2/3-Port Mechanical Valve with One-touch Fitting

New

RoHS

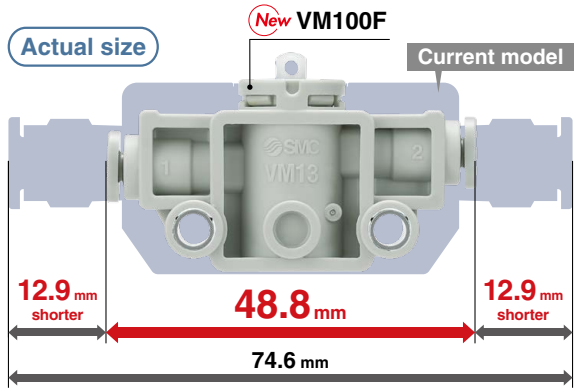
Built-in One-touch fitting reduced installation space and less piping work

Space saving

Built-in One-touch fitting

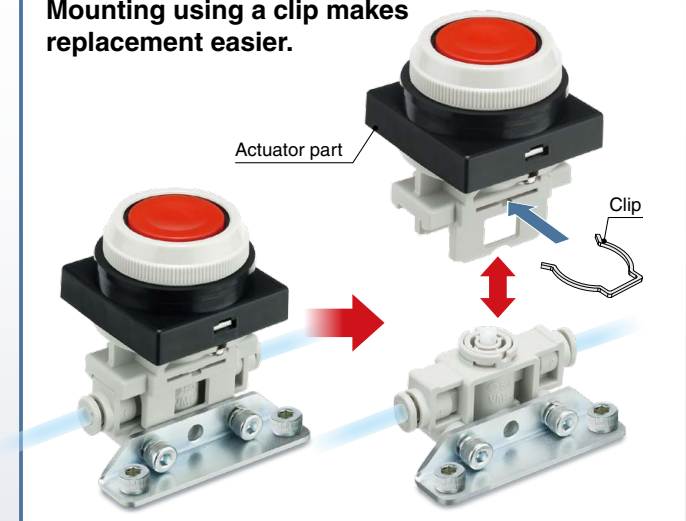
Approx. 35% reduction
(25.8 mm shorter)

48.8 mm (VM131F-06-00) ← 74.6 mm (VM131-01-00A + KQ2H06-01S)



Less man-hours replacing the actuator

Mounting using a clip makes replacement easier.



Lightweight

With resin body material

80% reduction (48 g lighter)

12 g (Resin body: VM131F-06-00) ← 60 g (Metal body: VM131-01-00A)



Variations

	Applicable tubing O.D.	
	Metric size	Inch size
Side ported 	ø3.2 ø4 ø6	ø1/8" ø5/32" ø1/4"
Bottom ported 	ø3.2 ø4	ø1/8" ø5/32"

VM100F Series

Actuator type	
	Mechanical operation: 5 types
	Manual operation: 7 types

SMC

CAT.ES12-9A

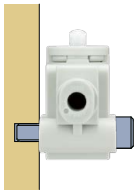
2/3-Port Mechanical Valve with One-touch Fitting *VM100F Series*

Mounting

Bracket mounting



Side mounting



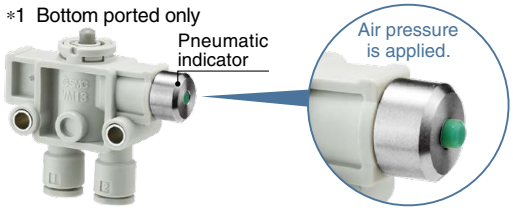
Panel mounting



With miniature indicator*1

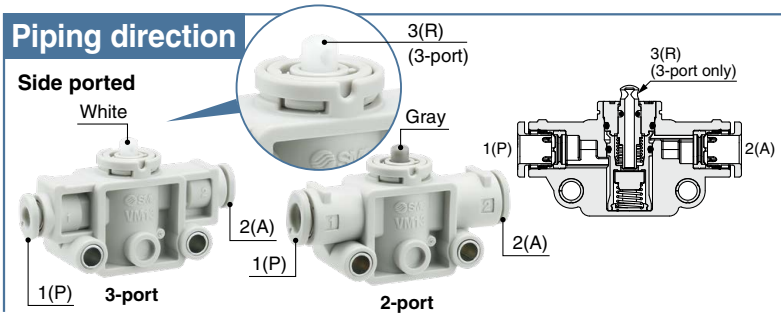
Possible to check if air pressure is applied

*1 Bottom ported only

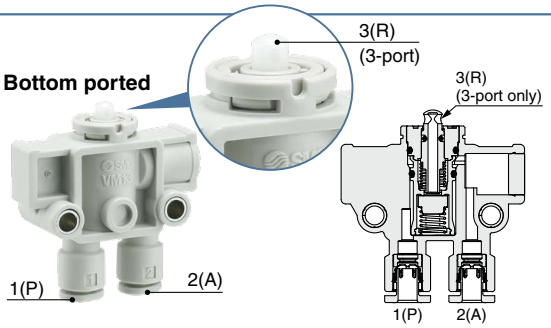


Piping direction

Side ported



Bottom ported



Mounting interchangeable with the conventional model

Mounting pitch and height are the same as the current model

Available in vacuum applications

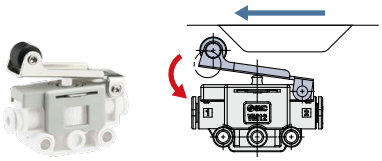
–100 kPa to 0.7 MPa

Actuator Variations

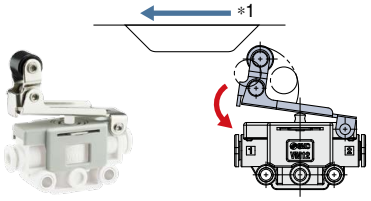
*2 It is possible to change the actuator assembly and mount to basic model.

Mechanical Operation

Roller lever *2

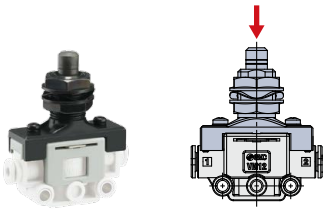


One way roller lever *2

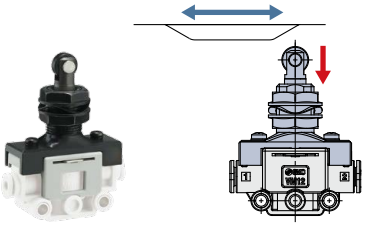


*1 If operated (by cam or dog) in the opposite direction, the valve will not be opened.

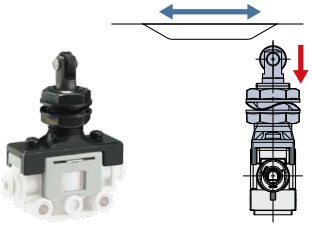
Straight plunger *2



Roller plunger *2

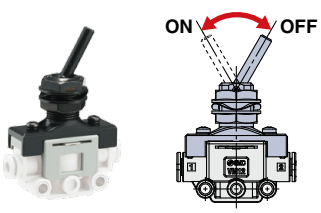


Cross roller plunger *2

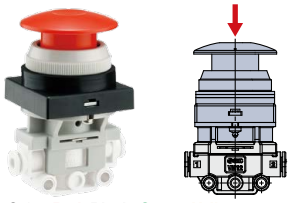


Manual Operation

Toggle lever *2

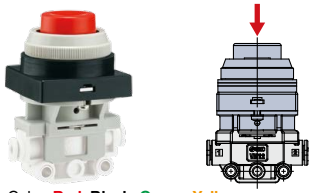


Push button (Mushroom) *2



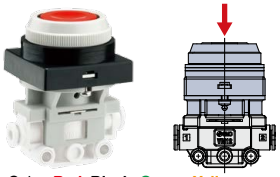
Color: **Red**, **Black**, **Green**, **Yellow**

Push button (Extended) *2



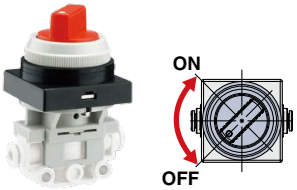
Color: **Red**, **Black**, **Green**, **Yellow**

Push button (Flush) *2



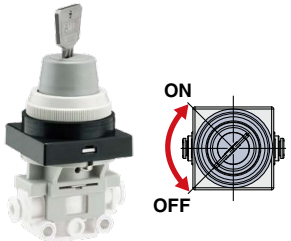
Color: **Red**, **Black**, **Green**, **Yellow**

Twist selector (2-position) *2

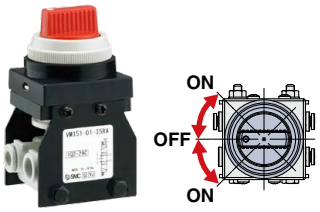


Color: **Red**, **Black**, **Green**, **Yellow**

Key selector (2-position) *2



Twist selector (3-position)



Color: **Red**, **Black**, **Green**, **Yellow**

4 colors available for buttons



SMC

2/3-Port Mechanical Valve with One-touch Fitting

VM100F Series

RoHS

Specifications

Piping	Side ported	Bottom ported
Fluid	Air/Inert gas	
Operating pressure range	−100 kPa to 0.7 MPa	
Ambient and fluid temperatures	−5 to 60°C (No freezing)	
Applicable tubing material	Nylon, Soft nylon, Polyurethane*3, FEP, PFA	
Lubrication*1	Not required	
Weight (Basic model)	12 g	15 g
Bracket part number*2	VM1-B	—

*1 Use turbine oil Class 1 ISO VG32, if lubricated.
*2 The bracket can only be used for side mounting of the side ported type.
*3 Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (For details, refer to the **Web Catalog**.)

