KOGANEI

VALVES GENERAL CATALOG

MANUAL VALVES, MECHANICAL VALVES

INDEX

Features (Diaphragm Type)

● **Reliable operation**
Uses diaphragm construction that enables quick and sharp switching peculiar to this type. The valve seat is also reliable.

● **Trouble free structure**
An extremely simple structure and a poppet-type seat method ensures freedom from galling, even if a certain amount of dust intrudes inside.
Moreover, it will not stick even after being left unused for long periods.

● **Can be used without lubrication.**
No sliding parts, and lubrication is unnecessary, and no breakdown problems due to inadequate lubrication.

● **Any mounting direction is acceptable.**
This structure ensures operations without a hitch, no matter what the mounting direction is.

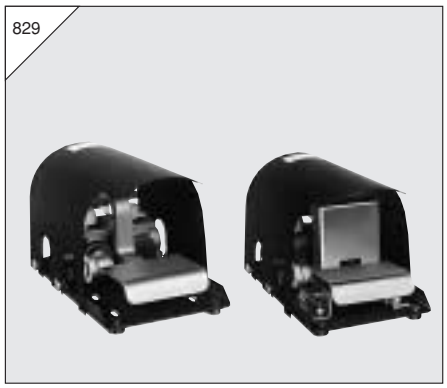
● **Compact and lightweight**
An original compact design, and a light aluminum alloy body.

■ Manual valves (push button type)

● Using nuts enables compact installation on panels (125P, 125HO types).
● Can also hold the pressed-down condition (125HO type).
● A vacuum valve with a non-leakage structure is also available.

Applications
● ON/OFF for pilot air
● Operation for single acting air cylinders and air grippers
● Filling or exhausting of air tank
● ON/OFF for air supply (125HO)
● ON/OFF for air jet and air blowing

■ Foot valves



● A holding mechanism maintains the unit in an operating condition, which can then be released by pushing a foot-operated latch located back of the pedal (250FL, 250-4FL, 25034FL).

Applications
● Operation for double acting air cylinders and air grippers
● ON/OFF for pilot air (Double air-piloted valve)

■ Manual valves (lever-operated type 2-, 3-port)

826

- Using nuts enables compact installation on panels (125V).
- A vacuum valve with a non-leakage structure is also available.

Applications
- ON/OFF for pilot air
- Operation for single acting air cylinders and air gripper
- Filling or exhausting of air tank
- ON/OFF for air supply
- ON/OFF for air jet and air blowing

■ Manual valves (lever-operated type 3-position, 5-port)

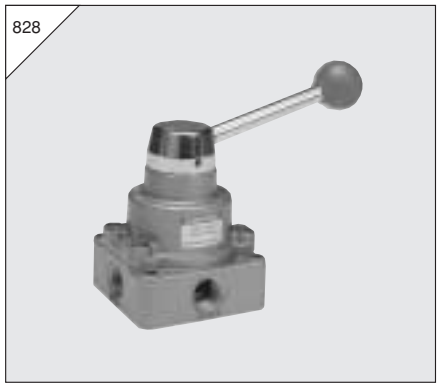
827

- Operation of double acting air cylinders and air grippers (In the neutral position, the air cylinder and air gripper are in the free condition, and can be operated manually).
- A vacuum valve with a non-leakage structure is also available.

Applications
- Switching of pilot air
- Switching of air supply

■ Manual valves

828



- Sliding valve construction, and manually switched 4-port valve.
- Rotary type (swing lever) for reliable switching.

Applications
- For switching air cylinders

■ Mechanical valves (ball-cam type)

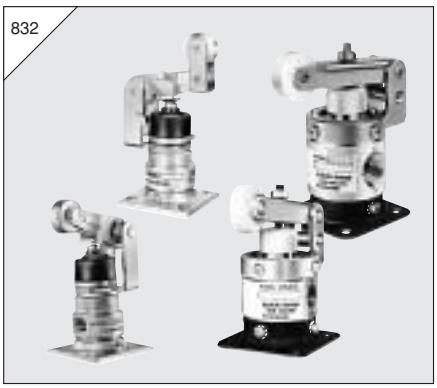
831

- Using nuts enables compact installation on panels (125B).
- A vacuum valve with a non-leakage structure is also available.

Applications
- ON/OFF for pilot air
- Operation for single acting air cylinders and air gripper
- Filling or exhausting of air tank
- ON/OFF for air jet and air blowing

■ Mechanical valves (roller-cam type)

832

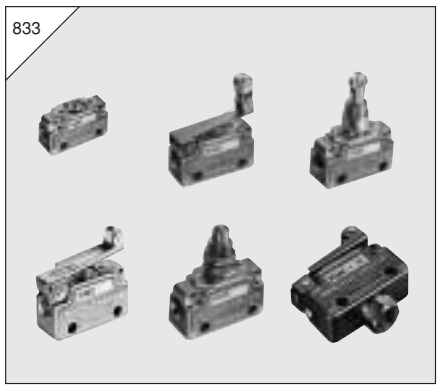


- Sturdy structure capable of withstanding harsh operation.
  Offers smooth pilot air switching.

Applications
- ON/OFF for pilot air
- Operation for single acting air cylinders and air gripper
- Filling or exhausting of air tank
- ON/OFF for air jet

■ Micro valves

833



- Both normally closed and normally open types are available for 2-port and 3-port valves, to ensure applications of using every type of pneumatic signal.
- Virtually no change in operational force from low to high pressure range.
- No neutral position means smooth switching between the A port and R port.

Applications
- Confirms operations in pneumatic control circuits.
- Switches air pressure signals.
- Operation of air cylinder
- Filling or exhausting of air tank

MANUAL VALVES

Push Button Type

Symbols

Spring return				Spring return with holding mechanism			
2-port		3-port		2-port		3-port	
NC (Normally closed)	NO (Normally open)	NC (Normally closed)	NO (Normally open)	NC (Normally closed)	NO (Normally open)	NC (Normally closed)	NO (Normally open)
							
125P-2 250P-2 2503P-2	125P-2-11 250P-2-11 2503P-2-11	125P 250P 2503P	125P-11 250P-11 2503P-11	125HO-2	125HO-2-11	125HO	125HO-11

Specifications

Item \ Operation type	Basic model	Spring return			Spring return with holding mechanism
		125P	250P	2503P	125HO
Port size		Rc1/8	Rc1/4	Rc3/8	Rc1/8
Media		Air			
Operating pressure range MPa {kgf/cm²} [psi.]		0～0.9 {0～9.2} [0～131]			
Proof pressure MPa {kgf/cm²} [psi.]		1.35 {13.8} [196]			
Operating temperature range (atmosphere and media) °C [°F]		5～60 [41～140]			
Effective area mm²		5.5	15		5.5
Flow coefficient Cv		0.27	0.76		0.27
Valve stroke mm [in.]		0.8 [0.031]	1.6 [0.063]		0.8 [0.031]
Lubrication		Not required			
Mass kg [lb.]		0.10 [0.22]	0.20 [0.44]	0.25 [0.55]	0.10 [0.22]
Options ·····Order codes		2-port ·····2 Normally open ·····-11 With lock nuts for panel mounting ···-22	2-port ·····-2 Normally open ·····-11		2-port ·····-2 Normally open ····-11 With lock nuts for panel mounting ····-22

Order Codes

Basic model - Option

Examples:
125P-2-11-22
250P
2503P-11

Basic model

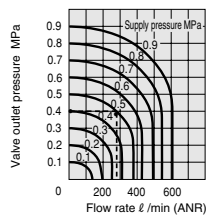
Basic model	Port size
125P	Rc1/8
250P	Rc1/4
2503P	Rc3/8
125HO	Rc1/8 (with holding mechanism)

Option

Code	Specifications
Blank	3-port, normally closed
2	2-port
11	Normally open
22	With lock nuts for panel mounting (125P,125HO only)

Flow Rate

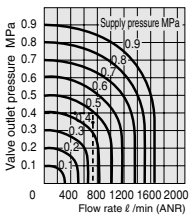
125 series



1MPa = 145psi.
1 ℓ /min = 0.0353ft³/min.

How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 275 ℓ /min [9.71ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

250 series



How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 740 ℓ /min [26.1ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

Button Pushing Down Force

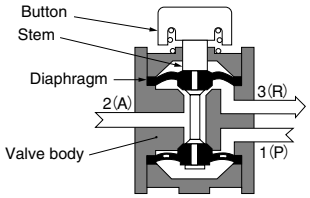
N [lbf.]

