

# Heavy Duty Stopper Cylinder

## RS2H Series

ø50, ø63, ø80



### How to Order

**RS2H50** **30** **D** **L** **M9BW**

**Bore size**

50	50 mm
63	63 mm
80	80 mm

**Port thread type**

Nll	Rc
TN	NPT
TF	G

**Number of auto switches (auto switch number mounted)**

Nll	2 pcs.
S	1 pc.

**Made to Order Specifications**  
For details, refer to page 595.

**Piping direction**

**Nll** Flange side

**A** Axial direction (tube)

**Cylinder stroke**

30	30 mm (ø50, 63)
40	40 mm (ø80)

**Action**

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

**Roller material**

L	Resin
M	Carbon steel

**Option**<sup>Note 1)</sup>

Nll	Without option
D	With lock mechanism
C	With cancel cap
S	With lever detection switch <sup>Note 2)</sup>

**Auto switch**

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

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

**Positional relationship of lever and port**

<b>Nll</b>		<b>Q</b>	
<b>P</b>		<b>R</b>	

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 595.

### Applicable Auto Switches/Refer to pages 941 to 1067 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	Perpendicular	In-line	0.5 (Nll)	1 (M)	3 (L)	5 (Z)				
Solid state auto switch	—	Grommet	Yes	3-wire (NPN)	5 V, 12 V	—	<b>M9NV</b>	<b>M9N</b>	●	●	○	○	○	IC circuit	Relay, PLC	
				3-wire (PNP)			<b>M9PV</b>	<b>M9P</b>	●	●	○	○	○			
				2-wire	12 V		<b>M9BV</b>	<b>M9B</b>	●	●	○	○	○			
				3-wire (NPN)	24 V		<b>M9NVV</b>	<b>M9NW</b>	●	●	○	○	○			
	3-wire (PNP)			<b>M9PVV</b>			<b>M9PW</b>	●	●	○	○	○				
	Water-resistant (2-color display)			2-wire	12 V		<b>M9BWW</b>	<b>M9BW</b>	●	●	○	○	○			
				3-wire (NPN)	5 V, 12 V		<b>M9NAV</b> <sup>*1</sup>	<b>M9NA</b> <sup>*1</sup>	○	○	●	○	○			
	Magnetic field resistant (2-color display)			3-wire (PNP)	5 V, 12 V		<b>M9PAV</b> <sup>*1</sup>	<b>M9PA</b> <sup>*1</sup>	○	○	●	○	○			
2-wire		12 V	<b>M9BAV</b> <sup>*1</sup>	<b>M9BA</b> <sup>*1</sup>	○	○	●	○	○							
Reed auto switch	—	Grommet	Yes	3-wire (NPN equivalent)	—	5 V	<b>A96V</b>	<b>A96</b>	●	●	—	—	—	IC circuit	—	
				No	2-wire	24 V	12 V	100 V	<b>A93V</b> <sup>*2</sup>	<b>A93</b>	●	●	●	—	—	Relay, PLC
							5 V, 12 V	100 V or less	<b>A90V</b>	<b>A90</b>	●	●	—	—	—	IC circuit

\*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.....Nll (Example) M9NV \*Solid state auto switches marked with a "○" symbol are produced upon receipt  
1 m.....M (Example) M9NVV of order.  
3 m.....L (Example) M9NVL  
5 m.....Z (Example) M9NVZ

\*Since there are other applicable auto switches than listed, refer to page 599 for details.  
\*For details about auto switches with pre-wired connector, refer to pages 1014 and 1015.  
\*Auto switches are shipped together, (but not assembled).