Flow Rate and Sonic Conductance

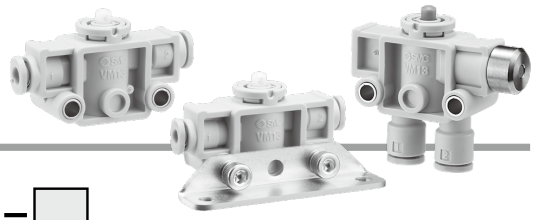
Piping		Side ported						Bottom ported			
Tubing O.D.	Metric size	ø3.2		ø4		ø6		ø3.2		ø4	
	Inch size	ø1/8"		ø5/32"		ø1/4"		ø1/8"		ø5/32"	
Flow rate characteristics		1(P) ⇒ 2(A)	2(A) ⇒ 3(R)	1(P) ⇒ 2(A)	2(A) ⇒ 3(R)	1(P) ⇒ 2(A)	2(A) ⇒ 3(R)	1(P) ⇒ 2(A)	2(A) ⇒ 3(R)	1(P) ⇒ 2(A)	2(A) ⇒ 3(R)
C values: Sonic conductance $dm^3/(s \cdot bar)$		0.35	0.35	0.4	0.4	0.45	0.4	0.35	0.35	0.35	0.35
b values: Critical pressure ratio		0.09	0.06	0.09	0.06	0.1	0.06	0.1	0.06	0.15	0.06
Cv factor		0.07	0.07	0.08	0.07	0.1	0.07	0.07	0.07	0.08	0.07

Model

Model	Piping	Applicable tubing O.D.					
		Metric size			Inch size		
		3.2	4	6	1/8"	5/32"	1/4"
VM1□$^{0}_{1}$F-□-□□□	Side ported	●	●	●	●	●	●
VM1□$^{2}_{3}$F-□-□□□	Bottom ported	●	●	—	●	●	—

	Piping direction		Side ported		Bottom ported		Actuator	
	Number of ports		**2-port**	**3-port**	**2-port**	**3-port**	Actuator part number	Additional weight for actuator
Mechanical operation	Basic model		VM120F-□-00	VM130F-□-00	VM122F-□-00	VM132F-□-00	—	—
			VM121F-□-00	VM131F-□-00	VM123F-□-00	VM133F-□-00		
	Roller lever	Polyacetal roller	VM121F-□-01	VM131F-□-01	VM123F-□-01	VM133F-□-01	VM-01J	14 g
		Hard steel roller	VM121F-□-01S	VM131F-□-01S	VM123F-□-01S	VM133F-□-01S	VM-01JS	19 g
	One way roller lever	Polyacetal roller	VM121F-□-02	VM131F-□-02	VM123F-□-02	VM133F-□-02	VM-02J	18 g
		Hard steel roller	VM121F-□-02S	VM131F-□-02S	VM123F-□-02S	VM133F-□-02S	VM-02JS	23 g
	Straight plunger		VM121F-□-05	VM131F-□-05	VM123F-□-05	VM133F-□-05	VM-05J	47 g
	Roller plunger	Polyacetal roller	VM121F-□-06	VM131F-□-06	VM123F-□-06	VM133F-□-06	VM-06J	47 g
		Hard steel roller	VM121F-□-06S	VM131F-□-06S	VM123F-□-06S	VM133F-□-06S	VM-06JS	49 g
	Cross roller plunger	Polyacetal roller	VM121F-□-07	VM131F-□-07	VM123F-□-07	VM133F-□-07	VM-07J	47 g
		Hard steel roller	VM121F-□-07S	VM131F-□-07S	VM123F-□-07S	VM133F-□-07S	VM-07JS	49 g
Manual operation	Toggle lever		VM121F-□-08	VM131F-□-08	VM123F-□-08	VM133F-□-08	VM-08J	46 g
	Push button (Mushroom)	Red	VM121F-□-30R	VM131F-□-30R	VM123F-□-30R	VM133F-□-30R	VM-30JR	39 g
		Black	VM121F-□-30B	VM131F-□-30B	VM123F-□-30B	VM133F-□-30B	VM-30JB	
		Green	VM121F-□-30G	VM131F-□-30G	VM123F-□-30G	VM133F-□-30G	VM-30JG	
		Yellow	VM121F-□-30Y	VM131F-□-30Y	VM123F-□-30Y	VM133F-□-30Y	VM-30JY	
	Push button (Extended)	Red	VM121F-□-32R	VM131F-□-32R	VM123F-□-32R	VM133F-□-32R	VM-32JR	34 g
		Black	VM121F-□-32B	VM131F-□-32B	VM123F-□-32B	VM133F-□-32B	VM-32JB	
		Green	VM121F-□-32G	VM131F-□-32G	VM123F-□-32G	VM133F-□-32G	VM-32JG	
		Yellow	VM121F-□-32Y	VM131F-□-32Y	VM123F-□-32Y	VM133F-□-32Y	VM-32JY	
	Push button (Flush)	Red	VM121F-□-33R	VM131F-□-33R	VM123F-□-33R	VM133F-□-33R	VM-33JR	33 g
		Black	VM121F-□-33B	VM131F-□-33B	VM123F-□-33B	VM133F-□-33B	VM-33JB	
		Green	VM121F-□-33G	VM131F-□-33G	VM123F-□-33G	VM133F-□-33G	VM-33JG	
		Yellow	VM121F-□-33Y	VM131F-□-33Y	VM123F-□-33Y	VM133F-□-33Y	VM-33JY	
	Twist selector (2-position)	Red	VM121F-□-34R	VM131F-□-34R	VM123F-□-34R	VM133F-□-34R	VM-34JR	39 g
		Black	VM121F-□-34B	VM131F-□-34B	VM123F-□-34B	VM133F-□-34B	VM-34JB	
		Green	VM121F-□-34G	VM131F-□-34G	VM123F-□-34G	VM133F-□-34G	VM-34JG	
		Yellow	VM121F-□-34Y	VM131F-□-34Y	VM123F-□-34Y	VM133F-□-34Y	VM-34JY	
	Key selector (2-position)		VM121F-□-36	VM131F-□-36	VM123F-□-36	VM133F-□-36	VM-36J	57 g
			3-port	**5-port**	**3-port**	**5-port**		
	Twist selector (3-position)	Red	VM131F-□-35R	VM151F-□-35R	VM133F-□-35R	VM153F-□-35R	—	126 g (Add to 2 basic model units.)
		Black	VM131F-□-35B	VM151F-□-35B	VM133F-□-35B	VM153F-□-35B		
		Green	VM131F-□-35G	VM151F-□-35G	VM133F-□-35G	VM153F-□-35G		
		Yellow	VM131F-□-35Y	VM151F-□-35Y	VM133F-□-35Y	VM153F-□-35Y		

* It is possible to change the actuator assembly and mount to basic model when an actuator part number is specified in the column.
* For the push button (mushroom), push button (flush), push button (extended) and individual fastening ring replacement, refer to page 16.
* The selector (2-position and 3-position) knob cannot be removed or replaced.
* Color of plunger: Gray (2-port), White (3-port)
* □ indicates the applicable tube outside diameter.



How to Order

VM1 3 1 F – 06 – 30 R □ – □

Number of ports

2	2-port
3	3-port
5	5-port (Twist selector 3-position only)

Piping direction and the height of plunger

0	Side ported	Long (Basic model only)
1		Short
2	Bottom ported	Long (Basic model only)
3		Short

With One-touch fitting

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2	01	ø1/8"
04	ø4	03	ø5/32"
06	ø6	07	ø1/4"

∗ For selecting applicable tubing O.D., refer to the "Model" on page 2.
Metric size and inch size types can be visually identified by color of the release button.
Metric size: Light gray
Inch size: Orange

Actuator type∗1

00	Basic model
01	Roller lever
02	One way roller lever
05	Straight plunger
06	Roller plunger
07	Cross roller plunger
08	Toggle lever
30	Push button (Mushroom)
32	Push button (Extended)
33	Push button (Flush)
34	Twist selector (2-position)
36	Key selector (2-position)
35	Twist selector (3-position)

Suffix for indicator

Nil	None
Z	With miniature indicator

∗ Applicable only to bottom ported

Suffix for actuator∗1

S	Hard steel roller	
R	Red	Color of push button, selector
B	Black	
G	Green	
Y	Yellow	

Bracket option

Nil	None
B	With bracket (included)

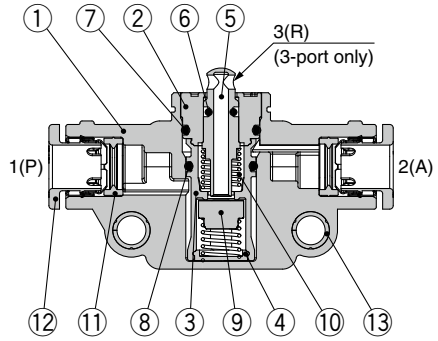
∗ Applicable only to side ported Twist selector (3-position), plunger (straight, roller, cross roller), toggle lever type cannot be mounted. These are only for panel mount type. Refer to page 15 for details.

∗1 **Refer to the table on page 2 for combinations of actuator type and suffix.**

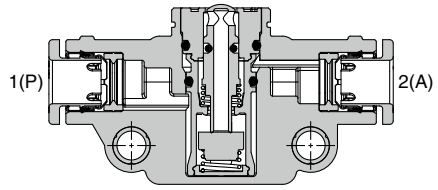
Construction

Side ported

Non-actuated

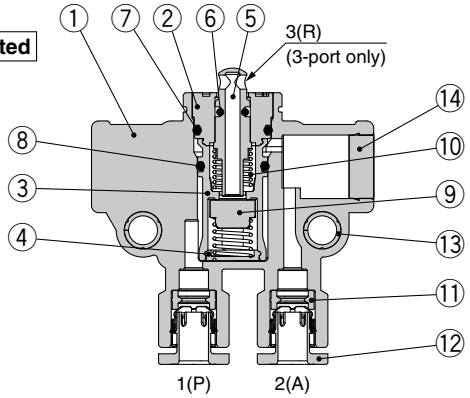


Actuated

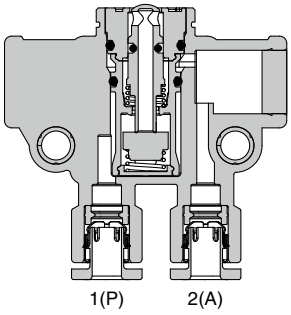


Bottom ported

Non-actuated



Actuated



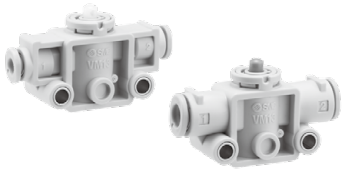
Component Parts

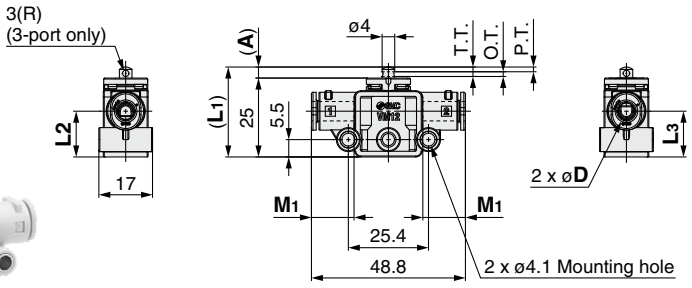
No.	Description	Material	Note	
1	**Valve**	PBT		
2	**Valve sheet A**	PBT		
3	**Valve sheet B**	PBT		
4	**Valve sheet C**	PBT		
5	**Plunger**	POM	White	3-port
			Gray	2-port
6	**O-ring**	NBR		
7	**O-ring**	NBR		