Model \ Main pressure MPa [psi.]		0	0.2	0.4	0.6	0.8
125P	Normally closed	14.7 [3.30]	21.6 [4.86]	28.4 [6.38]	36.3 [8.16]	43.2 [9.71]
	Normally open		30.4 [6.83]	44.1 [9.91]	58.8 [13.22]	72.6 [16.32]
125HO	Normally closed	6.9 [1.55]	14.7 [3.30]	21.6 [4.86]	28.4 [6.38]	36.3 [8.16]
	Normally open		21.6 [4.86]	36.3 [8.16]	50.0 [11.24]	58.8 [13.22]
250P 2503P	Normally closed	26.5 [5.96]	44.1 [9.91]	64.7 [14.54]	88.2 [19.83]	116.7 [26.23]
	Normally open		42.2 [9.49]	53.0 [11.91]	65.7 [14.77]	85.3 [19.18]

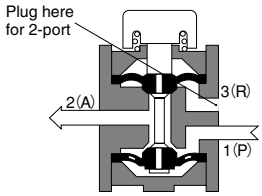
Inner Construction, Major Parts and Materials

125 series

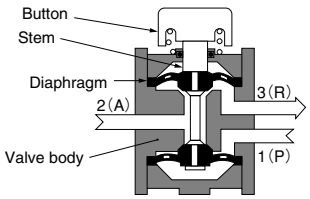
Normal condition

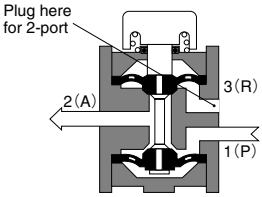


Operating condition



250, 2503 series

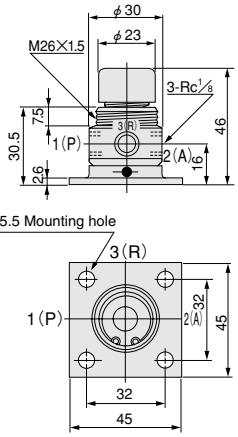




Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Brass
Diaphragm	Synthetic rubber
Button	Nylon (Steel in 125HO)

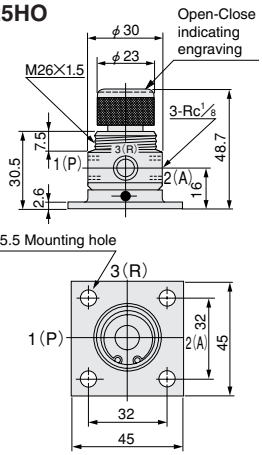
Dimensions (mm)

125P



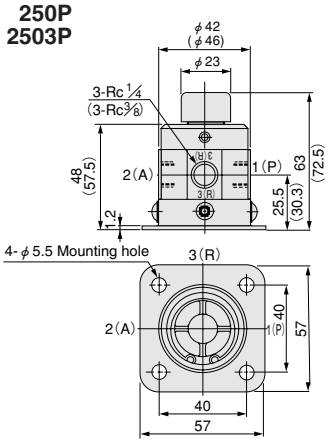
Note: For the normally open type, the exhaust port 3(R) is on the opposite side.

125HO



Note: For the normally open type, the exhaust port 3(R) is on the opposite side.

250P 2503P

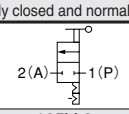
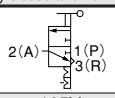


Notes: 1. For the normally open type, the exhaust port 3(R) is on the opposite side.
2. Dimensions in parentheses ( ) are for the 2503P.

MANUAL VALVES

Lever-operated Type 2-, 3-port

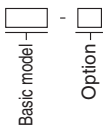
Symbols

2-port	3-port
NC/NO (both normally closed and normally open use)	**NC/NO** (both normally closed and normally open use)
	
125V-2 250V-2 2503V-2	125V 250V 2503V

Specifications

Item \ Basic model	125V	250V	2503V
Port size	Rc1/8	Rc1/4	Rc3/8
Media	Air		
Operating pressure range MPa {kgf/cm²} [psi.]	0～0.9 {0～9.2} [0～131]		
Proof pressure MPa {kgf/cm²} [psi.]	1.35 {13.8} [196]		
Operating temperature range (atmosphere and media) °C [°F]	5～60 [41～140]		
Effective area mm²	5.5	15	
Flow coefficient Cv	0.27	0.76	
Valve stroke mm [in.]	0.8 [0.031]	1.6 [0.063]	
Lubrication	Not required		
Mass kg [lb.]	0.11 [0.24]	0.24 [0.53]	0.29 [0.64]
Options ·····Order codes	2-port ·····-2 With lock nuts for panel mounting ····-22	2-port ·····-2	

Order Codes



Examples:
125V-2-22
250V
2503V-2

Basic model

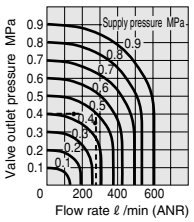
Basic model	Port size
125V	Rc1/8
250V	Rc1/4
2503V	Rc3/8

Option

Code	Specifications
Blank	3-port
2	2-port
22	With lock nuts for panel mounting (125V only)

Flow Rate

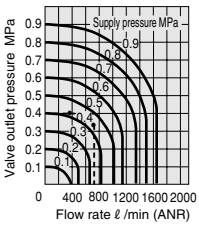
125 series



1MPa = 145psi.
1 ℓ /min = 0.0353ft³/min.

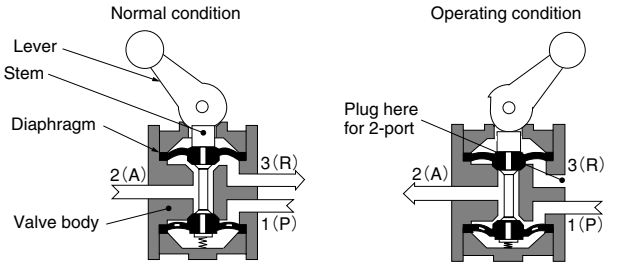
How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 275 ℓ /min [9.71ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

250 series
2503 series



How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 740 ℓ /min [26.1ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

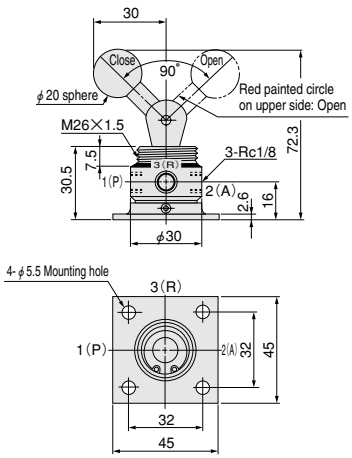
Inner Construction, Major Parts and Materials



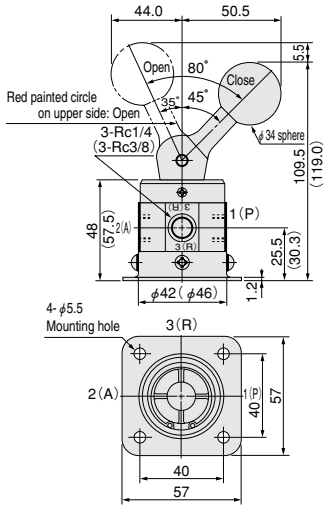
Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Brass
Diaphragm	Synthetic rubber

Dimensions (mm)

125V



250V
2503V



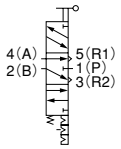
Notes: 1. Although the 125V lever is set on the 1(P) port side in the normal condition, it can be positioned in 360° range.
2. Dimensions in parentheses ( ) are for the 2503V.

MANUAL VALVES

Lever-operated Type 3-position, 5-port

Symbol

5-port (Exhaust center)



250-4H, 2503-4H

Specifications

Item \ Basic model	250-4H	2503-4H
Port size	Rc1/4	Rc3/8
Media	Air	
Operating pressure range MPa {kgf/cm²} [psi.]	0.1～0.9 {0～9.2} [15～131]	
Proof pressure MPa {kgf/cm²} [psi.]	1.35 {13.8} [196]	
Operating temperature range (atmosphere and media) °C [°F]	5～60 [41～140]	
Effective area mm²	15	
Flow coefficient Cv	0.76	
Valve stroke mm [in.]	1.6 [0.063]	
Lubrication	Not required	
Mass kg [lb.]	0.6 [1.3]	

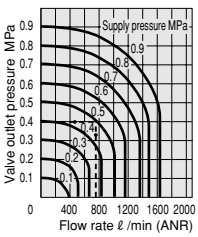
Order Code

Basic model

Basic model	Port size
250-4H	Rc1/4
2503-4H	Rc3/8

Examples:
250-4H
2503-4H

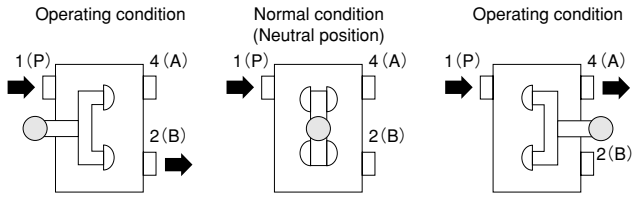
Flow Rate



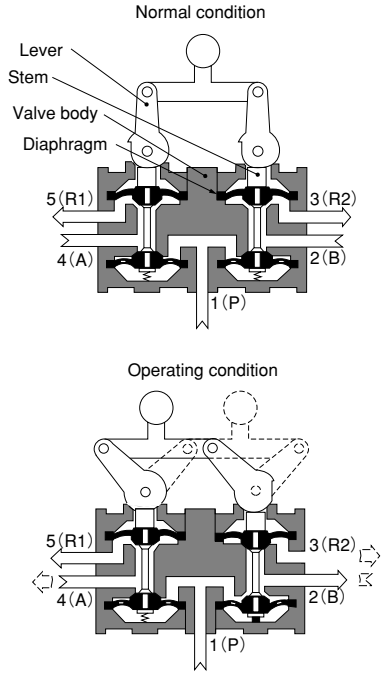
1MPa = 145psi., 1 ℓ /min = 0.0353ft³/min.

