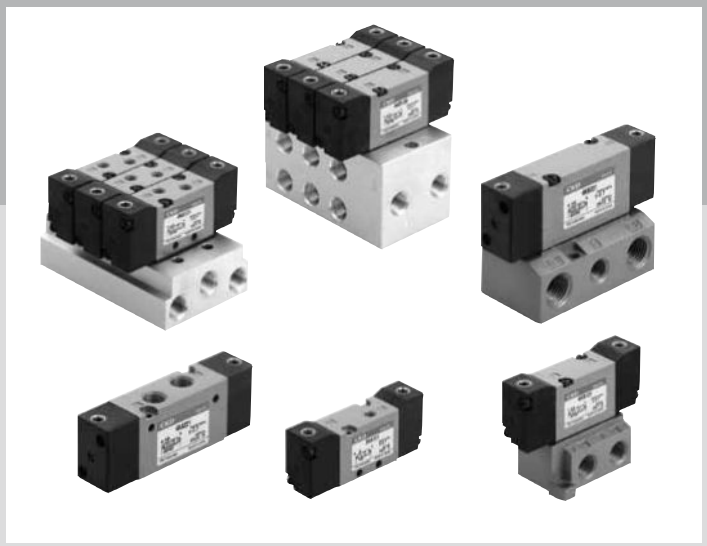
4KA/4KB

Pneumatic valve/master valve

Pilot operated 3, 5-port valve



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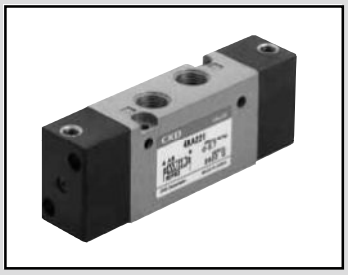


Master valve; body piping
Pilot operated 3, 5-port pneumatic valve

3KA1/4KA1/2/3/4 Series

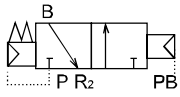
● Cylinder bore size: φ20 to φ160

RoHS

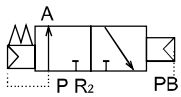
JIS symbol

● 3-port valve

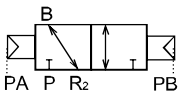
2-position NC single



2-position NO single

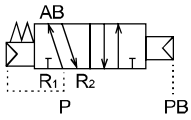


2-position double

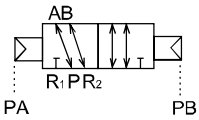


● 5-port valve

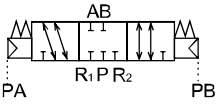
2-position single



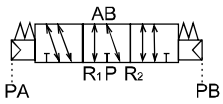
2-position double



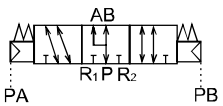
3-position all ports closed



3-position A/B/R connection



3-position P/A/B connection



Common specifications

Descriptions		Content
Valve and operation		Pilot operated soft spool valve
Working fluid		Compressed air
Max. working pressure	MPa	0.70 (≈100 psi, 7 bar)
Min. working pressure	MPa	Refer to section on working pressure in table below
Proof pressure	MPa	1.05 (≈150 psi, 10.5 bar)
Ambient temperature	°C	-5 (23°F) to 50 (122°F) (no freezing)
Fluid temperature	°C	5 (41°F) to 50 (122°F)
Lubrication		Not required
Vibration resistance	m/s^2	50 or less
Shock resistance	m/s^2	300 or less
Atmosphere		Cannot be used in corrosive gas environment.

Individual specifications: body piping (single valve/manifold)

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Position Number of solenoids							Model No.		Specifications					
									*1 Port size					
2-position NC single	2-position NO single	2-position single	2-position double	3-position all ports closed	3-position A/B/R connection	3-position P/A/B connection	Series model No.		Air supply port: P	Cylinder port A/B	Exhaust Port R1, R2	Pilot port PA/PB	Working pressure MPa	Pilot pressure MPa
●							**3KA1** Series	3KA111	M5	M5	M5	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
●								M3KA111	Rc1/8		Rc1/8			
	●							3KA1111	M5		M5			
	●							M3KA1111	Rc1/8		Rc1/8			
			●					3KA121	M5		M5		0 to 0.7	0.15 to 0.7
			●					M3KA121	Rc1/8		Rc1/8			
		●					**4KA1** Series	4KA111	M5	M5	M5	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
		●						M4KA111	Rc1/8		Rc1/8			
			●					4KA121	M5		M5		0 to 0.7	0.15 to 0.7
			●					M4KA121	Rc1/8		Rc1/8			
				●				4KA131	M5		M5			0.2 to 0.7
				●				M4KA131	Rc1/8		Rc1/8			
					●			4KA141	M5		M5			
					●			M4KA141	Rc1/8		Rc1/8			
						●		4KA151	M5		M5			
						●		M4KA151	Rc1/8		Rc1/8			
		●					**4KA2** Series	4KA211	Rc1/8	Rc1/8	Rc1/8	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
		●						M4KA211	Rc1/4		Rc1/4			
			●					4KA221	Rc1/8		Rc1/8		0 to 0.7	0.2 to 0.7
			●					M4KA221	Rc1/4		Rc1/4			
				●				4KA231	Rc1/8		Rc1/8			
				●				M4KA231	Rc1/4		Rc1/4			
					●			4KA241	Rc1/8		Rc1/8			
					●			M4KA241	Rc1/4		Rc1/4			
						●		4KA251	Rc1/8		Rc1/8			
						●		M4KA251	Rc1/4		Rc1/4			
		●					**4KA3** Series	4KA311	Rc1/4	Rc1/4	Rc1/4	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
		●						M4KA311	Rc3/8		Rc3/8			
			●					4KA321	Rc1/4		Rc1/4		0 to 0.7	0.2 to 0.7
			●					M4KA321	Rc3/8		Rc3/8			
				●				4KA331	Rc1/4		Rc1/4			
				●				M4KA331	Rc3/8		Rc3/8			
					●			4KA341	Rc1/4		Rc1/4			
					●			M4KA341	Rc3/8		Rc3/8			
						●		4KA351	Rc1/4		Rc1/4			
						●		M4KA351	Rc3/8		Rc3/8			
		●					**4KA4** Series	4KA411	Rc3/8	Rc3/8	Rc3/8	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
		●						M4KA411	Rc1/2		Rc1/2			
			●					4KA421	Rc3/8		Rc3/8		0 to 0.7	0.2 to 0.7
			●					M4KA421	Rc1/2		Rc1/2			
				●				4KA431	Rc3/8		Rc3/8			
				●				M4KA431	Rc1/2		Rc1/2			
					●			4KA441	Rc3/8		Rc3/8			
					●			M4KA441	Rc1/2		Rc1/2			
						●		4KA451	Rc3/8		Rc3/8			
						●		M4KA451	Rc1/2		Rc1/2			

*1: There are options available with the port size other than those in the above table. Refer to the model No. display on page 1326.