No.	Description	Material	Note
8	**O-ring**	NBR	
9	**Valve**	NBR	
10	**Spring**	Stainless steel	
11	**Seal**	NBR	
12	**Cassette**	—	
13	**Spacer**	Steel	
14	**Plug**	Brass	Electroless nickel plating

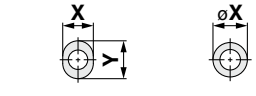
Dimensions / Side Ported

Basic model
VM120F-□-00
VM130F-□-00
VM121F-□-00
VM131F-□-00

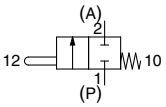




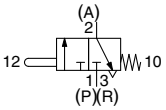
Release button dimensions



Symbol
2-port



3-port



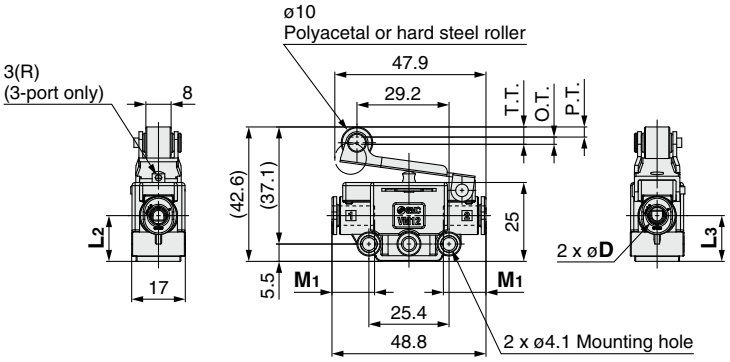
Model	Applicable tubing O.D. ø**D**	Release button dimensions ø**X**(**X**)	**Y**	**A**	**L1**	**L2**	**L3**	**M1**
VM1□0F-23-00	3.2	6.7	9.5	7.5	32.5	13.5	15.5	13.5
VM1□0F-04-00	4	7.7	10.0					
VM1□0F-06-00	6	9.7	12.0			14.5	14.5	
VM1□0F-01-00	1/8"	6.7	9.5			13.5	15.5	
VM1□0F-03-00	5/32"	7.7	10.0					
VM1□0F-07-00	1/4"	10.9	—			14.5	14.5	
VM1□1F-23-00	3.2	6.7	9.5	3.5	28.5	13.5	15.5	
VM1□1F-04-00	4	7.7	10.0					
VM1□1F-06-00	6	9.7	12.0			14.5	14.5	
VM1□1F-01-00	1/8"	6.7	9.5			13.5	15.5	
VM1□1F-03-00	5/32"	7.7	10.0					
VM1□1F-07-00	1/4"	10.9	—			14.5	14.5	

∗1 0.5 MPa supply

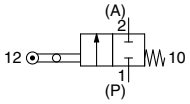
F.O.F.∗1	20 N
P.T.	1.5 mm
O.T.	1.5 mm
T.T.	3 mm

Roller lever
VM121F-□-01
VM131F-□-01
VM121F-□-01S
VM131F-□-01S

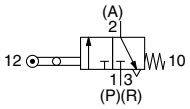




Symbol
2-port



3-port



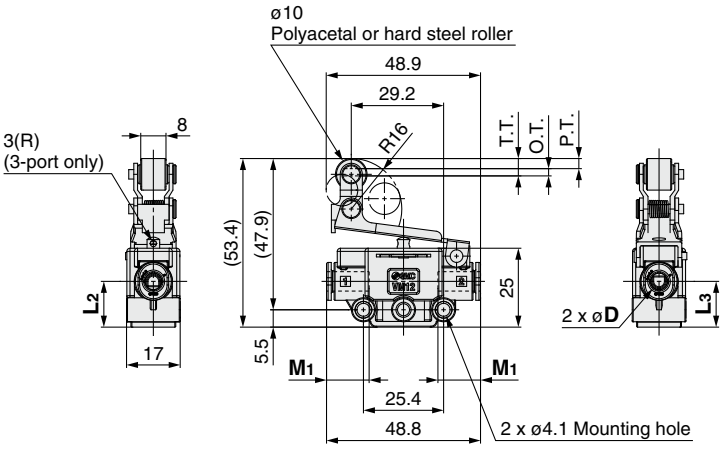
∗1 0.5 MPa supply

F.O.F.∗1	10 N
P.T.	3.2 mm
O.T.	2.3 mm
T.T.	5.5 mm

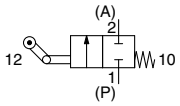
ø**D,** dimensions **L2, L3** and **M1** are the same as basic models.

One way roller lever
VM121F-□-02
VM131F-□-02
VM121F-□-02S
VM131F-□-02S

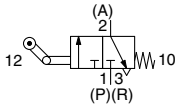




Symbol
2-port



3-port



∗1 0.5 MPa supply

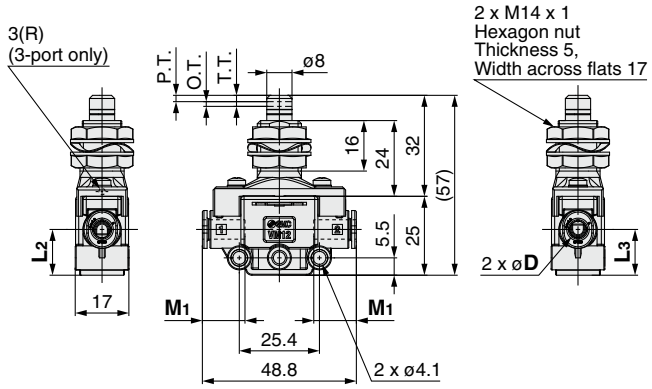
F.O.F.∗1	10 N
P.T.	3.2 mm
O.T.	2.3 mm
T.T.	5.5 mm

ø**D,** dimensions **L2, L3** and **M1** are the same as basic models.

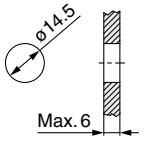
Dimensions / Side Ported

Straight plunger
VM121F-□-05
VM131F-□-05

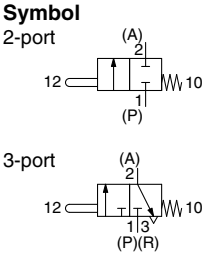




Panel mounting hole



Symbol



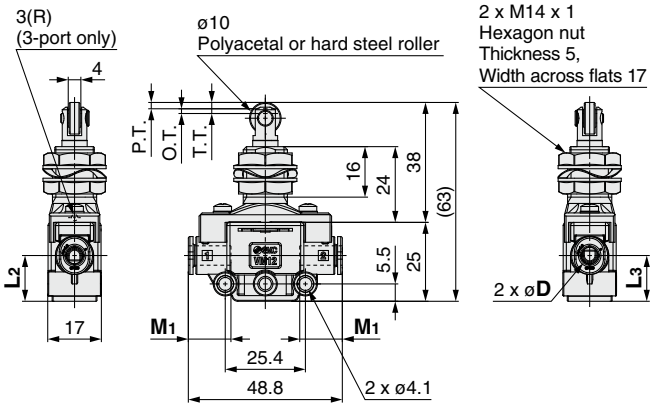
øD, dimensions L2, L3 and M1 are the same as basic models.

∗1 0.5 MPa supply

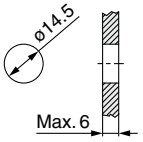
F.O.F.∗1	23 N
P.T.	2 mm
O.T.	1.5 mm
T.T.	3.5 mm

Roller plunger
VM121F-□-06
VM131F-□-06
VM121F-□-06S
VM131F-□-06S

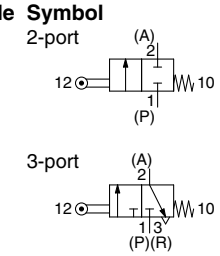




Panel mounting hole



Symbol



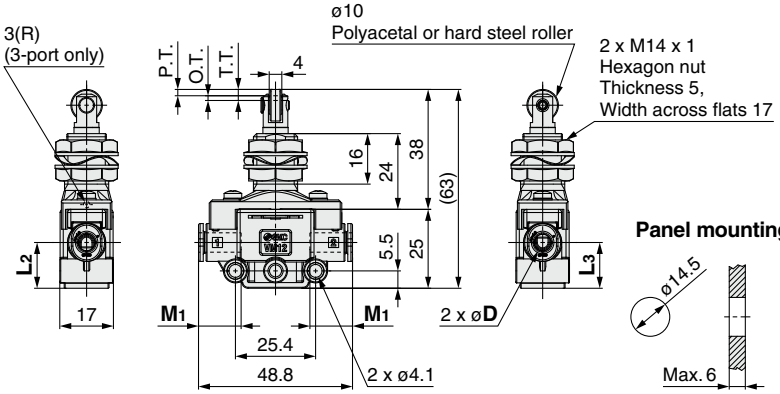
øD, dimensions L2, L3 and M1 are the same as basic models.

∗1 0.5 MPa supply

F.O.F.∗1	23 N
P.T.	2 mm
O.T.	1.5 mm
T.T.	3.5 mm

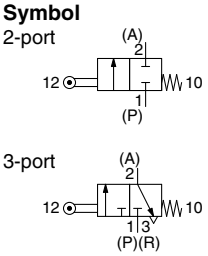
Cross roller plunger
VM121F-□-07
VM131F-□-07
VM121F-□-07S
VM131F-□-07S





Panel mounting hole

Symbol



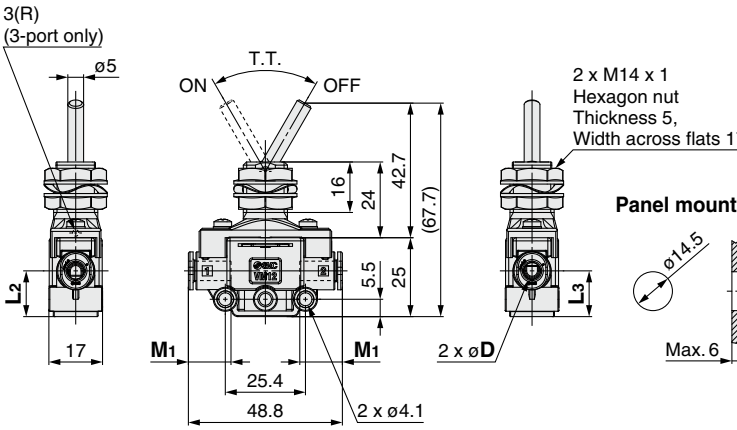
øD, dimensions L2, L3 and M1 are the same as basic models.