Made to Order

**Made to Order: Individual Specifications**  
(For details, refer to pages 601 and 602.)

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

Made to Order

**Made to Order Common Specifications**  
(For details, refer to page 1896-1.)

Symbol	Specifications
-XC102	Lock release specification

## Specifications

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

## Standard Strokes

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

## Weight

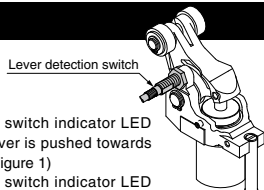
Action	Rod end configuration	Bore size (mm)	Weight (kg)
Double acting	Lever with built-in shock absorber	50	1.70
		63	2.78
		80	4.96

## Lever Detection Switch (Proximity Switch)

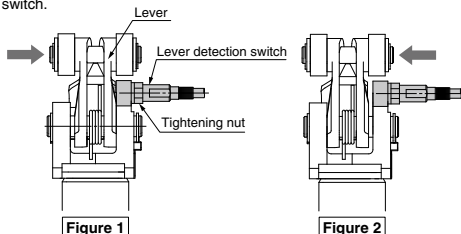
**Proximity Switch Specifications/**  
**Maker: OMRON Corporation**

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

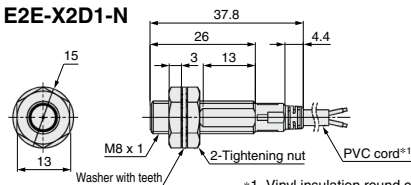


**<Mounting position>**  
Confirm that the proximity switch indicator LED turns to green when the lever is pushed towards the proximity switch side. (Figure 1)  
Confirm that the proximity switch indicator LED turns to green when the lever is pushed towards the opposite side from the proximity switch. (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

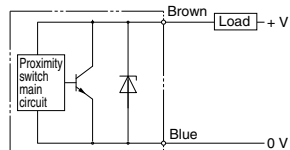
E2E-X2D1-N



\*1 Vinyl insulation round cord, 2 cores, 2 m  
ø4 (Conductor area: 0.3 mm<sup>2</sup>, Insulator O.D.: 1.15 mm)

## Output Circuit

E2E-X2D1-N/2-wire



RSQ

RSQ

RS2H

RSH

MIW

MIS

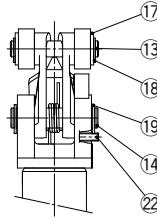
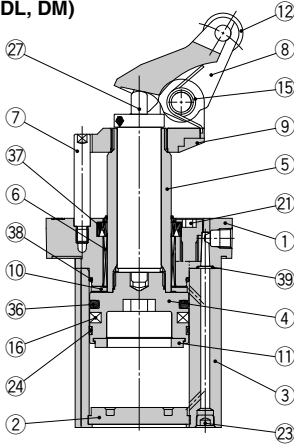
D-□

-X□

# RS2H Series

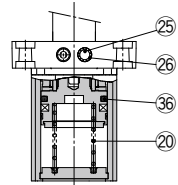
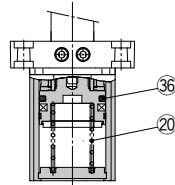
## Construction

### Double acting (DL, DM)

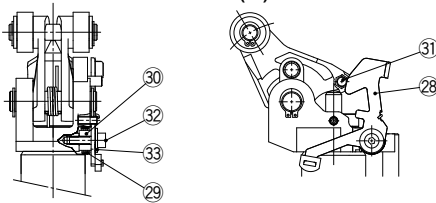


Double acting spring type  
(BL, BM)

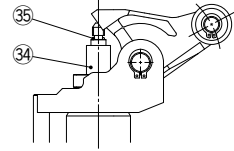
Single acting  
(TL, TM)



### 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	-□□/□□
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	-□□□/□□□
26	Retaining ring	Carbon tool steel	-□□□/□□□
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
63	RS2H63D-PS	RS2H63T-PS	③⑥ to ③⑨
80	RS2H80D-PS	RS2H80T-PS	(excluding ③⑦)

