30 stroke)



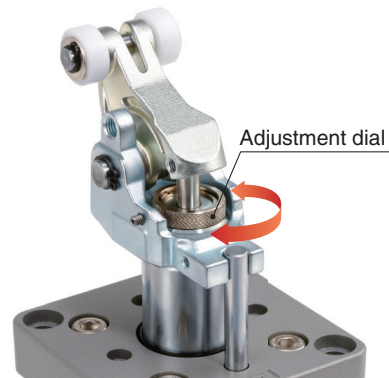
Easy replacement of shock absorbers

Replaceable just by loosening the set screw



Stop the workpiece gently with adjustable shock absorber.

Resistance value can be adjusted by rotating the adjustment dial.



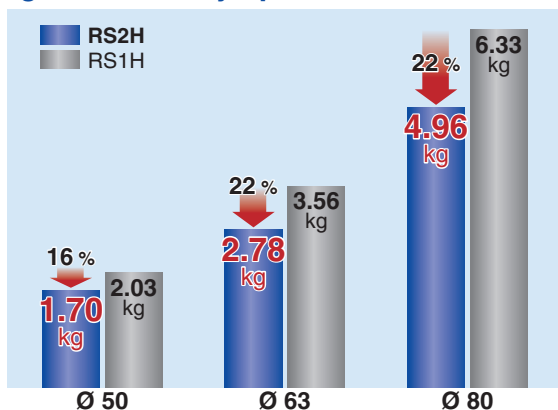
Series RS2H



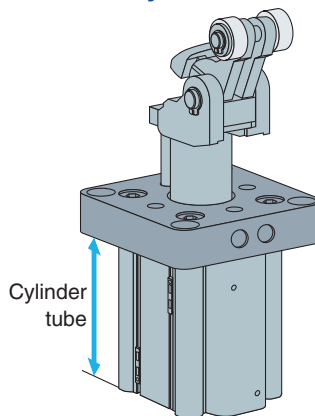
CAT.EUS20-216A'-UK

Heavy Duty Stopper Cylinder

Weight reduced by up to 22 %



Shorter cylinder tube



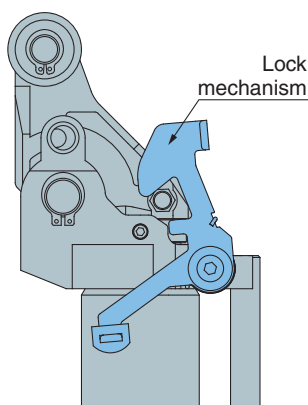
Dimensions		
Bore size (mm)	Series RS2H	Shortened by*
50	84.5	8.5
63	90	9
80	121	7

*Compared with the RS1H series.

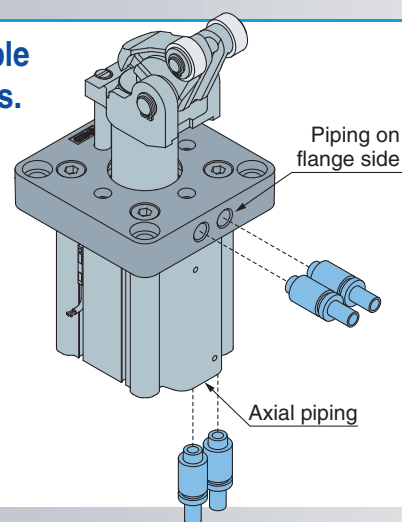
*The height from the cylinder mounting surface to the roller is the same.

Better handling and visibility of the lock mechanism (Option)

The shape of the lock is changed. Easy to unlock manually, and instantly see whether it is locked.

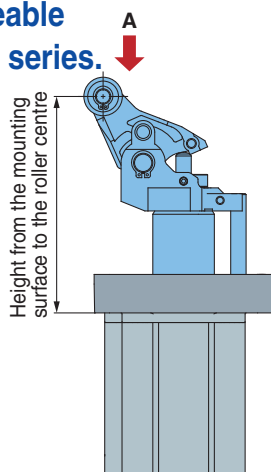
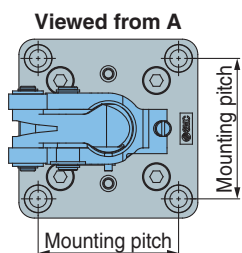


Piping is available from 2 directions.



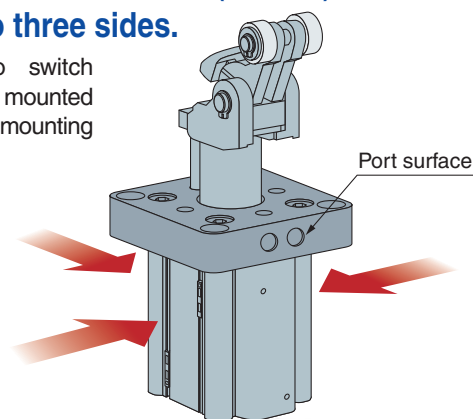
Mounting is interchangeable with conventional RS1H series.

Cylinder mounting pitch and the height from the mounting surface to the roller centre are interchangeable with the RS1H series.

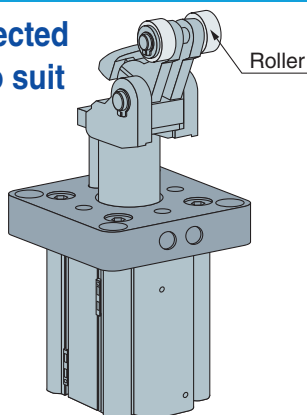


Compact auto switch (D-M9□) and magnetic field resistant auto switch (D-P3DW) can be mounted to three sides.

Compact auto switch can be directly mounted to round switch mounting groove.

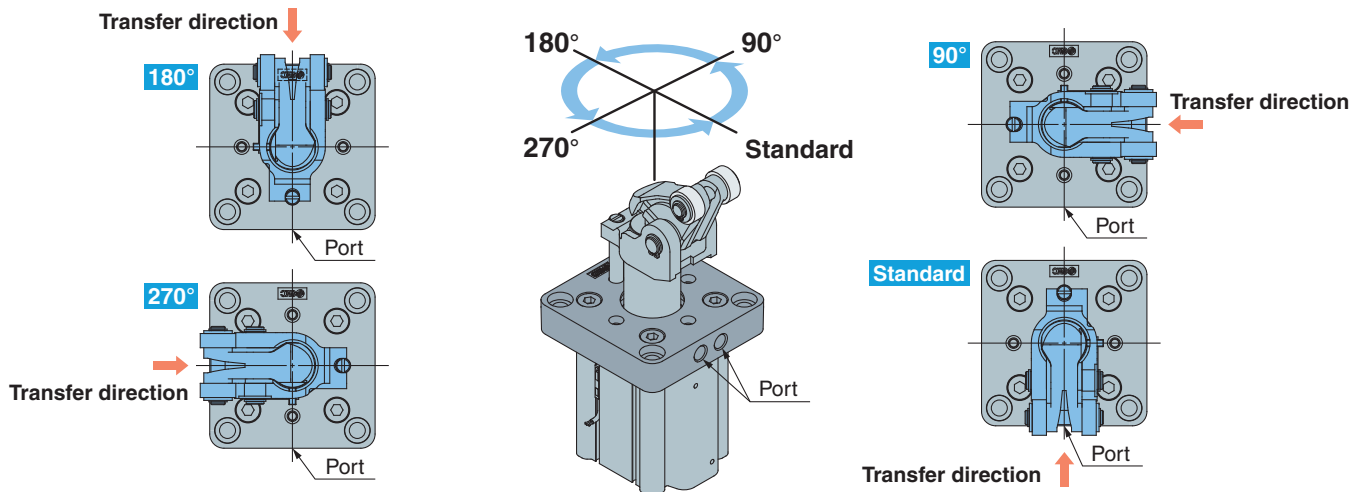


The roller can be selected from two materials to suit the application. (Resin, Carbon steel)



The roller lever direction can be changed in 90° steps.

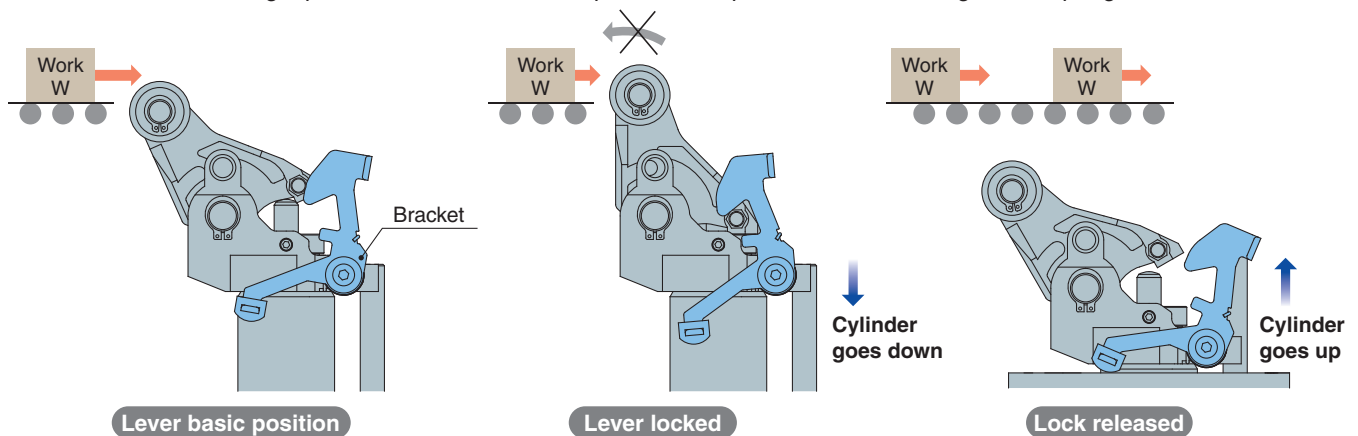
To adapt the roller lever of the stopper to the work piece direction, the roller lever can be positioned in 4 different directions in 90° steps around the piston rod.