∗1 0.5 MPa supply

F.O.F.∗1	23 N
P.T.	2 mm
O.T.	1.5 mm
T.T.	3.5 mm

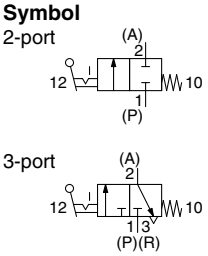
Toggle lever
VM121F-□-08
VM131F-□-08





Panel mounting hole

Symbol



øD, dimensions L2, L3 and M1 are the same as basic models.

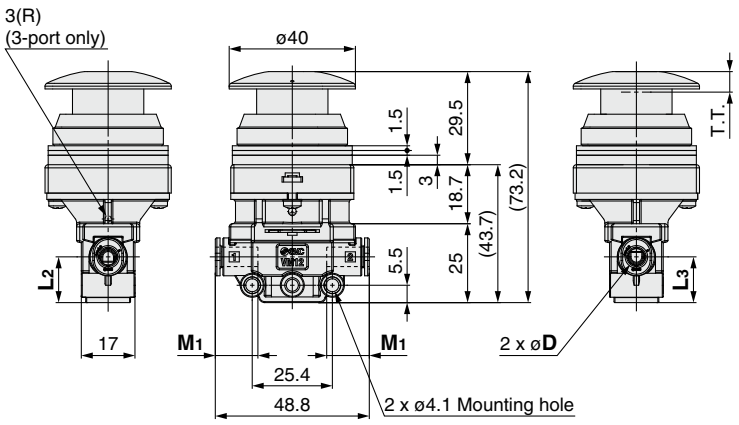
∗1 0.5 MPa supply

F.O.F.∗1	10 N
T.T.	60°

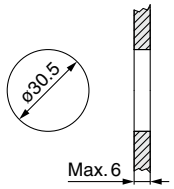
Dimensions / Side Ported

Push button (Mushroom)
VM121F-□-30 (R, B, G, Y)
VM131F-□-30 (R, B, G, Y)

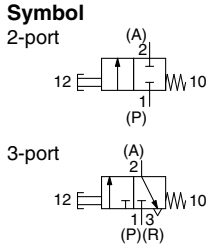




Panel mounting hole



Symbol



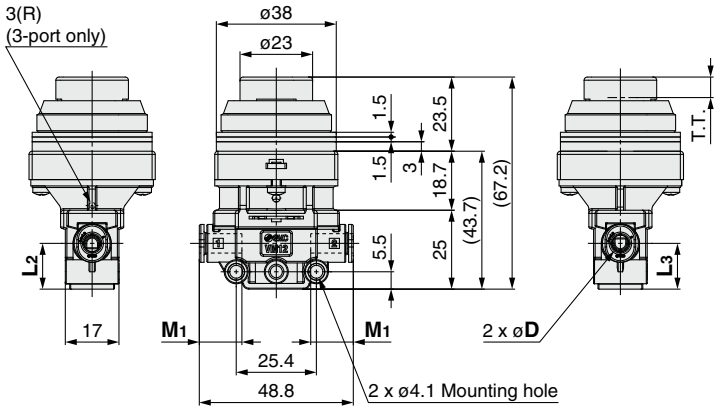
øD, dimensions L2, L3 and M1 are the same as basic models.

∗1 0.5 MPa supply

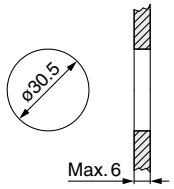
F.O.F.∗1	21 N
T.T.	6.5 mm

Push button (Extended)
VM121F-□-32 (R, B, G, Y)
VM131F-□-32 (R, B, G, Y)

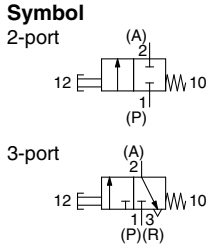




Panel mounting hole



Symbol



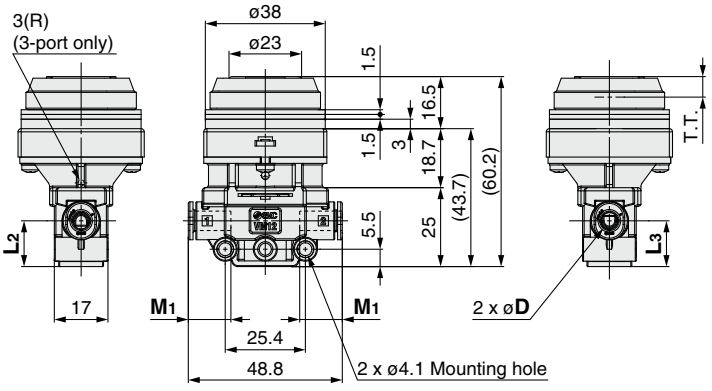
øD, dimensions L2, L3 and M1 are the same as basic models.

∗1 0.5 MPa supply

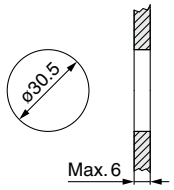
F.O.F.∗1	21 N
T.T.	6.5 mm

Push button (Flush)
VM121F-□-33 (R, B, G, Y)
VM131F-□-33 (R, B, G, Y)

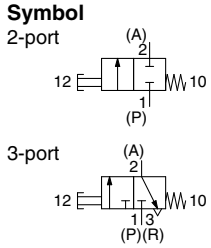




Panel mounting hole



Symbol



øD, dimensions L2, L3 and M1 are the same as basic models.

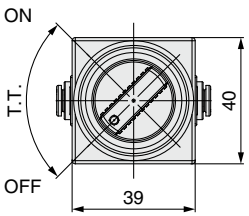
∗1 0.5 MPa supply

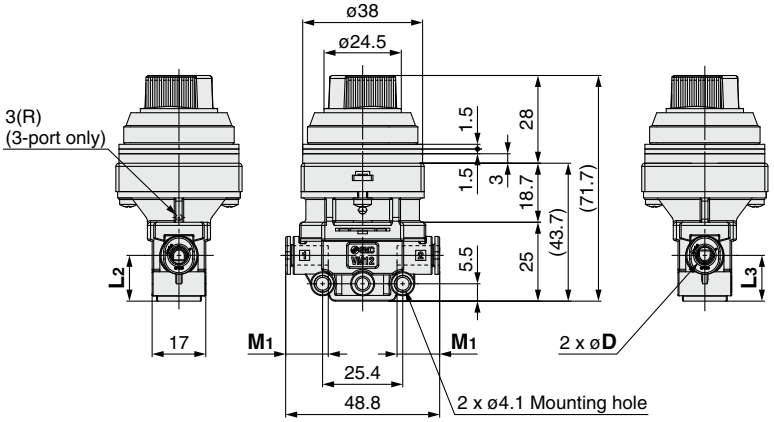
F.O.F.∗1	21 N
T.T.	6.5 mm

Dimensions / Side Ported

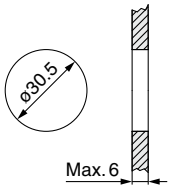
Twist selector (2-position)
VM121F-□-34 (R, B, G, Y)
VM131F-□-34 (R, B, G, Y)



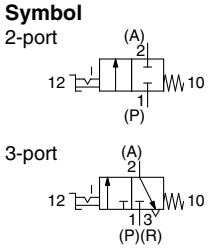




Panel mounting hole



Symbol



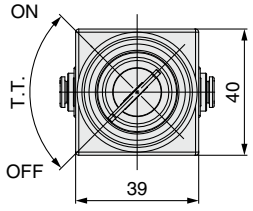
øD, dimensions L2, L3 and M1 are the same as basic models.

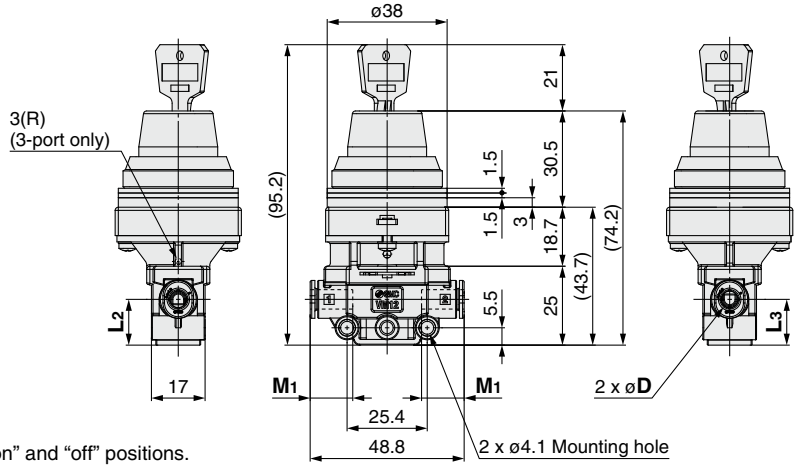
∗1 0.5 MPa supply

F.O.F.∗1	15 N
T.T.	90°

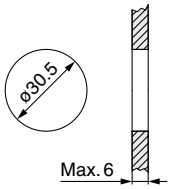
Key selector (2-position)
VM121F-□-36
VM131F-□-36



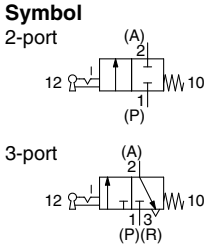




Panel mounting hole



Symbol



A key can be removed at the “on” and “off” positions.
One spare key is included.
øD, dimensions L2, L3 and M1 are the same as basic models.

