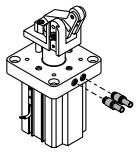
Heavy Duty Stopper Cylinder

Series RSH/RS1H

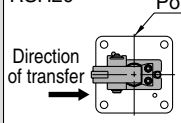
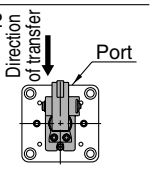
ø20, ø32 ø50, ø63, ø80

How to Order

Piping direction

Nil	Flange side 

Positional relationship of lever and port

Nil	RSH20 
	RSH32 

Bore size

20	20mm
32	32mm

Cylinder stroke

15	15mm (RSH20)
20	20mm (RSH32)

RSH 32 □ □ 20 D L □ □ Z73 □

RS1H 50 □ □ 30 D L □ □ Z73 □

Bore size

50	50mm
63	63mm
80	80mm

Thread type

Nil	M*
	Rc
TN	NPT
TF	G

*The tube I.D. of 20 is only available to port size M screws.

Number of auto switches

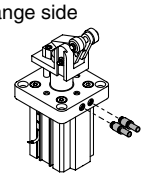
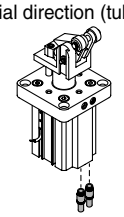
Nil	2 pcs.
S	1 pc.

Auto switch

Nil	Without auto switch (Built-in magnet)

*For the applicable auto switch model, refer to the table below.
*The auto switch is included in the package (not assembled.)

Piping direction

Nil	Flange side 
A	Axial direction (tube) 

Cylinder stroke

30	30mm (RS1H50, 63)
40	40mm (RS1H80)

Action

D	Double acting
B	Double acting with spring
T	Single acting, Spring extend

Roller material

L	Resin
M	Carbon steel

Option Note 1)

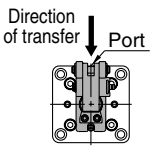
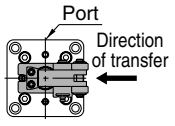
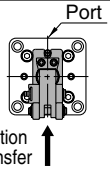
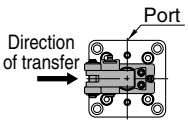
Nil	Without option
D	With lock mechanism
C	With cancel cap
S Note 2)	With lever detection switch

Note 1) Options can be combined. Indicate the part no. according to the priority order of D.C.S.

Note 2) **Lever detection switch type**

Type	Applicable model
E2E-X1C1	RSH 20,30
E2E-X2D1-N	RS1H 50,63,80

Positional relationship of lever and port

Nil	
P	
Q	
R	

Applicable Auto Switch/Refer to page 10-20-1 for further information on auto switches.

Type	Special function	Electrical entry	Indicator light	Wiring (output)	Load voltage			Auto switch model		Lead wire length (m) *			Applicable load	
					DC		AC	Electrical entry direction		0.5 (Nil)	3 (L)	5 (Z)		
								Perpendicular	In-line					
Reed switch	———	Grommet	Yes	3-wire (NPN equiv)	—	5V	—	—	**Z76**	●	●	—	IC circuit	—
				2-wire	24V	12V	100V	—	**Z73**	●	●	●	—	Relay, PLC
			No			5V, 12V	100V or less	—	**Z80**	●	●	—	IC circuit	
Solid state switch	———	Grommet	Yes	3-wire (NPN)	24V	5V, 12V	—	**Y69A**	**Y59A**	●	●	○	IC circuit	Relay, PLC
				3-wire (PNP)				**Y7PV**	**Y7P**	●	●	○		
				2-wire		12V		**Y69B**	**Y59B**	●	●	○	—	
	Diagnostic indication (2-color indication)			3-wire (NPN)		5V, 12V		**Y7NWV**	**Y7NW**	●	●	○	IC circuit	
				3-wire (PNP)				**Y7PWV**	**Y7PW**	●	●	○		
				2-wire		12V		**Y7BWV**	**Y7BW**	●	●	○	—	
	Water resistance (2-color indication)							—	**Y7BA**	—	●	○		

∗Lead wire length symbols: 0.5 m ····· Nil (Example) Y69B
3 m ····· L (Example) Y69BL
5 m ····· Z (Example) Y69BZ

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

RSH

RS1H

Specifications

Model	RSH		RS1H		
Bore size (mm)	**20**	**32**	**50**	**63**	**80**
Action	Double acting, Double acting wish spring, Single acting, Spring extend				
Style of rod end	Lever type with built-in shock absorber				
Fluid	Air				
Proof pressure	1.5MPa				
Max. operating pressure	1.0MPa				
Ambient and fluid temperature	−10 to 60°C (with no condensation)				
Lubrication	Not required (non-lube)				
Cushion	Rubber bumper				
Stroke length tolerance	$+^{1.4}_{0}$				
Mounting	Flange				
Port size	M5 x 0.8	Rc 1/8	Rc 1/8	Rc 1/4	Rc 1/4
	—	NPT 1/8	NPT 1/8	NPT 1/4	NPT 1/4
	—	G 1/8	G 1/8	G 1/4	G 1/4
Auto switch	Moantable				

Bore Size/Standard Stroke

(mm)

Model	Bore size (mm)	Standard stroke
RSH	**20**	15
	32	20
RS1H	**50**	30
	63	30
	80	40