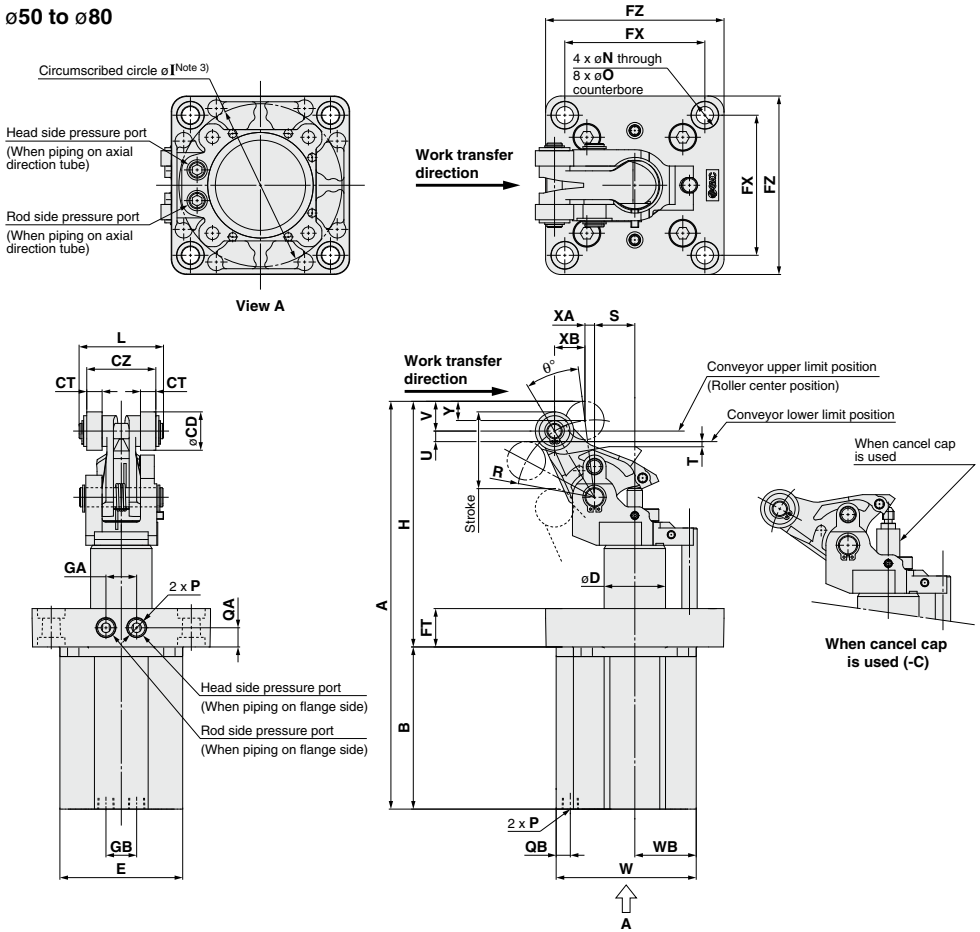
\*Seal kit includes ③⑥ to ③⑨ (excluding ③⑦).  
Order the seal kit based on each bore size.  
\*Since the seal kit does not include a grease pack, order it separately.  
**Grease pack part no.:** GR-S-010 (10 g)

### Replacement Parts/Shock Absorber

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

## Dimensions

### Basic ø50 to ø80



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  $\phi$  I means that diameter of the circle circumscribed to the cylinder angles.  
 Mounting hole must be  $\phi$  (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.

RSQ  
 RSG  
 RS2H  
 RSH  
 MIW  
 MIS

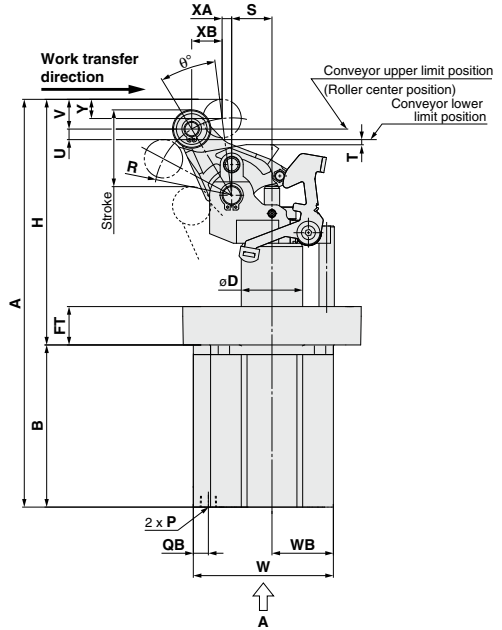
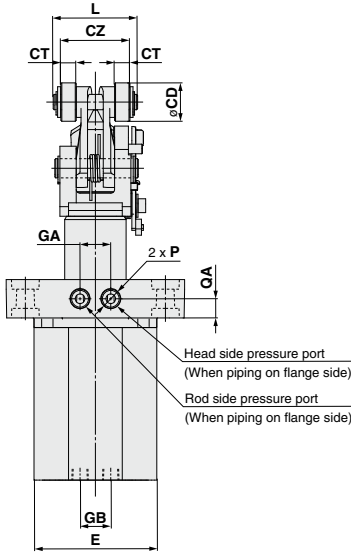
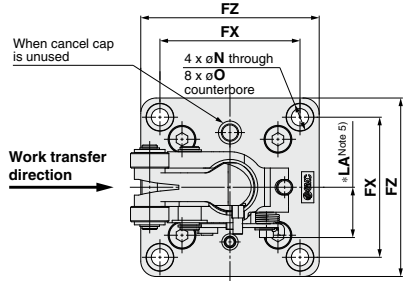
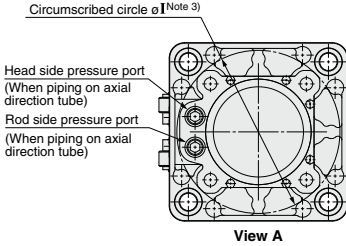
D-□  
 -X□