Flow characteristics

Series	Model No.	Port size	C[dm³/(s·bar)]	b
3KA1	3KA111	M5	0.65	0.37
	M3KA111		0.69	0.29
	3KA1111		0.65	0.37
	M3KA1111		0.69	0.29
	3KA121		0.65	0.37
	M3KA121		0.69	0.29
4KA1	4KA111	M5	0.65	0.37
	M4KA111		0.69	0.29
	4KA121		0.65	0.37
	M4KA121		0.69	0.29
	4KA131		0.60	0.32
	M4KA131		0.69	0.29
	4KA141		0.68	0.39
	M4KA141		0.97	0.31
	4KA151		0.61	0.36
	M4KA151		0.73	0.30
4KA2	4KA211	Rc1/8	2.6	0.43
	M4KA211		2.6	0.25
	4KA221		2.6	0.43
	M4KA221		2.6	0.25
	4KA231		2.3	0.43
	M4KA231		2.4	0.32
	4KA241		2.9	0.34
	M4KA241		3.0	0.16
	4KA251		2.3	0.42
	M4KA251		2.4	0.31
4KA3	4KA311	Rc1/4	5.6	0.49
	M4KA311		5.6	0.39
	4KA321		5.6	0.49
	M4KA321		5.6	0.39
	4KA331		4.1	0.60
	M4KA331		4.1	0.51
	4KA341		4.1	0.62
	M4KA341		5.9	0.37
	4KA351		4.2	0.68
	M4KA351		4.1	0.56
4KA4	4KA411	Rc3/8	9.8	0.49
	M4KA411		9.7	0.29
	4KA421		9.8	0.49
	M4KA421		9.7	0.29
	4KA431		8.2	0.54
	M4KA431		8.3	0.40
	4KA441		11	0.50
	M4KA441		11	0.30
	4KA451		8.4	0.54
	M4KA451		8.7	0.46

*1: Effective cross-sectional area "S" and sonic conductance "C" are converted as S ≈ 5.0 x C.

How to order

● Single master valve

4KA2 1 1 - 06 - ○

● Single master valve for manifold (gasket, mounting screws attached)

4KA2 1 8 - 06

● Manifold

M 4KA2 1 1 - 06 - ○ - 2

Operating classification master valve

Ⓑ Solenoid position

Ⓐ Model No.

Ⓒ Port size

Ⓓ Other options

Ⓔ Station No.

Code	Content	Ⓐ Model No. 3KA1	4KA1	4KA2	4KA3	4KA4
Ⓑ Solenoid position						
1	2-position NC single	●				
11	2-position NO single	●				
1	2-position single		●	●	●	●
2	2-position double	●	●	●	●	●
3	3-position all ports closed		●	●	●	●
4	3-position A/B/R connection		●	●	●	●
5	3-position P/A/B connection		●	●	●	●
8	2/3 position mix manifold *1		●	●	●	●
Ⓒ Port size						
Port	P/A/B port (Single valve) A/B Port (Manifold)	R1/R2 port (single valve) (1)=M5 (2)=Rc1/8 (3)=Rc1/4 (4)=Rc3/8 P/R1/R2 port (manifold) (1)=Rc1/8 (2)=Rc1/4 (3)=Rc3/8 (4)=Rc1/2				
M5	M5	(1)	(1)			
06	Rc1/8			(2)		
08	Rc1/4				(3)	
10	Rc3/8					(4)
GS 4	φ 4 Push-in fitting	(1)	(1)			
GS 6	φ 6 Push-in fitting	(1)	(1)	(2)		
GS 8	φ 8 Push-in fitting			(2)	(3)	
GS10	φ 10 Push-in fitting				(3)	(4)
GS12	φ 12 Push-in fitting					(4)
Ⓓ Other options						
Blank	None	●	●	●	●	●
P	Mounting plate (Dedicated for 2-position single of single master valve)	●	●	●	●	●
Ⓔ Station No.						
2 to 15	2 stations to 15 stations				●	●
2 to 20	2 stations to 20 stations	●	●	●		

[Example of model No.]

4KA311-08-P

Ⓐ Model: 4KA3
Ⓑ Solenoid position : 2-position single
Ⓒ Port size : Rc1/4
Ⓓ Other options : Mounting plate

⚠ Precautions for model No. selection

*1: 8 is appropriate for the manifold assembly.
Read the following for how to list the combination.
*2: With regard to the printed model No., although the model No. when placing an order is "4KA□□8", the model No. listed on the product name plate will be "4KA□□1".

[Mix manifold]

● How to list combination descriptions
When selecting a combination manifold (write 8 from Ⓑ), list the code (refer to table 1) for required functions and the arrangement No. (numbering up to specified station No. with left side as 1) in the field for remarks below the normal model No. display as shown in the example.