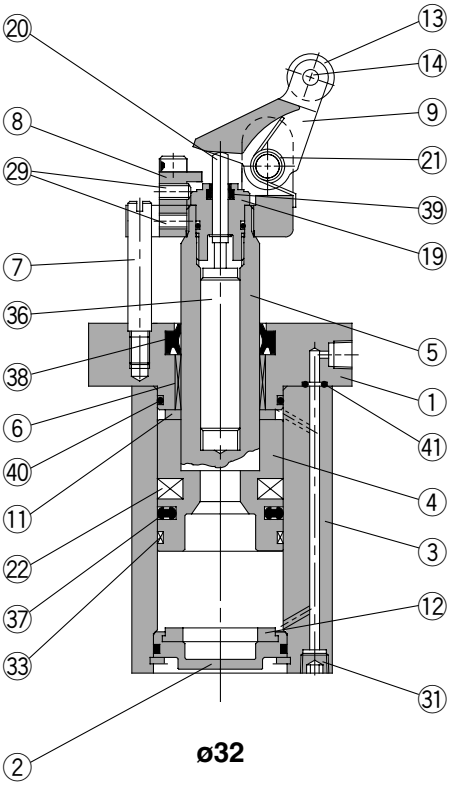
Weight

(kg)

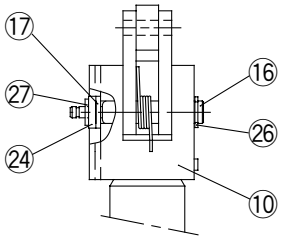
Action	Rod end configuration	Bore size (mm)	Weight
Double acting, Double acting with spring, Single acting, Spring extend	Lever type with built-in shock absorber	**20**	0.41
		32	0.75
		50	2.03
		63	3.56
		80	6.33

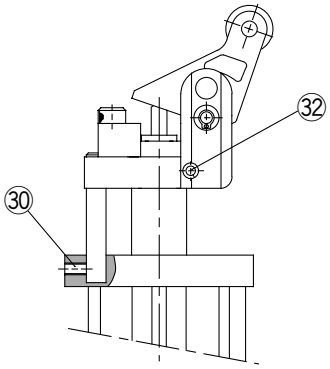
Construction

ø20, ø32
Double acting (DL, DM)



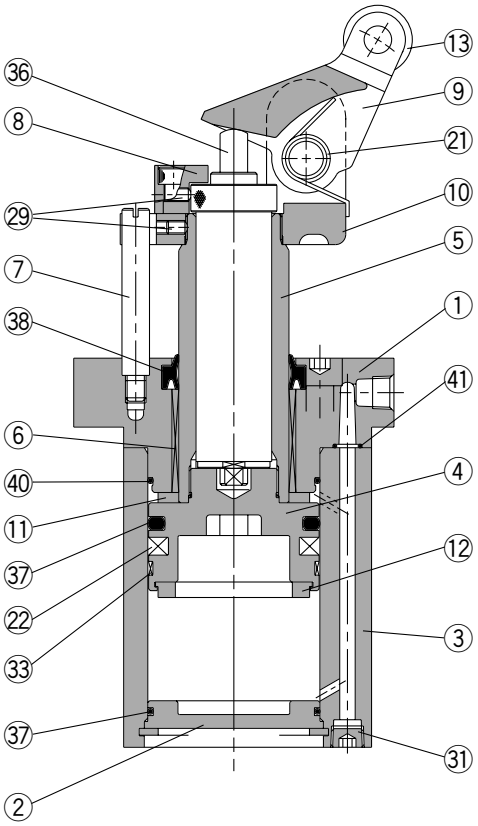
ø32

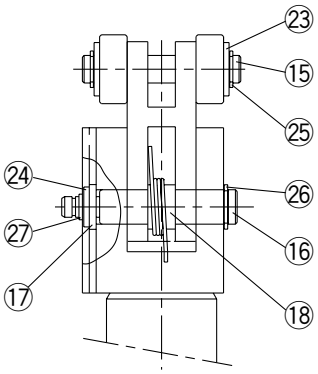




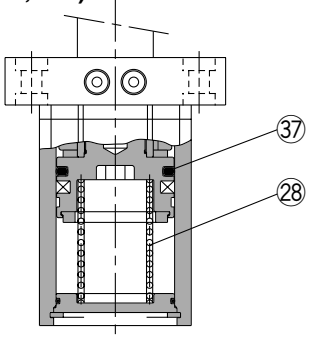
ø20

ø50, ø63, ø80
Double acting (DL, DM)

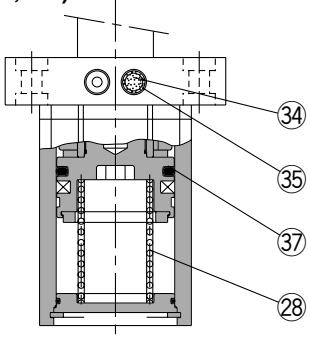




Double acting with spring (BL, BM)



Single acting, Spring extend (TL, TM)



Construction

Component Parts (For single acting)

No.	Description	Material	Note
①	Rod cover	Aluminium alloy	Metallic painted
②	Bottom plate	Aluminium alloy	Chromate
③	Cylinder tube	Aluminium alloy	Hard anodized
④	Piston	Aluminium alloy	Chromate
⑤	Piston rod	ø20: Stainless steel ø32, ø50, ø63, ø80: Carbon steel	Hard chromium electro plating
⑥	Bushing	Bronze alloy	
⑦	Guide rod	Carbon steel	Hard chromium electro plating
⑧	Stopper screw	Stainless steel	
⑨	Lever	Carbon steel	Nickel plated
⑩	Lever holder	Carbon steel	Nickel plated
⑪	Bumper A	Urethane rubber	
⑫	Bumper B	Urethane rubber	
⑬	Roller	Resin	–□□L
		Carbon steel	–□□M
⑭	Spring pin	Carbon tool steel	ø20, 32 only
⑮	Roller pin	Carbon steel	
⑯	Lever pin	Carbon steel	
⑰	Ring A	Aluminium alloy	Clear anodized
⑱	Ring B	Aluminium alloy	Clear anodized
⑲	Adjustment dial	Aluminium alloy	ø20, 32 only
⑳	End rod	Special steel	ø20, 32 only
㉑	Lever spring	Stainless steel wire	
㉒	Magnet	Magnet	
㉓	Flat washer	Steel wire	Nickel plated
㉔	Flat washer	Steel wire	Nickel plated
㉕	Type C snap ring for shaft	Carbon tool steel	
㉖	Type C snap ring for shaft	Carbon tool steel	
㉗	Type C snap ring for shaft	Carbon tool steel	
㉘	Return spring	Piano wire	
㉙	Hexagon socket head set screw	Chrome molybdenum steel	
㉚	Hexagon socket head set screw	Chrome molybdenum steel	ø20 only
㉛	Hexagon socket head plug	Chrome molybdenum steel	Nickel plated
㉜	Spring pin	Carbon tool steel	ø20 only
㉝	Wear ring	Resin	
㉞	Element	Bronze	ø20 is socket set screw
㉟	Snap ring	Steel wire	
㊱	Shock absorber	—	
㊲	Piston seal	NBR	
㊳	Rod seal	NBR	
㊴	Scraper	NBR	ø20, 32 only
㊵	Tube gasket	NBR	
㊶	O-ring	NBR	