How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 740 ℓ /min [26.1ft.³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

Lever Position and Air Path

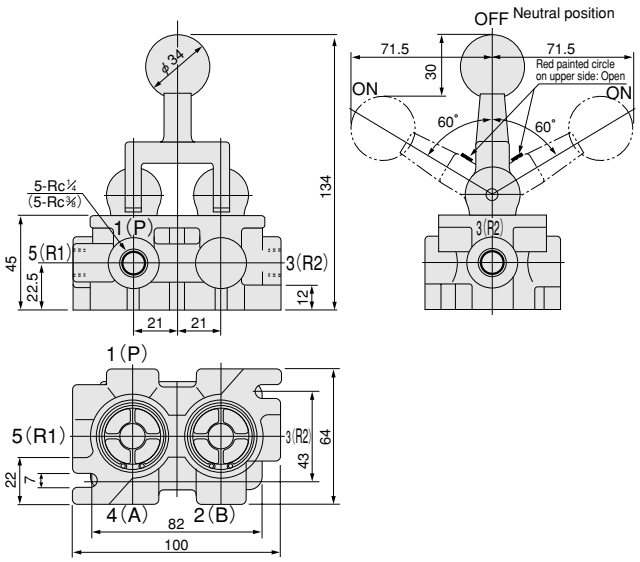


Inner Construction, Major Parts and Materials



Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Brass
Diaphragm	Synthetic rubber

Dimensions (mm)



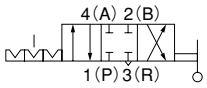
MANUAL VALVES

400HV Series

Features

- Optimum valve for air cylinder operation switching.
- Sliding valve construction, and manually switched 4-port valve.
- Rotary type (swing lever) for reliable switching.

Symbol



Order Codes

400HV - □

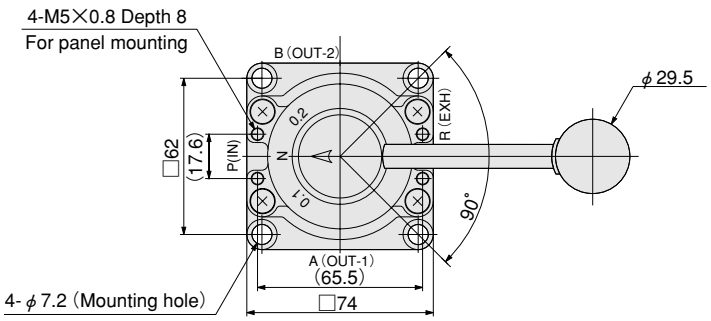
Port size
02—Rc1/4
03—Rc3/8
04—Rc1/2

Manual valve

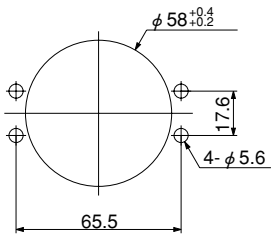
Specifications

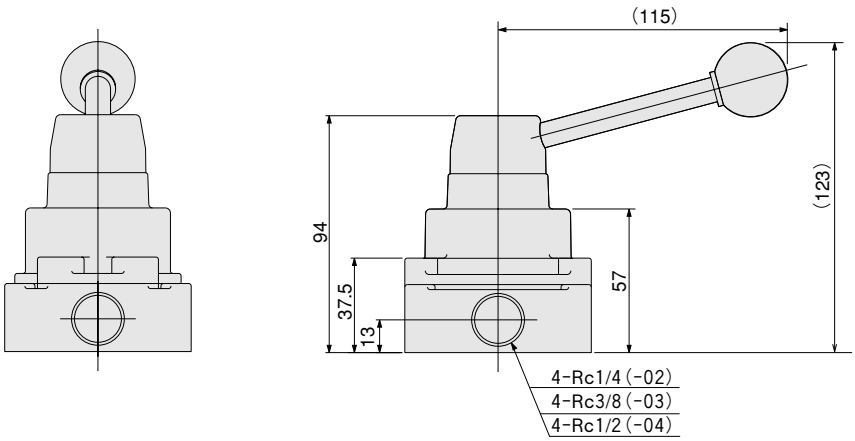
Item \ Model	400HV-02	400HV-03	400HV-04
Media	Air		
Valve function	4-port, 3-position		
Operation type	Direct acting		
Effective area mm²	26		
Port size	Rc1/4	Rc3/8	Rc1/2
Operating pressure range MPa {kgf/cm²} [psi.]	0～0.97 {0～9.9} [0～141]		
Proof pressure MPa {kgf/cm²} [psi.]	1.47 {15.0} [213]		
Operating temperature range °C [°F]	5～60 [41～140]		
Angle of lever operation	90°		
Mounting direction	Any		
Mass g [oz.]	800 [28.2]		

Dimensions (mm)

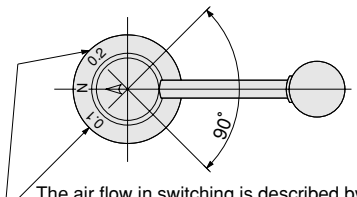


● Detailed diagram for machining panel mounting holes





Handling precautions



The air flow in switching is described by the figure which the arrow indicator on the selector handle shows.
For 1 : P (IN) →A (OUT-1)
For 2 : P (IN) →B (OUT-2)

FOOT VALVES

2-, 3-port

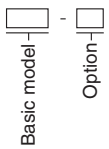
Symbols

Spring return				Spring return with holding mechanism			
2-port		3-port		2-port		3-port	
NC (Normally closed)	**NO** (Normally open)	**NC** (Normally closed)	**NO** (Normally open)	**NC** (Normally closed)	**NO** (Normally open)	**NC** (Normally closed)	**NO** (Normally open)
							
250F-2	250F-2-11	250F	250F-11	250FL-2	250FL-2-11	250FL	250FL-11

Specifications

Item \ Operation type	Spring return	Spring return with holding mechanism
Basic model	**250F**	**250FL**
Port size	Rc1/4	Rc1/4
Media	Air	
Operating pressure range MPa {kgf/cm²} [psi.]	0～0.9 {0～9.2} [0～131]	
Proof pressure MPa {kgf/cm²} [psi.]	1.35 {13.8} [196]	
Operating temperature range (atmosphere and media) °C [°F]	5～60 [41～140]	
Effective area mm²	15	
Flow coefficient Cv	0.76	
Valve stroke mm [in.]	1.6 [0.063]	
Lubrication	Not required	
Mass kg [lb.]	1.0 [2.2]	1.6 [3.5]
Options ·····Order codes	2-port ·····-2 Normally open ·-11	

Order Codes



Examples:
250F
250FL-2-11

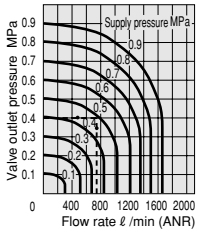
Basic model

Basic model	Operation method
250F	Spring return
250FL	Spring return with holding mechanism

Option

Code	Specifications
Blank	3-port Normally closed
2	2-port
11	Normally open

Flow Rate



1MPa = 145psi., 1 ℓ /min = 0.0353ft³/min.

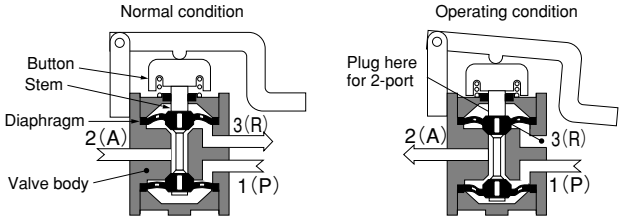
How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 740 ℓ /min [26.1ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

Pedal Pushing Down Force

N [lbf.]

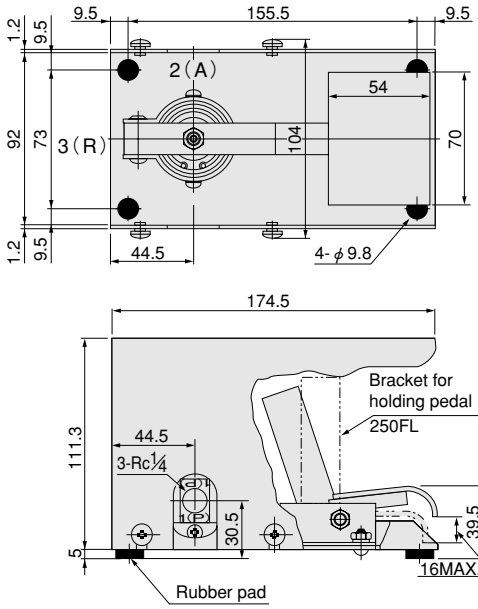
Model \ Main pressure MPa [psi.]		0 [0]	0.2 [29]	0.4 [58]	0.6 [87]	0.8 [116]
250F 250FL	Normally closed	5.9 [1.33]	9.8 [2.20]	13.7 [3.08]	18.6 [4.18]	25.5 [5.73]
	Normally open	5.9 [1.33]	8.8 [1.98]	11.8 [2.65]	14.7 [3.30]	18.6 [4.18]

Inner Construction, Major Parts and Materials



Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Brass
Diaphragm	Synthetic rubber
Cover, pedal	Steel

Dimensions (mm)



Note: In the cases of 250F and 250FL normally open, 1(P) port and 2(A) port are on the opposite side.

FOOT VALVES

5-port

Symbols

Spring return	Spring return with holding mechanism
	
250-4F 2503-4F	250-4FL 2503-4FL

Specifications

Item \ Operation type	Basic model	Spring return		Spring return with holding mechanism	
		250-4F	**2503-4F**	**250-4FL**	**2503-4FL**
Port size		Rc1/4	Rc3/8	Rc1/4	Rc3/8
Media		Air			
Operating pressure range	MPa {kgf/cm²} [psi.]	0～0.9 {0～9.2} [0～131]			
Proof pressure	MPa {kgf/cm²} [psi.]	1.35 {13.8} [196]			
Operating temperature range (atmosphere and media)	°C [°F]	5～60 [41～140]			
Effective area	mm²	15			
Flow coefficient	Cv	0.76			
Valve stroke	mm [in.]	1.6 [0.063]			
Lubrication		Not required			
Mass	kg [lb.]	1.6 [3.5]		1.7 [3.7]	

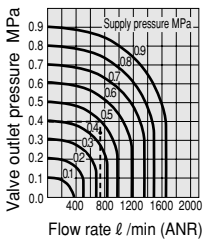
Order Codes

Examples:
250-4F
2503-4FL

Basic model

Basic model	Specifications
250-4F	Rc 1/4 Spring return
250-4FL	Rc 1/4 Spring return with holding mechanism
2503-4F	Rc3/8 Spring return
2503-4FL	Rc 3/8 Spring return with holding mechanism

Flow Rate



1MPa = 145psi., 1 ℓ /min = 0.0353ft³/min.

