CKD

SM-2319-A

INSTRUCTION MANUAL

MECHANICAL VALVE

MS

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the product for further consultation whenever necessary.

2nd

CKD Corporation

For Safety Use

To use this product safely, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, read this instruction manual carefully for proper operation.

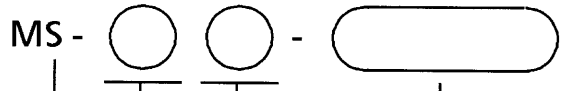
INDEX

MS
Mechanical Valve
Manual No. SM-2319-A

NOTE : Letters & figures enclosed within Gothic style bracket (examples such as [C2-4PP07] · [V2-503-B] etc.) are editorial symbols being unrelated with contents of the book.

Apr. 04.1990
Revision : Jun.30.2000

1. HOW TO ORDER



TYPE OF ACTUATOR

- PP ····· Pin Plunger type
- RL ····· Roller Lever type
- RLOW ···· One-way Roller Lever type
- RP ····· Roller Plunger type
- SP ····· Straight Plunger type
- TG ····· Toggle Switch type
- PB1 ····· Push Button Valve type
- ESP ····· Mushroom Head valve type
- SE1 ····· Select Valve type
- SE2 ····· Select Valve type (Dual-block type)

TYPE OF CONNECTING PORT

- 0 ····· Rc1/8 Thread
- 1 ····· ϕ4 Snap Joint Type

TYPE OF PRESSURIZING

- 0 ····· Normally Closed Valve
- 1 ····· Normally Open Valve
- 4 ····· 4-port Valve

MEDIUM SIZE MECHANICAL VALVE

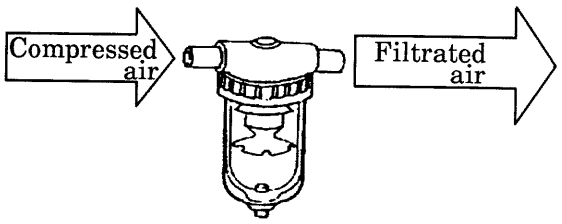
2. SPECIFICATIONS

Item		Specification
1) Media		Compressed Air
2) Range of working pressure		0 to 0.8MPa
3) Range of working media temperature		5° to 60°C (Not to be frozen)
4) Range of ambient temperature		5° to 60°C
Lubrication		Not required
Effective sectional area	Rc1/8 thread	2.5mm^2
	ϕ4 snap joint type	1.6mm^2

3. CAUTION

3.1 Fluid

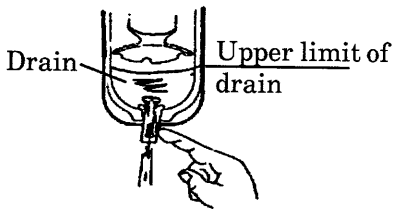
1) Use the compressed air, filtrated and dehumidified. Carefully select a filter of an adequate filtration rate (5μm or lower preferred), flow rate and its mounting location (as closest to directional control valve as possible).



[C2-201-E]

2) Be sure to drain out the accumulation in filter periodically.

3) Note that the intrusion of carbide of compressor oil (such as carbon or tarry substance) into the circuit causes malfunction of solenoid valve and cylinder. Be sure to carry out thorough inspection and maintenance of compressor.



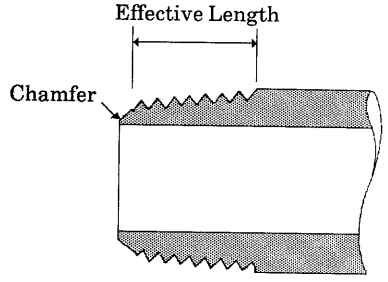
[C2-201-F]

3.2 Piping

1) For piping beyond the filter, use pipes that hardly get corroded such as galvanized pipes, nylon tubes, rubber tubes, etc. (Refer to Selection Guide Table for Related Equipment.)

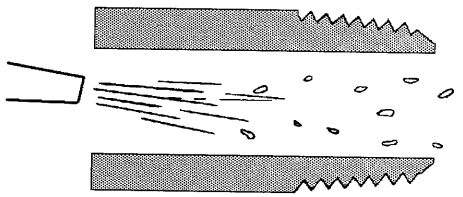
2) Install filter preferably adjacent upper-stream to solenoid valve for eliminating rust, foreign substance and drain in the pipe.

3) Strictly observe the effective thread length of gas pipe and give a chamfer of approx. 1/2 pitch from the threaded end.



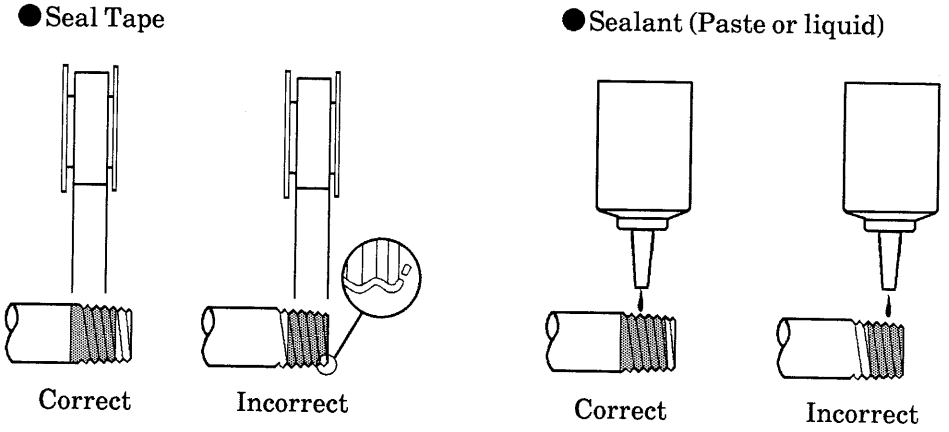
[C0-400-A]

4) Flush air into the pipe to blow out foreign substances and chips before piping.



[C0-400-B]

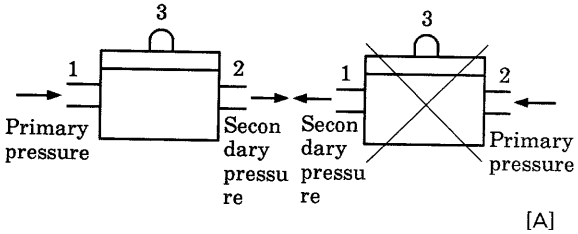
5) Refrain applying sealant or sealing tape approx. two pitches of thread off the tip of pipe to avoid residual substances from falling into piping system.



[C0-400-C]

6) Carefully install valve as each one has specified direction of flow.

1 port ..... Primary pressure
2 port ..... Secondary pressure
3 port ..... Exhaust



[A]

7) Installation of a filter is mandatory. Install a lubricator (Turbine oil class 1, ISO VG32) at an upper-stream location to the valve when it seems to be necessary.

8) Select an appropriate mounting location for valve, while designing a lay-out of circuit, where only the least vibration or shock is generated or nil.

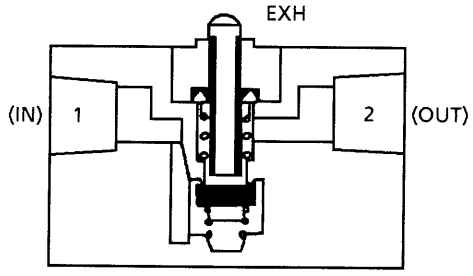
9) Inspect against any external leakage at each threaded joint, upon completion of plumbing, by applying soapy water over it.

10) Design plumbing circuit so as to provide an ample space for handling tools during later maintenance works

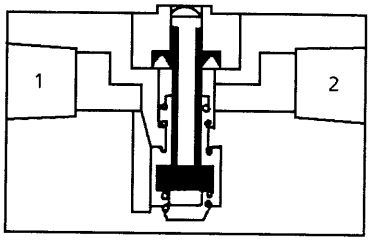
4. FUNCTION OF VALVE AND MATERIAL OF MAJOR COMPONENTS

4.1 Function of Valve

When it is Free



When actuated



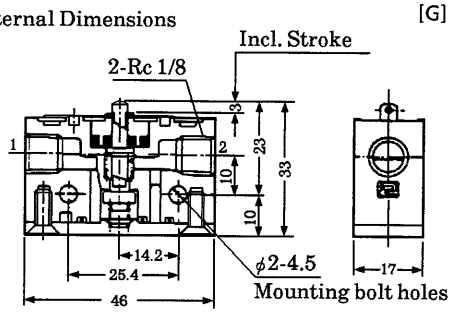
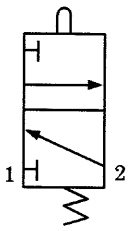
Note : It is unfeasible to pressurize in reverse direction (i.e. through port #2 toward port #1)

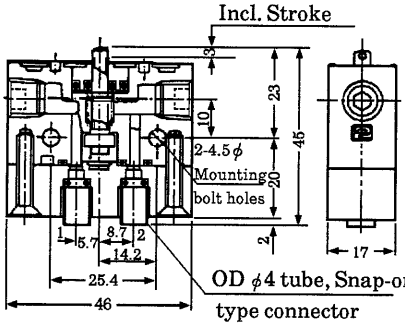
[B]

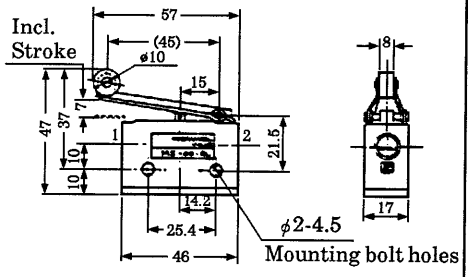
4.2 Material of major components

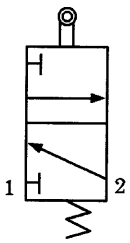
Parts	Material
Body	Zinc alloy
Spool	Stainless Steel
Spring	Stainless Steel
Valve	Nitril Rubber
Gasket	Nitril Rubber

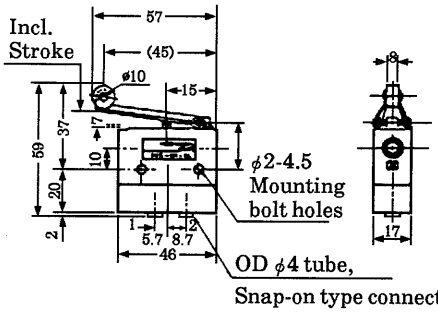
5. TYPE, EXTERNAL VIEW, SPECIFICATION AND JIS SYMBOLS

<table>
<tr><th>Type</th><th>External View</th><th>Specifications</th><th>Symbol</th></tr>
<tr><td>MS-00-PP Pin plunger type Rc 1/8 connection</td><td>External Dimensions [G]
 
</td><td rowspan="2"><table><tr><td>O.F.</td><td>10.8N (0.49MPa)</td></tr><tr><td>P.T.</td><td>1.2mm</td></tr><tr><td>O.T.</td><td>1.8mm</td></tr><tr><td>T.T.</td><td>3mm</td></tr></table></td><td rowspan="2"> 

[G1]</td></tr>
<tr><td>MS-01-PP Pin plunger type Snap-on connection</td><td>External Dimensions
 

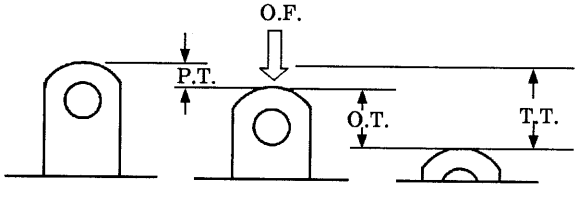
[H]</td></tr>
<tr><td>MS-00-RL Roller lever type Rc 1/8 connection</td><td>External Dimensions
 

[I]</td><td rowspan="2"><table><tr><td>O.F.</td><td>3.5N (0.49MPa)</td></tr><tr><td>P.T.</td><td>4.1mm</td></tr><tr><td>O.T.</td><td>2.9mm</td></tr><tr><td>T.T.</td><td>7mm</td></tr></table></td><td rowspan="2"> 

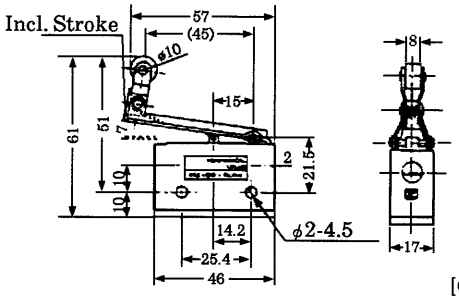
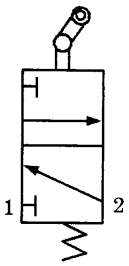
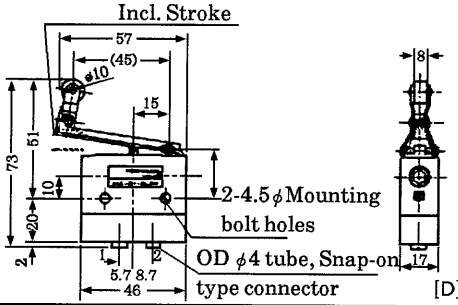
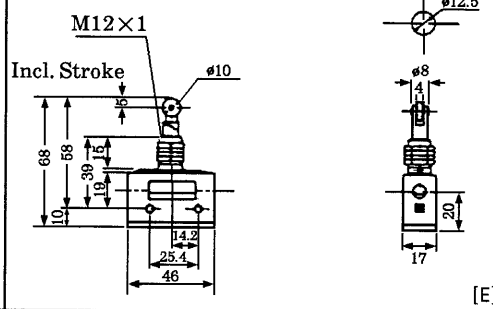
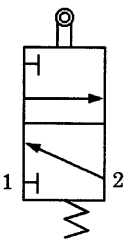
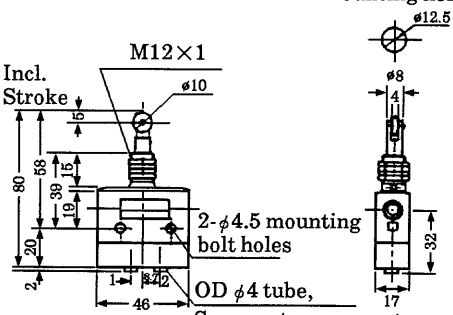
[E1]</td></tr>
<tr><td>MS-01-RL Roller lever type Snap-on connection</td><td>External Dimensions [J]
 
</td></tr>
</table>

Motion symbols of Actuators

Symbol	Definition
O.F.	Required Operating Force
P.T.	Stroke to start opening valve
O.T.	Stroke succeeding opening valve
T.T.	Total Stroke

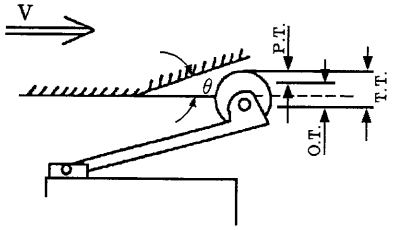


[X]

Type	External View	Specifications	Symbol
MS-00-RLOW One-way Roller lever type Rc 1/8 connection	External Dimensions Incl. Stroke  [C]	O.F. 3.5N (0.49MPa) P.T. 4.1mm O.T. 2.9mm T.T. 7mm	 [C1]
MS-01-RLOW One-way Roller lever type Snap-on connection	External Dimensions Incl. Stroke  2-4.5φMounting bolt holes OD φ4 tube, Snap-on type connector [D]		
MS-00-RP Roller Plunger type Rc 1/8 connection	External Dimensions Mounting hole  [E]	O.F. 10.8N (0.49MPa) P.T. 1.3mm O.T. 3.7mm T.T. 5mm	 [E1]
MS-01-RP Roller Plunger type Snap-on connection	External Dimensions Mounting hole  2-φ4.5 mounting bolt holes OD φ4 tube, Snap-on type connector [F]		

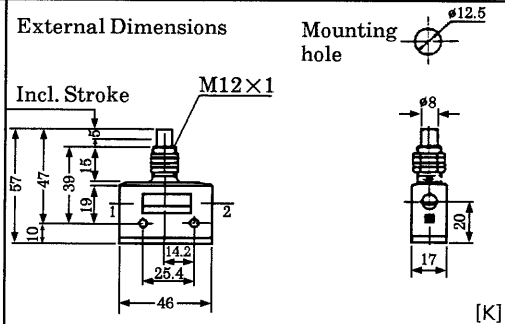
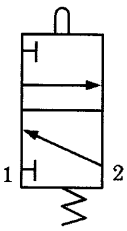
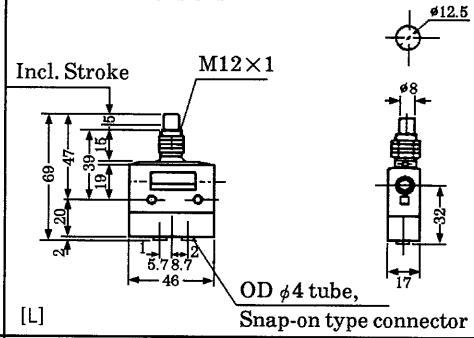
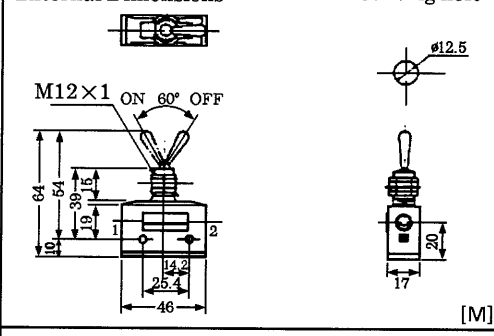
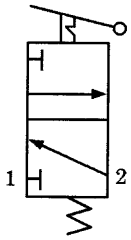
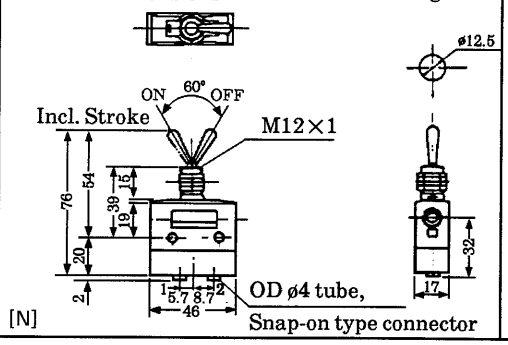
Application

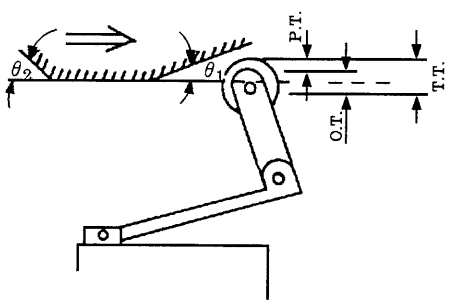
- Dog cut angle(θ) should be less than 45°
- Make the angle(θ) smaller when dog speed if comparably fast.
- As for actuating point and depth of dog, it is preferable to be (P.T. + O.T./2). Eliminate of using for more than T.T.
- Never intend to use the mechanical valve itself as for a mechanical stopper.
- Design configuration of dog so as to allow lever its slow return.



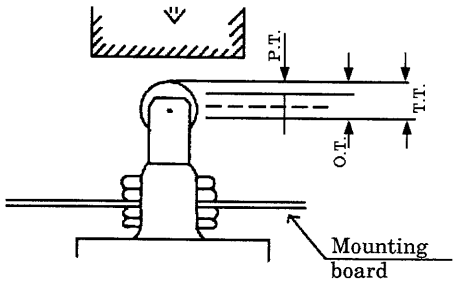
[W]

[SM-2319-A]

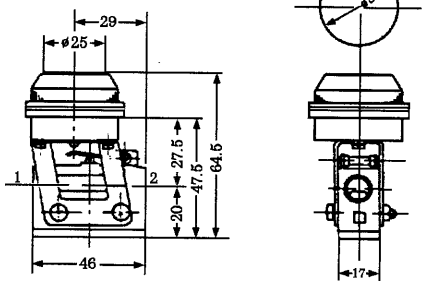
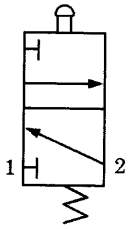
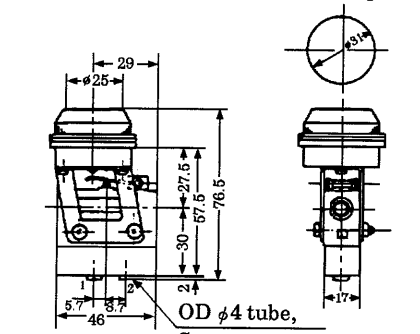
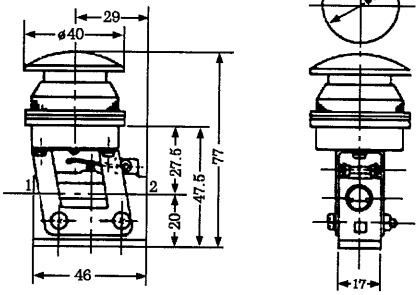
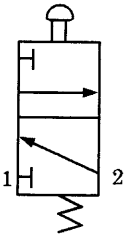
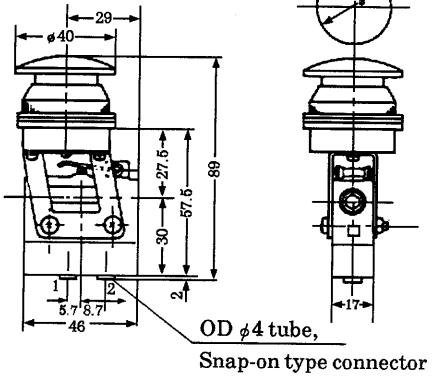
Type	External View	Specifications	Symbol
MS-00-SP Straight plunger type Rc 1/8 connection	External Dimensions Mounting hole Incl. Stroke M12×1  [K]	O.F. 10.5N (0.49MPa) P.T. 1.3mm O.T. 3.7mm T.T. 5mm	 [G1]
MS-01-SP Straight plunger type Snap-on connection	External Dimensions Mounting hole Incl. Stroke M12×1  OD ϕ4 tube, Snap-on type connector [L]		
MS-00-TG Toggle switch type Rc 1/8 connection	External Dimensions Mounting hole M12×1 ON 60° OFF  [M]	Operation angle 60°	 [M1]
MS-01-TG Toggle switch type Snap-on connection	External Dimensions Mounting hole ON 60° OFF Incl. Stroke M12×1  OD ϕ4 tube, Snap-on type connector [N]		

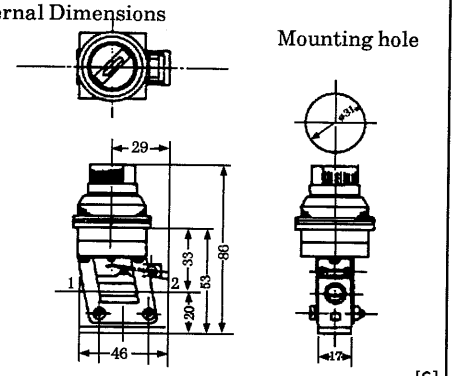
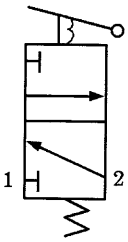
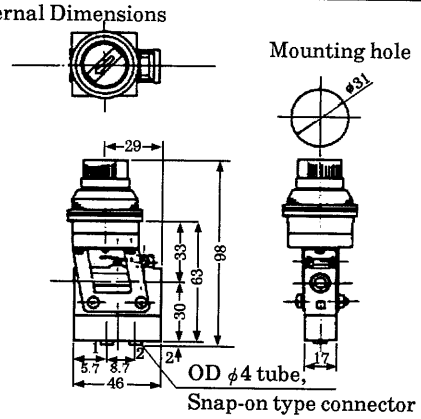
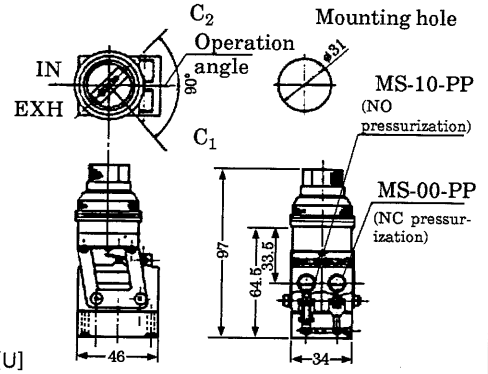
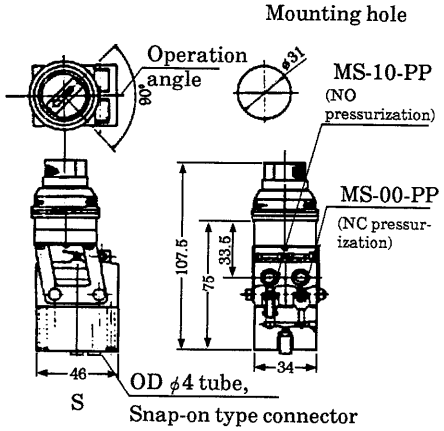
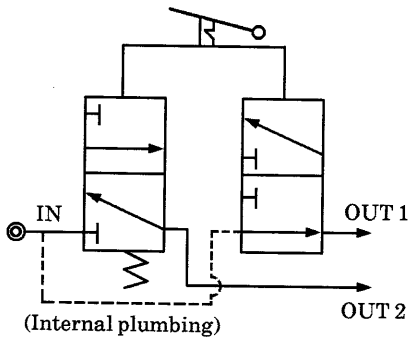


[Y]



[Z]

Type	External View	Specifications	Symbol
MS-00-PB$_1$ Push Button type Rc 1/8 connection	External Dimensions  O	(Note) Three kinds of color chips (red,green and black) are supplied Select an appropriate chip adapting to the color to be used Color of push buttons Red (PB1) Green (PB1) Black (PB1) Yellow (PB1-Y)	
MS-01-PB$_1$ Push Button type Snap-on connection	External Dimensions  P		O1
MS-00-ESP Mushroom head valve type Rc 1/8 connection	External Dimensions  Q	Color of push buttons Red (ESP - R) Black (ESP - B) Green (ESP - G) Yellow (ESP-Y)	
MS-01-ESP Mushroom head valve type Snap-on connection	External Dimensions  R		Q1

Type	External View	Specifications	Symbol
MS-00-SE_1 SELECT Valve type Rc 1/8 connection	External Dimensions  [S]	Operation angle 90° Color of Knob Black	 [S1]
MS-01-SE_1 SELECT Valve type Snap-on connection	External Dimensions  [T]		
MS-40-SE_2 SELECT Valve type Rc1/8 connection, 4- way valve	External Dimensions  [U]		
MS-41-SE_2 SELECT Valve type Snap-on connection, 4- way valve	External Dimensions  [V]		 [V1]