Options

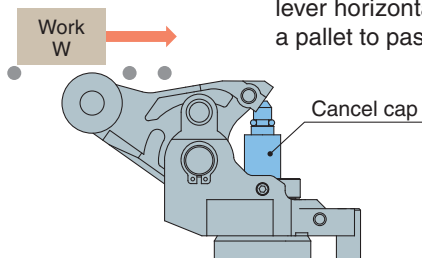
With lock mechanism

Even in the case of a light pallet, the lock mechanism prevents the pallet from rebounding due to spring.

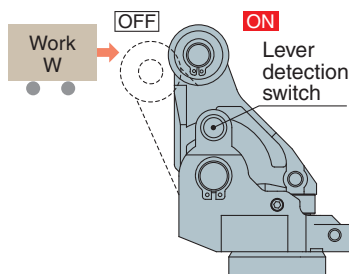


With cancel cap

The cancel cap holds the lever horizontally allowing a pallet to pass.



With lever detection switch



When the lever stands erect (when the energy is absorbed), the switch turns on a signal that determines the pallet has reached the stop position. (For details of lever detection switch, refer to page 2.)

Series Variations

Series	Bore size (mm)	Standard stroke (mm)				Mounting	Action	Rod end configuration	Standard variation	Option		
		15	20	30	40					With lock mechanism	With cancel cap	With lever detection switch
RSH	20	●				Flange	Double acting	Lever with built-in shock absorber Adjustable	●	●	●	●
	32		●				Double acting		●	●	●	●
New RS2H	50			●			Double acting spring type		●	●	●	●
	63			●			Single acting/spring extend		●	●	●	●
	80				●				●	●	●	●
									●	●	●	●

Series RS2H Model Selection

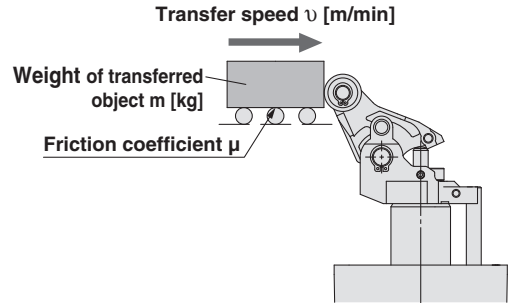
Operating Range

(Example)

Weight of transferred object:
300 kg,
Transfer speed: 20 m/min
Friction coefficient: $\mu = 0.1$

(How to read graph)

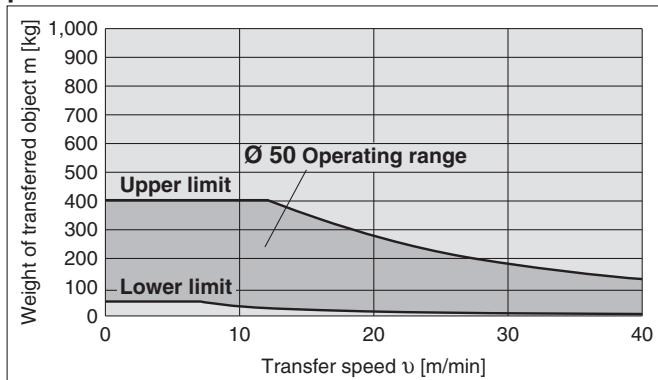
In following graph, find the intersection of the **vertical axis representing a weight of 300 kg** and the **horizontal axis representing a transfer speed of 20 m/min**. And select the **bore size Ø 63** positioned within the operating range of the cylinder.



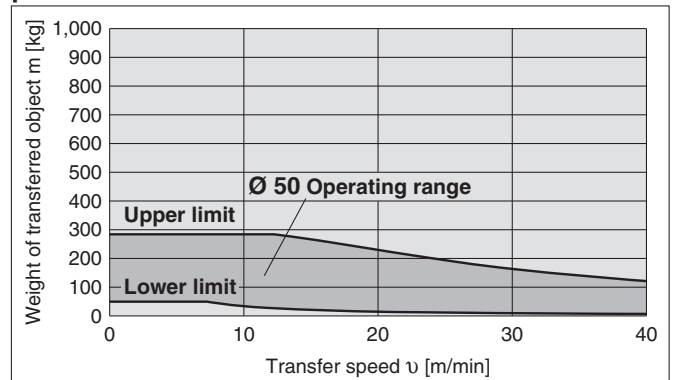
RS2H50-30 □ □

*The graphs indicate the values at normal temperature. (20 to 25 °C)

$\mu = 0.1$



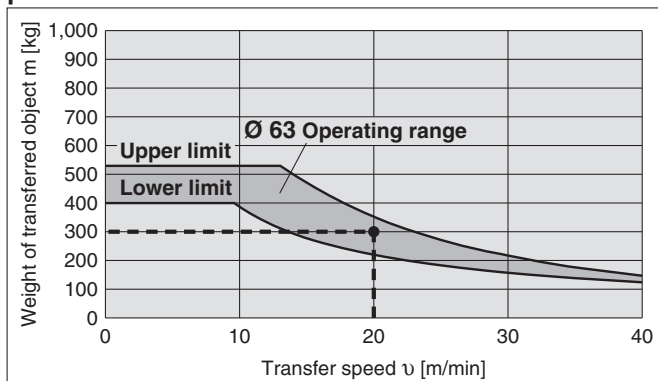
$\mu = 0.2$



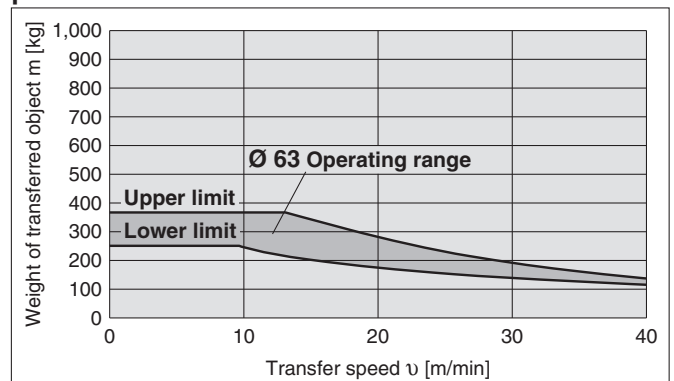
RS2H63-30 □ □

*The graphs indicate the values at normal temperature. (20 to 25 °C)

$\mu = 0.1$



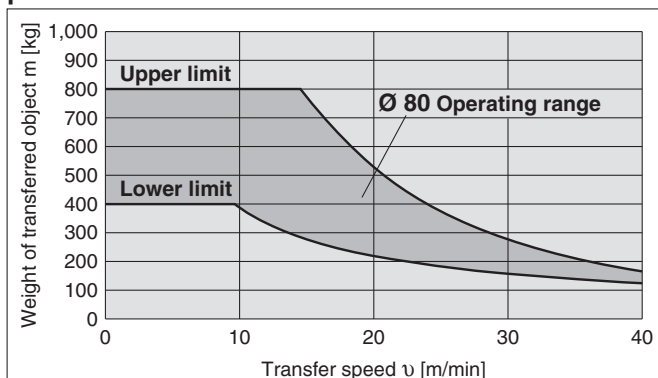
$\mu = 0.2$



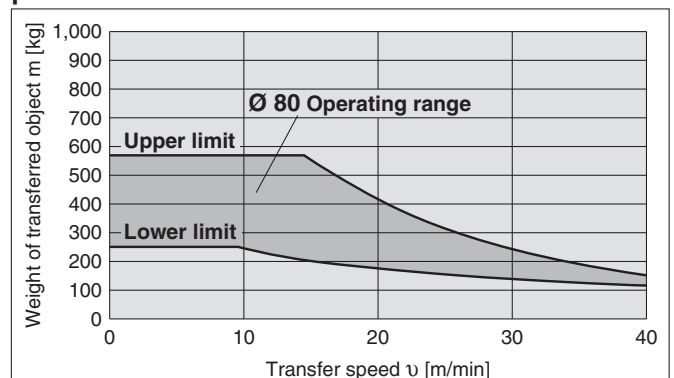
RS2H80-40 □ □

*The graphs indicate the values at normal temperature. (20 to 25 °C)