How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 740 ℓ /min [26.1ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

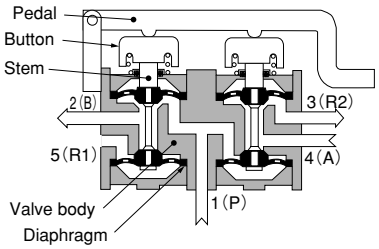
Pedal Pushing Down Force

N [lbf.]

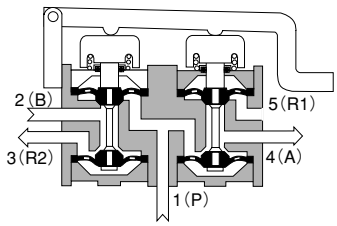
Model \ Main pressure MPa [psi.]	0 [0]	0.2 [29]	0.4 [58]	0.6 [87]	0.8 [116]
250-4F 2503-4F 250-4FL 2503-4FL	10.8 [2.43]	17.7 [3.98]	25.5 [5.73]	33.3 [7.49]	44.1 [9.91]

Inner Construction, Major Parts and Materials

Normal condition

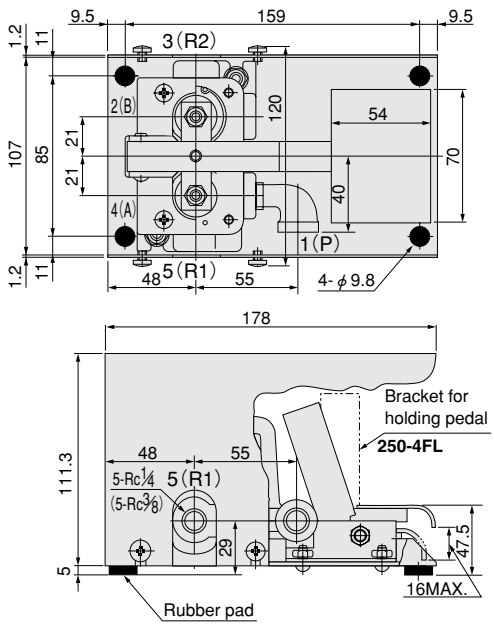


Operating condition



Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Brass
Diaphragm	Synthetic rubber
Cover, pedal	Steel

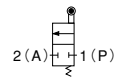
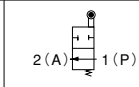
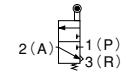
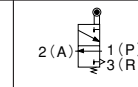
Dimensions (mm)



MECHANICAL VALVES

Ball-cam Type

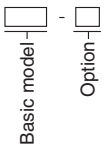
Symbols

2-port		3-port	
NC (Normally closed)	**NO** (Normally open)	**NC** (Normally closed)	**NO** (Normally open)
			
125B-2 250B-2 2503B-2	125B-2-11	125B 250B 2503B	125B-11

Specifications

Item \ Basic model	125B	250B	2503B
Port size	Rc1/8	Rc1/4	Rc3/8
Media	Air		
Operating pressure range MPa {kgf/cm²} [psi.]	0～0.9 {0～9.2} [0～131]		
Proof pressure MPa {kgf/cm²} [psi.]	1.35 {13.8} [196]		
Operating temperature range (atmosphere and media) °C [°F]	5～60 [41～140]		
Effective area mm²	5.5	15	
Flow coefficient Cv	0.27	0.76	
Valve stroke mm [in.]	0.8 [0.031]	1.6 [0.063]	
Lubrication	Not required		
Mass kg [lb.]	0.11 [0.24]	0.21 [0.46]	0.26 [0.57]
Options ·····Order codes	2-port ·····-2 Normally open ··-11 With lock nuts for panel mounting ··-22	2-port ·····-2	

Order Codes



Basic model

Basic model	Port size
125B	Rc1/8
250B	Rc1/4
2503B	Rc3/8

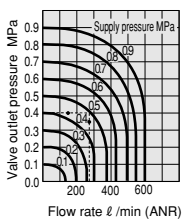
Option

Code	Specifications
Blank	3-port Normally closed
2	2-port
11	Normally open (125B only)
22	125B With lock nuts for panel mounting

Examples:
125B-2-11-22
250B

Flow Rate

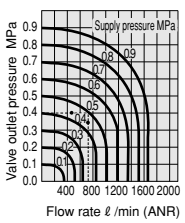
125 series



1MPa = 145psi.
1 ℓ /min = 0.0353ft³/min.

How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 275 ℓ /min [9.71ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

250 series
2503 series



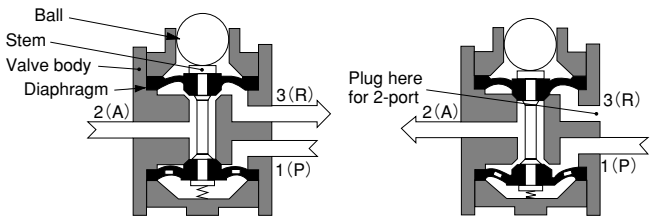
How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 740 ℓ /min [26.1ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

Ball Pushing Down Force

N [lbf.]

Model \ Main pressure MPa [psi.]		0 [0]	0.2 [29]	0.4 [58]	0.6 [87]	0.8 [116]
125B	Normally closed	16.7 [3.75]	24.5 [5.51]	32.4 [7.28]	40.2 [9.04]	48.1 [10.81]
	Normally open		30.4 [6.83]	50.0 [11.24]	71.6 [16.10]	86.3 [19.40]
250B, 2503B	Normally closed	17.5 [3.93]	36.3 [8.16]	55.9 [12.57]	78.5 [17.65]	104.0 [23.38]

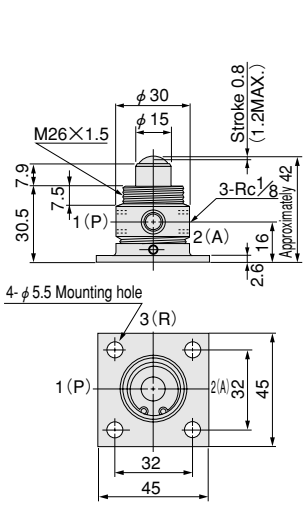
Inner Construction, Major Parts and Materials



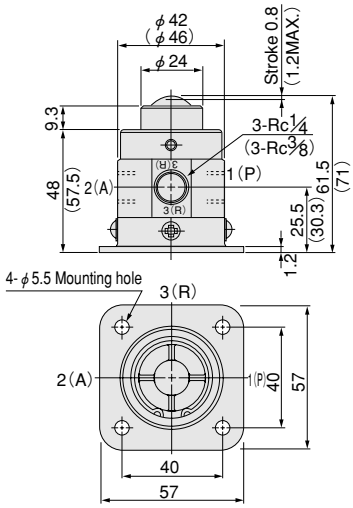
Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Brass
Diaphragm	Synthetic rubber
Ball	Steel

Dimensions (mm)

125B



250B
2503B



Note: For the normally open type, the exhaust port 3(R) is on the opposite side.

MECHANICAL VALVES

Roller-cam Type

Symbols

Roller-cam				One way roller-cam			
2-port		3-port		2-port		3-port	
NC (Normally closed)	**NO** (Normally open)	**NC** (Normally closed)	**NO** (Normally open)	**NC** (Normally closed)	**NO** (Normally open)	**NC** (Normally closed)	**NO** (Normally open)
							
125MC-2 250C-2 2503C-2	125MC-2-11 250C-2-11 2503C-2-11	125MC 250C 2503C	125MC-11 250C-11 2503C-11	125MOC-2	125MOC-2-11	125MOC	125MOC-11

Specifications

Item \ Basic model	125MC	125MOC	250C	2503C
Operation type	Roller-cam (Steel roller)	One way roller-cam (Steel roller)	Roller-cam (Nylon roller)	
Port size	Rc1/8		Rc1/4	Rc3/8
Media	Air			
Operating pressure range MPa {kgf/cm²} [psi.]	0～0.9 {0～9.2} [0～131]			
Proof pressure MPa {kgf/cm²} [psi.]	1.35 {13.8} [196]			
Operating temperature range (atmosphere and media) °C [°F]	5～60 [41～140]			
Effective area mm²	5.5		15	
Flow coefficient Cv	0.27		0.76	
Valve stroke mm [in.]	0.8 [0.031]		1.6 [0.063]	
Lubrication	Not required			
Mass kg [lb.]	0.15 [0.33]		0.30 [0.66]	0.35 [0.77]
Options ·····Order codes	2-port ·····-2 Normally open ·-11			

Order Codes

Basic model - Option

Examples:
125MC-2-11
2503C

Basic model

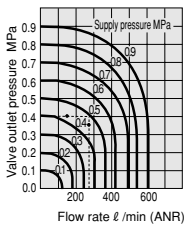
Basic model	Specifications
125MC	Rc1/8 Roller-cam
125MOC	Rc 1/8 One way roller-cam
250C	Rc1/4 Roller-cam
2503C	Rc3/8 Roller-cam

Option

Code	Specifications
Blank	3-port Normally closed
2	2-port
11	Normally open

Flow Rate

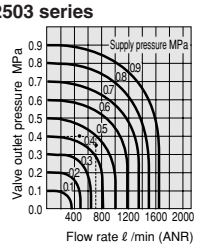
125 series



1MPa = 145psi.
1 ℓ /min = 0.0353ft³/min.