[Table 1]

Code	Function
S1	2-position single
S2	2-position double
S3	3-position all ports closed
S4	3-position A/B/R connection
S5	2-position P/A/B connection
MP	Masking plate

1	2	3	4	5	6	7
(S1) 2-position single	(S2) 2-position double	(S3) 3-position all ports closed	(S3) 3-position all ports closed	(S2) 2-position double	(S1) 2-position single	(S4) 3-position A/B/R connection

S1	S2	S3	S4	S5	MP
2	2	2	1	0	0

Example

The model No. when a combination manifold (7 stations) of an arrangement such as that on the left is configured with 4KA3 and A/B port: Rc1/8, upwards piping

M4KA381-06-7- 2 2 2 1 0 0

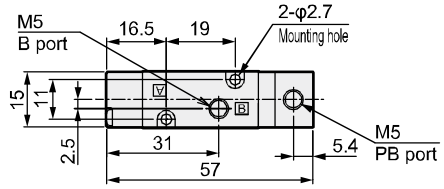
S1=1, 6 S2=2, 5 S3=3, 4 S4=7
Code Position

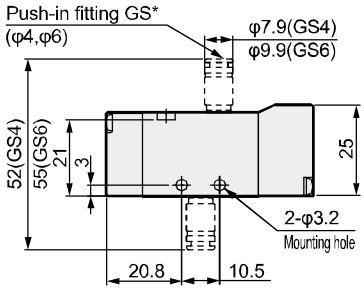
Dimensions

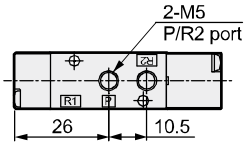
3-port valve

3KA111

● 2-position single NC

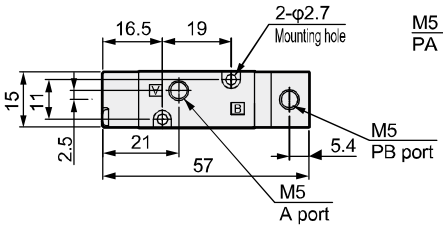


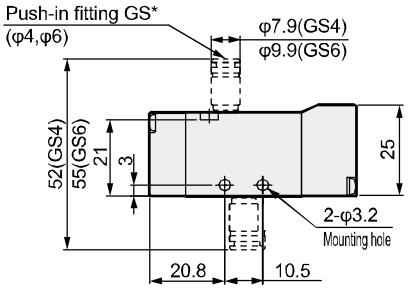


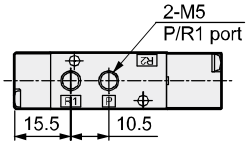


3KA1111

● 2-position single NO

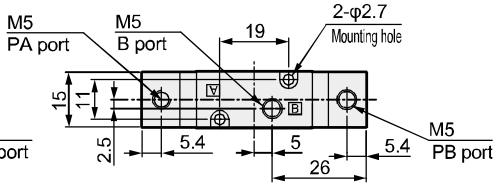


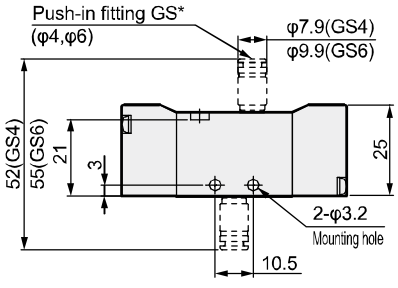


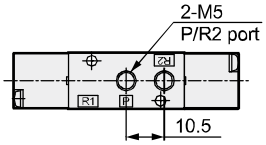


3KA121

● 2-position double



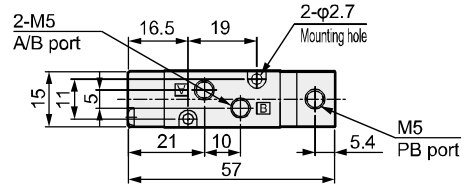


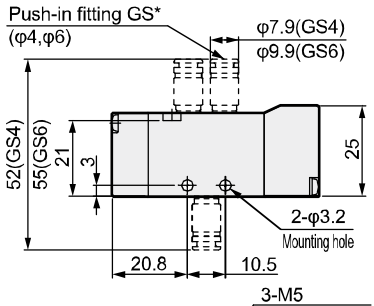


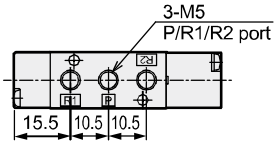
5-port valve

4KA111

● 2-position single

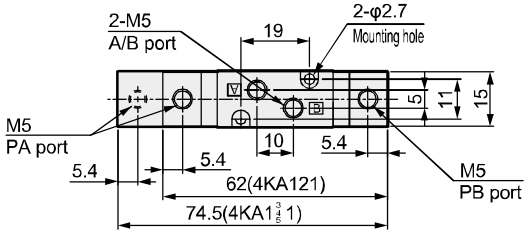


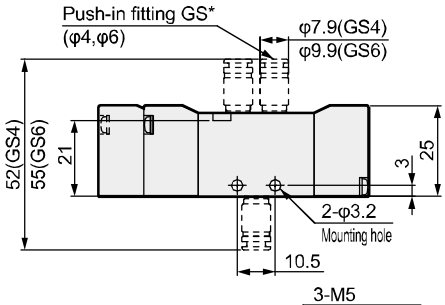


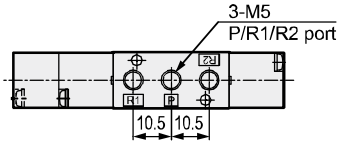


4KA1 2 3 4 5 1

● 2-position double/3 position





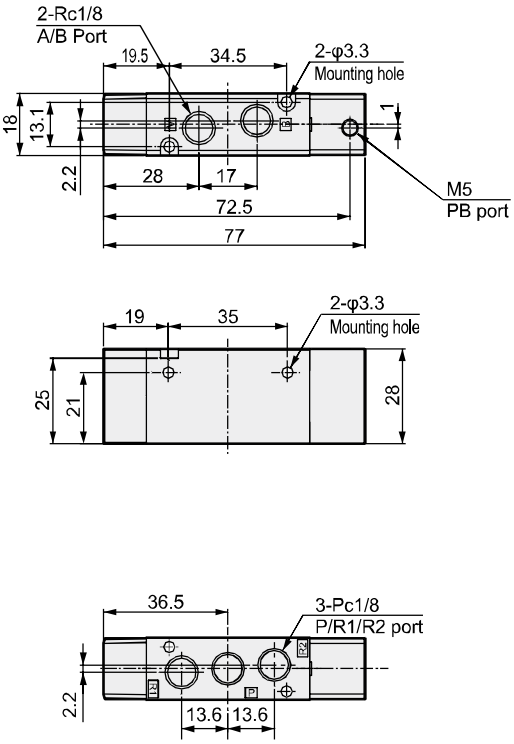


* Refer to pages 1246 and 1248 for type with mounting plate (P).