$\mu = 0.1$



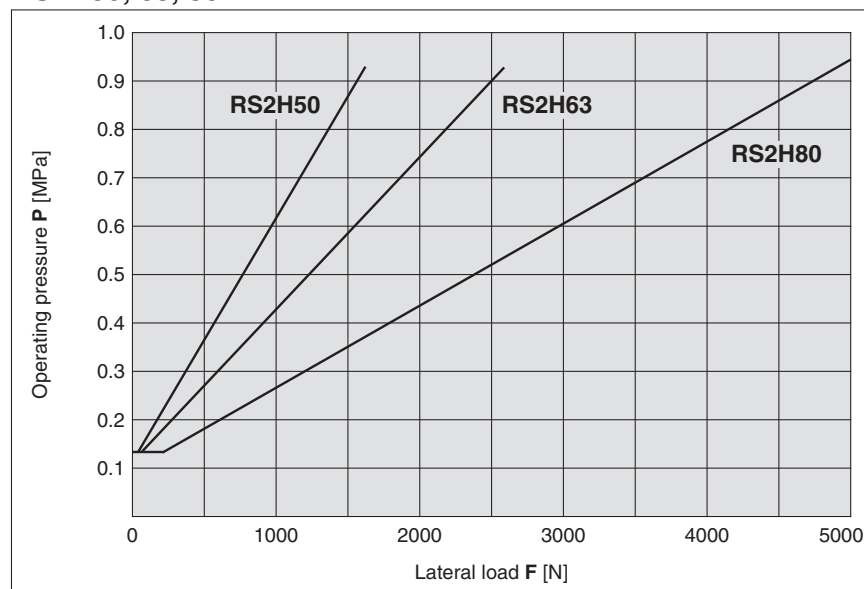
$\mu = 0.2$



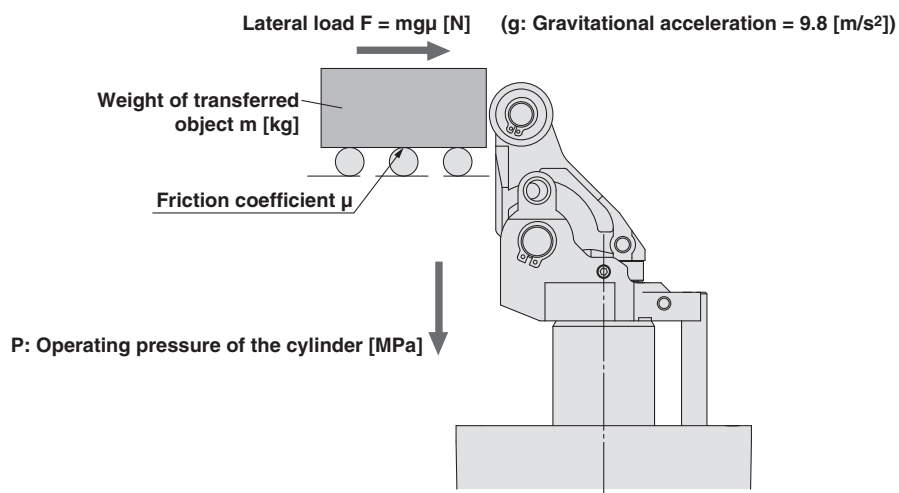
Lateral Load and Operating Pressure

The greater lateral load **F** needs higher cylinder operating pressure. Set the operating pressure by using the graph as a guideline.

RS2H50, 63, 80



Even after the impact of the carried object is absorbed, lateral load acts on the stopper cylinder due to the friction generated between the conveyor and the carried object.



Heavy Duty Stopper Cylinder

Series RS2H

Ø 50, Ø 63, Ø 80

RoHS

How to Order

RS2H 50 - 30 D L - M9BW

Bore size

50	50 mm
63	63 mm
80	80 mm

Port thread type

—	Rc
TN	NPT
TF	G

Piping direction

Flange side

Axial direction (tube)

Cylinder stroke

30	30 mm (Ø 50, 63)
40	40 mm (Ø 80)

Action

D	Double acting
B	Double acting spring type
T	Single acting/spring extend

Roller material

L	Resin
M	Carbon steel

Option (Note 1)

—	Without option
D	With lock mechanism
C	With cancel cap
S	With lever detection switch (Note 2)

Number of auto switches (auto switch number mounted)

—	2 pcs.
S	1 pc.

Made to Order Specifications
For details, refer to page 2.

Auto switch

—	Without auto switch (Built-in magnet)
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*For applicable auto switches, refer to the table below.
*Auto switches are shipped together, (but not assembled).

Shock absorber

—	Standard
Y	Shock absorber with scraper

*Option Y only available when selecting the made to order lock release specification -XC102

Positional relationship of lever and port

Transfer direction

Port

Q

Transfer direction

Port

P

Transfer direction

Port

R

Transfer direction

Port

Specifications and dimensions:
Same as those of the standard model

Note 1) Options can be combined.
Indicate the option symbols according to the priority order of D,C,S.

Note 2) For details of the lever detection switch alone, refer to page 2.

Applicable 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	Perpendicular	In-line	0.5 (—)	1 (M)	3 (L)	5 (Z)						
Solid state switch	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	—	M9NV	M9N	●	●	●	○	○	IC circuit	Relay, PLC		
	3-wire (PNP)			M9PV				M9P	●	●	●	○	○					
	2-wire			M9BV				M9B	●	●	●	○	○					
	3-wire (NPN)			M9NWV				M9NW	●	●	●	○	○					
	3-wire (PNP)			M9PWV				M9PW	●	●	●	○	○					
	2-wire			M9BWV				M9BW	●	●	●	○	○					
	3-wire (NPN)			M9NAV ^{*1}				M9NA ^{*1}	○	○	●	○	○					
	3-wire (PNP)			M9PAV ^{*1}				M9PA ^{*1}	○	○	●	○	○					
	2-wire			M9BAV ^{*1}				M9BA ^{*1}	○	○	●	○	○					
Magnetic field resistant (2-colour display)	2-wire (Non-polar)	—	—	—	P3DWA	●	—	●	●	○	—							
Reed switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	—	A96V	A96	●	—	●	—	—	IC circuit	—		
			No	2-wire	24 V	12 V	100 V	A93V ^{*2}	A93	●	—	●	●	—	—	—	IC circuit	Relay, PLC
						5 V, 12 V	100 V or less	A90V	A90	●	—	●	—	—	—			

*1 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.

*2 1 m type lead wire is only applicable to D-A93.

*Lead wire length symbols

0.5 m.....—	(Example) M9NW
1 m.....M	(Example) M9NWM
3 m.....L	(Example) M9NWL
5 m.....Z	(Example) M9NWZ

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

*Since there are other applicable auto switches than listed, contact SMC for details.

*For details about auto switches with pre-wired connector, contact SMC.

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



Made to Order: Individual Specifications (For details, refer to pages 9 and 10.)

Symbol	Specifications
-X2464	Built-in low resistive force shock absorber
-X2541	Built-in shock absorber with scraper

Specifications

Bore size (mm)	50	63	80
Action	Double acting, Double acting spring type, Single acting/spring extend		
Rod end configuration	Lever with built-in shock absorber		
Fluid	Air		
Proof pressure	1.5 MPa		
Max. operating pressure	1.0 MPa		
Ambient and fluid temperature	-10 to 60 °C (No freezing)		
Lubrication	Not required (non-lube)		
Cushion	Rubber bumper		
Stroke length tolerance	+1.4 0		
Mounting	Flange		
Port size (Rc, NPT, G)	1/8	1/4	1/4

Made to Order: Common Specifications (For details, refer to page 10)

Symbol	Specifications
-XC102	Lock release specifications

Standard Strokes

Bore size (mm)	Standard stroke (mm)
50	30
63	30
80	40

Weight

Action	Rod end configuration	Bore size (mm)	Weight (kg)
Double acting	Lever with built-in shock absorber	50	1.70
		63	2.78
		80	4.96

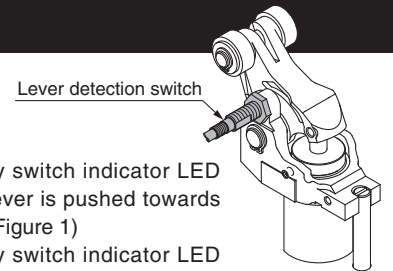
Lever Detection Switch (Proximity Switch)

Proximity Switch Specifications/ Maker: OMRON Corporation

Model	E2E-X2D1-N
Output type	Normally open
Power supply voltage (Operating voltage range)	12 to 24 VDC (10 to 30 VDC) Ripple 10 % or less (P-P)
Current consumption (Leakage current)	0.8 mA or less
Response frequency	1.5 kHz
Control output (Chest)	3 to 100 mA
Indicator LED	Operation indication (Red LED), Set operation indication (Green LED)
Ambient temperature	-25 to 70 °C (No freezing)
Operating ambient humidity	35 to 95 % RH
Residual voltage ^{Note 1)}	3 V or less
Withstand voltage ^{Note 2)}	1000 VAC
Vibration	Endurance 10 to 55 Hz, Double amplitude 1.5 mm X, Y, Z direction each 2 h
Impact	Endurance 500 m/s ² (approx. 50 G), X, Y, Z direction each 10 times
Enclosure	IEC standards IP67 (Immersion proof and oil proof by JEM standards IP67G)