How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 275 ℓ /min [9.71ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

250 series
2503 series



How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 740 ℓ /min [26.1ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

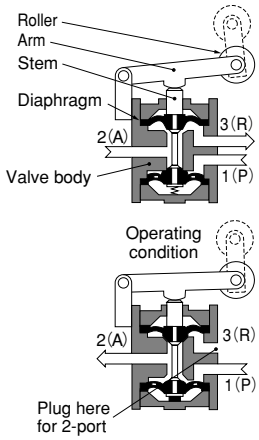
Roller Pushing Down Force

N [lbf.]

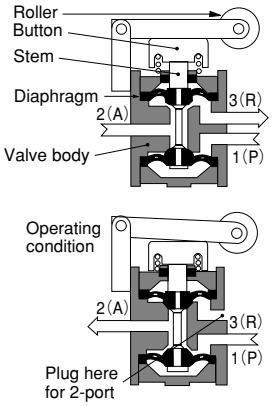
Model \ Main pressure MPa [psi.]		0 [0]	0.2 [29]	0.4 [58]	0.6 [87]	0.8 [116]
125MC	Normally closed	12.8 [2.88]	15.7 [3.53]	19.6 [4.41]	24.5 [5.51]	29.4 [6.61]
	Normally open		14.7 [3.30]	17.7 [3.98]	22.6 [5.08]	26.5 [5.96]
125MOC	Normally closed	10.8 [2.43]	13.7 [3.08]	18.6 [4.18]	22.6 [5.08]	26.5 [5.96]
	Normally open		12.8 [2.88]	15.7 [3.53]	19.6 [4.41]	23.5 [5.28]
250C 2503C	Normally closed	12.8 [2.88]	19.6 [4.41]	28.4 [6.38]	38.3 [8.61]	54.9 [12.34]
	Normally open			24.5 [5.51]	30.4 [6.83]	39.2 [8.81]

Inner Construction, Major Parts and Materials

125 series Normal condition



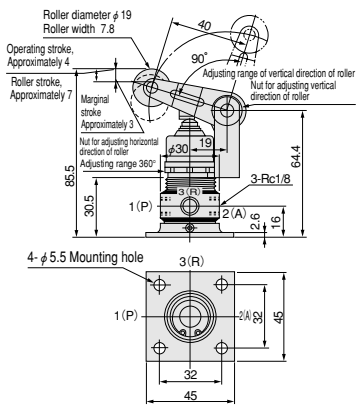
250 series
2503 series Normal condition



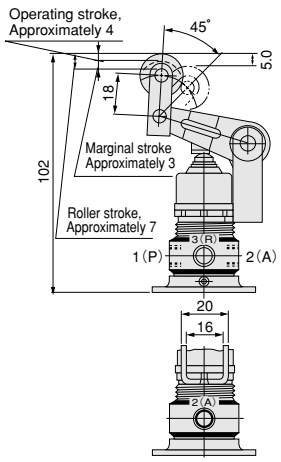
Parts	Materials
Body	Aluminum alloy (anodized)
Stem	Brass
Diaphragm	Synthetic rubber
Roller	125 series: Steel 250, 2503 series: Nylon

Dimensions (mm)

125MC

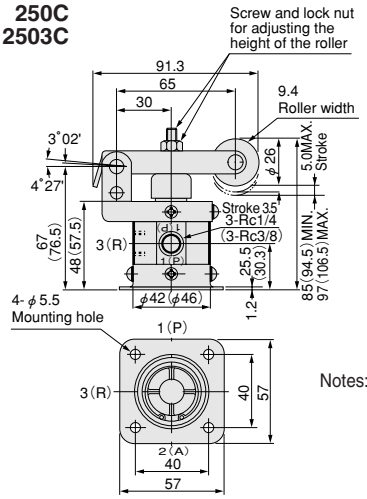


125MOC



Note: Dimensions not specified are the same as for the 125MC.

250C
2503C



Notes: 1. Dimensions in parentheses ( ) are for the 2503C.
2. For the normally open type, the exhaust port 3(R) is on the opposite side.

MICRO VALVES

Specifications

Port size		Rc1/8 (1(P), 2(A)), 2 holes ϕ 2 (3(R))
Media		Air
Operating pressure range	MPa {kgf/cm²} [psi.]	0～0.9 {0～9.2} [0～131]
Proof pressure	MPa {kgf/cm²} [psi.]	1.35 {13.8} [196]
Operating temperature range (atmosphere and media)	°C [°F]	0～60 [32～140]
Effective area	mm²	1.8
Flow coefficient	Cv	0.08
Valve stroke	mm	Approximately 1.5 (For details, see attached table.)
Lubrication		Required (Turbine Oil Class 1〔ISO VG32〕is recommended)
Mass	g [oz.]	90 [3.17] (KMP type), 100 [3.53] (KMC type), 130 [4.59] (KMR type)
Options ·····Order codes		2-port ·····-2 Normally open ·····-11 With 3(R) port fitting ···-60

Order Codes

KM □-□-□-□

Operation type / Number of ports / Valve function / 3(R) port fitting

Operation type

Code	Operation type
P	Pin plunger
C	Roller-cam
O	One way roller-cam
S	Straight plunger
R	Roller plunger

Number of ports

Code	Number of ports
Blank	3
2	2

3(R) port fitting

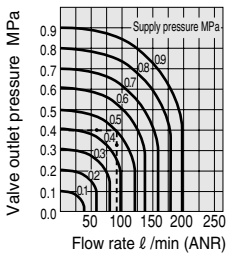
Code	3(R) port fitting
Blank	—
60	With fitting

Valve function

Code	Valve function
Blank	NC (normally closed)
11	NO (normally open)

Note : When using as a divider valve, specify as “normally open, and with 3(R) port fitting (-11-60).”
Avoid using the normally closed type as a divider valve.

Flow Rate



1MPa = 145psi.
1 ℓ /min = 0.0353ft³/min.

How to read the graph
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 85 ℓ /min [3.0ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

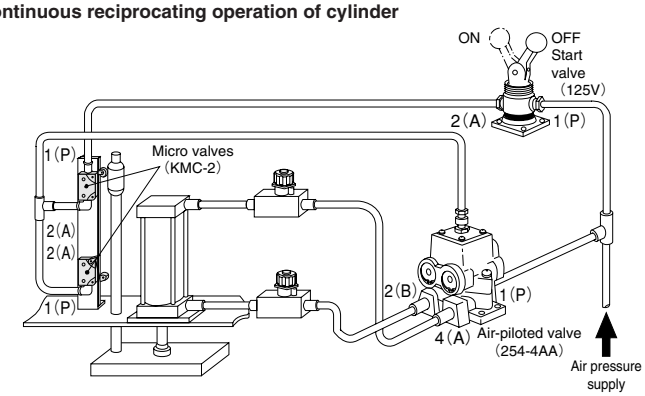
Time Required for Switching

s

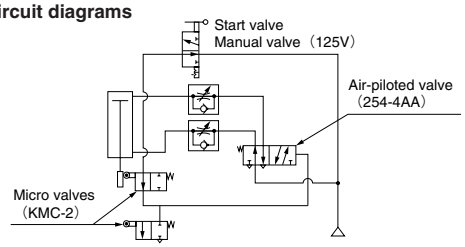
Model and air-piloted valve position		Switching time
254-4A	Valve: ON (switching air flowing state to 1(P)→4(A)) Valve: OFF (switching air flowing state to 1(P)→2(B))	0.07 0.20
375-4A 501-4A	Valve: ON (switching air flowing state to 1(P)→4(A)) Valve: OFF (switching air flowing state to 1(P)→2(B))	0.09 0.23
750-4A	Valve: ON (switching air flowing state to 1(P)→4(A)) Valve: OFF (switching air flowing state to 1(P)→2(B))	0.16 0.25
1000-4A 1250-4A	Valve: ON (switching air flowing state to 1(P)→4(A)) Valve: OFF (switching air flowing state to 1(P)→2(B))	0.25 0.42

Application example

Continuous reciprocating operation of cylinder

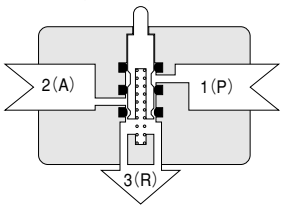


Circuit diagrams

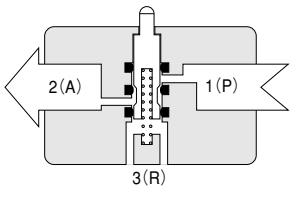


Inner Construction, Major Parts and Materials

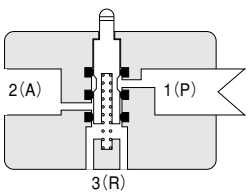
3-port, normally closed type (normal condition)



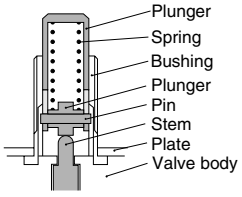
3-port, normally open type (normal condition)



2-port, normally closed type (normal condition)

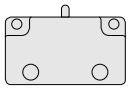
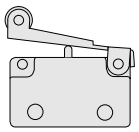
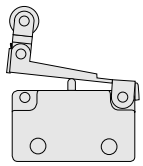
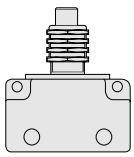
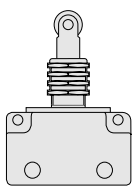