# RS2H Series

## Dimensions

### With lock mechanism

ø50 to ø80



Model	Stroke	A	B	CD	CT	CZ	D	E	FT	FX	FZ	GA	GB	H	Circumscribed circle $\phi I$	L	$\approx LA$ (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	$\theta^\circ$
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)		
	NII	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  $\phi I$  means that diameter of the circle circumscribed to the cylinder angles.

Mounting hole must be  $\phi (I + 1)$ .

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)

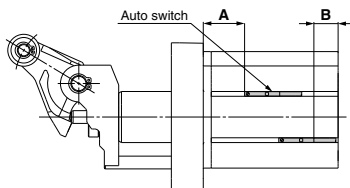
Note 4) Set the conveyor height within the range from the lower limit position to the upper limit position (U dimension) shown in the figure.

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

# Auto Switch Mounting 1

## 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

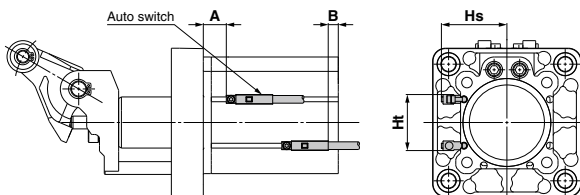
(mm)

Auto switch model Bore size	D-M9□ D-M9□W D-M9□AV		D-M9□V D-M9□WV		D-M9□A		D-A9□ D-A9□V	
	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 Bore size	D-P3DWA□			
	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.

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

- \*Normally closed (NC=b contact) solid state auto switches (D-M9□E(V)) are also available. For details, refer to page 1592-1.
- \*With pre-wired connector is also available for solid state auto switches. For details, refer to pages 1014 and 1015.

RSQ

RSG

RS2H

RSH

MIW

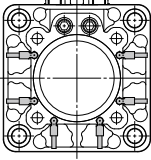
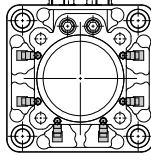
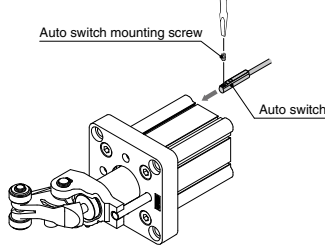
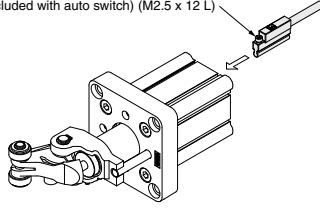
MIS

D-□

-X□

# Auto Switch Mounting 2

## Auto Switch Mounting Brackets/Part No.

Applicable auto switches	<b>D-M9□/M9□V</b> <b>D-M9□W/M9□WV</b> <b>D-M9□A/M9□AV</b> <b>D-A9□/A9□V</b>	<b>D-P3DWA</b>										
Bore size (mm)	<b>ø50 to ø80</b>	<b>ø50 to ø80</b>										
Auto switch mounting surfaces	Surfaces with auto switch mounting slot	Surfaces with auto switch mounting slot										
												