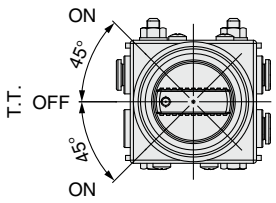
∗1 0.5 MPa supply

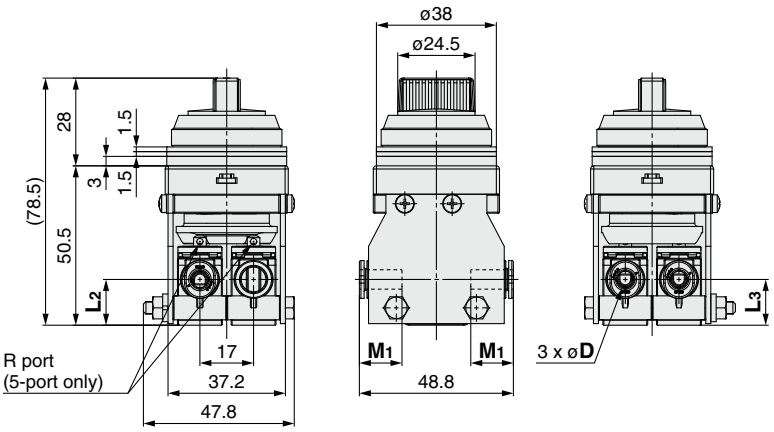
F.O.F.∗1	15 N
T.T.	90°

Dimensions / Side Ported

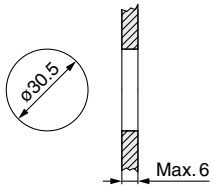
Twist selector (3-position)
VM131F-□-35 (R, B, G, Y)
VM151F-□-35 (R, B, G, Y)





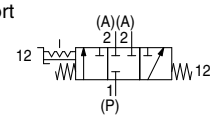


Panel mounting hole

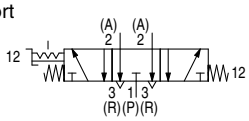


Symbol

3-port



5-port



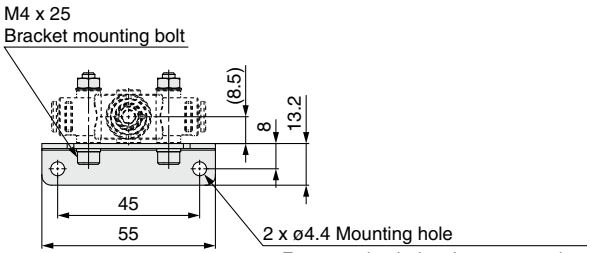
øD, dimensions L2, L3 and M1 are the same as basic models.

∗1 0.5 MPa supply

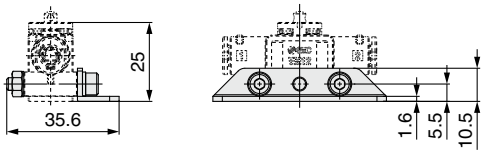
F.O.F.∗1	20 N
T.T.	45°

With bracket
VM120F-□-□□□-B
VM130F-□-□□□-B
VM121F-□-□□□-B
VM131F-□-□□□-B





∗ For mounting bolt, a hexagon socket head cap screw is recommended.



VM1-B

Component parts	Qty.
Bracket	1
Hexagon socket head cap screw M4 x 25	2
Hexagon nut M4	2

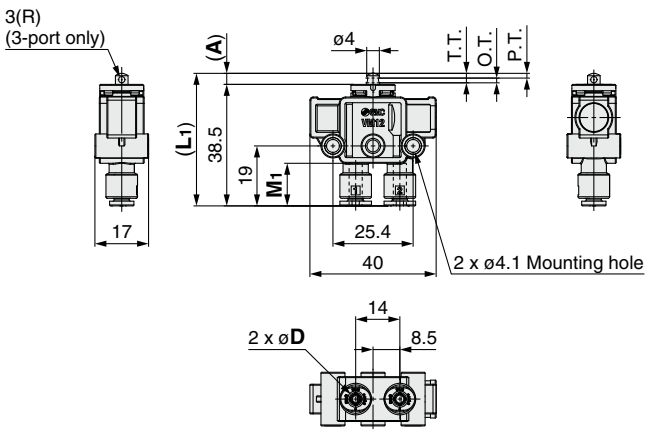
Dimensions / Bottom Ported

Basic model
VM122F-□-00
VM132F-□-00
VM123F-□-00
VM133F-□-00





With miniature indicator

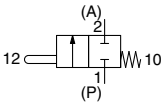


Model	Applicable tubing O.D. ø**D**	Release button dimensions		**A**	**L1**	**M1**
		X	**Y**			
VM1□2F-23-00	3.2	6.7	9.5	7.5	46	13.5
VM1□2F-04-00	4	7.7	10.0			
VM1□2F-01-00	1/8"	6.7	9.5			
VM1□2F-03-00	5/32"	7.7	10.0			
VM1□3F-23-00	3.2	6.7	9.5	3.5	42	
VM1□3F-04-00	4	7.7	10.0			
VM1□3F-01-00	1/8"	6.7	9.5			
VM1□3F-03-00	5/32"	7.7	10.0			

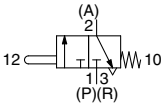
Release button dimensions



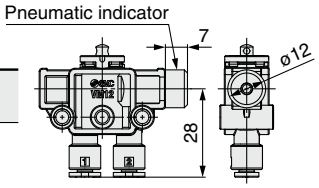
Symbol
2-port



3-port



With miniature indicator

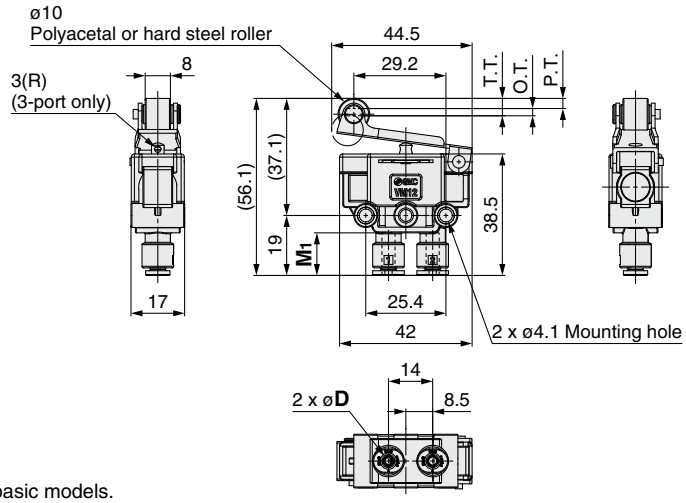


∗1 0.5 MPa supply

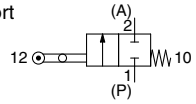
F.O.F.∗1	20 N
P.T.	1.5 mm
O.T.	1.5 mm
T.T.	3 mm

Roller lever
VM123F-□-01
VM133F-□-01
VM123F-□-01S
VM133F-□-01S

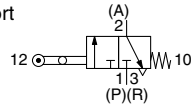




Symbol
2-port



3-port



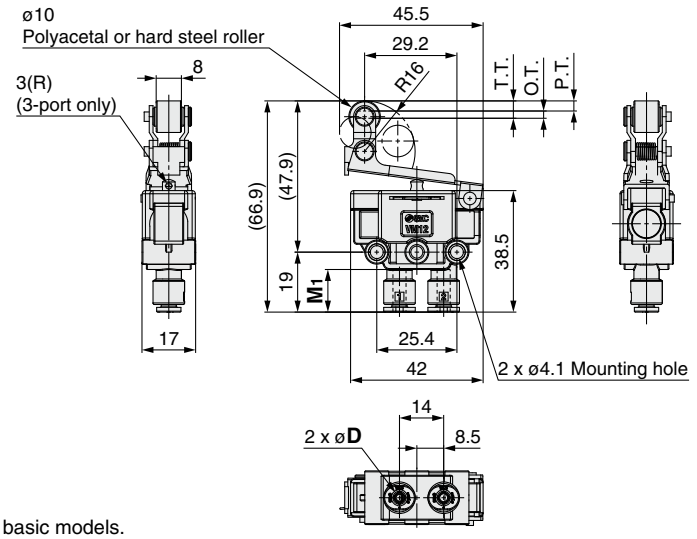
∗1 0.5 MPa supply

F.O.F.∗1	10 N
P.T.	3.2 mm
O.T.	2.3 mm
T.T.	5.5 mm

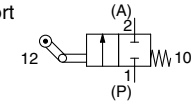
ø**D** and dimension **M1** are the same as basic models.

One way roller lever
VM123F-□-02
VM133F-□-02
VM123F-□-02S
VM133F-□-02S

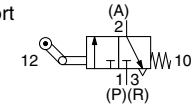




Symbol
2-port



3-port



∗1 0.5 MPa supply

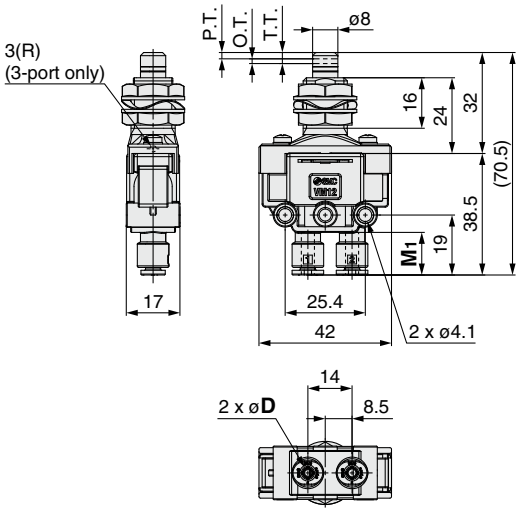
F.O.F.∗1	10 N
P.T.	3.2 mm
O.T.	2.3 mm
T.T.	5.5 mm

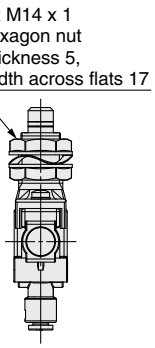
ø**D** and dimension **M1** are the same as basic models.

Dimensions / Bottom Ported

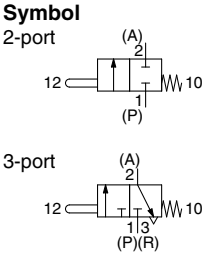
Straight plunger
VM123F-□-05
VM133F-□-05



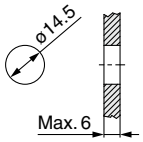




Symbol



Panel mounting hole



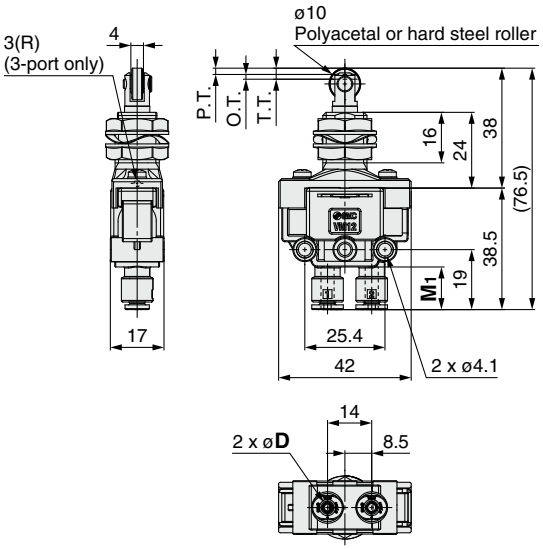
∗1 0.5 MPa supply

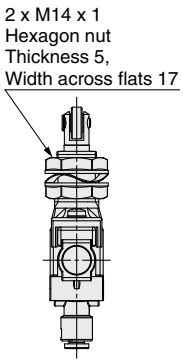
F.O.F.∗1	23 N
P.T.	2 mm
O.T.	1.5 mm
T.T.	3.5 mm

ø**D** and dimension **M1** are the same as basic models.