Note 1) At load current 100 mA and cord length of 2 m

Note 2) Between case and whole live part



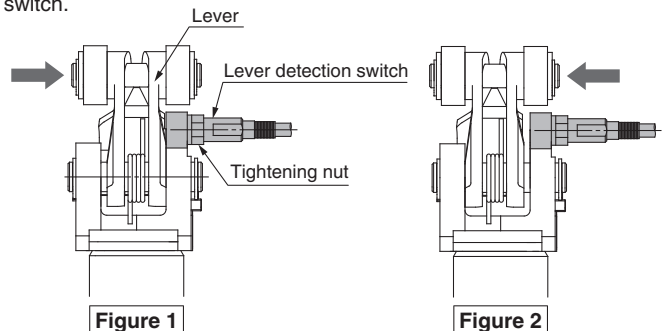
<Mounting position>

Confirm that the proximity switch indicator LED turns to green when the lever is pushed towards the proximity switch side. (Figure 1)

Confirm that the proximity switch indicator LED turns to green when the lever is pushed towards the opposite side from the proximity switch. (Figure 2)

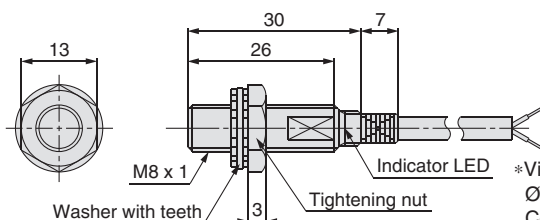
Then, rotate the lever by 90° to confirm that the indicator LED of the proximity switch (red, green) does not turn on.

Fix the cylinder with screws included as accessories after confirming that there is no interference between the lever and the proximity switch.



Dimensions

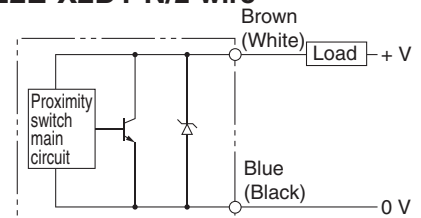
E2E-X2D1-N



*Vinyl insulation round cord
Ø 3.5 (18/Ø 0.12), 2-wire, Standard 2 m,
Cord extension (Individual metal piping),
Max. 200 m

Output Circuit

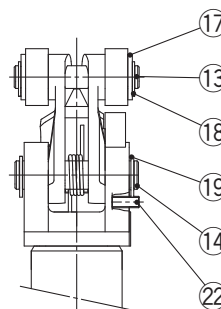
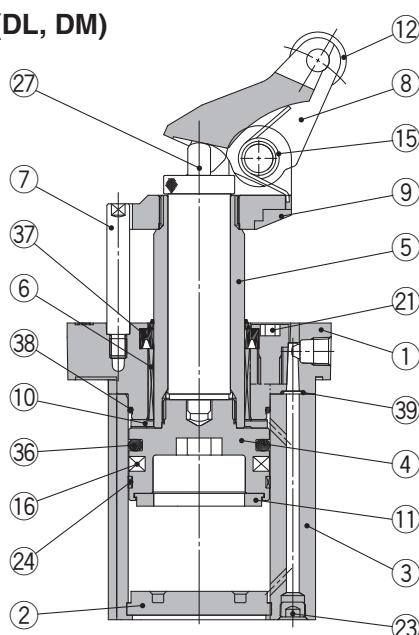
E2E-X2D1-N/2-wire



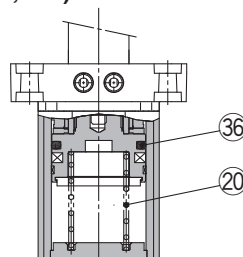
RS2H Series

Construction

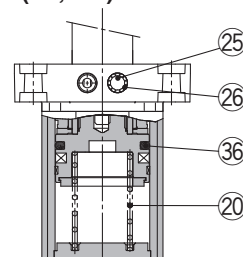
Double acting (DL, DM)



Double acting spring type (BL, BM)

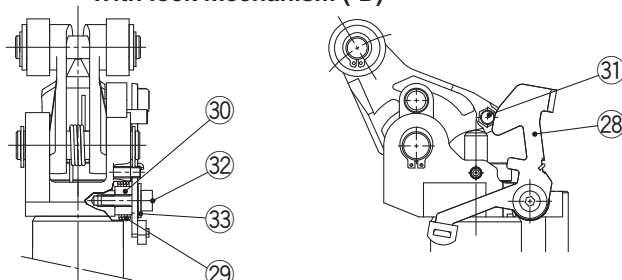


Single acting (TL, TM)

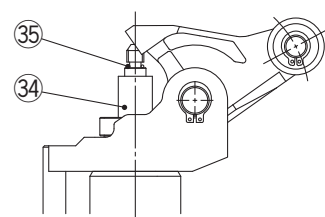


Options (With lock mechanism and cancel cap)

With lock mechanism (-D)



When cancel cap is used (-C)



Component Parts

No.	Description	Material	Note
1	Rod cover	Aluminum alloy	Metallic painted
2	Bottom plate	Aluminum alloy	Hard anodized
3	Cylinder tube	Aluminum alloy	Hard anodized
4	Piston	Aluminum alloy	Chromated
5	Piston rod	Carbon steel	Hard chrome plated
6	Bushing	Bearing alloy	
7	Guide rod	Carbon Steel	Hard chrome plated
8	Lever	Cast iron	Zinc chromated
9	Lever holder	Cast iron	Zinc chromated
10	Bumper A	Urethane	
11	Bumper B	Urethane	
12	Roller	Resin	-□□L
		Carbon steel	-□□M
13	Roller pin	Carbon steel	
14	Lever pin	Carbon steel	
15	Lever spring	Steel wire	
16	Magnet	—	
17	Flat washer	Steel wire	Zinc chromated
18	Type C retaining ring for shaft	Carbon tool steel	
19	Type C retaining ring for shaft	Carbon tool steel	
20	Return spring	Steel wire	-T□/-B□
21	Hexagon socket head cap screw	Chrome molybdenum steel	Zinc chromated
22	Hexagon socket head set screw	Chrome molybdenum steel	Zinc chromated
23	Hexagon socket head plug	Carbon steel	Zinc chromated
24	Wear ring	Resin	
25	Element	Bronze	-□TL/-□TM
26	Retaining ring	Carbon tool steel	-□TL/-□TM
27	Shock absorber	—	
28	Bracket assembly	Carbon steel	Used for -D (Lock type)

Component Parts

No.	Description	Material	Note
29	Bracket spring	Steel wire	Used for -D (Lock type)
30	Bracket spacer	Carbon steel	Used for -D (Lock type)
31	Lock pin	Carbon steel	Used for -D (Lock type)
32	Hexagon socket head cap screw	Chrome molybdenum steel	Used for -D (Lock type)
33	Flat washer	Carbon steel	Used for -D (Lock type)
34	Cancel cap	Aluminum alloy	Used for -C (Cancel cap type)
35	O-ring	NBR	Used for -C (Cancel cap type)
36	Piston seal	NBR	
37	Rod seal	NBR	
38	Tube gasket	NBR	
39	O-ring	NBR	

Replacement Parts/Seal Kit

Bore size (mm)	Kit no.			Contents
	Double acting	Double acting spring type	Single acting	
50	RS2H50D-PS	RS2H50T-PS		Set of nos. above 36 to 39 (excluding 37)
63	RS2H63D-PS	RS2H63T-PS		
80	RS2H80D-PS	RS2H80T-PS		

*Seal kit includes 36 to 39 (excluding 37).

Order the seal kit based on each bore size.

*Since the seal kit does not include a grease pack, order it separately.

Grease pack part no.: GR-S-010 (10 g)