Mounting of auto switch	 <p>Auto switch mounting screw</p> <p>Auto switch</p> <ul style="list-style-type: none"> <li>When tightening the auto switch mounting screw, use a watchmakers' screwdriver with a handle 5 to 6 mm in diameter.</li> </ul> <p><b>Tightening Torque for Auto Switch Mounting Screw (N·m)</b></p> <table border="1"> <thead> <tr> <th>Auto switch model</th> <th>Tightening torque</th> </tr> </thead> <tbody> <tr> <td><b>D-M9□(V)</b></td> <td rowspan="3">0.05 to 0.15</td> </tr> <tr> <td><b>D-M9□W(V)</b></td> </tr> <tr> <td><b>D-A93</b></td> </tr> <tr> <td><b>D-M9□A(V)</b></td> <td>0.05 to 0.10</td> </tr> <tr> <td><b>D-A9□(V) (Excludes the D-A93)</b></td> <td>0.10 to 0.20</td> </tr> </tbody> </table>	Auto switch model	Tightening torque	<b>D-M9□(V)</b>	0.05 to 0.15	<b>D-M9□W(V)</b>	<b>D-A93</b>	<b>D-M9□A(V)</b>	0.05 to 0.10	<b>D-A9□(V) (Excludes the D-A93)</b>	0.10 to 0.20	<ol style="list-style-type: none"> <li>Insert the mounting bracket into the mating groove of the cylinder tube.</li> <li>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).*</li> <li>If the detecting position is changed, go back to step ①.</li> </ol> <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> 
Auto switch model	Tightening torque											
<b>D-M9□(V)</b>	0.05 to 0.15											
<b>D-M9□W(V)</b>												
<b>D-A93</b>												
<b>D-M9□A(V)</b>	0.05 to 0.10											
<b>D-A9□(V) (Excludes the D-A93)</b>	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.



## 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.

RS2H 50 Standard model no. - **X2464**

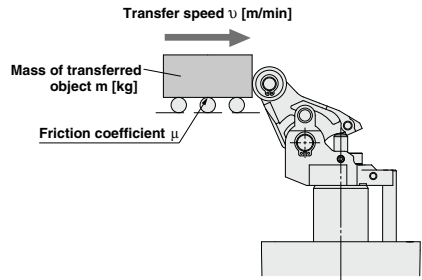
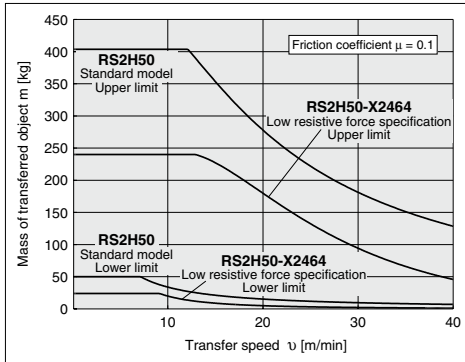
● Built-in low resistive force shock absorber

### Specifications

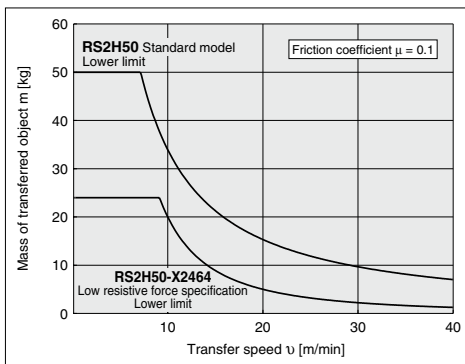
Bore size	ø50 only
Operating Range	Refer to the graph below.
Specifications other than the above	Same as standard product

Dimensions: Same as standard product

### Operating Range



### Operating Range Lower Limit Expansion



### Precautions

- Adjust the shock absorber corresponding to the energy of the transferred object before using it.
- 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.
- 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)

RSQ

RSG

RS2H

RSH

MIW  
MIS

D-□

-X□



## 2 Built-in Shock Absorber with Scrapper

**-X2541**

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

### How to Order

RS2H  - **X2541**

● Built-in shock absorber with scrapper

**Specifications: Same as standard type**

**Dimensions: Same as standard product**

The shock absorber with scrapper can be replaced individually.

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

Stopper cylinder Bore size	Part no.
ø50	RS2H-R50-X2666
ø63	RS2H-R63-X2666
ø80	RS2H-R80-X2666