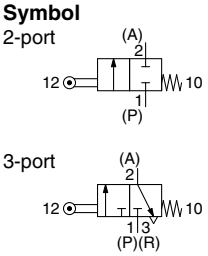
Roller plunger
VM123F-□-06
VM133F-□-06
VM123F-□-06S
VM133F-□-06S



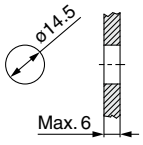




Symbol



Panel mounting hole



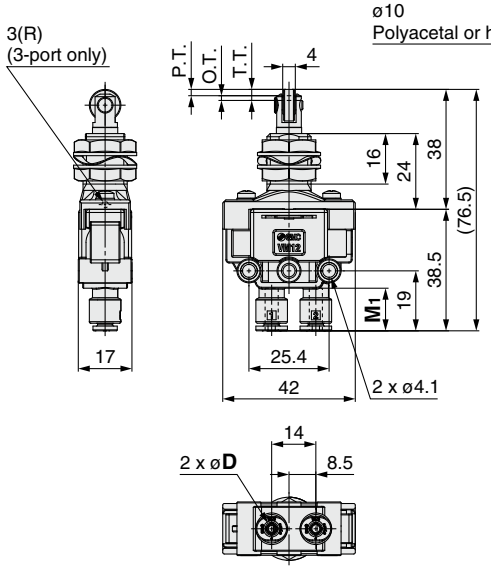
∗1 0.5 MPa supply

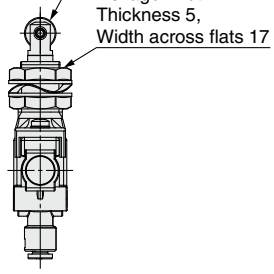
F.O.F.∗1	23 N
P.T.	2 mm
O.T.	1.5 mm
T.T.	3.5 mm

ø**D** and dimension **M1** are the same as basic models.

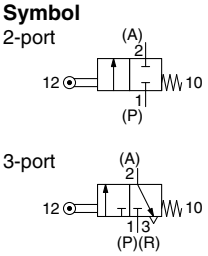
Cross roller plunger
VM123F-□-07
VM133F-□-07
VM123F-□-07S
VM133F-□-07S



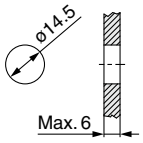




Symbol



Panel mounting hole



∗1 0.5 MPa supply

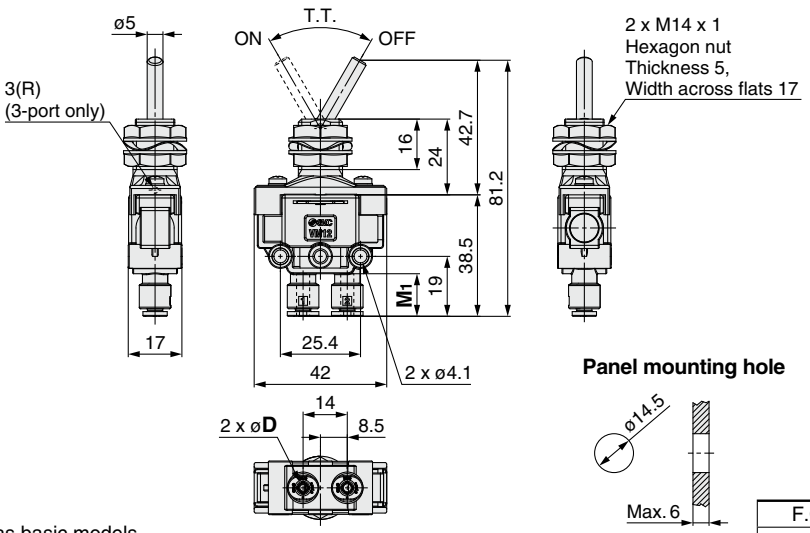
F.O.F.∗1	23 N
P.T.	2 mm
O.T.	1.5 mm
T.T.	3.5 mm

ø**D** and dimension **M1** are the same as basic models.

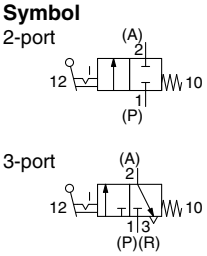
Dimensions / Bottom Ported

Toggle lever
VM123F-□-08
VM133F-□-08





Symbol



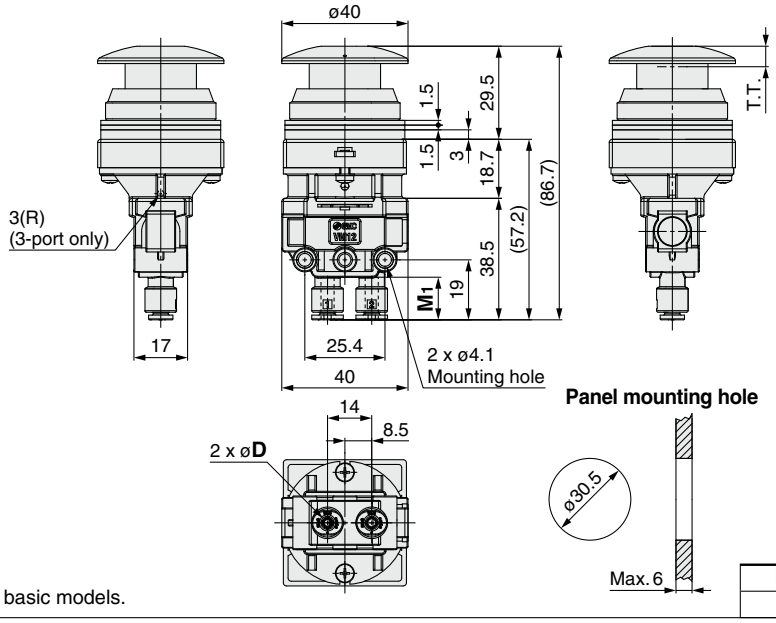
∗1 0.5 MPa supply

F.O.F.∗1	10 N
T.T.	60°

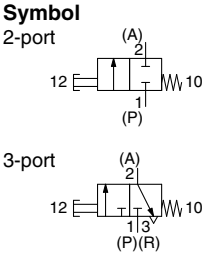
ø**D** and dimension **M1** are the same as basic models.

Push button (Mushroom)
VM123F-□-30 (R, B, G, Y)
VM133F-□-30 (R, B, G, Y)





Symbol



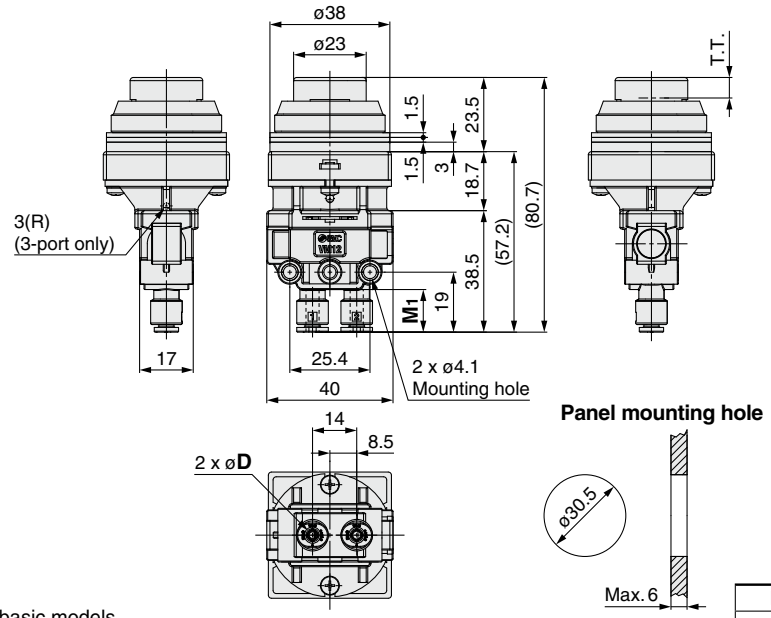
∗1 0.5 MPa supply

F.O.F.∗1	21 N
T.T.	6.5 mm

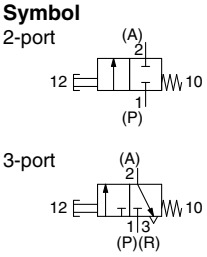
ø**D** and dimension **M1** are the same as basic models.

Push button (Extended)
VM123F-□-32 (R, B, G, Y)
VM133F-□-32 (R, B, G, Y)





Symbol



∗1 0.5 MPa supply

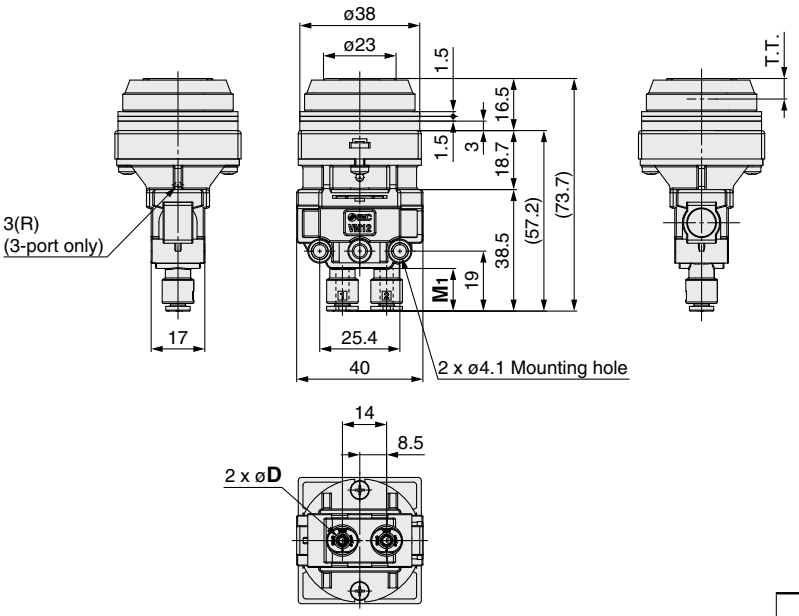
F.O.F.∗1	21 N
T.T.	6.5 mm

ø**D** and dimension **M1** are the same as basic models.