Construction of straight plunger type



Parts	Materials
Body	Zinc die-casting
Stem	Stainless steel
Seal O-ring	Synthetic rubber
Roller	Stainless steel

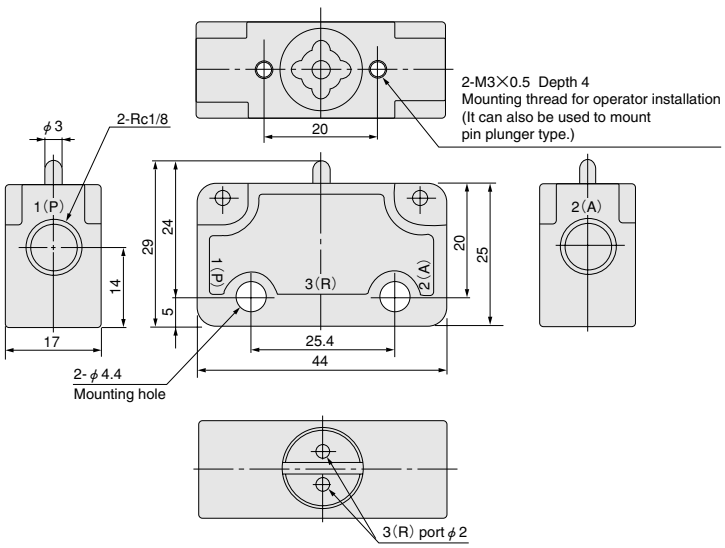
Model and Valve Stroke

Type	Shape	Model	Function		Operating force N [lbf.] At air pressure 0.9MPa {9.2 kgf/cm²} [131psi.]	Valve stroke mm [in.]			
						Stroke until actuating		Allowable stroke after actuation	Total stroke
Pin plunger type		**KMP-2**	2-port	Normally closed (NC) 	24.5 [5.51]	1.3 [0.051]	———	1.2 [0.047]	2.5 [0.098]
		(**KMP-2-11**)		Normally open (NO) 		0.7 [0.028]		1.8 [0.071]	
		KMP	3-port	Normally closed (NC) 		1.3 [0.051]		1.2 [0.047]	
		KMP-11		Normally open (NO) 		1.8 [0.071]		0.7 [0.028]	
Roller-cam type		**KMC-2**	2-port	Normally closed (NC) 	12.8 [2.88]	2.7 [0.106]	"When the lever is in a horizontal position" it can be used as a guide for full actuation.	2.3 [0.091]	5.0 [0.197]
		(**KMC-2-11**)		Normally open (NO) 		1.5 [0.059]		3.5 [0.138]	
		KMC	3-port	Normally closed (NC) 		2.7 [0.106]		2.3 [0.091]	
		KMC-11		Normally open (NO) 		3.8 [0.150]		1.2 [0.047]	
One way roller-cam type		**KMO-2**	2-port	Normally closed (NC) 		2.7 [0.106]		2.3 [0.091]	
		(**KMO-2-11**)		Normally open (NO) 		1.5 [0.059]		3.5 [0.138]	
		KMO	3-port	Normally closed (NC) 		2.7 [0.106]		2.3 [0.091]	
		KMO-11		Normally open (NO) 		3.8 [0.150]		1.2 [0.047]	
Straight plunger type		**KMS-2**	2-port	Normally closed (NC) 	24.5 [5.51]	2.0 [0.079]	Plunger play (Approxi-mately 1mm) is not included.	3.5 [0.138]	5.5 [0.217]
		(**KMS-2-11**)		Normally open (NO) 		1.0 [0.039]		4.5 [0.177]	
		KMS	3-port	Normally closed (NC) 		2.0 [0.079]		3.5 [0.138]	
		KMS-11		Normally open (NO) 		3.0 [0.118]		2.5 [0.098]	
Roller plunger type		**KMR-2**	2-port	Normally closed (NC) 		2.0 [0.079]		3.5 [0.138]	
		(**KMR-2-11**)		Normally open (NO) 		1.0 [0.039]		4.5 [0.177]	
		KMR	3-port	Normally closed (NC) 		2.0 [0.079]		3.5 [0.138]	
		KMR-11		Normally open (NO) 		3.0 [0.118]		2.5 [0.098]	

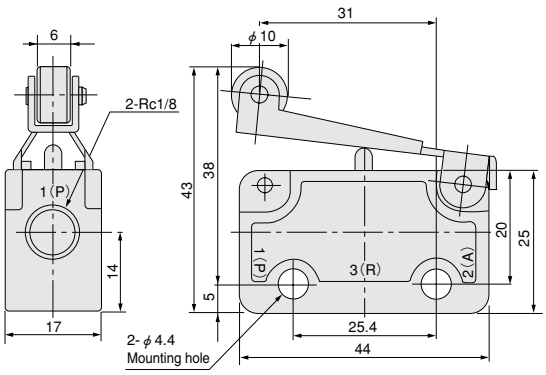
Notes: 1. Models in parentheses ( ) are made to order items.
2. The "stroke until actuating" means the movement which occurs from the free position until 1(P)↔2(A) is at the maximum flow rate, for normally closed type 2-, 3-port. And for the normally open type 2-port, it means the stroke which occurs until 1(P)↔2(A) is closed, while for the normally open type 3-port, it means the stroke which occurs until 2(A)↔3(R) is at the maximum flow rate.

Dimensions (mm)

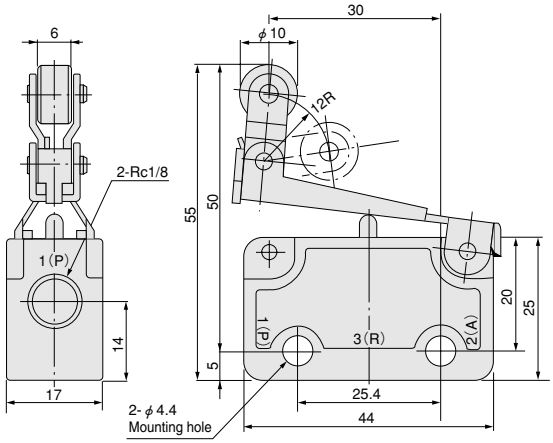
Pin plunger type (basic type)
KMP-2
KMP
KMP-11



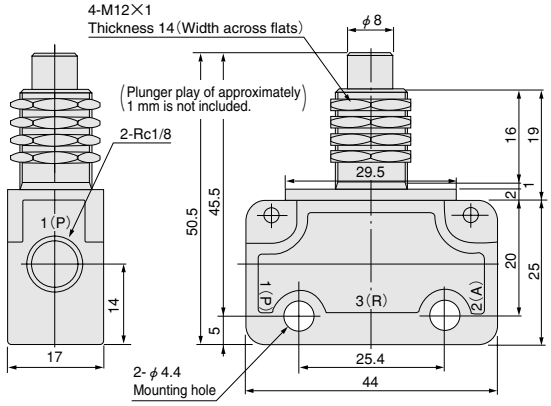
Roller-cam type
KMC-2
KMC
KMC-11



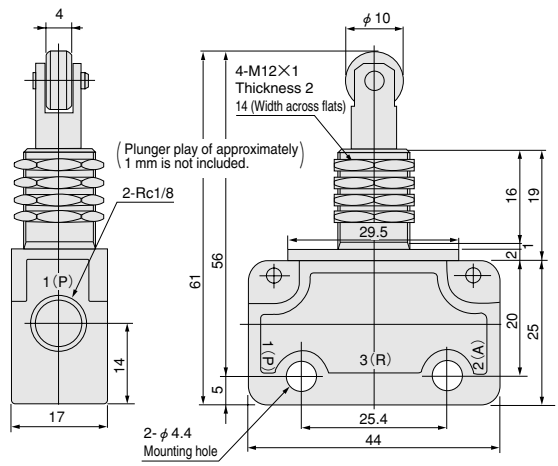
One way roller-cam type
KMO-2
KMO
KMO-11



Straight plunger type
KMS-2
KMS
KMS-11



Roller plunger type
KMR-2
KMR
KMR-11

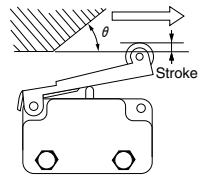


Handling Instructions and Precautions for Micro Valves

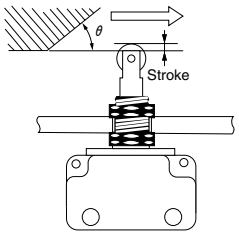
Micro valve mounting overview, and cam and dog shapes

- While normal mounting uses 2 mounting holes of ϕ 4.4 [0.173in.] on the body, use the neck for mounting when not using the roller plunger type in "pushed by load" applications.
- Since the exhaust hole is on the bottom surface of the valve body, leave a clearance of about 1mm [0.04in.] to avoid restricting exhaust.
- Always use the straight plunger type in "pushed by load" applications.
- While the cam and dog shapes normally set θ at about 30°, θ should be set even smaller when the speed reaches 500mm/s [19.7in./sec.] or more.
- For the valve strokes, see the table on p.834.

Roller-cam type



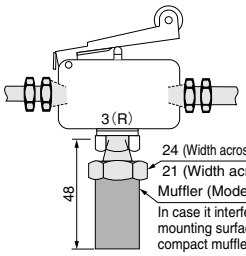
Roller plunger type



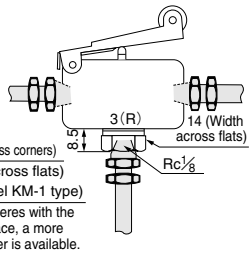
How to use units with exhaust (R) port fittings

For products with a special fitting (Rc1/8) on the 3(R) port, a muffler can be mounted to the 3(R) port, or piping can be connected to exhaust to the outside.

