

Heavy Duty Stopper Cylinder

Series *RSH/RS1H*

Ø20, Ø32 Ø50, Ø63, Ø80

How to Order

32mm Bore size only

Bore size	
20	20mm
32	32mm

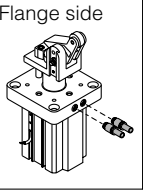
Cylinder stroke

Cylinder stroke	
15	15mm (RSH20)
20	20mm (RSH32)

Piping direction

Flange side

Nil



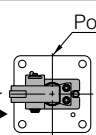
Positional relationship of lever and port

Nil

RSH20

Port

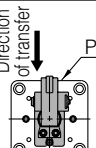
Direction of transfer



RSH32

Port

Direction of transfer



Heavy Duty Stopper Cylinder Ø20, Ø32 **RSH** **32** **TF** **20** **D** **L**

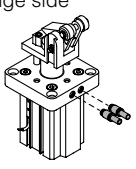
Heavy Duty Stopper Cylinder Ø50, Ø63, Ø80 **RS1H** **50** **30** **D** **L** - **XG**

Bore size	
50	50mm
63	63mm
80	80mm

Piping direction

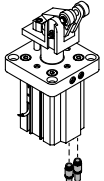
Flange side

Nil



Axial direction (tube)

A



Cylinder stroke

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

Action

Action	
D	Double acting type
B	Double acting spring type
T	Single acting/Spring extended

Roller material

Roller material	
L	Resin
M	Carbon steel

Option ^{Note 1)}

Option	
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**

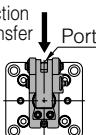
Type	Applicable model
E2E-X1C1	RSH 20 · 30
E2E-X2D1-N	RS1H 50 · 63 · 80

Positional relationship of lever and port

Nil

Direction of transfer

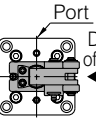
Port



P

Port

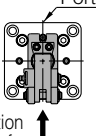
Direction of transfer



Q

Port

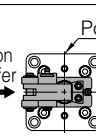
Direction of transfer



R

Port

Direction of transfer



Specifications



RSH



RS1H

Model	RSH		RS1H		
Bore size (mm)	20	32	50	63	80
Action	Double acting, Double acting spring, Single acting (Spring extended)				
Style of rod end	Lever with built-in shock absorber type				
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	G 1/8	G 1/8	G 1/4	G 1/4
Auto switch	Can be installed				

Bore size, Standard strokes

(mm)

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

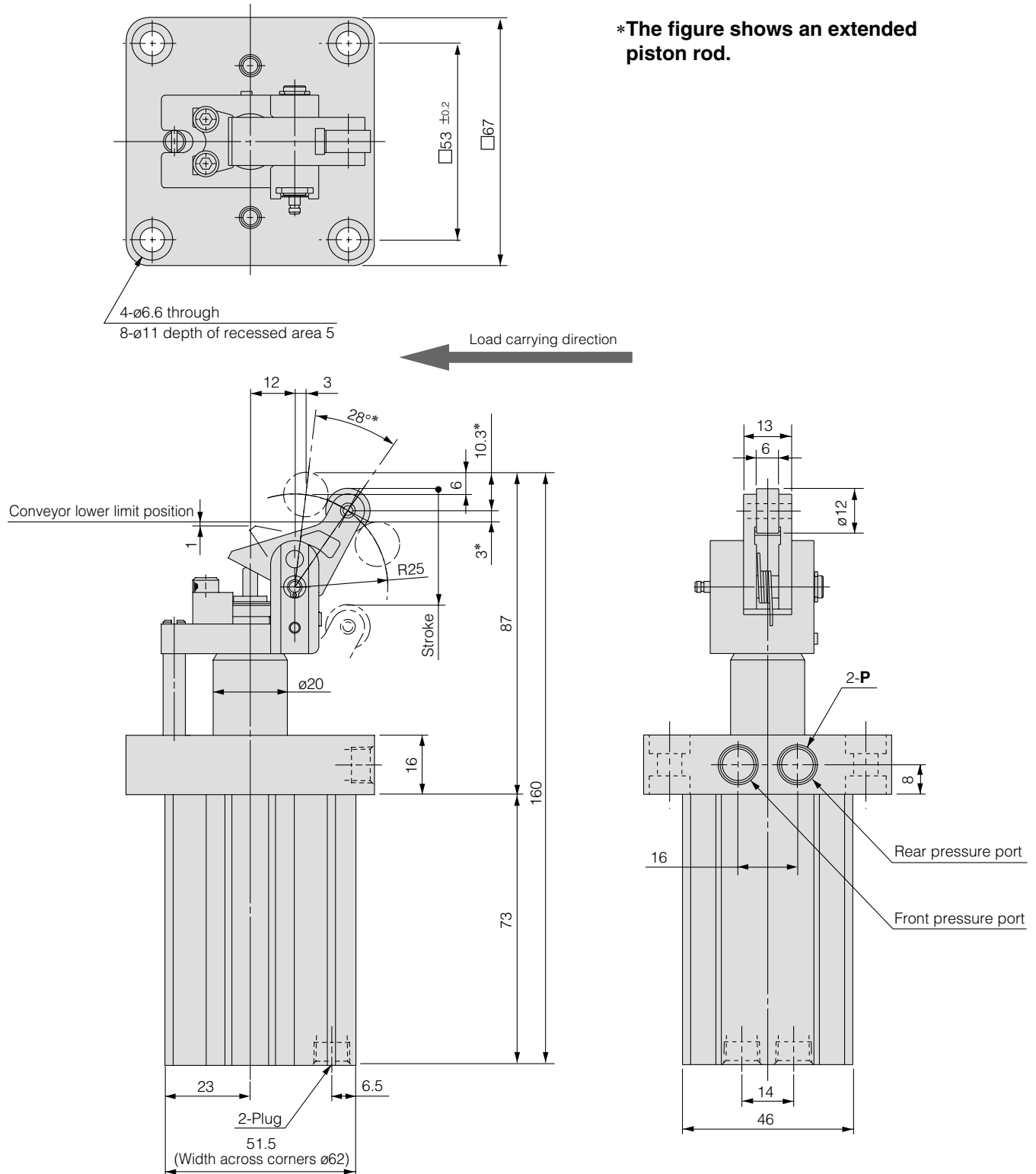
Weights

(kg)

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

Dimensions/Bore size: $\varnothing 32$

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.

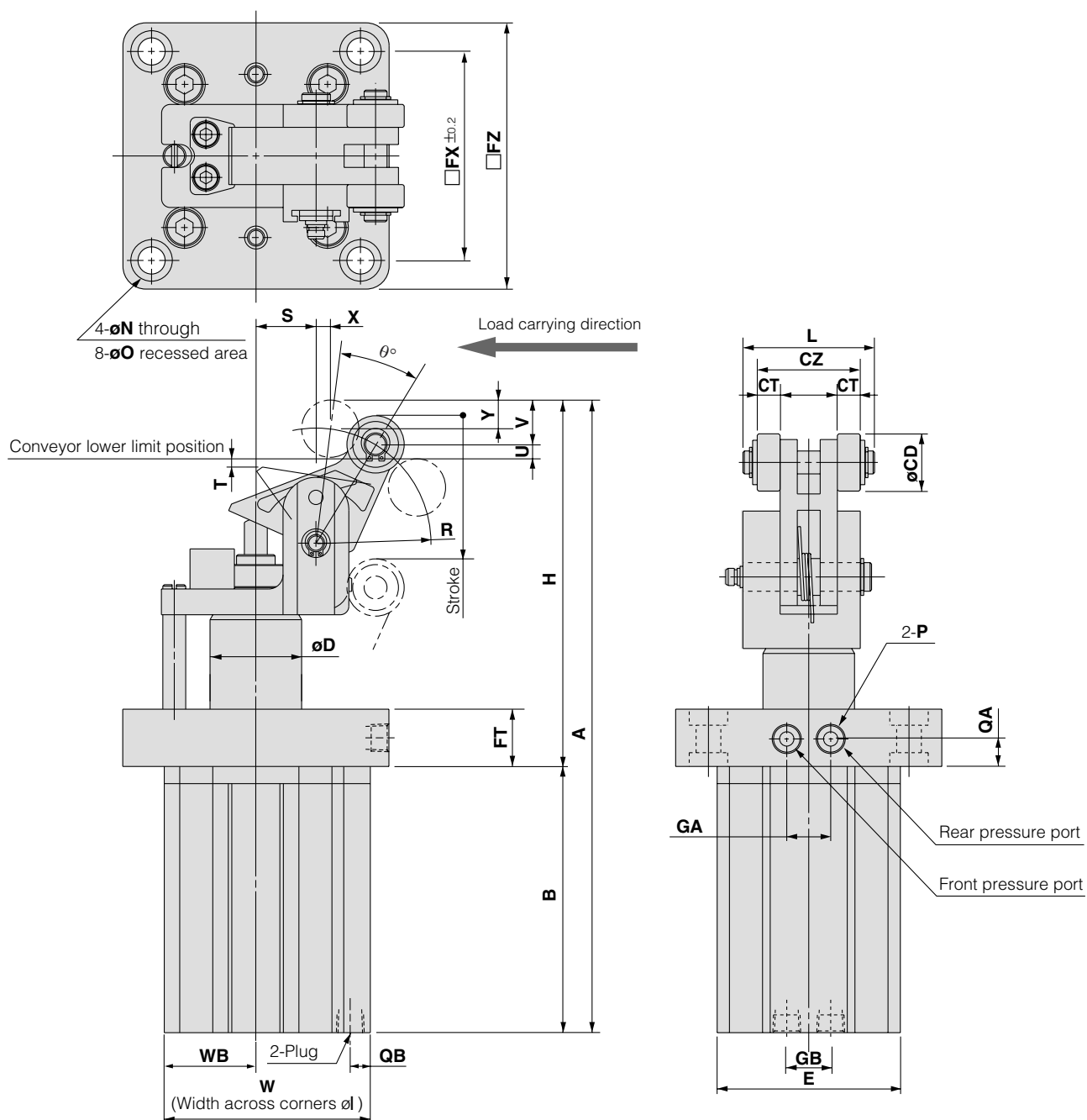
Note 3) The dimensions marked with "*" vary according to adjustment of the shock absorber dial.

P (Piping port)
TF
G 1/8

Series RSH/RS1H

Dimensions/Bore size: $\varnothing 50$, $\varnothing 63$, $\varnothing 80$


50
RS1H 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)
RS1H50	G 1/8
RS1H63	G 1/4
RS1H80	G 1/4

Note 1) Dimensions with auto switch are identical to the above

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

Lever Detection Switch (Proximity Switch)

Proximity switch specifications/Maker: OMRON Co. Ltd.

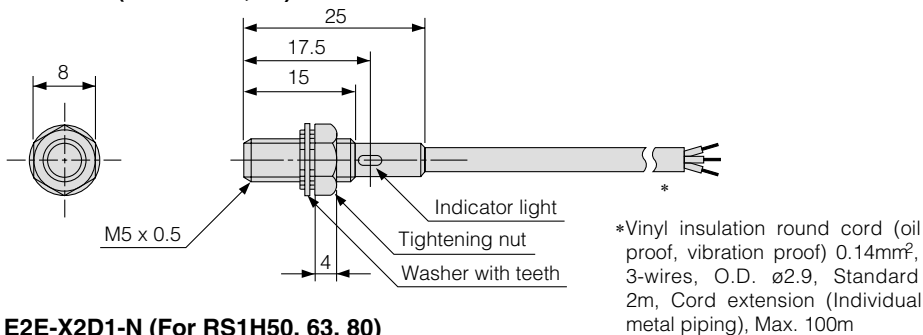
Model	E2E-X1C1	E2E-X2D1-N
Applicable cylinder bore size	RSH20, 32	RS1H50, 63, 80
Output type	Normally open	
Power supply voltage (Operating voltage range)	12 to 24VDC (10 to 30VDC), Ripple 10% or less (P-P)	
Current consumption (Leakage current)	17mA or less	0.8mA or less
Response frequency	3kHz	1.5kHz
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/s ² (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

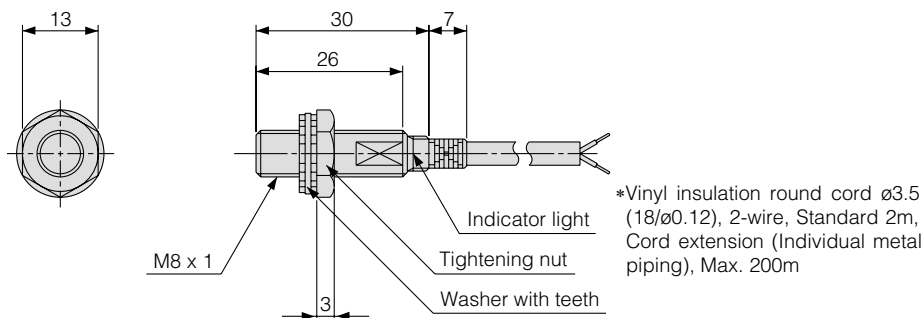
Note 2) Between case and whole charging part

Dimensions

E2E-X1C1 (For RSH20, 32)

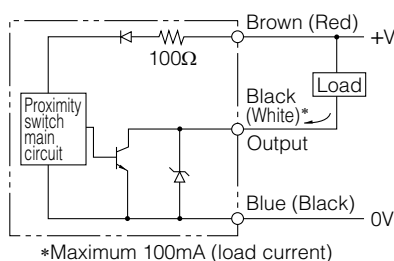


E2E-X2D1-N (For RS1H50, 63, 80)

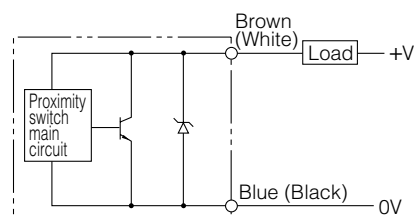


Output Circuit

E2E-X1C1/3-wire



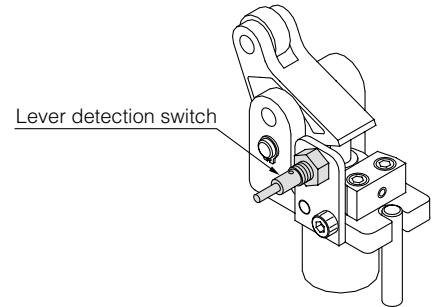
E2E-X2D1-N/2-wire



Mounting Position

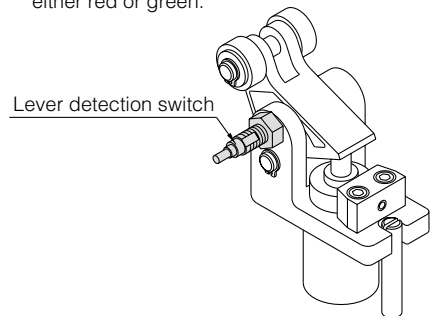
●E2E-X1C1 (For RSH20, 32)

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.



Series RSH/RS1H Model Selection

Operating Range

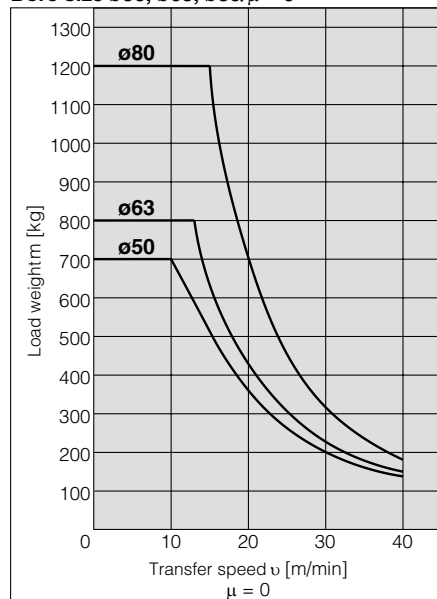
(Example) Load weight 300kg, Transfer speed 20m/min, Friction coefficient $\mu = 0.1$

(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 $\phi 63$ positioned within the operating range of the cylinder.

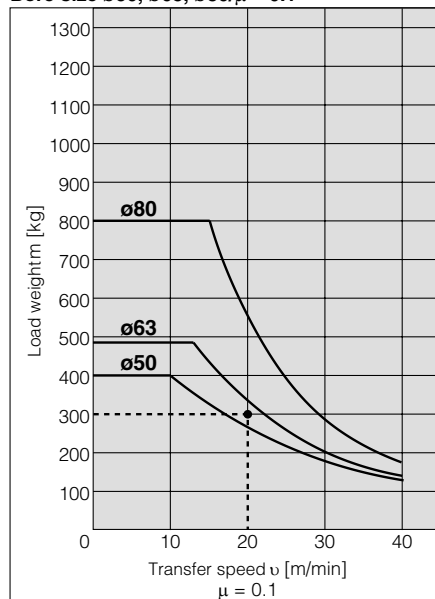
Graphq

Bore size $\phi 50, \phi 63, \phi 80/\mu = 0$



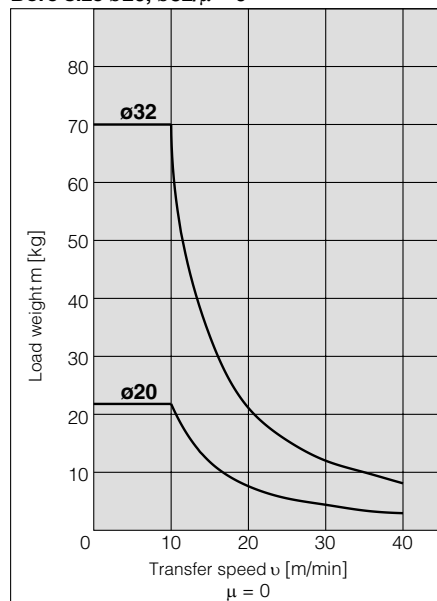
Graphw

Bore size $\phi 50, \phi 63, \phi 80/\mu = 0.1$



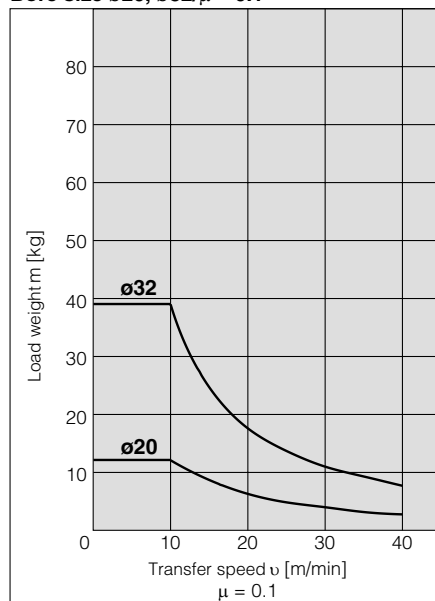
Graphe

Bore size $\phi 20, \phi 32/\mu = 0$



Graphr

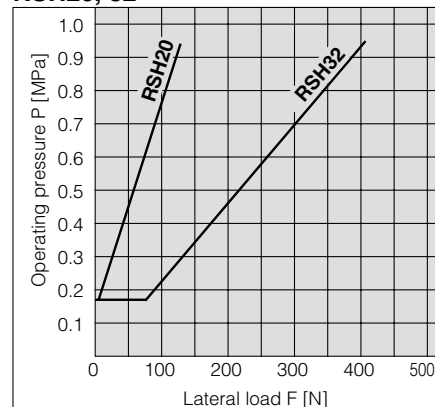
Bore size $\phi 20, \phi 32/\mu = 0.1$



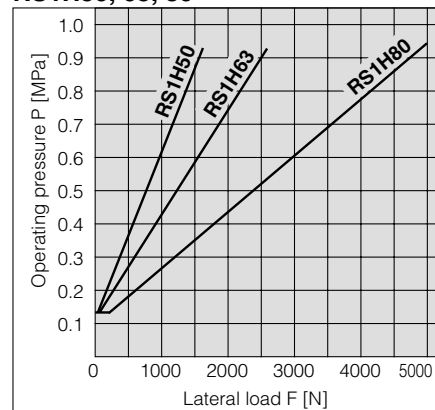
Lateral Load and Operating Pressure

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





Series *RSH/RS1H*

Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by a label of "**Caution**", "**Warning**" or "**Danger**". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ Caution : Operator error could result in injury or equipment damage.

⚠ Warning : Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems

Note 2) JIS B 8370: General Rules for Pneumatic Equipment

⚠ Warning

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.

Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment.

Compressed air can be dangerous if handled incorrectly. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.

1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back pressure.)

4. Contact SMC if the product is to be used in any of the following conditions:

1. Conditions and environments beyond the given specifications, or if product is used outdoors.
2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, press applications, or safety equipment.
3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.



Series RSH/RS1H Actuator Precautions 1

Be sure to read before handling.

Design

⚠ Warning

1. **There is a danger of sudden action by air cylinders if sliding parts of machinery are twisted, etc., and changes in forces occur.**

In such cases, human injury may occur; e.g., by catching hands or feet in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be designed to avoid such dangers.

2. **Install a protective cover when there is a risk of human injury.**

If a driven object and moving parts of a cylinder pose a danger of human injury, design the structure to avoid contact with the human body.

3. **Securely tighten all mounting parts and connecting parts so that they will not become loose.**

Especially when a cylinder operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

4. **A deceleration circuit or shock absorber, etc., may be required.**

When a driven object is operated at high speed or the load is heavy, a cylinder's cushion will not be sufficient to absorb the impact. Install a deceleration circuit to reduce the speed before cushioning, or install an external shock absorber to relieve the impact. In this case, the rigidity of the machinery should also be examined.

5. **Consider a possible drop in circuit pressure due to a power outage, etc.**

When a cylinder is used in a clamping mechanism, there is a danger of work pieces dropping if there is a decrease in clamping force due to a drop in circuit pressure caused by a power outage, etc. Therefore, safety equipment should be installed to prevent damage to machinery and/or human injury. Suspension mechanisms and lifting devices also require consideration for drop prevention.

6. **Consider a possible loss of power source.**

Measures should be taken to protect against human injury and equipment damage in the event that there is a loss of power to equipment controlled by air pressure, electricity or hydraulics, etc.

7. **Design circuitry to prevent sudden lurching of driven objects.**

When a cylinder is driven by an exhaust center type directional control valve or when starting up after residual pressure is exhausted from the circuit, etc., the piston and its driven object will lurch at high speed if pressure is applied to one side of the cylinder because of the absence of air pressure inside the cylinder. Therefore, equipment should be selected and circuits designed to prevent sudden lurching, because there is a danger of human injury and/or damage to equipment when this occurs.

8. **Consider emergency stops.**

Design so that human injury and/or damage to machinery and equipment will not be caused when machinery is stopped by a safety device under abnormal conditions, a power outage or a manual emergency stop.

9. **Consider the action when operation is restarted after an emergency stop or abnormal stop.**

Design the machinery so that human injury or equipment damage will not occur upon restart of operation. When the cylinder has to be reset at the starting position, install safe manual control equipment.

Selection

⚠ Warning

1. **Confirm the specifications.**

The products advertised in this catalog are designed according to use in industrial compressed air systems. If the products are used in conditions where pressure, temperature, etc., are out of specification, damage and/or malfunction may be caused. Do not use in these conditions. (Refer to specifications.)

Consult SMC if you use a fluid other than compressed air.

2. **Intermediate stops**

When intermediate stopping of a cylinder piston is performed with a 3-position closed center type directional control valve, it is difficult to achieve stopping positions as accurately and precisely as with hydraulic pressure due to the compressibility of air.

Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended period of time. Contact SMC in case it is necessary to hold a stopped position for an extended period.

⚠ Caution

1. **Operate within the limits of the maximum usable stroke.**

The piston rod will be damaged if operated beyond the maximum stroke.

Refer to the air cylinder model selection procedure for the maximum useable stroke.

2. **Operate the piston in such a way that collision damage will not occur at the stroke end.**

The operation range should prevent damage from occurring when a piston, having inertial force, stops by striking the cover at the stroke end. Refer to the cylinder model selection procedure for the maximum usable stroke.

3. **Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.**

4. **Provide intermediate supports for long stroke cylinders.**

Provide intermediate supports for cylinders with long strokes to prevent rod damage due to sagging of the rod, deflection of the tube, vibration and external loads.



Series RSH/RS1H Actuator Precautions 2

Be sure to read before handling.

Mounting

⚠ Caution

1. **Do not scratch or gouge the cylinder tube or the sliding parts of the piston rod by striking or grasping them with other objects.**

Cylinder bores are manufactured to precise tolerances, so that even a slight deformation may cause malfunction.

Scratches and gouges on the sliding part of the piston rod can damage packing and cause air leakage

2. **Prevent sticking of rotating parts.**

Prevent sticking of rotating parts (pin, etc.) by applying sufficient lubrication.

3. **Do not use until you can verify that equipment can operate properly.**

Verify correct mounting by suitable function and leakage tests after compressed air and power are connected following mounting, maintenance or conversions.

4. **Instruction manual**

The product should be mounted and operated after thoroughly reading the manual and understanding its contents.
Keep the instruction manual where it can be referred to as needed.

Piping

⚠ Caution

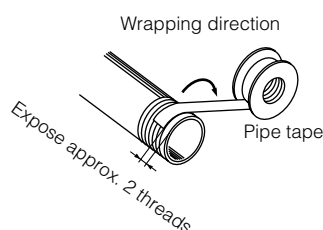
1. **Preparation before piping**

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. **Wrapping of pipe tape**

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping.

Also, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



Lubrication

⚠ Caution

1. **Lubrication of non-lube type cylinder**

The cylinder is lubricated for life at the factory and can be used without any further lubrication.

However, in the event that additional cylinder lubrication is required, be sure to use ISO VG32 Class 1 turbine oil (with no additives).

Stopping lubrication later may lead to malfunctions because the new lubricant will cancel out the original lubricant. Therefore, additional lubrication must be continued once it has been started.

Air Supply

⚠ Warning

1. **Use clean air.**

Do not use compressed air containing chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, as this can cause damage or malfunction.

⚠ Caution

1. **Install air filters.**

Install air filters immediately upstream of valves. The filtration degree should be 5µm or finer.

2. **Install an after-cooler, air dryer, or water separator (Drain Catch).**

Air that includes excessive drainage or condensate may cause malfunction of valves and other pneumatic equipment. To prevent this, install an after-cooler, air dryer or water separator (Drain Catch).

3. **Use the product within the specified range of fluid and ambient temperature.**

Take measures to prevent freezing when below 5°C or less, since moisture in circuits can freeze and cause damage to seals and lead to malfunction.

Refer to SMC's "Best Pneumatics vol. 4" catalog for further details on compressed air quality.

Operating Environment

⚠ Warning

1. **Do not use in environments where there is a danger of corrosion.**

Refer to the construction drawings regarding cylinder materials.

2. **In dusty locations or where water or oil splashing is a regular occurrence, protect the rod by installing a rod cover.**

3. **When using auto switches, do not operate in an environment where there are strong magnetic fields.**

Maintenance

⚠ Warning

1. **Perform maintenance inspection and service according to the procedure indicated in the instruction manual.**

Improper handling and maintenance may cause malfunctioning and damage of machinery or equipment to occur.

2. **Removal of components, and supply/exhaust of compressed air.**

Before any machinery or equipment is removed, first ensure that the appropriate measures are in place to prevent the fall or erratic movement of driven objects and equipment, then cut off the electric power and reduce the pressure in the system to zero only then should you proceed with the removal of any machinery and equipment.

When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent cylinder from lurching.

⚠ Caution

1. **Filter drainage**

Drain out condensate from air filters regularly.



Series RSH/RS1H Auto Switch Precautions 1

Be sure to read before handling.

Design and Selection

Warning

1. Confirm the specifications.

Read the specifications carefully and use the product appropriately. The product may be damaged or malfunction if it is used outside the range of specifications for load current, voltage, temperature, or impact.

2. Take precautions when multiple cylinders are used close together.

When two or more auto switch cylinders are lined up in close proximity to each other, magnetic field interference may cause the switches to malfunction. Maintain a minimum cylinder separation of 40mm. (When the allowable interval is specified for each cylinder series, use the indicated value.)

3. Monitor the length of time that a switch is ON at an intermediate stroke position.

When an auto switch is placed at an intermediate position of the stroke and a load is driven at the time the piston passes, the auto switch will operate, but if the speed is too great the operating time will be shortened and the load may not operate properly. The maximum detectable piston speed is:

$$V(\text{mm/s}) = \frac{\text{Auto switch operating range (mm)}}{\text{Load operating time}} \times 1000$$

4. Keep wiring as short as possible.

<Reed switches>

As the length of the wiring to a load gets longer, the rush current at switching ON becomes greater, and this may shorten the product's life. (The switch will stay ON all the time.)

- 1) For an auto switch without a contact protection circuit, use a contact protection box when the wire length is 5m or longer.

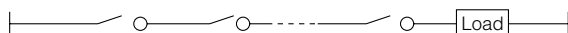
<Solid state switches>

- 2) Although wire length should not affect switch function, use a wire that is 100m or shorter.

5. Monitor the internal voltage drop of the switch.

<Reed switches>

- 1) Switches with an indicator light (Except D-Z76)
 - If auto switches are connected in series as shown below, take note that there will be a large voltage drop because of internal resistance in the light emitting diodes. (Refer to internal voltage drop in the auto switch specifications.)
[The voltage drop will be "n" times larger when "n" auto switches are connected.]
Even though an auto switch operates normally, the load may not operate.



- Similarly, when operating below a specified voltage, it is possible that the load may be ineffective even though the auto switch function is normal. Therefore, the formula below should be satisfied after confirming the minimum operating voltage of the load.

$$\text{Supply voltage} - \text{Internal voltage drop of switch} > \text{Minimum operating voltage of load}$$

- 2) If the internal resistance of a light emitting diode causes a problem, select a switch without an indicator light (Model D-Z80).

<Solid state switches>

- 3) Generally, the internal voltage drop will be greater with a 2-wire solid state auto switch than with a reed switch. Take the same precautions as in 1).

Also, note that a 12VDC relay is not applicable.

6. Monitor leakage current.

<Solid state switch>

With a 2-wire solid state auto switch, current (leakage current) flows to the load to operate the internal circuit even when in the OFF state.

$$\text{Operating current of load (OFF condition)} > \text{Leakage current}$$

If the condition given in the above formula are not met, the switch will not reset correctly (it stays ON). Use a 3-wire switch if this condition cannot be satisfied.

Moreover, leakage current flow to the load will be "n" times larger when "n" auto switches are connected in parallel.

7. Do not use a load that generates surge voltage.

<Reed switches>

If driving a load that generates surge voltage, use as a relay, use a switch with a built-in contact protection circuit or a contact protection box.

<Solid state switches>

Although a zener diode for surge protection is connected at the output side of a solid state auto switch, damage may still occur if a surge is applied repeatedly. When directly driving a load that generates surge, such as a relay or solenoid valve, use a switch with a built-in surge absorbing element.

8. Cautions for use in an interlock circuit

When an auto switch is used for an interlock signal requiring high reliability, devise a double interlock system to safeguard against malfunctions by providing a mechanical protection function, or by also using another switch (sensor) together with the auto switch. Also perform periodic maintenance inspections and confirm proper operation.

9. Ensure sufficient clearance for maintenance activities.

When designing an application, be sure to allow sufficient clearance for maintenance and inspections.



Series RSH/RS1H Specific Product Precautions 1

Be sure to read before handling.

Refer to pages 17 through 22 for safety instructions, actuator precautions and auto switch precautions.

Instructions

⚠ Caution

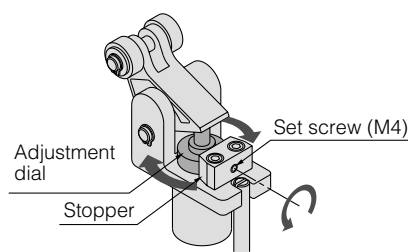
1. Shock absorber capacity variable adjustment method (ø50 to ø80)

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 work piece 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.)

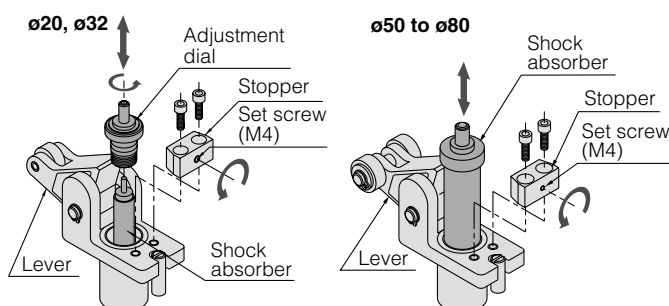


3. How to replace shock absorber during maintenance

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.



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

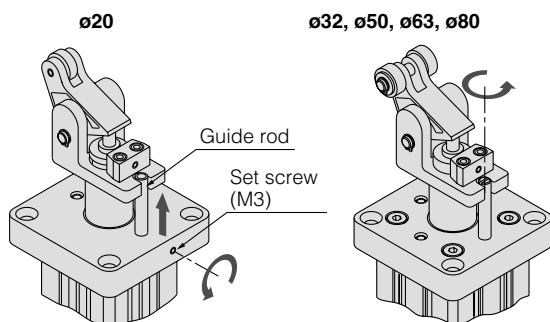
The positional relationship between the transfer and piping directions can be changed in 90° increments (or 180° increments in case of ø20).

●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.





Series RSH/RS1H Specific Product Precautions 2

Be sure to read before handling.

Refer to pages 17 through 22 for safety instructions, actuator precautions and auto switch precautions.

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 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. 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. 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.