Dimensions

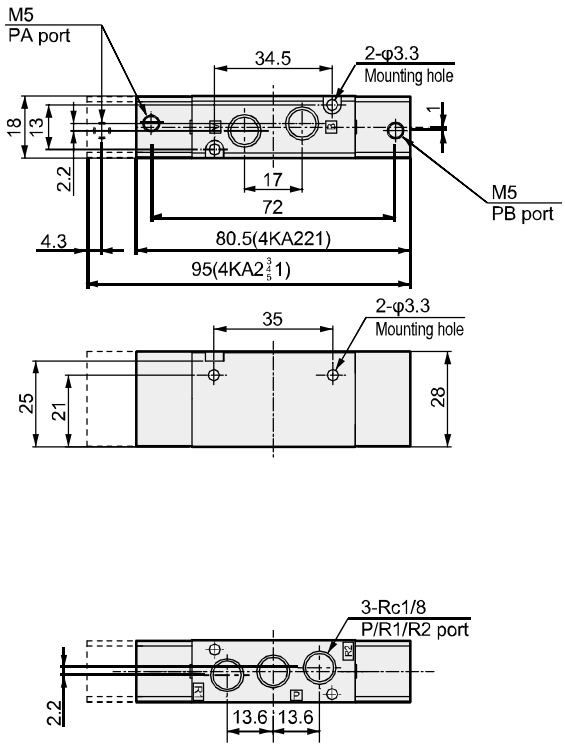
4KA211

● 2-position single



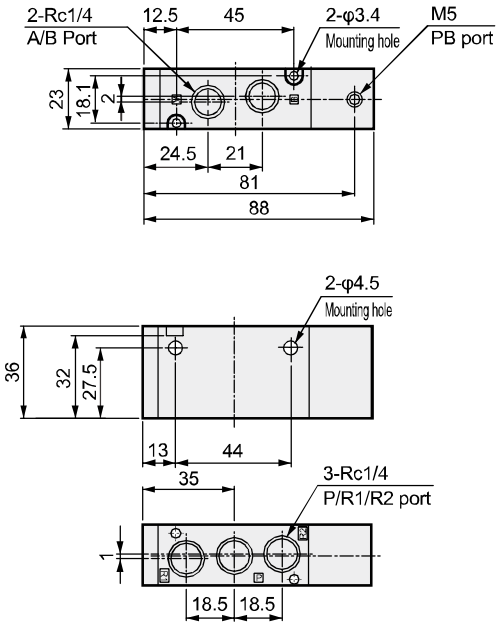
4KA2$^{2}_{3}_{5}$1

● 2-position double/3 position



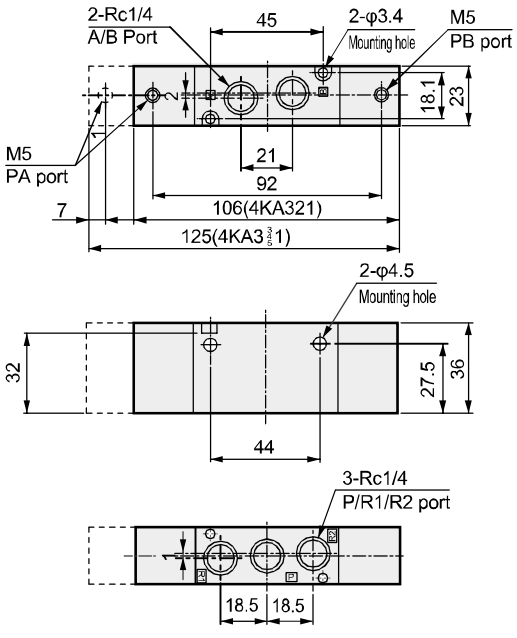
4KA311

● 2-position single



4KA3$^{2}_{3}_{5}$1

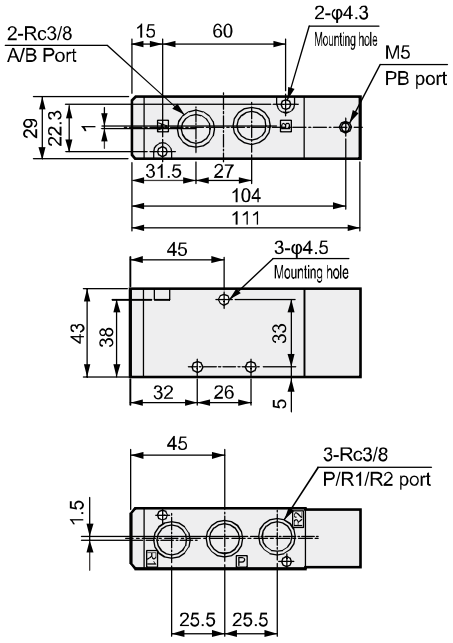
● 2-position double/3 position



Dimensions

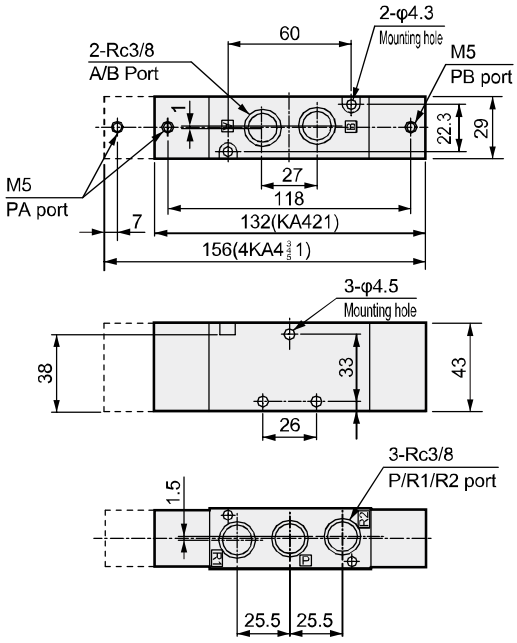
4KA411

● 2-position single

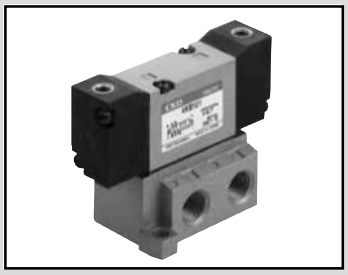


4KA4 2 3 4 5 1

● 2-position double/3 position



* Refer to pages 1250, 1252, 1254 for type with mounting plate (P).