Replacement Parts: Seal Kit

Bore size (mm)	Kit no.			Contents
	Double acting	Double acting spring type	Single acting	
20	RSH20D-PS	RSH20T-PS		Set of items ㊲ to ㊶ in above table
32	RSH32D-PS	RSH32T-PS		
50	RSH50D-PS	RSH50T-PS		Set of items ㊲ to ㊶ in above table (not including ㊴)
63	RSH63D-PS	RSH63T-PS		
80	RSH80D-PS	RSH80T-PS		

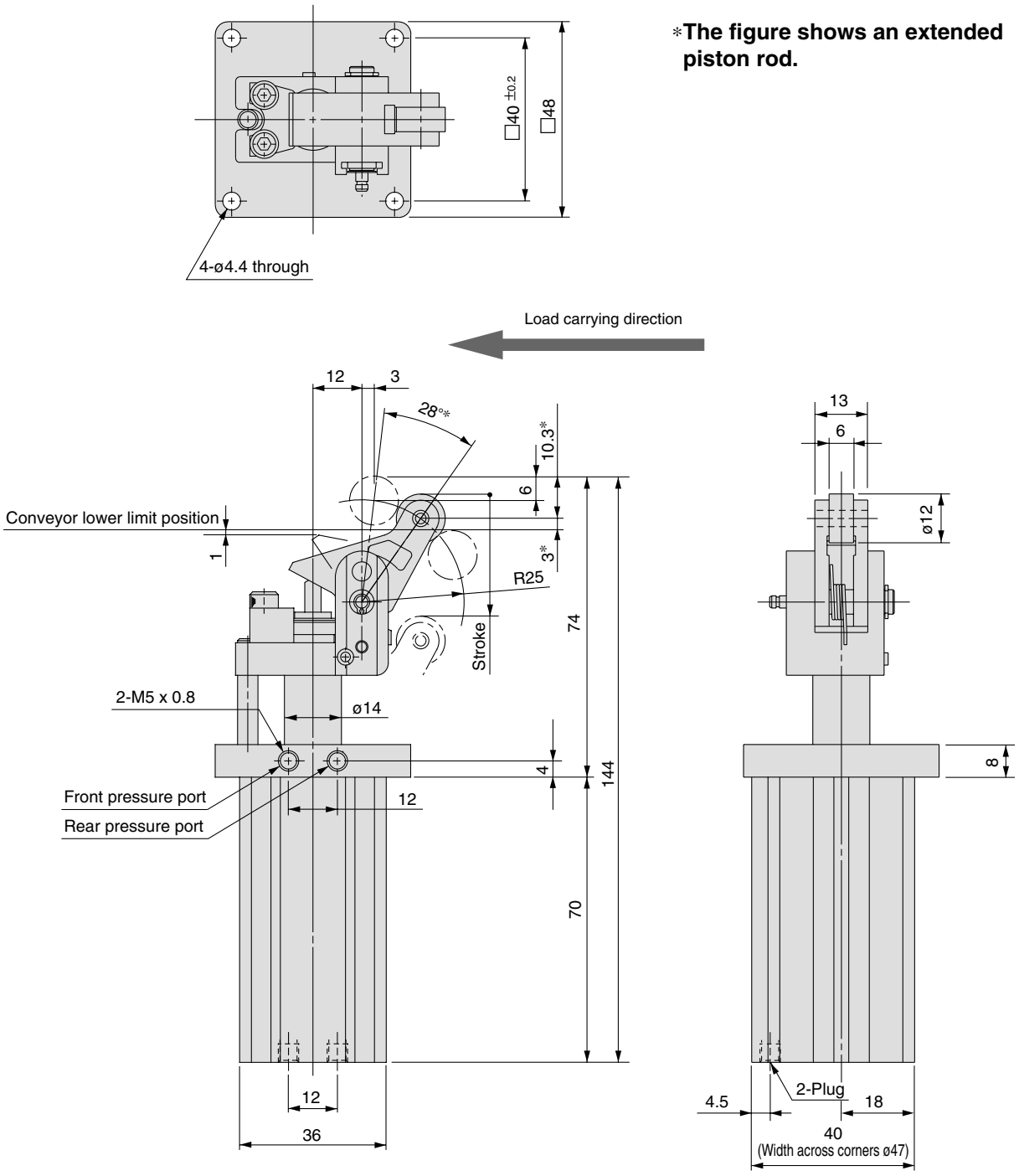
∗ The seal kits for ø20 to ø32 consist of items ㊲ to ㊶ and those for ø50 to ø80 consist of items ㊲ to ㊶. Please order them by using the seal kit number corresponding to each bore size.

Replacement Parts: Shock Absorber

Bore size (mm)	Part no.
20	RSH-R20
32	RSH-R32
50	RS1H-R50
63	RS1H-R63
80	RS1H-R80

Dimensions/Bore Size: ø20

RSH20-15□□

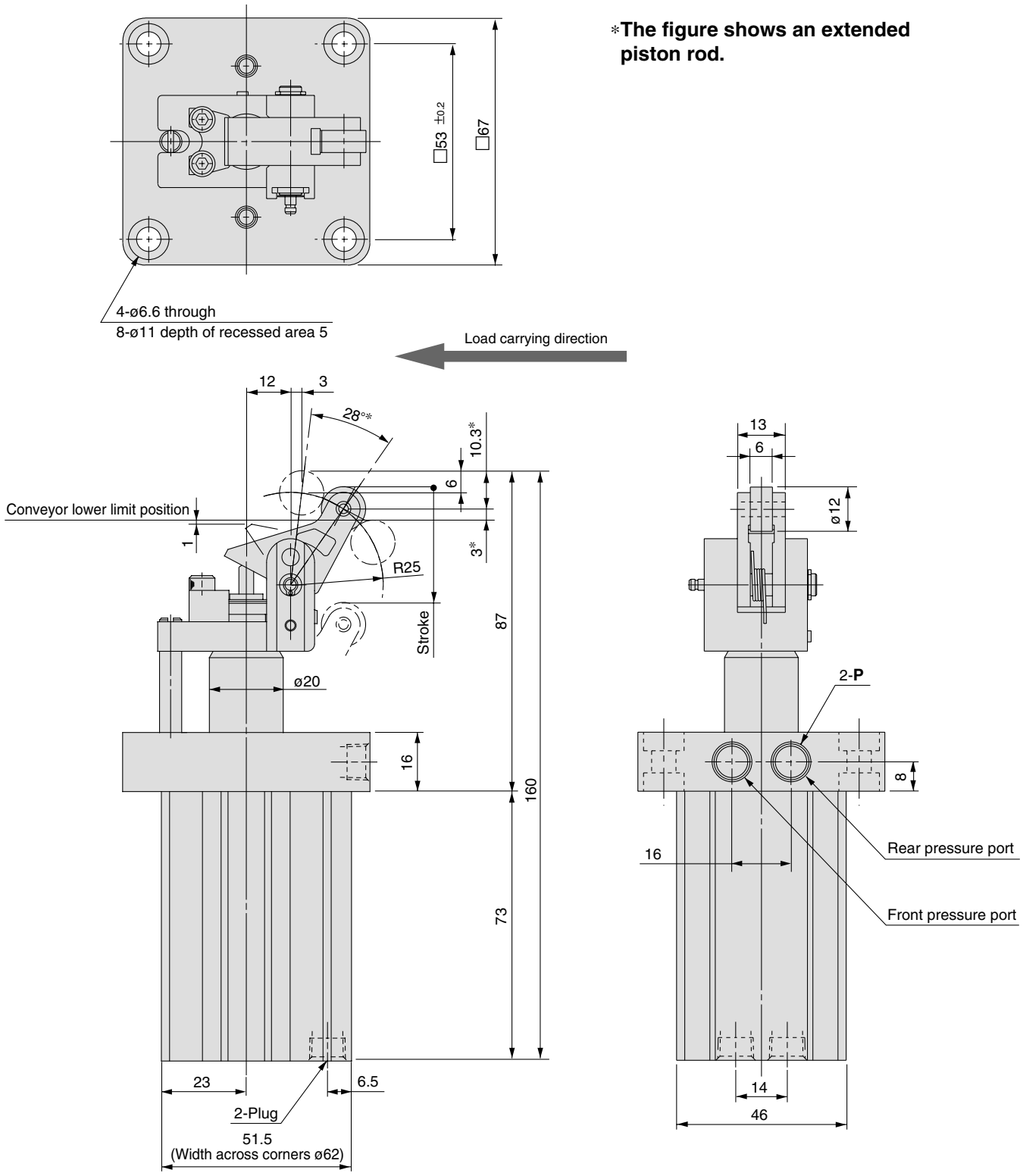


***The figure shows an extended piston rod.**

Note 1) The figure shows dimensions at the maximum energy absorption capacity.
Note 2) Dimensions with auto switch are identical to the above.
Note 3) The dimensions marked with "*" vary according to adjustment of the shock absorber dial.

Dimensions/Bore Size: ø32

RSH32-20□□

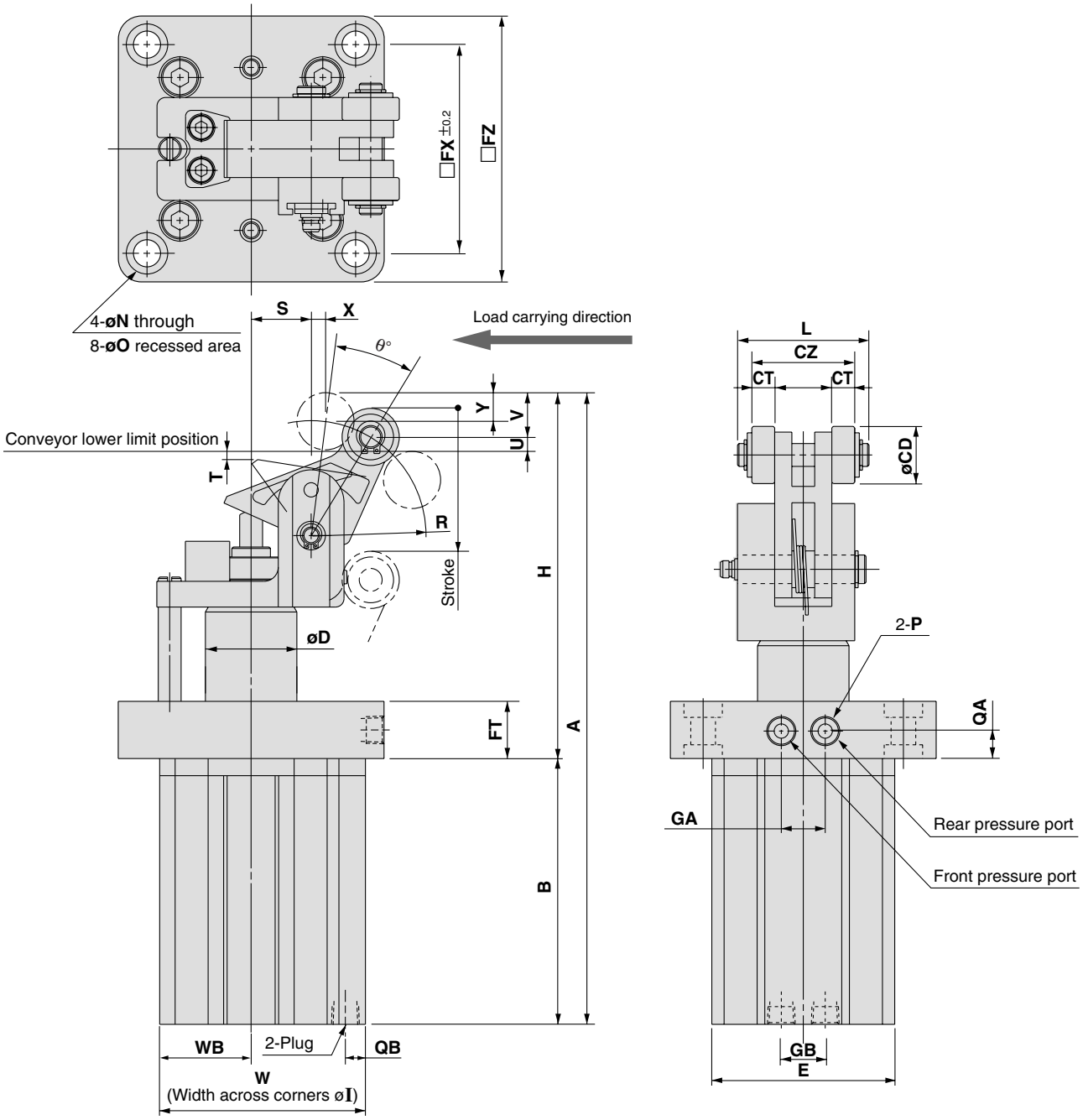


Note 1) The figure shows dimensions at the maximum energy absorption capacity.
Note 2) Dimensions with auto switch are identical to the above.
Note 3) The dimensions marked with "∗" vary according to adjustment of the shock absorber dial.

P (Piping port)		
Nil	TN	TF
Rc 1/8	NPT 1/8	G 1/8

Dimensions/Bore Size: ø50, ø63, ø80

RS1H 50 / 63 / 80 -□□□



(mm)

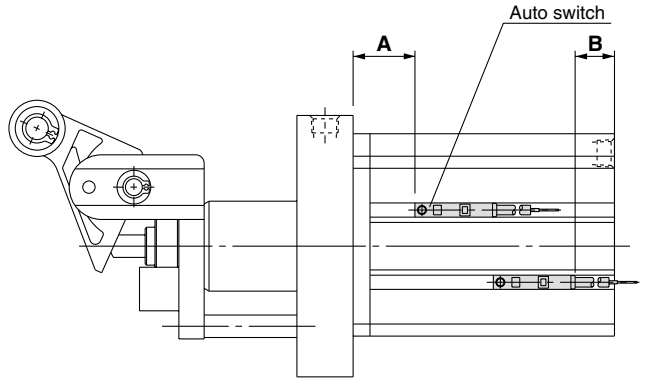
Bore size (mm)	Stroke	A	B	CD	CT	CZ	D	E	FT	FX	FZ	GA	GB	H	Width across corners I	L	N	O	QA	QB
50	30	221	93	20	8	36	32	64	20	73	93	16	16	128	85	45	9	14 depth 5	10	7
63	30	243.5	99	20	10	45	40	77	25	90	114	24	24	144.5	103	54	11	18 depth 6	12.5	8.5
80	40	299.5	128	25	10	45	50	98	25	110	138	24	35	171.5	132	56	13	20 depth 6	12.5	10

Bore size (mm)	Stroke	R	S	T	U	V	W	WB	X	Y	θ°
50	30	40	21	2	5.5	15.5	72	32	5	10	24
63	30	47	24.5	3.5	6.4	16	87.5	38.5	5	10	24
80	40	54	31	3	6.7	19.4	109	49	6	12.5	23

Model	**P** (Piping port)		
	Nil	TN	TF
RS1H50	Rc 1/8	NPT 1/8	G 1/8
RS1H63	Rc 1/4	NPT 1/4	G 1/4
RS1H80	Rc 1/4	NPT 1/4	G 1/4

Note 1) Dimensions with auto switch are identical to the above.
Note 2) The figure shows an extended piston rod.

Proper Auto Switch Mounting Position



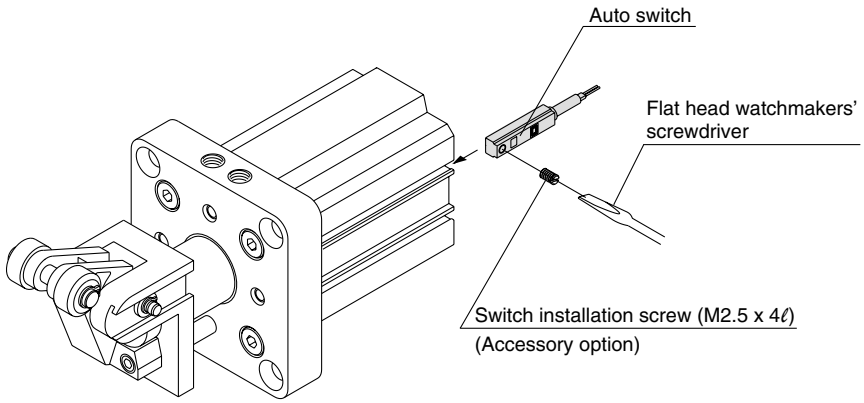
Proper Auto Switch Mounting Position

Auto switch models / Bore size (mm)	D-Z7□ D-Z80 D-Y59□ D-Y7P D-Y7□W		D-Y69□ D-Y7PV D-Y7□WV		D-Y7BAL	
	A	B	A	B	A	B
20	18	8(6.5)	18	9.5	18	2
32	13.5	10.5(9)	13.5	12	13.5	4.5
50	22	12(10.5)	22	13.5	22	6
63	24.5	15.5(14)	24.5	17	24.5	9.5
80	37	22(20.5)	37	23.5	37	16

The values inside ( ) are for D-Z73.

Mounting of Auto Switch

To set the auto switch, insert the auto switch into the switch groove from the direction shown in the drawing to the below, After placing it in the mounting position, use a flat head watchmakers' screwdriver to tighten the mounting screw which is included.



Note) When adjusting the auto switch mounting screws, use a flat head watchmakers' screwdriver.
The guideline of the tightening torque is 0.05 to 0.1 Nm.
Turn another 90° from the position where tightening is felt by hand.

Lever Detection Switch (Proximity Switch)

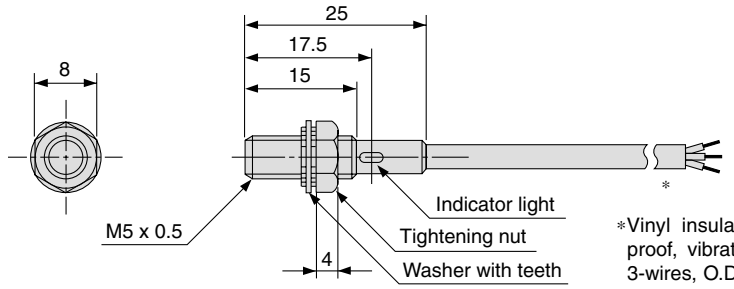
Proximity Switch Specifications/Maker: OMRON Corp.

Model	E2E-X1C1	E2E-X2D1-N
Applicable cylinder bore size	RSH20, 32	RS1H50, 63, 80
Output type	Normally open	
Power supply voltage (Operating voltage range)	12 to 24VDC (10 to 30VDC), Ripple10% or less (P-P)	
Current consumption (Leakage current)	17mA or less	0.8mA or less
Response frequency	3kHz	1.5kHz
Control output (chest)	Open collector maximum 100mA	3 to 100mA
Indicator light	Detection indication (Red 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)	2V or less	3V or less
Withstand voltage Note 2)	500VAC	1000VAC
Vibration	Endurance 10 to 55 Hz, Duplex amplitude 1.5mm X,Y,Z direction each 2h	
Impact	Endurance 500m/s² (approx. 50G), X, Y, Z direction each 10 times	
Enclosure	IEC standards IP67 (Immersion proof shape and oil proof shape by JEM standards)	

Note 1) At load current 100mA and cord length of 2m
Note 2) Between case and whole charging part

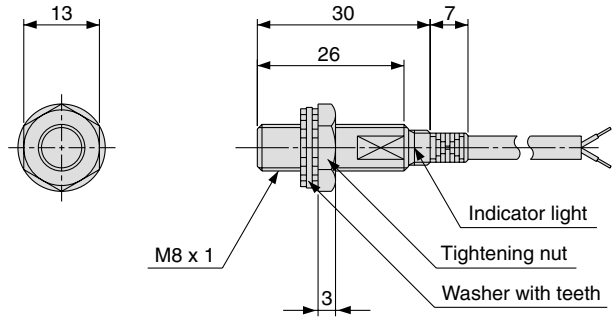
Dimensions

E2E-X1C1 (For RSH20/32)



∗Vinyl insulation round cord (oil proof, vibration proof) 0.14mm², 3-wires, O.D. ø2.9, Standard 2m, Cord extension (Individual metal piping), Max. 100m

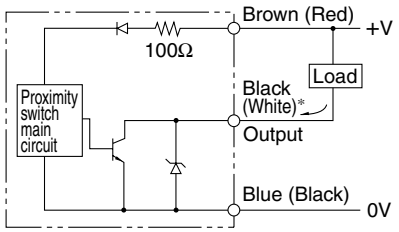
E2E-X2D1-N (For RS1H50/63/80)



∗Vinyl insulation round cord ø3.5 (18/ø0.12), 2-wire, Standard 2m, Cord extension (Individual metal piping), Max. 200m

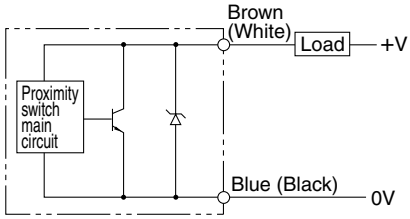
Output Circuit

E2E-X1C1/3-wire



∗Maximum 100mA (load current)

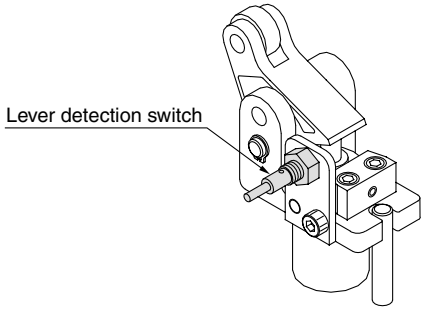
E2E-X2D1-N/2-wire



Mounting Position

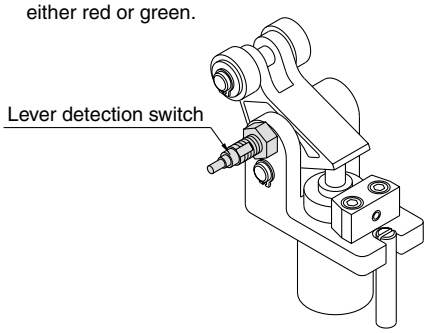
●E2E-X1C1 (For RSH20/32)

While holding the lever in the detection range of the switch, screw in the switch gradually until the indicator light (red) turns on. Then, screw the switch in further, halfway between the turn-on point and the lever.



●E2E-X2D1-N (For RS1H50/63/80)

While holding the lever in the detection range of the switch, screw in the switch until the indicator light (green) turns on. Then, give an additional half rotation of screw. After that, incline the lever by 90° and confirm that the indicator light is not on and does not show either red or green.



Model Selection

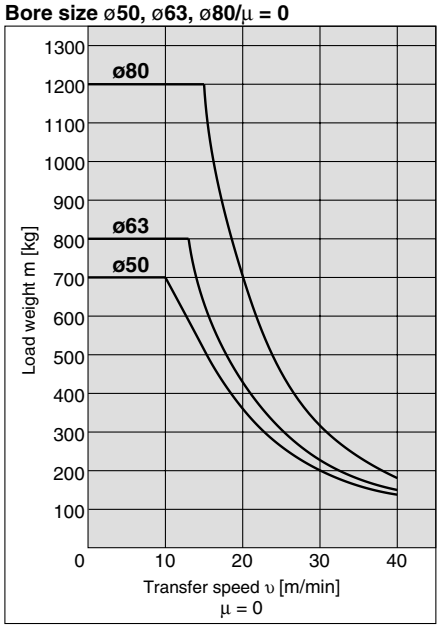
Operating Range

(Example) Load weight 300kg, Transfer speed 20m/min, Friction coefficient μ = 0.1

(How to read graph)
In graph (2), find the intersection of the vertical axis representing the weight of 300kg and the horizontal axis representing the speed of 20m/min. And select the bore size ø63 positioned within the operating range of the cylinder.

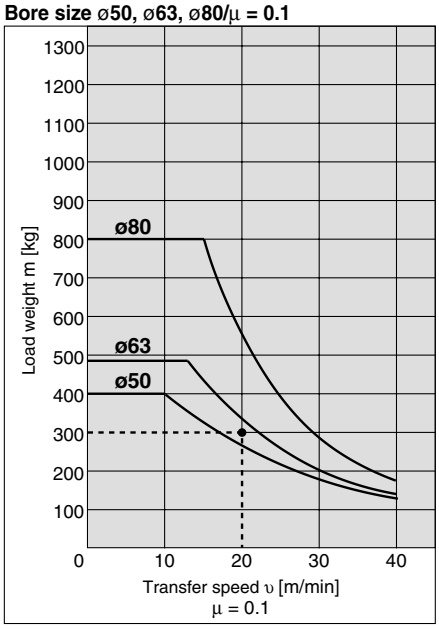
Graph (1)

Bore size ø50, ø63, ø80/μ = 0



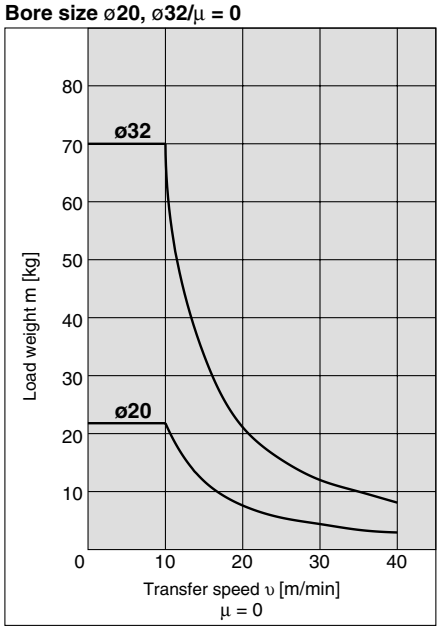
Graph (2)

Bore size ø50, ø63, ø80/μ = 0.1



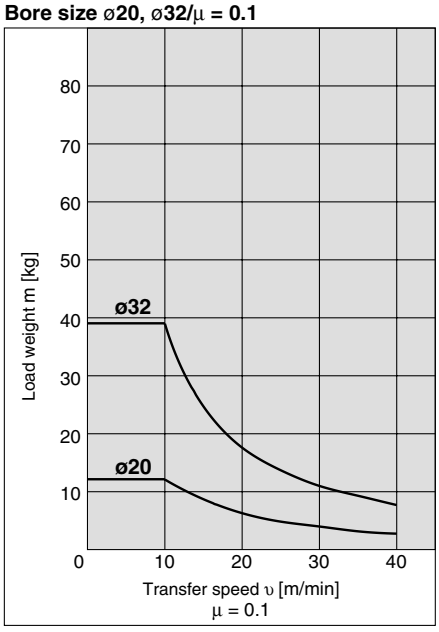
Graph (3)

Bore size ø20, ø32/μ = 0



Graph (4)

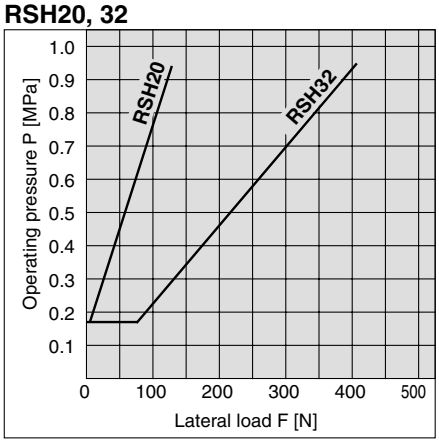
Bore size ø20, ø32/μ = 0.1



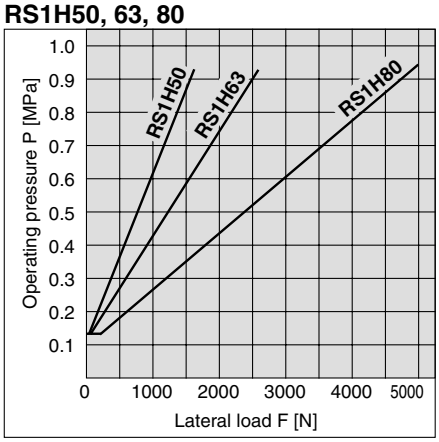
Lateral Load and Operating Pressure

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

RSH20, 32



RS1H50, 63, 80



Specific Product Precautions 1

Be sure to read before handling.

Instructions

⚠ Caution

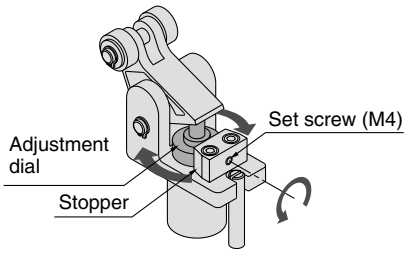
1. Shock absorber capacity variable adjustment method (ø50 to ø80)

To stop the work gently, loosen the fixing 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 fixing screw firmly to secure the shock absorber dial.

Note 1) Cautions for adjustment

When adjusting the shock absorber retardation value, first try the maximum value and then proceed to smaller values. If the energy value of the transferred workpiece is larger than the retardation value of the shock absorber, an excessive load will be applied to the lever and may cause malfunction.

Note 2) Although it is not possible to change the shock absorber drag value of ø20 and ø32 types, the shock absorber stroke can be changed by adjusting the height of the adjustment dial (6st to 4st.).



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 (or 180° increments in case of ø20).

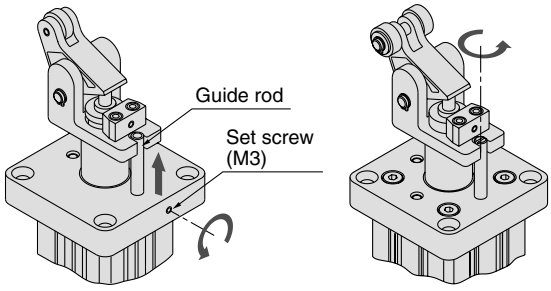
●ø20

Loosen the fixing screw (M3) beside the rod cover and pull up the guide rod. The lever is released to allow 180° rotations.

●ø32 to ø80

Fit a driver (−) into the notch on the guide rod end surface and loosen the guide rod. The lever is released to allow rotations in 90° increments.

ø20 **ø32, ø50, ø63, ø80**



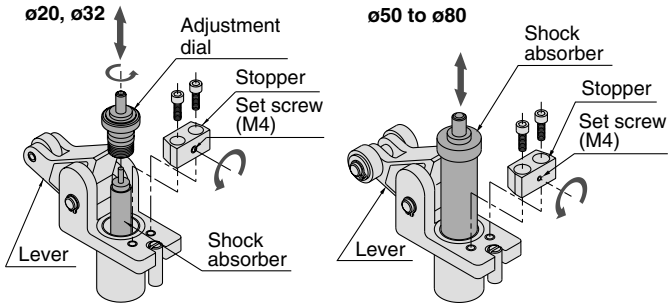
3. How to replace shock absorber during maintenance

Loosen the hexagon socket head bolts and shock absorber fixing screw (M4) on the stopper to remove the stopper from the lever holder. Incline the lever by 90° and pull out the shock absorber. (In case of ø20 and ø32, remove the stopper, loosen the adjustment dial and then pull out the shock absorber.)

∗Cautions for assembly

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

ø20, ø32 **ø50 to ø80**



Specific Product Precautions 2

Be sure to read before handling.

Selection (RSH, RS1H)

⚠ 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 damages.

⚠ Caution

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

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

2. When a load directly connected to the cylinder is stopped 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 with SMC in such cases.

Mounting (RSH, RS1H)

⚠ 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 (RSH, RS1H)

⚠ Caution

1. In case of an end lever type with locking 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. 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 lever holder.

3. Do not let water, cutting oil or dust splash on the equipment.

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

Selection (RSA)

⚠ Caution

1. Do not allow pallets to strike the lever when it is standing up.

Do not allow pallets to strike the lever when it is standing up (after the shock absorber has absorbed energy), because the cylinder body will be subjected to the full energy of the impact.

2. Do not use a stopper cylinder for intermediate stopping of loads directly connected to a cylinder, etc.

The operating ranges shown in the catalog should only be used for stopping pallets on a conveyor. If loads connected directly to a cylinder, etc., are stopped with a stopper cylinder, the cylinder's thrust will become a lateral load. Please consult with SMC in this case.

Mounting (RSA)

⚠ Caution

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

To prevent rotational torque from being applied to the cylinder rod, mount so that the contact surfaces of the pallet and cylinder are parallel to one another.

2. Do not scratch or nick the sliding parts of the piston.

Damage to seals can cause air leakage and malfunction, etc.

Operation (RSA)

⚠ Caution

1. Do not apply external force from the opposite direction to the end lever type locking mechanism when the lever is locked.

When pallets move during conveyor adjustment, first lower the cylinder.

2. Be careful in the space between the cylinder and the lever holder.

Since the lever holder moves up and down during cylinder operation, be careful that hands and fingers, etc., are not caught between the rod and lever holder.

3. Do not allow the cylinder to be exposed to cutting oil, water or dust, etc.

Do not use the cylinder under conditions where it will be exposed to liquids such as cutting oil and water, or dust, etc. This can cause malfunction of the built-in shock absorber.

4. When making adjustments, be sure that transferred articles do not strike the cylinder until shock absorber resistance has been set to the maximum value.

If transferred articles strike the cylinder with energy greater than the resistance of the shock absorber, a load will be applied to the lever which can cause malfunction.
(It is set to maximum when shipped from the factory.)