When attaching a muffler on the R port



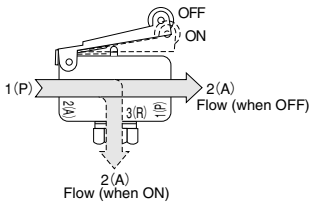
When piping on the R port



Note: Avoid over-tightening the R port fitting.
For piping work, use a wrench to hold the fitting and prevent it from rotating.

How to use as a divider valve

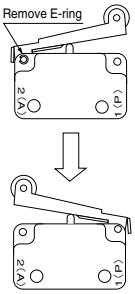
The 3-port, normally open type can be used as a divider valve.
Let air in from the 2(A) port to flow toward the 1(P) port when OFF, and toward the 3(R) port when ON.



Notes: 1. Avoid using the normally closed type as a divider valve.
2. When using as a divider valve, the Order Code is "-11-60."
Example: Roller-cam type divider valve KMC-11-60

Instructions for cam lever facing changes

The cam acting direction of the roller-cam type (KMC) and one way roller-cam type (KMO) can be changed for use according to the piping requirement.



Lubrication

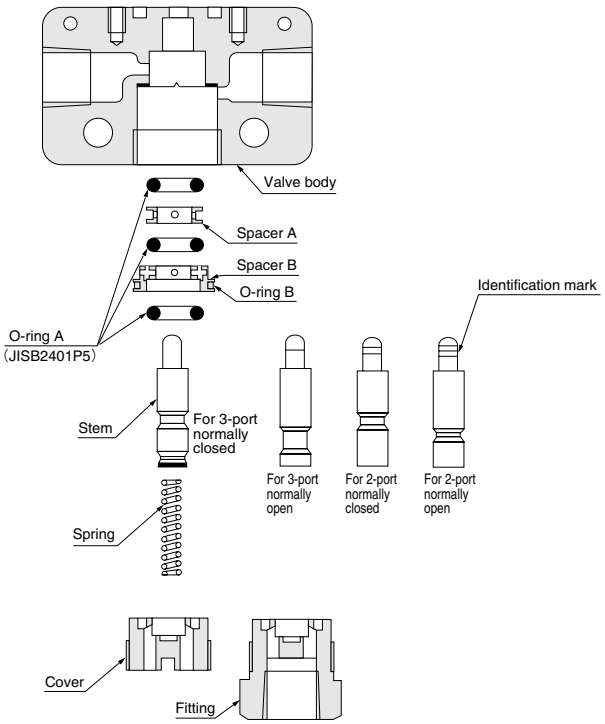
For this micro valve, use Turbine Oil Class 1 (ISO VG32).
Depending on the piping conditions (length, height) etc., oil may fail to reach the micro valve. When it occurs, consider supplying turbine oil into the piping at periodic intervals.

Dust protection

Use appropriate protection when using the micro valve in locations subject to heavy dust, powder, machining chips, etc.

Micro Valve Parts Configuration

The micro valve is composed of the parts shown in the diagram below. The valve functions can differ depending on the shape of the stem, as shown in the diagram.
An identification mark is found on the top of the stem.



Before selecting and using products, please read all the Safety Precautions carefully to ensure proper product use.
The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury or damage to assets beforehand.
Follow the Safety Precautions for: ISO4414 (Pneumatic fluid power—Recommendations for the application of equipment to transmission and control systems), JIS B 8370 (Pneumatic system regulations)

The directions are ranked according to degree of potential danger or damage: "DANGER!" "WARNING!" "CAUTION!" and "ATTENTION!"

⚠ **DANGER**	Expresses situations that can be clearly predicted as dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
⚠ **WARNING**	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of assets.
⚠ **CAUTION**	Expresses situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in light or semi-serious injury. It could also result in damage or destruction of assets.
⚠ **ATTENTION**	While there is little chance of injury, this content refers to points that should be observed for appropriate use of the product.

■ This product was designed and manufactured as parts for use in General Industrial Machinery.

■ In the selection and handling of equipment, the system designer or other person with fully adequate knowledge and experience should always read the Safety Precautions, Catalog, User's Manual and other literature before commencing operation. Making mistakes in handling is dangerous.

■ After reading the Instruction Manual, Catalog, etc., always place it where it can be easily available for reference to users of this product.

■ If transferring or lending the product to another person, always attach the Instruction Manual, Catalog, etc., to the product where it is easily visible, to ensure that the new user can use the product safely and properly.

■ The danger, warning, and caution items listed under these "Safety Precautions" do not cover all possible cases. Read the catalog and user's manual carefully, and always keep safety first.

⚠ DANGER

● Do not use for the purposes listed below:
1. Medical equipment related to maintenance or management of human lives or bodies.
2. Mechanical devices or equipment designed for the purpose of moving or transporting people.
3. Critical safety components in mechanical devices.

This product has not been planned or designed for purposes that require advanced stages of safety. It could cause injury to human life.

● Do not use in locations with or near dangerous substances such as flammable or ignitable substances. This product is not explosion-proof. It could ignite or burst into flames.

● When attaching the product and workpiece, always ensure that it is securely mounted in place. Dropping or falling the product or improper operation could result in injury.

● Persons who use a pacemaker, etc., should keep a distance of at least one meter [3.28ft.] away from the product. There is a possibility that the pacemaker will malfunction due to the strong magnet built into the product.

● Never attempt to remodel the product. It could result in abnormal operation leading to injury, electric shock, fire, etc.

● Never attempt inappropriate disassembly, assembly or repair of the product's basic construction, or of its performance or functions. It could result in injury, electric shock, fire, etc.

● Do not splash water on the product. Spraying it with water, washing it, or using it underwater could result in malfunction of the product leading to injury, electric shock, fire, etc.

● While the product is in operation, avoid touching it with your hands or otherwise approaching too close. In addition, do not make any adjustments to the interior or to the attached mechanisms (manual override, connecting and disconnecting of wiring connectors, adjustment of pressure switches, or release or connection of piping tubes or plugs) while in operation. The actuator can move suddenly, possibly resulting in injury.

⚠ WARNING

● Do not use the product in excess of its specification range. Such use could result in product breakdowns, function stop or damage or drastically reduce the operating life.

● Before supplying air or electricity to the device and before starting operation, always conduct a safety check of the area of machine operation. Unintentional supply of air or electricity could possibly result in electric shocks, or in injury caused by contact with moving portion.

● Do not touch the terminal and the miscellaneous switches, etc., while the device is power on. There is a possibility of electric shock and abnormal operation.

● Do not allow the product to be thrown into fire. The product could explode and/or release toxic gases.

● Do not sit on the product, place your foot on it, or place other objects on it. Accidents such as falling and tripping over could result in injury. Dropping the product may result in injury, or also damage or break the product resulting in abnormal or erratic operation, or runaway etc.

● When conducting any kind of operation for the product, such as maintenance, inspection, repair, or connect/disconnect or replacement of piping, always turn off the air supply completely and confirm that residual pressure inside the product or in piping connected to the product is zero before proceeding. In particular, be aware that residual air will still be in the air compressor or air storage tank. The actuator could abruptly move if residual air pressure remains inside the piping, causing injury.

● Before commencing normal operation, always release the lock on the locking type manual override, and confirm that the manual override is in the normal position and that the main valve is in the proper switching position, and only then commence the operation. Failure to do so could lead to erroneous operation.

● Always shut off power when performing wiring operations. Leaving the power on could result in electric shocks.

● Apply the specified voltage for the solenoid. Using the wrong voltage level will prevent the solenoid from performing its function, and could lead to breakage or burn damage of the product itself.

● Avoid scratching the cords for the sensor switch lead wires, etc. Letting the cords be subject to scratching, excessive

bending, pulling, rolling up, or being placed under heavy objects or squeezed between two objects, may result in current leaks or defective transmission that lead to fires, electric shocks, or abnormal operation.

- Do not pull out the connectors while the power is ON. Also, do not put unnecessary stress on the connector. It could result in erroneous equipment operation that could lead to personal injury, equipment breakdown, or electrical shocks, etc.
- Always check the Catalog to ensure that the product wiring and piping is done correctly. Errors in wiring and piping could lead to abnormal operation of the actuators, etc.
- In the first operation after the equipment has been idle for 48 hours or more, or has been in storage, there is a possibility that contacting parts have been sticked, resulting in equipment operation delays or sudden movements. For these first operations, always run a test operation before use to check that operating performance is normal.
- In low frequency use (more than 30 days between uses), there is a possibility that contact parts will stick, resulting in equipment operation delays or sudden movements that could lead to personal injury. Run a test operation at least once every 30 days to confirm that movement is normal.
- For double solenoid type (excluding the Tandem 3-port valve), do not apply current through both solenoids simultaneously. It is impossible in such a situation to maintain the correct valve position, and the equipment may operate in an unintended direction, leading to the possibility of equipment breakdown or personal injury.
- Do not use the solenoid valves or the wiring that controls them, near power lines where large electrical currents are flowing, or in locations subject to powerful magnetic fields or power surges. Such application could lead to unintended operation.
- The solenoid valve can generate surge voltage and electromagnetic waves when the switch is turned off, affecting the operations of surrounding equipment. Use solenoids with surge suppression, or take countermeasures in the electrical circuits for surges or electromagnetic waves.
- Do not use where ozone may be generated, such as near ocean beaches or other places subject to direct sunlight or mercury lamps. Ozone can cause rubber parts to deteriorate, which can lead to degraded performance and functions, or to equipment stoppages and functional shutdown. (Excludes items where measures against ozone have been taken.)
- Do not use any media other than shown on the specifications. Use of non-specified media could lead to functional shutdown after a short period, to sudden performance drops, or to shorter operating life.
- If mounting the solenoid valve inside a control panel, or if energizing it for long periods, provide heat radiation measures to ensure that temperatures surrounding the solenoid valve always remain within the specified temperature range. If energizing the unit for long periods, consult us.
- After finishing wiring operations, always check to ensure that no wiring connection errors exist before turning on the power.
- Do not collect the exhaust lines for air cylinders, etc. with pilot exhaust lines for solenoid valves into the same piping, etc. Interference in the exhaust could result in erratic operation.