Master valve sub-plate piping
Pilot operated 3, 5-port pneumatic valve

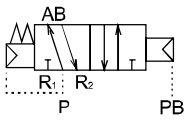
4KB1/2/3/4 Series

● Cylinder bore size: φ20 to φ160

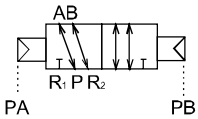
RoHS

JIS symbol

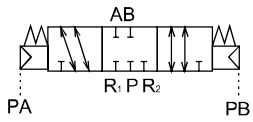
● 5-port valve
2-position single



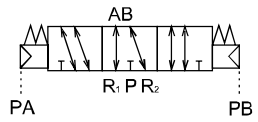
2-position double



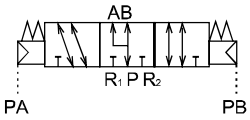
3-position all ports closed



3-position A/B/R connection



3-position P/A/B connection



4KB1 only R1, R2
Common exhaust

Common specifications

Descriptions	Content
Valve and operation	Pilot operated soft spool valve
Working fluid	Compressed air
Max. working pressure MPa	0.70 (≈100 psi, 7 bar)
Min. working pressure MPa	Refer to section on working pressure in table below
Ambient temperature °C	-5 (23°F) to 50 (122°F)
Fluid temperature °C	5 (41°F) to 50 (122°F)
Lubrication	Not required
Vibration resistance m/s^2	50 or less
Shock resistance m/s^2	300 or less
Atmosphere	Cannot be used in corrosive gas environment.

Individual specifications: sub-plate piping (single valve/manifold)

1 MPa ≈ 145.0 psi, 1 MPa = 10 bar

Position No. of solenoids					Model No.		Specifications					
							*1 Port size					
2-position single	2-position double	3-position all ports closed	3-position A/B/R connection	3-position P/A/B connection	Series Model No.		Air supply port P	Cylinder port A/B	Exhaust port R1/R2	Pilot port PA/PB	Working pressure MPa	Pilot pressure MPa
●					4KB1 Series	4KB111	Rc1/8	Rc1/8	Rc1/8	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
●						M4KB111		M5/Rc1/8				
	●					4KB121		Rc1/8			0 to 0.7	0.15 to 0.7
	●					M4KB121		M5/Rc1/8				
		●				4KB131		Rc1/8				0.2 to 0.7
		●				M4KB131		M5/Rc1/8				
			●			4KB141		Rc1/8				
			●			M4KB141		M5/Rc1/8				
				●		4KB151		Rc1/8				
				●		M4KB151		M5/Rc1/8				
●					4KB2 Series	4KB211	Rc1/8	Rc1/8	Rc1/4	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
●						M4KB211	Rc1/4					
	●					4KB221	Rc1/8				0 to 0.7	0.2 to 0.7
	●					M4KB221	Rc1/4					
		●				4KB231	Rc1/8					
		●				M4KB231	Rc1/4					
			●			4KB241	Rc1/8					
			●			M4KB241	Rc1/4					
				●		4KB251	Rc1/8					
				●		M4KB251	Rc1/4					
●					4KB3 Series	4KB311	Rc1/4	Rc1/4	Rc1/4	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
●						M4KB311	Rc3/8		Rc3/8			
	●					4KB321	Rc1/4		Rc1/4		0 to 0.7	0.2 to 0.7
	●					M4KB321	Rc3/8		Rc3/8			
		●				4KB331	Rc1/4		Rc1/4			
		●				M4KB331	Rc3/8		Rc3/8			
			●			4KB341	Rc1/4		Rc1/4			
			●			M4KB341	Rc3/8		Rc3/8			
				●		4KB351	Rc1/4		Rc1/4			
				●		M4KB351	Rc3/8		Rc3/8			
●					4KB4 Series	4KB411	Rc3/8	Rc3/8	Rc3/8	M5	0.15 to 0.7	(0.6 x working pressure + 0.06) to 0.7
●						M4KB411	Rc1/2		Rc1/2			
	●					4KB421	Rc3/8		Rc3/8		0 to 0.7	0.2 to 0.7
	●					M4KB421	Rc1/2		Rc1/2			
		●				4KB431	Rc3/8		Rc3/8			
		●				M4KB431	Rc1/2		Rc1/2			
			●			4KB441	Rc3/8		Rc3/8			
			●			M4KB441	Rc1/2		Rc1/2			
				●		4KB451	Rc3/8		Rc3/8			
				●		M4KB451	Rc1/2		Rc1/2			

*1: There are options available with the port size other than those in the above table. Refer to the model No. display on page 1332.

Flow characteristics

Series	Model No.	Port size	C[dm^3/(s·bar)]	b
4KB1	4KB111	Rc1/8	0.89	0.44
	M4KB111	M5/Rc1/8	0.71	0.25
	4KB121	Rc1/8	0.89	0.44
	M4KB121	M5/Rc1/8	0.71	0.25
	4KB131	Rc1/8	0.63	0.50
	M4KB131	M5/Rc1/8	0.60	0.23
	4KB141	Rc1/8	1.2	0.29
	M4KB141	M5/Rc1/8	0.81	0.25
	4KB151	Rc1/8	0.75	0.39
	M4KB151	M5/Rc1/8	0.67	0.32
4KB2	4KB211	Rc1/8	2.7	0.24
	M4KB211		2.1	0.13
	4KB221		2.7	0.24
	M4KB221		2.1	0.13
	4KB231		2.4	0.29
	M4KB231		1.8	0.11
	4KB241		3	0.27
	M4KB241		2	0.17
	4KB251		2.4	0.34
	M4KB251		1.8	0.23
4KB3	4KB311	Rc1/4	6.3	0.26
	M4KB311		4.5	0.11
	4KB321		6.3	0.26
	M4KB321		4.5	0.11
	4KB331		5.6	0.27
	M4KB331		4.4	0.21
	4KB341		6.6	0.20
	M4KB341		4.8	0.18
	4KB351		5.9	0.27
	M4KB351		4.3	0.20
4KB4	4KB411	Rc3/8	12	0.24
	M4KB411		8.9	0.22
	4KB421		12	0.24
	M4KB421		8.9	0.22
	4KB431		11	0.27
	M4KB431		8.9	0.24
	4KB441		13	0.21
	M4KB441		9.4	0.23
	4KB451		10	0.22
	M4KB451		8.6	0.20

*1: Effective cross-sectional area “S” and sonic conductance “C” are converted as S ≈ 5.0 x C.