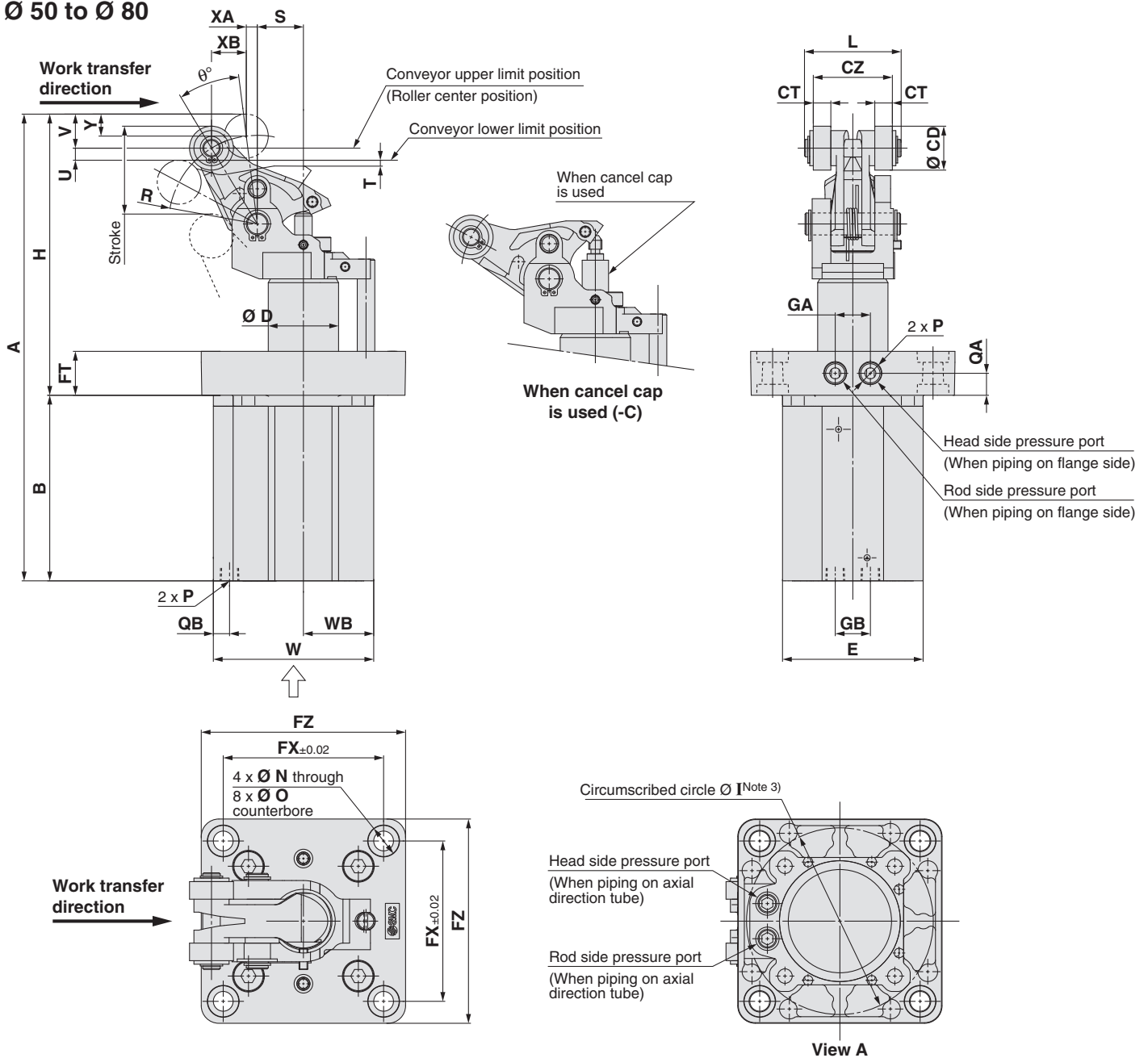
Replacement Parts/Shock Absorber

Bore size (mm)	Order no.
50	RS2H-R50
63	RS2H-R63
80	RS2H-R80

Dimensions


Basic

Ø 50 to Ø 80



																				(mm)
Model	Stroke	A	B	CD	CT	CZ	D	E	FT	FX	FZ	GA	GB	H	Circumscribed circle I	L	N	O	QA	QB
RS2H50	30	212.5	84.5	20	8	36	32	64	20	73	93	16	16	128	85	44	9	14 depth 5	10	8
RS2H63	30	234.5	90	20	10	45	40	77	25	90	114	24	24	144.5	103	53	11	18 depth 6	12.5	8.5
RS2H80	40	292.5	121	25	10	45	50	98	25	110	138	24	35	171.5	132	54.5	13	20 depth 6	12.5	10

Model	Stroke	R	S	T	U	V	W	WB	XA	XB	Y	θ°
RS2H50	30	40	21	2	5.5	15.5	73	32	5	15.8	10	24
RS2H63	30	47	24.5	3.5	6.4	16	87.5	38.5	5	18.7	10	24
RS2H80	40	54	31	3	6.7	19	109	49	6	20.6	12.5	23

 Note 1) Dimensions when equipped with auto switch are the same as drawing above.

Model	P (Piping port)		
	—	TN	TF
RS2H50	Rc1/8	NPT1/8	G1/8
RS2H63	Rc1/4	NPT1/4	G1/4
RS2H80	Rc1/4	NPT1/4	G1/4



Note 1) Dimensions when equipped with auto switch are the same as drawing above.

Note 2) The figure shows an extended piston rod.

Note 3) Circumscribed circle $\varnothing I$ means that diameter of the circle circumscribed to the cylinder angles.

Mounting hole must be $\varnothing (\mathbf{I} + 1)$.

Be careful of the interference between the lever and the mounting base when mounted from the lever side.

Thus, the thickness of the mounting base must be the values shown below or less.

Thus, the thickness of the mounting base must be the value of the following table (RS2H50: 10 mm RS2H63: 15 mm RS2H80: 18 mm)

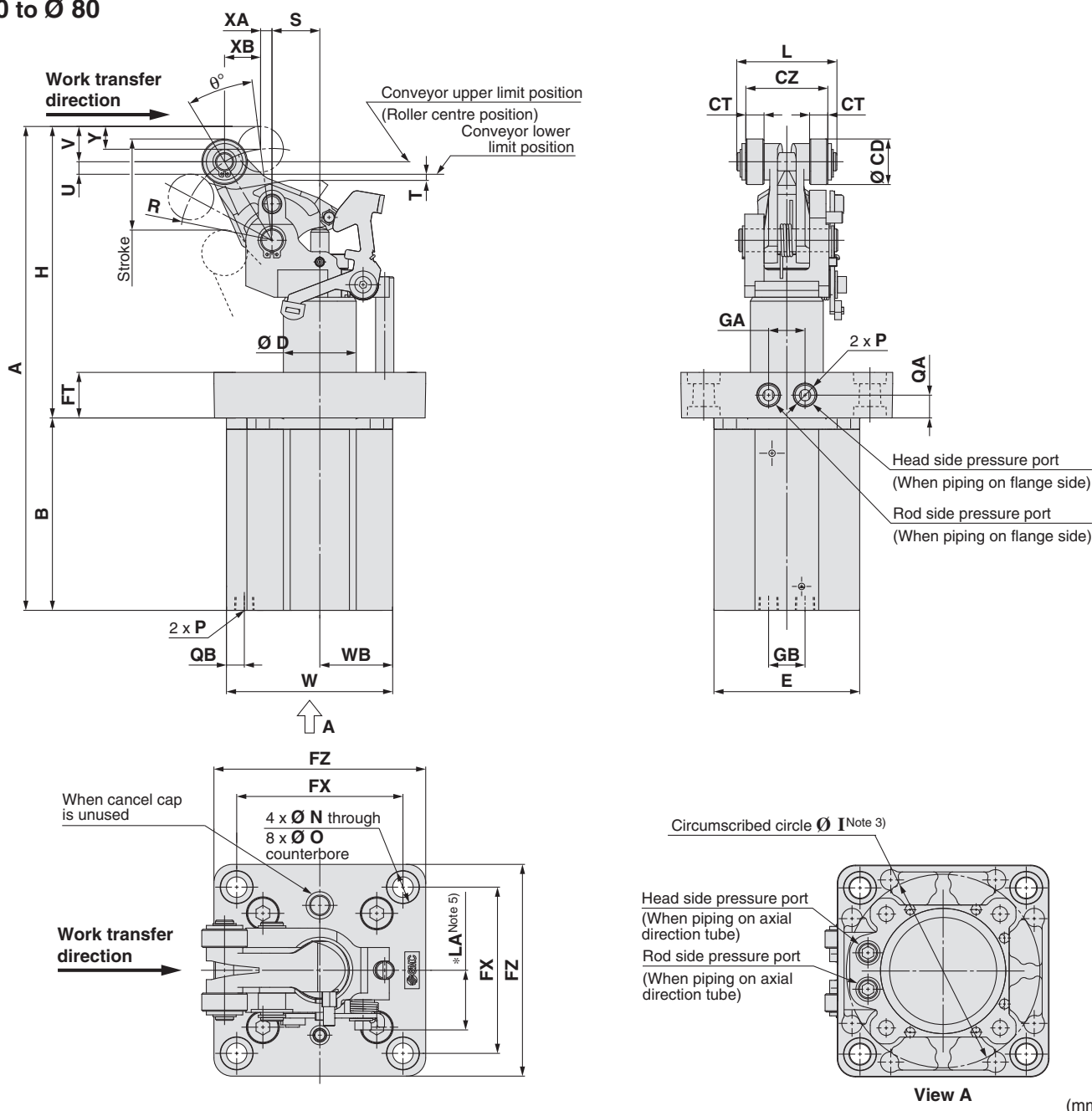
Note 4) Set the conveyor height within the range from the lower limit position to the upper limit position (U dimension) shown in the figure.