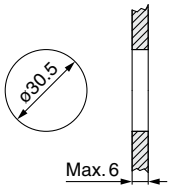
Dimensions / Bottom Ported

Push button (Flush)
VM123F-□-33 (R, B, G, Y)
VM133F-□-33 (R, B, G, Y)

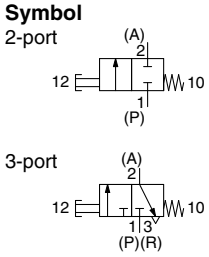




Panel mounting hole



Symbol



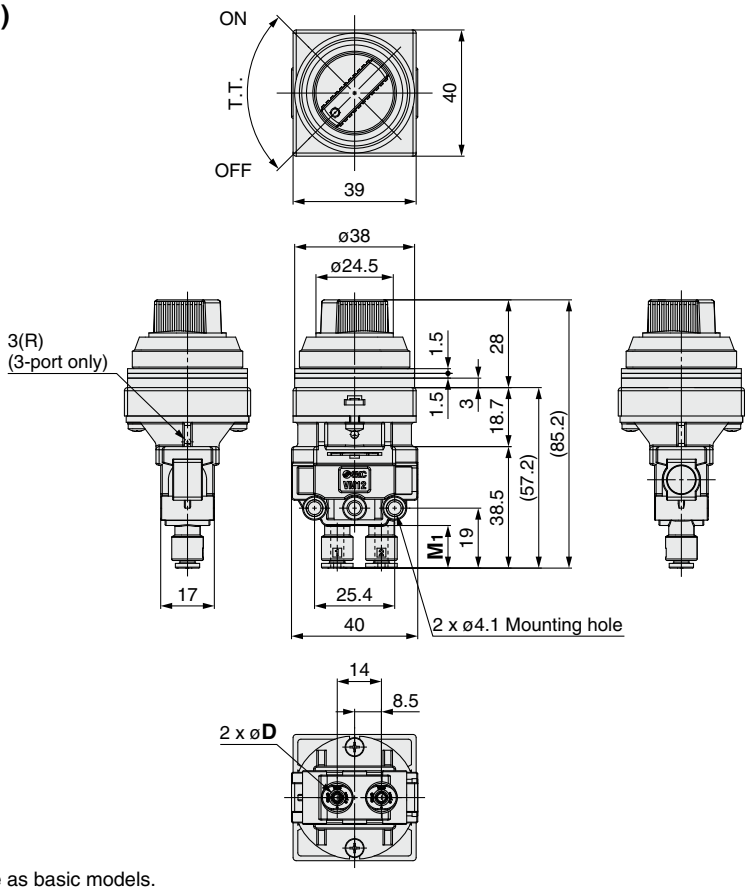
øD and dimension M1 are the same as basic models.

∗1 0.5 MPa supply

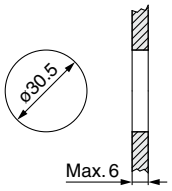
F.O.F.∗1	21 N
T.T.	6.5 mm

Twist selector (2-position)
VM123F-□-34 (R, B, G, Y)
VM133F-□-34 (R, B, G, Y)

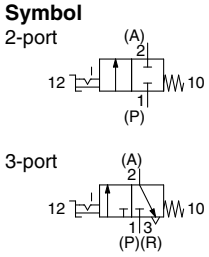




Panel mounting hole



Symbol



øD and dimension M1 are the same as basic models.

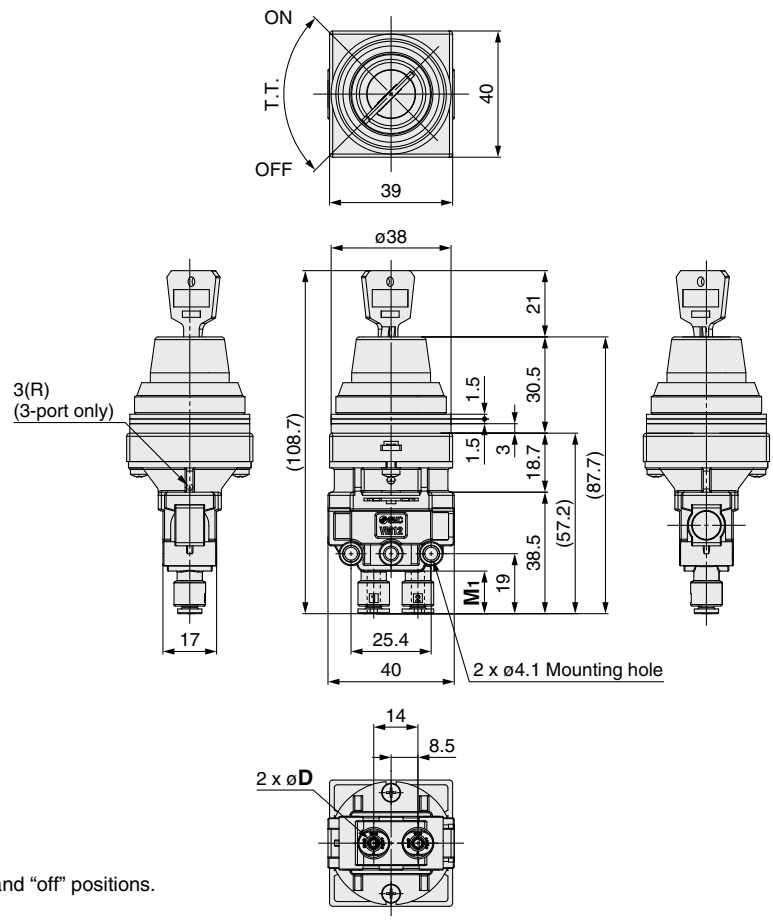
∗1 0.5 MPa supply

F.O.F.∗1	15 N
T.T.	90°

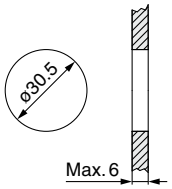
Dimensions / Bottom Ported

Key selector (2-position)
VM123F-□-36
VM133F-□-36



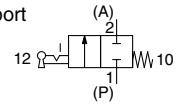


Panel mounting hole

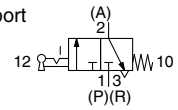


Symbol

2-port



3-port



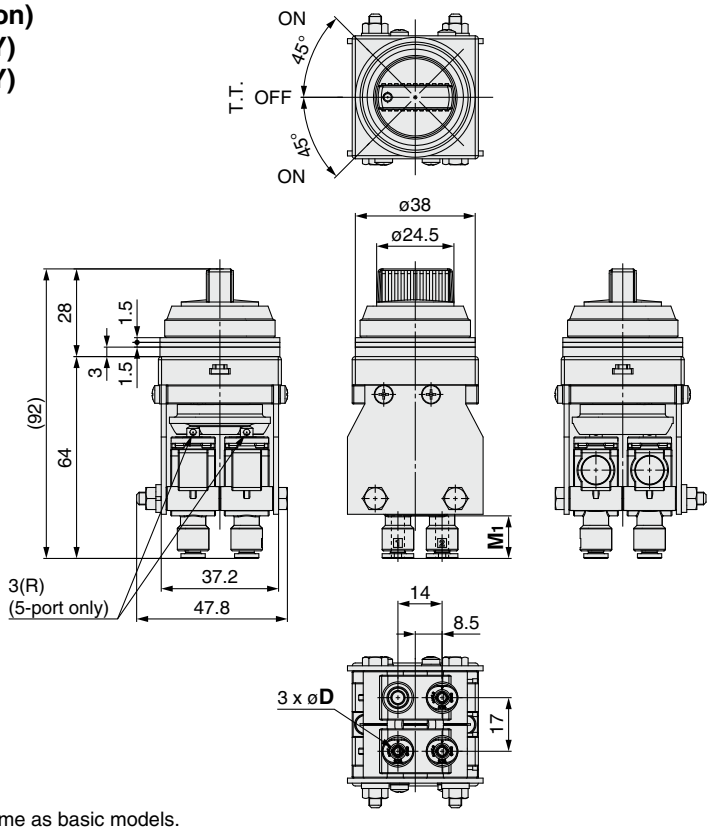
A key can be removed at the “on” and “off” positions.
One spare key is included.
ø**D** and dimension **M1** are the same as basic models.

∗1 0.5 MPa supply

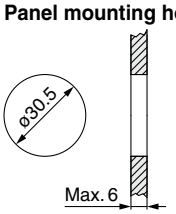
F.O.F.∗1	15 N
T.T.	90°

Twist selector (3-position)
VM133F-□-35 (R, B, G, Y)
VM153F-□-35 (R, B, G, Y)



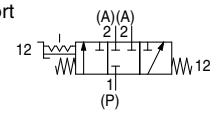


Panel mounting hole

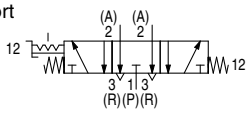


Symbol

3-port



5-port



ø**D** and dimension **M1** are the same as basic models.

∗1 0.5 MPa supply

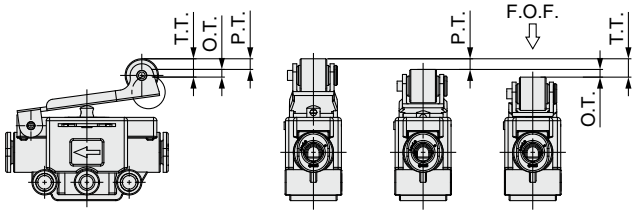
F.O.F.∗1	20 N
T.T.	45°

VM100F Series
Specific Product Precautions 1

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For 3/4/5-port solenoid valve precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: http://www.smcworld.com

Definition of Symbol

The abbreviations F.O.F. / P.T. / O.T. / T.T. shown in this catalog are detailed below.



- **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 the VM100F are poppet type valves, fluid flows backward when the pressure on port 2 (A) rises.

Since the valves are subject to air leakage, they cannot be used for applications such as 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. When installing the mechanical operation type mechanical valves, adjust the position so that the valves do not operate over the operating limit range.