⚠ CAUTION

- When mounting the product, leave room for adequate working space around it. Failure to ensure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- For mounting or transport of heavy products, use a lift, supporting tool, or several people, to provide firm support, and proceed with due caution to ensure personal safety.
- Do not bring floppy disks or magnetic media, etc., within one meter [3.28ft.] of the product. There is the possibility that the data on the floppy disks will be destroyed due to the magnetism of the magnet.
- If leakage current is occurring in the control circuit, there is a possibility of the product performing an unintended operation. Take measures against current leaking in the control circuit, to ensure that the leakage current value does not exceed the allowed range in the product specifications.
- Do not block the product's breathing holes. Pressure changes occur due to changes in volume during operation. Blocking the breathing holes destroys the pressure balance, and could cause failure of the intentioned operation, equipment damage, or personal injury.
- Do not use the solenoid valve in locations subject to large electrical currents or magnetic fields. It could result in erratic operation.
- Oily materials from the compressor (excluding the oil-free compressor) can cause drastic deterioration in product performance, and even a functional shutdown. Always install a mist filter before pneumatic equipment to remove the oily component.
- The properties of the lubrication oil can change when used in dry air where dew point temperatures is lower than –20 degrees Celsius [–4°F]. It could result in degraded performance or in functional shutdown.
- Do not use the product in locations of direct sunlight (ultraviolet), in locations subject to dust, salt, or iron powder, in locations with humidity and high temperature, or in the media and/or the ambient atmospheres that include organic solvents, phosphoric ester type hydraulic oil, sulfur dioxide, chlorine gas, or acids, etc. These conditions could lead to functional shutdowns, sudden degraded performance, or shortened operating life in a brief period of time. For materials used, see Major Parts and Materials.

⚠ ATTENTION

- When considering the possibility of using this product in situations or environments not specifically noted in the Catalog or User's Manual, or in applications where safety is an important requirement, such as in an airplane facility, combustion equipment, leisure equipment, safety equipment and other places where human life or assets may be greatly affected, take adequate safety precautions such as application with enough margins for ratings and performance or fail-safe measures. Be sure to consult us with such applications.
- Always check the catalog and other reference materials for product wiring and piping.
- Install a muffler, etc. on the exhaust port. It is effective in reducing exhaust noise.
- When handling the product, wear protective gloves, safety glasses, safety boots, etc. to keep safety.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and function over its operating life. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
- Air leaks from the valve are not zero. For application of requiring holding pressure (including vacuum) inside the pressure vessel, consider adequate margin of capacity and holding time in design of the system.
- For inquiries about the product, consult your nearest Koganei sales office or Koganei overseas department. The address and telephone number is shown on the back cover of this catalog.

⚠ OTHERS

- Always observe the following items.
  1. When using this product in pneumatic systems, always use genuine KOGANEI parts or compatible parts (recommended parts).
     When conducting maintenance and repairs, always use genuine KOGANEI parts or compatible parts (recommended parts). Always observe the required methods and procedure.
  2. Do not attempt inappropriate disassembly or assembly of the product relating to basic construction, or its performance or functions.

  Koganei cannot be responsible if these items are not properly observed.

Mounting

1. While any mounting direction is allowed, be sure to avoid strong shocks or vibrations applied directly to the body. Also, avoid strong shocks in the lateral direction when using a mounting base for installation. For the order code, see the Additional Parts item under each series.
2. Avoid using in the locations and environment listed below, as it could result in malfunction of the valve. If use in such conditions is unavoidable, always provide a cover or other adequate protective measures.
- Location directly exposed to water drops or oil drops
- Environment where a valve body is subject to dew condensation
- Location directly exposed to machining chips, dust, etc

3. Install a muffler, etc. in the exhaust port to prevent dust from entering into the piping.
4. In piping connection with valves, flush the tube completely (by blowing compressed air) before piping.
   Intrusion of machining chips or sealing tape, rust, etc., generated during plumbing could result in air leaks and other defective operations.
5. When mounting a valve unit inside the control panels or when the operation requires long energizing periods, consider providing heat radiation measure such as ventilation.
6. Never use the valve with the 4(A) and 2(B) ports vent to atmosphere.

Media

1. Use air for the media. For the use of any other media, consult us.
2. Air used for the cylinder should be clean air that contains no deteriorated compressor oil, etc. Install an air filter (filtration of 40 μm or less) near the valve to remove collected liquid or dust. In addition, drain the air filter periodically.
3. When supply pressure is low, use piping for the 1(P) port with sufficient tube size.

Lubrication

Can be used without lubrication. When the actuator requires lubrication, use Turbine Oil Class 1 (ISO VG32) or the equivalent. Avoid using spindle oil or machine oil.

Atmosphere

The product cannot be used when the media or ambient atmosphere contains any of the substances listed below.
Organic solvents, phosphate ester type hydraulic oil, sulphur dioxide, chlorine gas, or acids, etc.

How to find the flow rate

Subsonic speed flow when
$P_1 + 0.1013 < 1.89\ (P_2 + 0.1013)$

$$Q = 226S\sqrt{\Delta P\ (P_2 + 0.1013)}$$

Sonic speed flow when
$P_1 + 0.1013 \geqq 1.89\ (P_2 + 0.1013)$

$$Q = 113S\ (P_1 + 0.1013)$$

Q: Air flow rate〔ℓ/min (ANR)〕
S: Effective area〔mm^2〕
ΔP: Pressure drop $P_1 - P_2$〔MPa〕
P_1: Upstream pressure〔MPa〕
P_2: Downstream pressure〔MPa〕

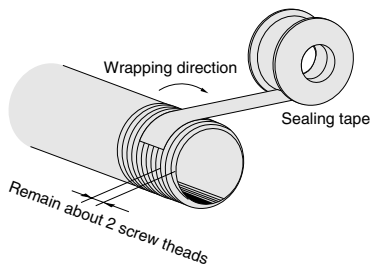
※ Corrections for variances in air temperature
Multiply the flow rate calculated in the formula above by the coefficients in the table below.

Air temperature °C [°F]	–20 [–4]	–10 [14]	0 [32]	10 [50]	30 [86]	40 [104]	50 [122]	60 [140]
Correction coefficient	1.08	1.06	1.04	1.02	0.98	0.97	0.95	0.94

Piping

Since the 1(P) and exhaust ports are on both ends of the manifold, piping direction can be selected depending on the application (excluding some models).
At shipping, plugs are temporarily screwed in ports at one end, but are not firmly tightened. Regardless of which end piping is connected, always remove the plugs, use sealing tape or apply other sealing agent, and securely tighten the plugs into the unused ports.

1. Sealing tape wrapping method
① Before piping, use air blowing (flushing) or cleaning to eliminate any machining chips, cutting oil, or dust, etc., remaining inside the pipes.
② When screwing in piping or fittings, caution should be taken to avoid letting machining chips or sealing materials from entering into the valves. When using sealing tape, wrap it so that 1.5～2 screw threads remain.



2. Tightening torque for piping

Connection thread	Suitable tightening torque N·cm (kgf·cm) [in·lbf]
M3	59 (6) [5.2]
M5×0.8	157 (16) [13.9]
Rc (PT)1/8	686～883 (70～90) [60.8～78.1]
Rc (PT)1/4	1177～1373 (120～140) [104～122]
Rc (PT) 3/8	2157～2354 (220～240) [191～208]
Rc (PT) 1/2	2746～2942 (280～300) [243～260]
Rc (PT) 3/4	2746～2942 (280～300) [243～260]
Rc (PT) 1	3530～3727 (360～380) [313～330]
Rc (PT) 1 1/4	3923～4119 (400～420) [347～365]
Rc (PT) 1 1/2	4707～4903 (480～500) [417～434]

Block-off plate

To close the unused stations, use a block-off plate.
For the order code, see the Additional Parts item under each series.

Cautions:
1. For the 1(P) port piping, use a size that matches the manifold's piping connection port.
2. When installing piping or mufflers to the exhaust port, ensure there will be minimum exhaust resistance.
3. On rare occasions, exhaust can interfere with other valves and actuators. In this case, let exhaust from the R ports on both ends.
4. When a multiple number of valves are operating simultaneously on a multi-unit manifold, or during high frequency applications, supply air from the 1(P) ports on both ends, and let exhaust from the R ports on both ends.
5. Since the twin solenoid valve uses 2 stations, it cannot be mounted on the final station.
6. In the 025 series, the seal between the valve and manifold is used reversed top-to-bottom, in accordance with the valve function (NC or NO). Install the seal as the mark (NC or NO) is located on the valve side and matches the valve function.

Tube installation and removal

Insert the tube to connect as far as the tube stopper contacts the tubes. Pull the tube to confirm the connection.
For tube removal, push the release ring forward parallel to the ring, and pull the tube out.

Tubes

Either nylon or urethane tubes can be used. Use tubes that are not scratched on their outer surface.
The tube's outer diameter tolerance should be within ±0.1mm [±0.004in.] of the nominal dimension, and within 0.2mm [0.008in.] for the ellipticity (difference between long and short diameter).

Caution: Do not excessively bend the tube near fittings.