Series RS2H

Dimensions

With lock mechanism

Ø 50 to Ø 80



Model	Stroke	A	B	CD	CT	CZ	D	E	FT	FX	FZ	GA	GB	H	Circumscribed circle Ø I	L	*LA (Note 5)	N	O	QA
RS2H50	30	212.5	84.5	20	8	36	32	64	20	73	93	16	16	128	85	44	26	9	14 depth 5	10
RS2H63	30	234.5	90	20	10	45	40	77	25	90	114	24	24	144.5	103	53	31	11	18 depth 6	12.5
RS2H80	40	292.5	121	25	10	45	50	98	25	110	138	24	35	171.5	132	54.5	38	13	20 depth 6	12.5

Model	Stroke	QB	R	S	T	U	V	W	WB	XA	XB	Y	θ°
RS2H50	30	8	40	21	2	5.5	15.5	73	32	5	15.8	10	24
RS2H63	30	8.5	47	24.5	3.5	6.4	16	87.5	38.5	5	18.7	10	24
RS2H80	40	10	54	31	3	6.7	19	109	49	6	20.6	12.5	23

Model	P (Piping port)		
	—	TN	TF
RS2H50	Rc1/8	NPT1/8	G1/8
RS2H63	Rc1/4	NPT1/4	G1/4
RS2H80	Rc1/4	NPT1/4	G1/4



Note 1) Dimensions when equipped with auto switch are the same as drawing above.

Note 2) The figure shows an extended piston rod.

Note 3) Circumscribed circle Ø I means that diameter of the circle circumscribed to the cylinder angles.

Mounting hole must be Ø (I + 1).

Be careful of the interference between the lever and the mounting base when mounted from the lever side.

Thus, the thickness of the mounting base must be the values shown below or less.

(RS2H50: 10 mm RS2H63: 15 mm RS2H80: 18 mm)

Note 4) Set the conveyor height within the range from the lower limit position to the upper limit position (U dimension) shown in the figure.

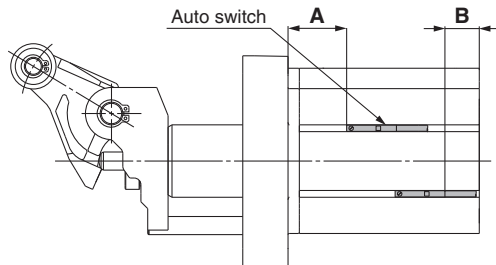
Note 5) Dimensions other than those marked * (LA) are the same as the basic type (no locking type).

Series RS2H

Auto Switch Mounting

Auto Switch Proper Mounting Position (Detection at Stroke End)

D-M9□
D-M9□W
D-M9□AV
D-M9□V
D-M9□WV
D-M9□A
D-A9□
D-A9□V



Auto Switch Proper Mounting Position

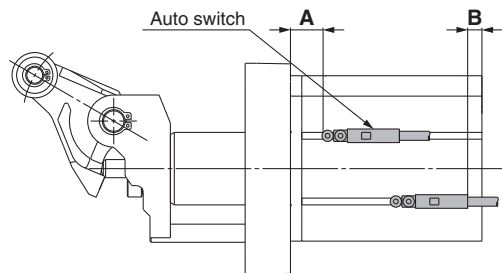
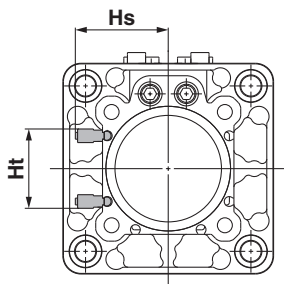
(mm)

Auto switch model	D-M9□ D-M9□W D-M9□AV		D-M9□V D-M9□WV		D-M9□A		D-A9□ D-A9□V	
Bore size	A	B	A	B	A	B	A	B
50	23.5	9.0	23.5	11.0	23.5	7.0	19.5	10.5 (13.0)
63	25.5	12.5	25.5	14.5	25.5	10.5	21.5	14.0 (16.5)
80	39.5	19.5	39.5	21.5	39.5	17.5	35.5	21.0 (23.5)

The values inside () are for the D-A96/A96V.

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

D-P3DWA□



Auto Switch Proper Mounting Position

(mm)

Auto switch model	D-P3DWA□			
Bore size	A	B	Hs	Ht
50	19	6.5	43	35
63	21	10	48.5	44
80	35	17	56.5	54

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

Operating Range

(mm)

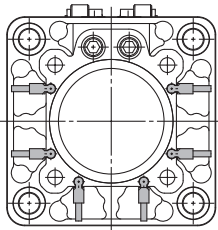
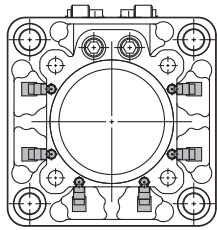
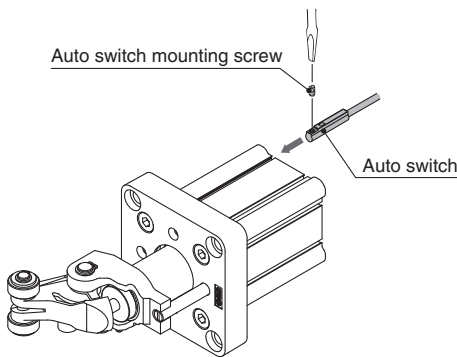
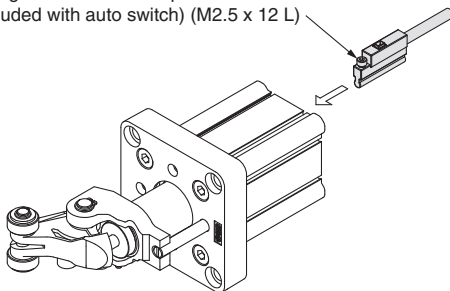
Auto switch model	Bore size		
	50	63	80
D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV	6	6	7
D-P3DWA□	5.5	6.5	6.5
D-A9□/A9□V	8	9	9

*Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed. (assuming approximately ±30 % dispersion)
It may vary substantially depending on an ambient environment.

Besides applicable auto switches listed in "How to Order", the following auto switches are also mountable.

*Normally closed (NC=b contact) solid state auto switches (D-M9□E(V)) are also available. For details, contact SMC.
*With pre-wired connector is also available for solid state auto switches. For details, contact SMC.

Auto Switch Mounting Brackets/Part No.

Applicable auto switches	D-M9□/M9□V D-M9□W/M9□WV D-M9□A/M9□AV D-A9□/A9□V	D-P3DWA								
Bore size (mm)	Ø 50 to Ø 80	Ø 50 to Ø 80								
Auto switch mounting surfaces	Surfaces with auto switch mounting slot	Surfaces with auto switch mounting slot								
										
Mounting of auto switch	<div></div> <div><p>• When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter.</p><p>Tightening Torque for Auto Switch Mounting Screw (N·m)</p><table><tr><th>Auto switch model</th><th>Tightening torque</th></tr><tr><td>D-M9□(V) D-M9□W(V) D-A93</td><td>0.05 to 0.15</td></tr><tr><td>D-M9□A(V)</td><td>0.05 to 0.10</td></tr><tr><td>D-A9□(V) (Excludes the D-A93)</td><td>0.10 to 0.20</td></tr></table></div>	Auto switch model	Tightening torque	D-M9□(V) D-M9□W(V) D-A93	0.05 to 0.15	D-M9□A(V)	0.05 to 0.10	D-A9□(V) (Excludes the D-A93)	0.10 to 0.20	<div><p>① Insert the mounting bracket into the mating groove of the cylinder tube.</p><p>② Check the detecting position of the auto switch and fix the auto switch firmly with the hexagon socket head cap screw (M2.5 x 12 L).*</p><p>③ If the detecting position is changed, go back to step ①.</p><p>Note 1) Ensure that the auto switch is covered with the mating groove to protect the auto switch.</p><p>Note 2) The tightening torque for the hexagon socket head cap screw (M2.5 x 12 L) is 0.2 to 0.3 N·m.</p><p>Hexagon socket head cap screw (Included with auto switch) (M2.5 x 12 L)</p></div>
Auto switch model	Tightening torque									
D-M9□(V) D-M9□W(V) D-A93	0.05 to 0.15									
D-M9□A(V)	0.05 to 0.10									
D-A9□(V) (Excludes the D-A93)	0.10 to 0.20									

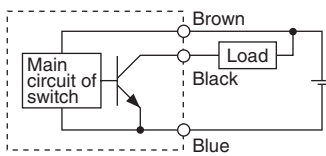
Note) Auto switch mounting brackets and auto switches are enclosed with the cylinder for shipment.
For an environment that needs the water-resistant auto switch, select the D-M9□A(V) type.

Prior to Use

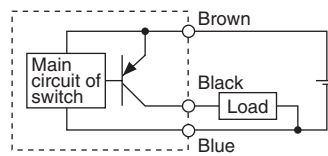
Auto Switch Connection and Example

Basic Wiring

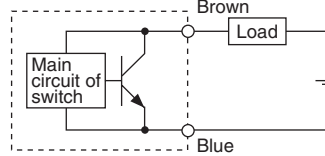
Solid state 3-wire, NPN



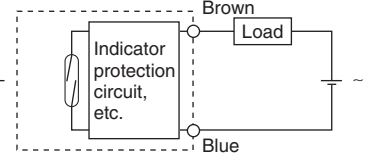
Solid state 3-wire, PNP



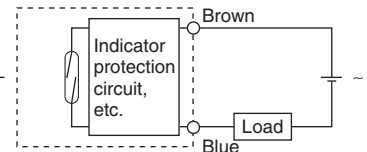
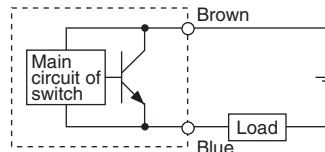
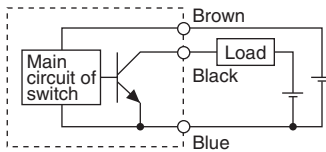
2-wire (Solid state)



2-wire (Reed)

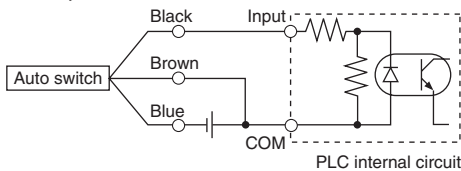


(Power supply for switch and load are separate.)

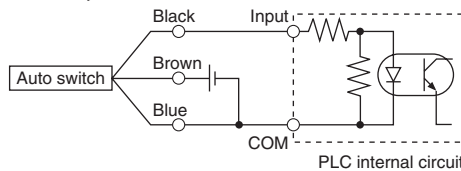


Example of Connection with PLC (Programmable Logic Controller)

• Sink input specifications 3-wire, NPN

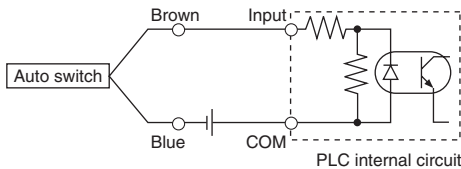


• Source input specifications 3-wire, PNP

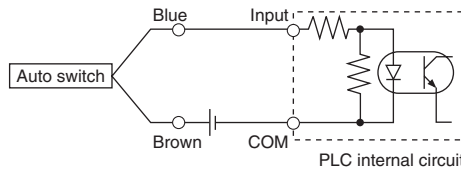


Connect according to the applicable PLC input specifications, as the connection method will vary depending on the PLC input specifications.

2-wire



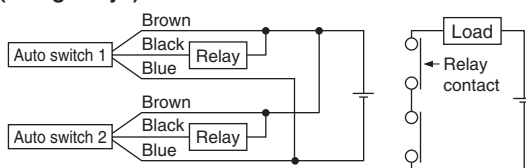
2-wire



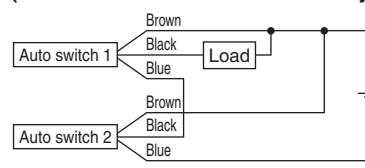
Example of AND (Series) and OR (Parallel) Connection

• 3-wire

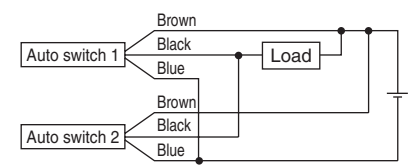
AND connection for NPN output (Using relays)



AND connection for NPN output (Performed with auto switches only)



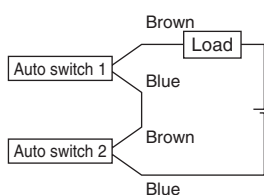
OR connection for NPN output



The indicator lights will light up when both of the auto switches are in the ON state.

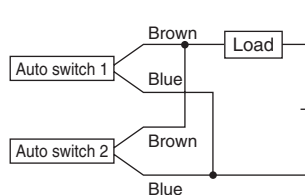
• 2-wire

2-wire with 2-switch AND connection



When two auto switches are connected in series, malfunction may occur because the load voltage will decrease in the ON state. The indicator lights will light up when both of the auto switches are in the ON state.

2-wire with 2-switch OR connection



(Solid state)

When two auto switches are connected in parallel, malfunction may occur because the load voltage will increase in the OFF state.

(Reed)

Because there is no leakage current, the load voltage will not increase in the OFF state. However, depending on the number of auto switches in the ON state, the indicator lights may sometimes grow dim or not light up, due to the dispersion and reduction of the current flowing to the auto switches.

$$\begin{aligned} \text{Load voltage at ON} &= \text{Power supply voltage} - \text{Residual voltage} \times 2 \text{ pcs.} \\ &= 24 \text{ V} - 4 \text{ V} \times 2 \text{ pcs.} \\ &= 16 \text{ V} \end{aligned}$$

$$\begin{aligned} \text{Load voltage at OFF} &= \text{Leakage current} \times 2 \text{ pcs.} \times \text{Load impedance} \\ &= 1 \text{ mA} \times 2 \text{ pcs.} \times 3 \text{ k}\Omega \\ &= 6 \text{ V} \end{aligned}$$

Example: Power supply voltage 24 VDC
Auto switch internal voltage drop 4 V

Example: Load impedance 3 kΩ
Auto switch leakage current 1 mA

1 Built-in Low Resistive Force Shock Absorber

Symbol
-X2464

Heavy duty stopper cylinder with a built-in shock absorber applicable to loads lighter than the operating range of the standard product.

RS2HX50 Standard model no. - 2464

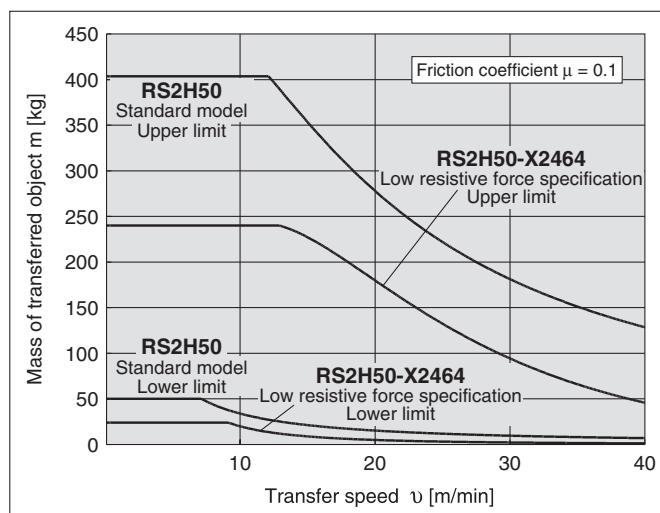
● Built-in low resistive force shock absorber

Specifications

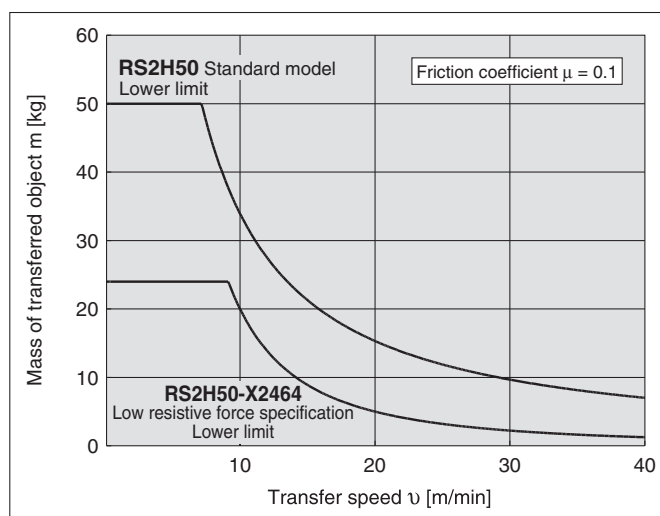
Bore size	Ø 50 only
Operating Range	Refer to the graph below.
Specifications other than the above	Same as standard product

Dimensions: Same as standard product

Operating Range



Operating Range / Lower Limit Expansion



Precautions

1. Adjust the shock absorber corresponding to the energy of the transferred object before using it.
2. When using a cylinder at around the lower limit of the operating range, it is recommended to use a cylinder with lock mechanism. Additionally, be aware that the transferred object may be pushed back due to the return force of the shock absorber.
3. Shock absorber order no.: RS2H-R50-X2464
Mounting is interchangeable with the standard shock absorber (RS2H-R50).

* The graphs indicate the values at normal temperature. (20 to 25 °C)

2 Built-in Shock Absorber with Scraper

Symbol
-X2541

The sliding type shock absorber with scraper reduces the penetration of dust, foreign matter, and coolant.

How to Order

RS2H Standard model no. - **X2541**

● Built-in shock absorber with scraper

Specifications: Same as standard type

Dimensions: Same as standard product

The shock absorber with scraper can be replaced individually.

* Mounting is interchangeable with the standard shock absorber (RS2H-R□).

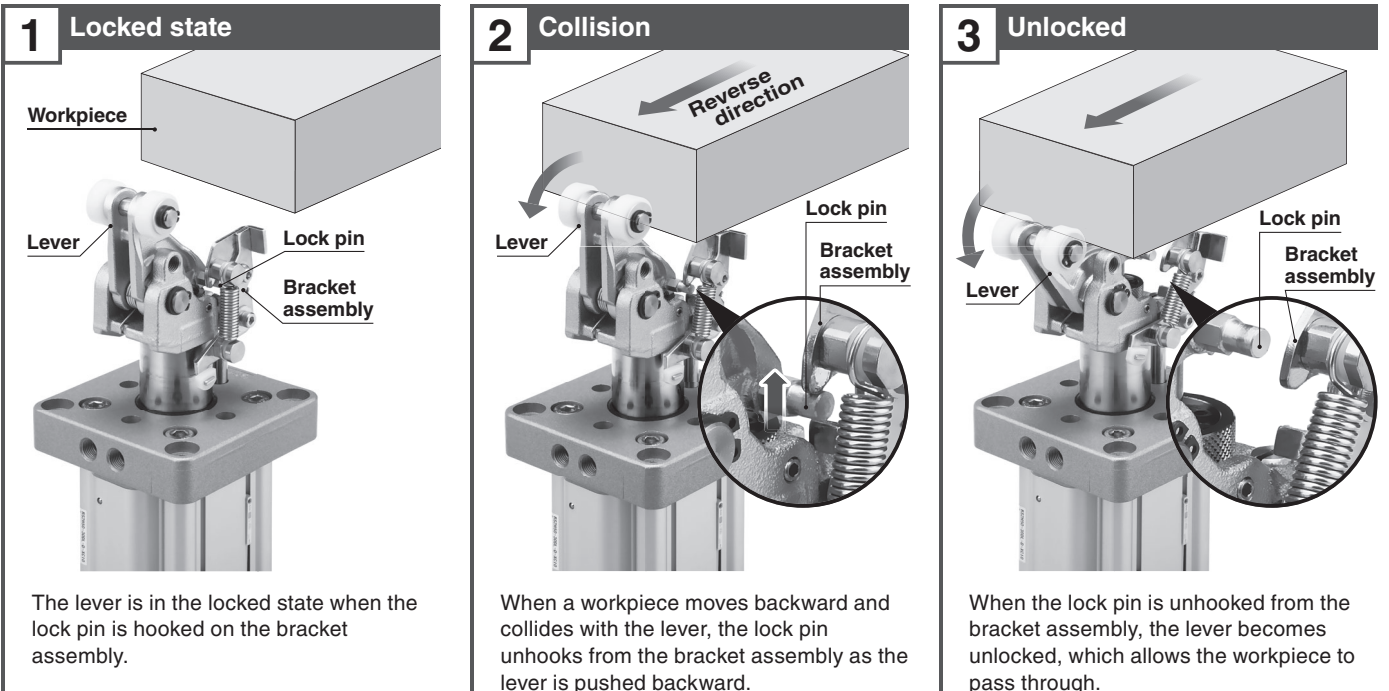
Stopper cylinder Bore size	Part no.
Ø 50	RS2H-R50-X2666
Ø 63	RS2H-R63-X2666
Ø 80	RS2H-R80-X2666

3 Heavy Duty Stopper Cylinder / Lock Release Specification

Symbol
-XC102

Prevents lever damage when a transferred workpiece moves backward

Prevents damage by releasing the locked lever when a pallet suddenly moves backward and collides with the lever



A part number for the built-in shock absorber with a scraper (option) is available.

A scraper is mounted on the piston rod of the shock absorber. This can reduce the entry of dust, foreign matter, and coolant.

Example)

RS2H50-30DL-D Y - M9BW-XC102

● Built-in shock absorber with scraper





RS2H Series

Specific Product Precautions 1

Be sure to read before handling. Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) and the Operation Manual for Actuator and Auto Switch Precautions. Please download it via our website. <http://www.smc.eu>

Instruction

⚠ Caution

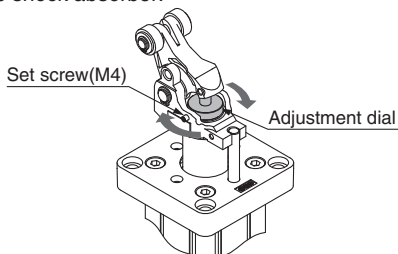
1. Shock absorber capacity variable adjustment method

To stop the work gently, loosen the set screw (M4) on the stopper and turn the shock absorber dial according to the energy value of the transferred object to select the optimum absorption position (retardation value). After adjustment, tighten the set screw firmly to secure the shock absorber dial.

- Set screw (M4) tightening torque: 1.5 N·m

Note1) Cautions for adjustment

When adjusting the shock absorber resistive force value, first try the maximum value and then proceed to smaller values. Confirm that the adjustment position is appropriate to avoid impact and bounce when the carried object hits the shock absorber.

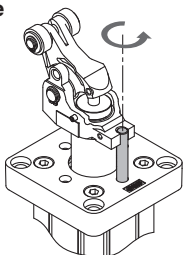


Note 2) Please consult SMC if shock absorption is not soft, even after adjusting the shock absorber with the above method.

2. How to change the positional relationship between the transfer and piping directions

The positional relationship between the transfer and piping directions can be changed in 90° increments. Apply a wrench, etc., to the width across flats of the guide rod end to remove the guide rod. The lever is released to allow rotations in 90° increments. When mounting the guide rod, apply glue for screw to the guide rod screw before tightening.

- Guide rod tightening torque
 Ø 50, Ø 63, Ø 80: 5.2 N·m



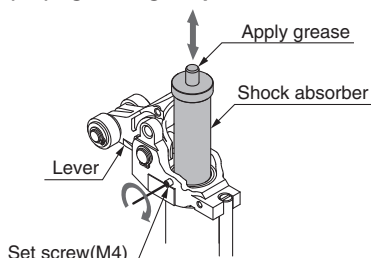
3. How to replace shock absorber during maintenance

Loosen the shock absorber set screw (M4) on the stopper to incline the lever by 90° and pull out the shock absorber.

Note) Cautions for assembly

After replacing the shock absorber, tighten the set screw firmly and apply grease to the shock absorber rod end surface.

- Set screw (M4) tightening torque: 1.5 N·m



Selection

⚠ Danger

1. Use the equipment only within the specified operating range.

If the condition exceeds the specified operating range, it will cause excessive impact or vibration to the stopper cylinder, leading to possible damage.

⚠ Caution

1. Do not collide the pallet while the lever is standing erect.

For the lever with built-in shock absorber, do not collide the next pallet while the lever is standing erect. Otherwise, all energy will be applied to the cylinder body.

2. When stopping a load directly connected to the cylinder at an intermediate position:

Apply the operating range in the catalog only in these cases where the stopper cylinder is used to stop pallets on a conveyor belt. When using the stopper cylinder to stop loads directly connected to a cylinder or some other equipment, a lateral load is applied as the cylinder thrust. Please consult SMC in such cases.

Mounting

⚠ Caution

1. Do not apply rotational torque to the cylinder rod.

Align the cylinder parallel to the working face of the pallet working when installing in order to prevent rotational torque working on the cylinder rod.

2. Do not scratch or gouge the sliding part of the piston rod or guide rod.

Scratches and gouges may damage the packing, causing air leakage or malfunction.

Operation

⚠ Caution

1. For a cylinder with lock mechanism, do not apply an external force from the opposite side when the lever is locked.

Lower the cylinder before adjusting the conveyor or moving the pallet.

2. For a cylinder with lock mechanism, do not collide the pallet and the roller when the lever is locked.

If the pallet collides with the roller in the locked state, it may cause lever malfunction. (The lever is released when the cylinder is fully retracted.)

3. Some structural backlash is present in the lever lock mechanism.

As the stopping position of the pallet can be affected by the weight of the object being transferred, the operating conditions of the conveyor, etc., the stopping position may vary. Please contact SMC if a higher level of stopping accuracy is required for the pallet.

4. Do not let your hand become caught when operating the cylinder.

The lever holder goes up and down while the cylinder is in operation. Pay sufficient attention not to let your hand or fingers become caught between the rod cover and the lever holder.



RS2H Series

Specific Product Precautions 2

Be sure to read before handling. Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) and the Operation Manual for Actuator and Auto Switch Precautions. Please download it via our website. <http://www.smc.eu>

Operation

Caution

- 5. Do not let water, cutting oil or dust splash on the equipment.**

It can cause oil leakage and malfunction of the shock absorber.

- 6. The stopping condition of the carried object may vary due to changes in ambient temperature or changes in the shock absorber resistance over time.**

Check the stopping condition periodically and adjust the shock absorber resistance as necessary.

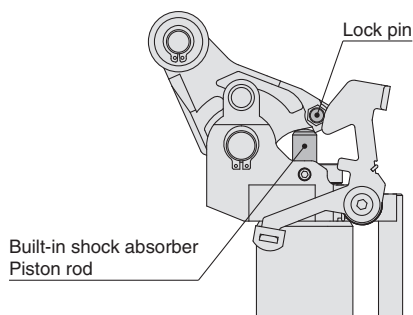
- 7. For a cylinder with lock mechanism, do not remove the grease applied to the lock pin (Refer to the figure below).**

When using the cylinder continuously with no grease applied, the lock and unlock may not operate correctly due to unusual wear of the lock pin. Check the grease application state periodically and apply the grease when necessary.

The grease to be applied is available as grease pack. When the grease pack is required, order it using the part number shown below.

Grease pack part number: GR-S-010 (10g)




(* The grease to be applied is the same as that used for the cylinder.)



Similarly, be careful not to remove the grease from the piston rod end of the built-in shock absorber. Check the grease application state periodically.

Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC) ¹⁾, and other safety regulations.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- 1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

Warning

- 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- 2. Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
 2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
 3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalogue.
 3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
 4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

- 1. The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first. ²⁾
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided. This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue for the particular products.
- 2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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