4KB1 to 4 Series

Master valve; sub-plate piping

How to order

● Single master valve

4KB2 (1) 1 - (06)

● Single master valve for manifold (gasket, mounting screws attached)

4KB2 (1) 8 - (00)

● Manifold

Operating classification master valve

M 4KB2 (1) 1 - (06) - (2)

Ⓑ Solenoid position

Ⓐ Model No.

Ⓒ Port size

Ⓓ Station No.

Code	Content	Ⓐ Model No. 4KB1	4KB2	4KB3	4KB4
Ⓑ Solenoid position					
1	2-position single	●	●	●	●
2	2-position double	●	●	●	●
3	3-position all ports closed	●	●	●	●
4	3-position A/B/R connection	●	●	●	●
5	3-position P/A/B connection	●	●	●	●
8	2-position/3-position mix manifold *1	●	●	●	●
Ⓒ Port size					
Port	P/A/B port (Single valves)	R1/R2 port (single valve) (1)=Rc1/8 (2)=Rc1/4 (3)=Rc3/8 (4)=Rc1/2			
06	Rc1/8	(1)	(2)		
08	Rc1/4		(2)	(2)	
10	Rc3/8			(3)	(3)
15	Rc1/2				(4)
Port	A/B port (Manifold)	P/R1/R2 port (manifold) (1)=Rc1/8 (2)=Rc1/4 (3)=Rc3/8 (4)=Rc1/2			
M5	M5 *2	(1)			
06	Rc1/8	(1)	(2)		
08	Rc1/4		(2)	(3)	
10	Rc3/8			(3)	(4)
15	Rc1/2				(4)
M5Y	M5 (rear piping)	(1)			
06Y	Rc1/8 (rear piping)		(2)		
08Y	Rc1/4 (rear piping)			(3)	
10Y	Rc3/8 (rear piping)				(4)
H6	φ6 push-in fitting *2	(1)	(2)		
H8	φ8 push-in fitting *2		(2)	(3)	
H10	φ10 push-in fitting			(3)	(4)
H12	φ12 push-in fitting				(4)
Ⓓ Station No.					
2 to 12	2 stations to 12 stations				●
2 to 15	2 stations to 15 stations			●	
2 to 20	2 stations to 20 stations	●	●		

[Example of model No.]

4KB311-08

Ⓐ Model: 4KB3
Ⓑ Solenoid position : 2-position single
Ⓒ Port size : Rc1/4

⚠ Precautions for model No. selection

*1: 8 is appropriate for the manifold assembly.
Read the following for how to list the combination.
*2: H6 and H8 can be manufactured with up to 10 stations.

[Mix manifold]

● How to list combination descriptions
When selecting a combination manifold (write 8 from Ⓑ), list the code (refer to table 1) for required functions and the arrangement No. (numbering up to specified station No. with left side as 1) in the field for remarks below the normal model No. display as shown in the example.

[Table 1]

Code	Function
S1	2-position single
S2	2-position double
S3	3-position all ports closed
S4	3-position A/B/R connection
S5	2-position P/A/B connection
MP	Masking plate

1	2	3	4	5	6	7
(S1) 2-position single	(S2) 2-position double	(S3) 3-position All ports closed	(S3) 3-position All ports closed	(S2) 2-position double	(S1) 2-position single	(S4) 3-position A/B/R connection

S1	S2	S3	S4	S5	MP
2	2	2	1	0	0

Example

The model No. when a combination manifold (7 stations) of an arrangement such as that on the left is configured with 4KB3 and A/B port: Rc1/8, sideways piping

M4KB381-06-7- 2 2 2 1 0 0

S1=1, 6 S2=2, 5 S3=3, 4 S4=7
Code Position

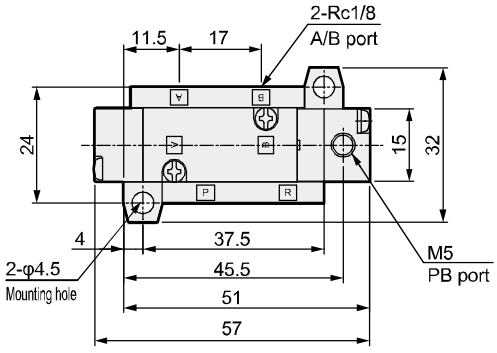
● With a mix manifold, when using 10 or more actuators of the same model No., specify using the codes in the table below.

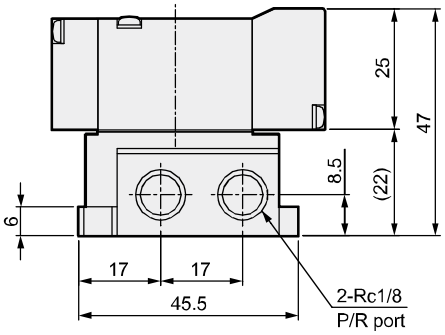
Actuator quantity	10	11	12	13	14	15	16	17	18	19
Code	A	B	C	D	E	F	G	H	I	J

Dimensions

4KB111

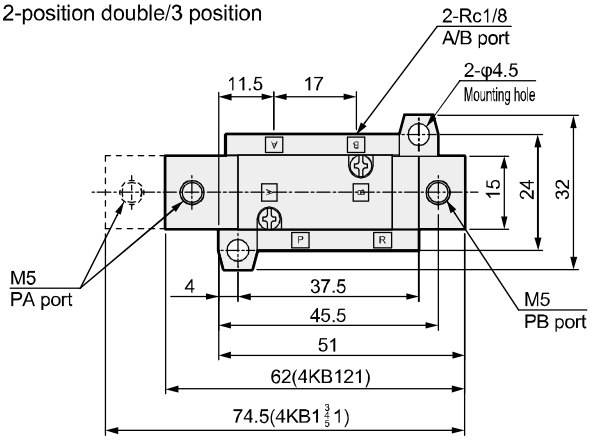
● 2-position single

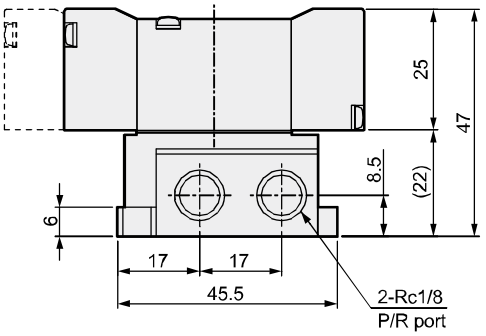




4KB1$^{2}_{3}_{4}_{5}$1

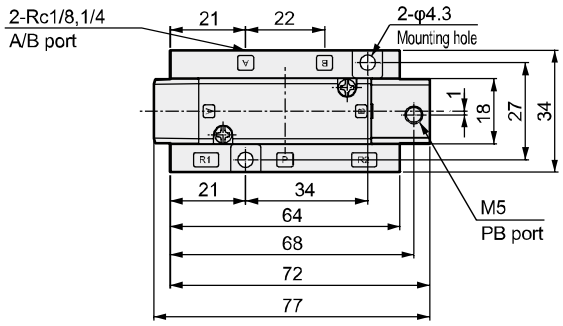
● 2-position double/3 position

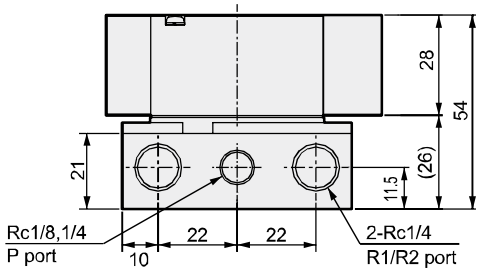




4KB211

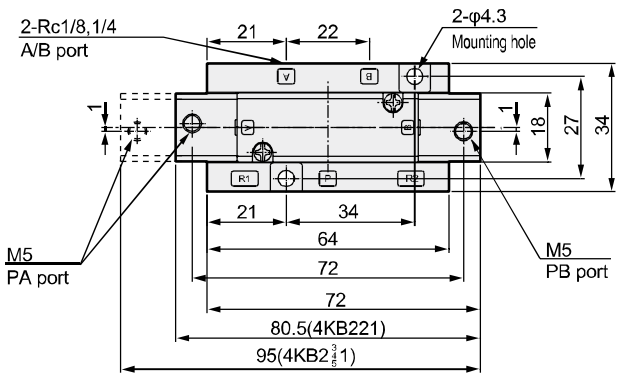
● 2-position single

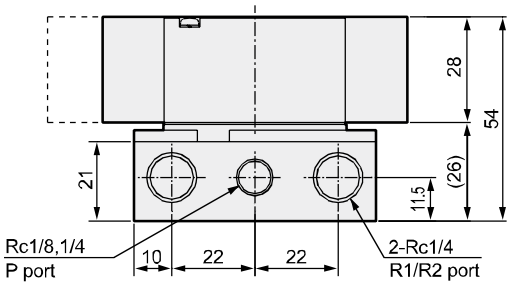




4KB2$^{2}_{3}_{4}_{5}$1

● 2-position double/3 position

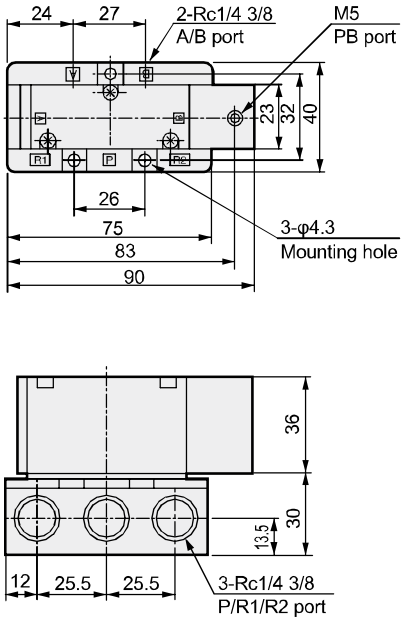




Dimensions

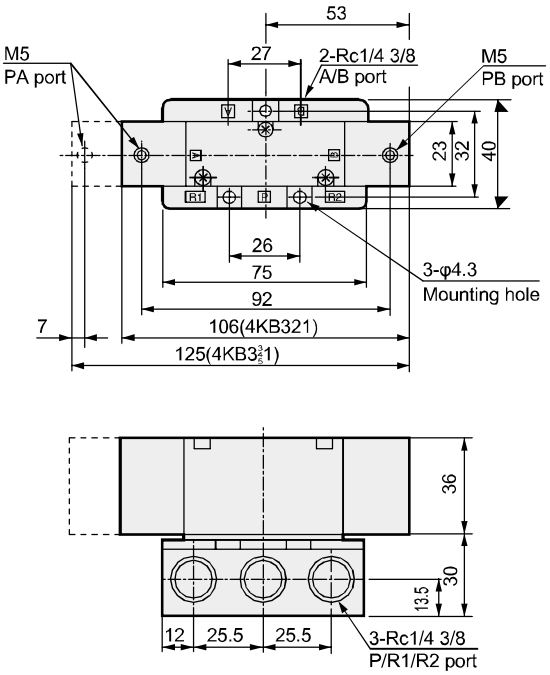
4KB311

● 2-position single



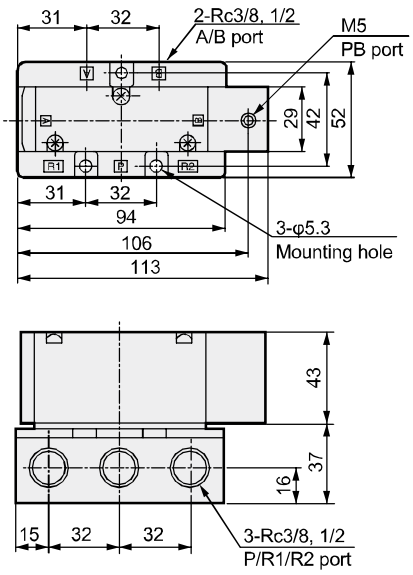
4KB3$^{2}_{3}_{4}_{5}$1

● 2-position double/3 position



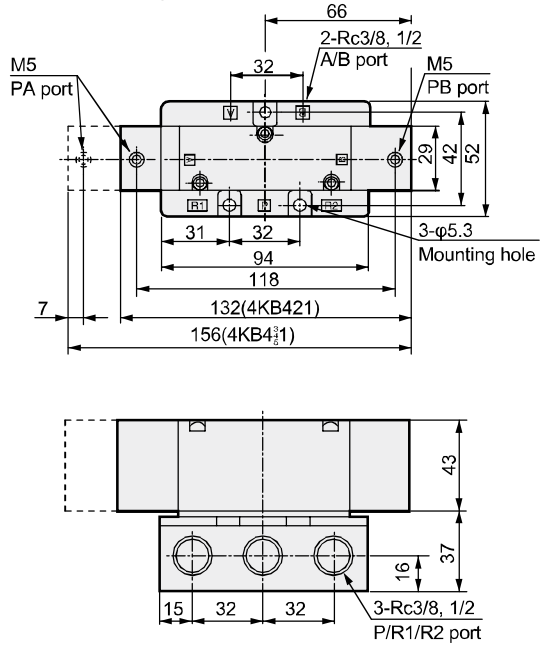
4KB411

● 2-position single



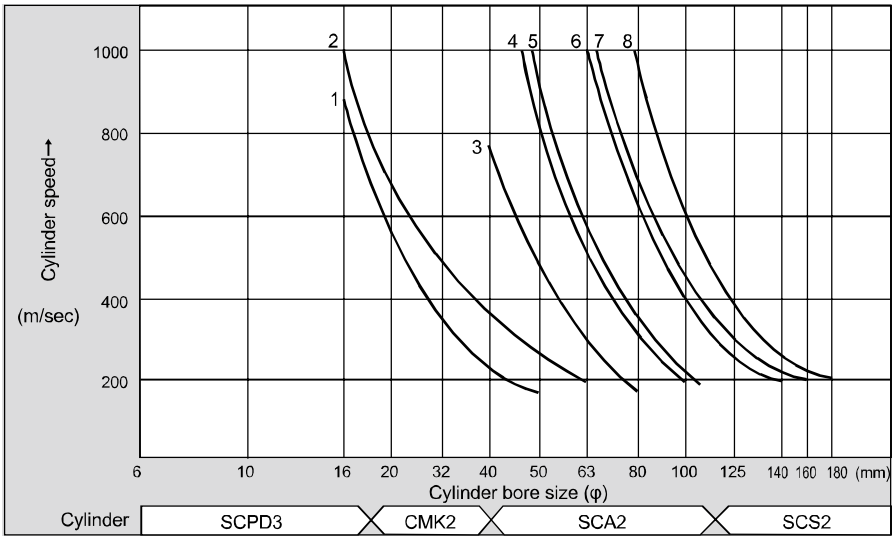
4KB4$^{2}_{3}_{4}_{5}$1

● 2-position double/3 position



The cylinder average speed is obtained from the combination of 4K$^{A}_{B}$ Series and piping system.

Example: For the system when moving SCA2-63 with a speed of 500 mm/sec, system "4" devices can be selected. For clean air system components, select system "4" devices with which a required flow rate of 520 ℓ/min or more will flow.



Standard system table

System No.	Valve	Speed controller	Silencer	Piping (1m)	Composite effective sectional area (mm²)	Required flow rate (ℓ/min)
1	4KA1$^{1}_{2}$0-M5	SC-M5-S	SL-M5	φ4×φ2.5	1.6	115
2	4KB1$^{1}_{2}$0-06	SC1-6	SLW-6S	φ6×φ4	3.2	215
3	4KA2$^{1}_{2}$0-06	SC1-6	SLW-6S	φ6×φ4	4.8	346
4	4KB2$^{1}_{2}$0-08	SC1-8	SLW-8S	φ8×φ5.7	8	581
5	4KA3$^{1}_{2}$0-08	SC1-8	SLW-8S	φ8×φ5.7	9.1	660
6	4KB3$^{1}_{2}$0-10	SC1-10	SLW-10L	φ10×φ7.2	16.5	1285
7	4KA4$^{1}_{2}$0-10	SC1-10	SLW-10L	φ10×φ7.2	19	1289
8	4KB4$^{1}_{2}$0-15	SC1-15	SLW-15A	φ12×φ8.9	25.8	1749

*1: The required flow rate is the condition for when the pressure is 0.5 MPa.
*2: Effective cross-sectional area "S" and sonic conductance "C" are converted as S ≈ 5.0 x C.

Clean air system components

Part name	Model No.	Port size	Max. flow rate ℓ/min (ANR)
F.R.L. combination	C1000-6-W	Rc 1/8	450
	C1000-8-W	Rc 1/4	630
	C3000-8-W	Rc 1/4	1280
	C3000-10-W	Rc 3/8	1750
	C4000-8-W	Rc 1/4	1430
	C4000-10-W	Rc 3/8	2400
	C4000-15-W	Rc 1/2	3000
	C8000-20-W	Rc 3/4	7000
	C8000-25(-A32)-W	Rc1(Rc1 1/4)	7500
F.R. unit	W1000-6-W	Rc 1/8	830
	W1000-8-W	Rc 1/4	1150
	W3000-8-W	Rc 1/4	2150
	W3000-10-W	Rc 3/8	2430
	W4000-8-W	Rc 1/4	2500
	W4000-10-W	Rc 3/8	4350
	W4000-15(-A20)-W	Rc 1/2 , