

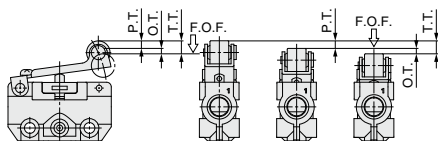
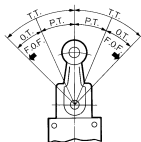


VM Series Specific Product Precautions 1

Be sure to read this before handling the products.

Refer to page 8 for safety instructions and pages 9 to 15 for 3/4/5 port solenoid valve precautions.

Definition of Symbol



• F.O.F. <Full Operating Force>

Required force to total travel position

• P.T. <Pre-travel>

From free position to initial valve operating position

• O.T. <Over Travel>

From initial valve operating position to total travel position

• T.T. <Total Travel>

From free position to total travel position

Design

⚠ Warning

1. This product cannot be used for applications in which the pressure must be sealed.

Since mechanical valves are subject to minimal air leakage, they cannot be used for applications that require holding pressure (including vacuum).

2. Not suitable for use as an emergency shutoff valve

This mechanical valve is not designed for safety applications such as an emergency shutoff valve. If the valves are used for the mentioned applications, additional safety measures should be adopted.

Mounting

⚠ Warning

1. Mount the mechanical operation type mechanical valve so that the valve does not operate over the operating limit range.

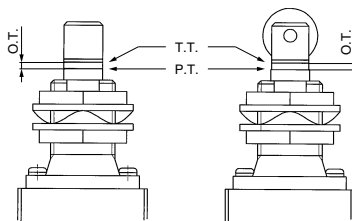
Failure to do so may result in damage to the mechanical valve itself or lead to equipment malfunction.

2. Operate the mechanism within the stroke range that has been obtained through the formula given below. (Do not move beyond the operating limit position.)

Actuator stroke = $(P.T. + 0.5 \times O.T.)$ to $(P.T. + O.T. - 0.1)$

Series	Actuator		Actuator stroke (mm)
VM1000	Basic	T.T. = 4.8 mm (T.T. = 2.5 mm)	3.7 to 4.7 (2.2 to 2.4)
	Roller lever		3.5 to 4.4
	One way roller lever		3.5 to 4.4
VM400	Basic		2.5 to 3.4
	Roller lever		6.2 to 8.4
	One way roller lever		6.5 to 8.9
	Straight plunger		4.5 to 5.4
	Roller plunger		4.5 to 5.4
	Cross roller plunger		4.5 to 5.4
VZM500 VZM400 VFM300 VFM200	Basic		2.0 to 2.9
	Roller lever		4.2 to 6.1
	One way roller lever		4.7 to 6.9
	Straight plunger		2.5 to 3.4
	Roller plunger		2.5 to 3.4

For the straight plunger and roller plunger, there are grooves indicating P.T. and T.T. for stroke adjustment.



3. Never perform additional machining such as enlarging the body mounting holes.

As doing so could lead to unexpected abnormal conditions such as air leakage.

For specific product precautions of the VM100/200 series, refer to pages 1435 to 1438.



VM Series

Specific Product Precautions 2

Be sure to read this before handling the products.

Refer to page 8 for safety instructions and pages 9 to 15 for 3/4/5 port solenoid valve precautions.

Operation

Warning

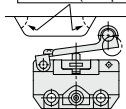
- When using a mechanical operation type mechanical valve, select the angle and the maximum speed limit of the cam and dog so that the valve does not exceed the following maximum values.

If operated over the maximum values, impact force from the cam and dog will be applied to the actuator, resulting in damage.

Series	Actuator	Angle limit switch actuator	Max. speed limit switch actuator (m/s)
VM1000	Roller lever	30°	0.7
		45°	0.3
	One way roller lever	30°	0.7
		45°	0.3
VM400	Roller lever	30°	0.7
		45°	0.3
	One way roller lever	30°	0.7
		45°	0.3
	Straight plunger	—	0.2
		30°	0.3
VZM500 VZM400 VFM300 VFM200	Roller lever	30°	1.5
		45°	0.7
	One way roller lever	30°	0.7
		45°	0.3
	Straight plunger	—	0.4
		30°	0.7
VM800	Roller lever	30°	0.5
		45°	0.2
		30°	0.2
	Adjustable roller lever	30°	0.1
		45°	0.1
	Adjustable rod lever	—	0.2

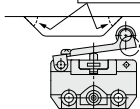
[Not acceptable]

Over 45° (Abrupt angle)



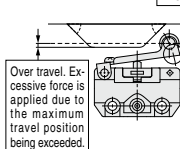
[Acceptable]

45° or less



[Not acceptable]

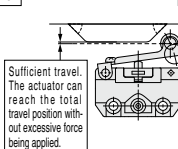
Max. travel



Over travel. Excessive force is applied due to the maximum travel position being exceeded.

[Acceptable]

Max. travel



Sufficient travel. The actuator can reach the total travel position without excessive force being applied.

- Be sure to always operate push button type, twist selector type, and toggle lever type mechanical valves with your finger.

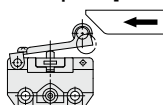
The use of tools such as hammers and equipment such as cylinders and cams to operate the product can damage the actuator and the valve body.

Operation

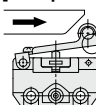
Warning

- Operate the roller lever type from the direction shown below. In cases where the dog goes over the actuator, select the one way roller lever type or the roller plunger type.

[Not acceptable]



[Acceptable]



- As the VZM and VFM series are pilot operated mechanical valves, when primary pressure is no longer being supplied due to the current operating state, the built-in spring will return the main valve to the non-operating state position. For this reason, when the supply of primary pressure is resumed, in the times it takes for the pilot pressure to be recovered, there may be some instantaneous output from 1 → 2 (P → B).

Caution

- If the operating condition is maintained for long periods of time, it may take some time for the valve to restart due to the adherence of the seals and there might be a delay for recovery.

Air Supply

Warning

- Operable fluid is either air or inert gas only. It cannot be used for corrosive gas and fluid.

Caution

- Grease is used for the inside of the valves. Grease may enter into the outlet port of the valve.

Operating Environment

Warning

- Do not operate it in an area in which fluids such as oil, coolant, or water splash on it or dust comes in contact with it.

Because it does not have a waterproof or dustproof construction, fluids or dust could enter the valve, leading to malfunction. Therefore, take measures such as providing a protective cover to prevent direct exposure.

- Do not expose the product to direct sunlight for an extended period of time.

Maintenance

Warning

- Perform inspections on a regular basis as necessary, such as at the beginning of an operation, to make sure that the mechanical valve operates properly.

- Do not disassemble, modify or repair the product.

This may lead to malfunction of equipment, injury and equipment damage. Please contact SMC for repairs and maintenance of the product.

For specific product precautions of the VM100/200 series, refer to pages 1435 to 1438.



VM Series

Specific Product Precautions 3

Be sure to read this before handling the products.

Refer to page 8 for safety instructions and pages 9 to 15 for 3/4/5 port solenoid valve precautions.

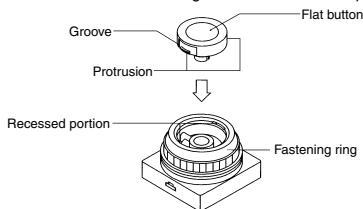
How to Change the Buttons

⚠ Caution

Replace the button in the following manner to change color of the button.

1. Push button (Flush type)

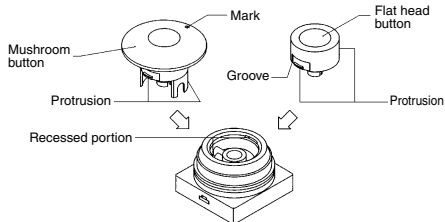
- Installation Of the four colors, red, green, black, and yellow, select and align the protruding portion of the button with the recessed portion of the body and push in.
- Removal Remove the fastening ring and insert the tip of a small flat screwdriver into the groove of the button to pry it up.



2. Push button (Mushroom and extended types)

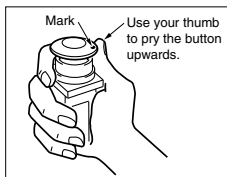
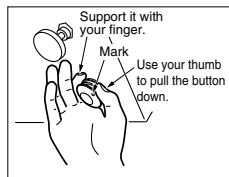
At the time of shipment, only 1 button of the color that you specified is attached to the body.

	Mushroom type	Extended type
Mounting	Align the protruding portion of the button with the recessed portion of the body and push in. (Use the mark on the button as a reference to align the protruding part.)	Align the protruding portion of the button with the recessed portion of the body and push in.
Removal	Placing your finger under the collar of the button on the side of the mark, tilt it upward.	Remove the fastening ring and insert the tip of a small flat screwdriver into the groove of the button to pry it up.



How to remove a mushroom button

How to remove at panel mount



How to Change the Buttons

⚠ Caution

Replacement Parts

1. Use the part numbers listed below to order individual mushroom, extended, or flush type buttons.

Color	Mushroom type button	Extended type button	Flush type button
Red	3402186R	3402187R	3402188R
Black	3402186B	3402187B	3402188B
Green	3402186G	3402187G	3402188G
Yellow	3402186Y	3402187Y	3402188Y

2. To order single fastening ring, use the part number below.

Fastening ring: 3402184

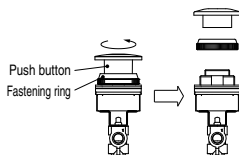
3. To order a single push button for VM1000 series and a single cover use the part number below.

Color	Push button	Cover for push button
Red	3410701-R	3410703 (White only)
Black	3410701-B	
Green	3410701-G	

X207, X219A Series How to Mount Panel

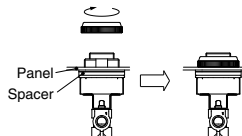
[Task 1] Removal of the push button and fastening ring

Remove them from the body turning them counterclockwise in the order of the pushbutton and fastening ring.



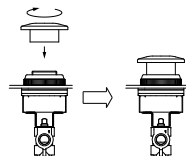
[Task 2] Mounting the valve to the panel

Insert the valve to the panel and fix it with a fastening ring. Remove three spacers attached to the valve depending on the panel thickness.



[Task 3] Mounting the push button

Tighten the push button clockwise by hand and further tighten it until load is applied.



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