Operating over the limit could damage the mechanical valve or actuator, and lead to equipment malfunction.

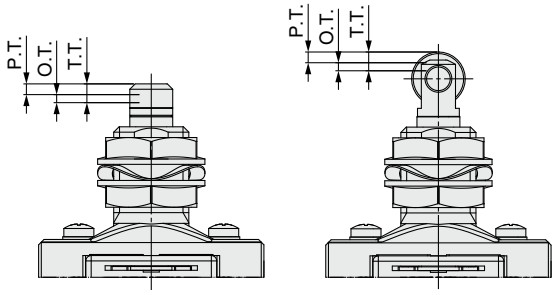
2. P.T. depends on pressure or differences between the individual product specifications. In order to ensure that the valve opens, keep the operating stroke value for the mechanical operation type within the range specified by the following formula.

Operating stroke range = (P.T. + 0.5 x O.T.) to (P.T. + O.T. – 0.1)

Operating Stroke Range

Series	Actuator type	Operating stroke [mm]
VM100F	Basic model	2.2 to 2.9
	Roller lever	4.3 to 5.4
	One way roller lever	4.3 to 5.4
	Straight plunger	2.7 to 3.4
	Roller plunger	2.7 to 3.4
	Cross roller plunger	2.7 to 3.4

For straight and roller plunger types, there is a groove indicating P.T. and T.T. for stroke adjustment.



3. Do not make any alterations to the valve body, such as enlarging the body mounting holes.

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

4. Refer to the Fittings and Tubing Precautions in the catalog available on the SMC website for handling One-touch fittings.

VM100F Series
Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For 3/4/5-port solenoid valve precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: http://www.smcworld.com

Operation

⚠ Warning

1. Operate the manual operation type mechanical valves (such as push button, twist selector and toggle lever types) with your finger.

The use of equipment such as a cylinder, cam or hammer, can result in the actuator and the valve being damaged. Do not operate over the operation limit. If excessive operation force is applied over total travel position, actuator part can get deformed and lead to equipment malfunction.

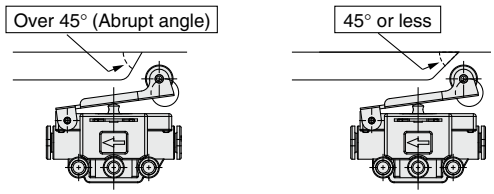
2. When operating the mechanical operation type mechanical valves, select the angle and the maximum speed limit of cam and dog so that valves do not operate over the following maximum values.

If operated over the maximum values, impact force from cam and dog will be applied to the actuator, leading to damage of the actuator or the valve itself.

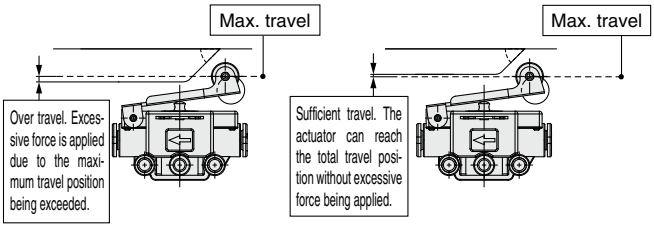
Cam and Dog

Series	Actuator type	Angle limit of cam and dog	Max. speed limit of cam and dog [m/s]
VM100F	Roller lever	30°	0.7
		45°	0.3
	One way roller lever	30°	0.7
		45°	0.3
	Straight plunger	—	0.2
	Roller plunger	30°	0.3
	Cross roller plunger	30°	0.3

[Not acceptable] **[Acceptable]**



[Not acceptable] **[Acceptable]**

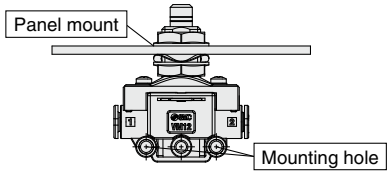


Cam and Dog Material

Roller material	Cam and dog material	Surface finish of cam and dog
Polyacetal	Steel	6.3 z or less
Hard steel	Steel, Resin	25 z or less

3. Mount the plunger (straight, roller, cross roller) and toggle lever type using the panel mount.

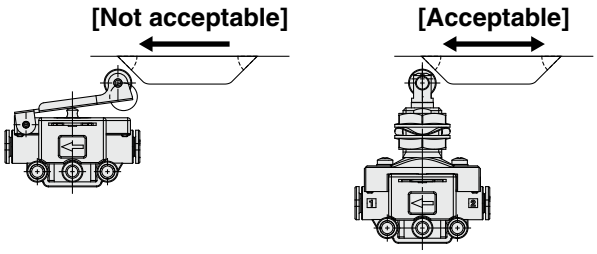
Do not use the mounting hole for side mounting or bracket mounting. If excessive torque is applied to the valve, it can cause breakage.



4. Do not use the roller lever type in the direction shown in the drawings below.

Select the roller plunger type when the dog goes over the actuator.

[Not acceptable] **[Acceptable]**



⚠ Caution

1. 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

1. Operable fluid is either air or inert gas only.

It cannot be used for corrosive gas and fluid.

⚠ Caution

1. Grease is used for the inside of the valves.

Grease may enter into the outlet port of the valve.

2. When using vacuum pressure for the VM100F, supply vacuum pressure to P port.

Operating Environment

⚠ Warning

1. 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.

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

Maintenance

⚠ Warning

1. 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.

2. 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.

VM100F Series
Specific Product Precautions 3

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For 3/4/5-port solenoid valve precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: http://www.smcworld.com

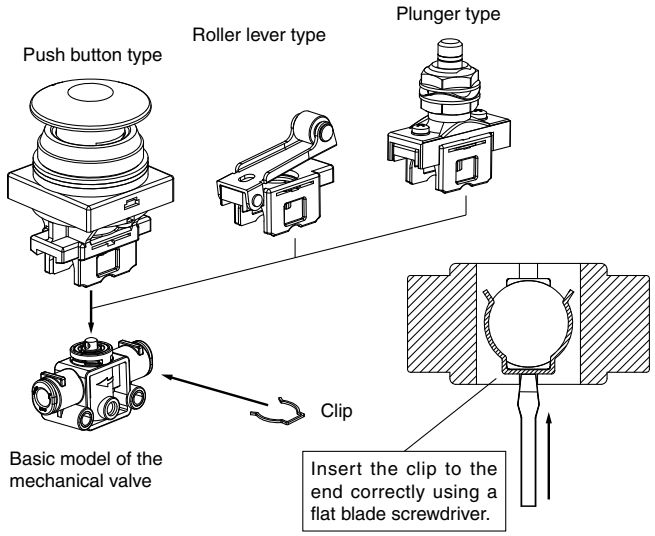
Change of the Actuator and Button

⚠ Caution

Refer to the procedure below for the mounting and removal of the actuator.

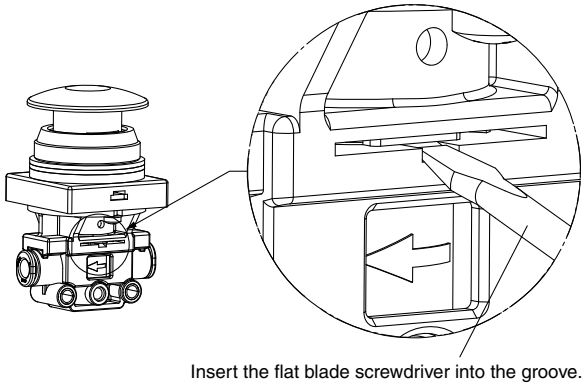
1. Installation

Mount the actuator onto the basic model. Insert the clip into the groove of the body to fix them together. Push the clip to the end using a flat blade screwdriver. After the clip is inserted, check if the clip is fixed correctly. Perform the change according to the procedure indicated in the Operation Manual.



2. Removal

Insert the flat blade screwdriver into the groove on the side of the actuator to remove the clip. Do not reuse the removed clip.



Change of the Button

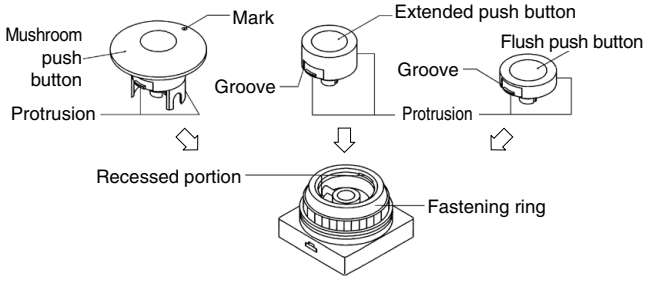
⚠ Caution

Follow the procedure below to mount and remove the button for changing the type and color. One specified button is set when the product is shipped.

Change of the Button

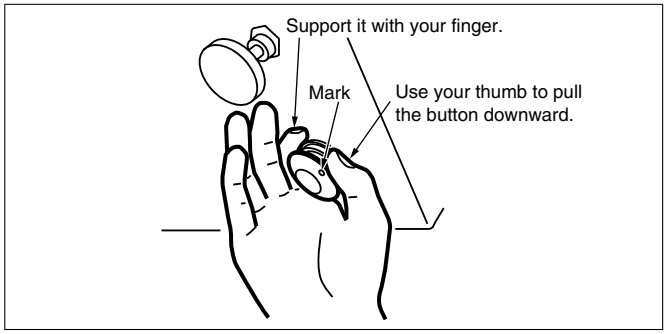
⚠ Caution

	Mushroom push button	Extended/Flush push button
Installation	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 blade screwdriver into the groove of the button to pry it up.

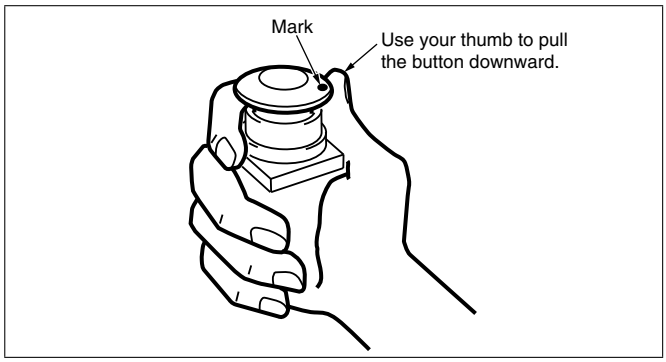


How to remove a mushroom push button

How to remove at panel mount



Removing the valve as a unit



Replacement Parts

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

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

2. Use the part number below to order individual fastening ring.
   Fastening ring: 3402184

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

⚠ Warning

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

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

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

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.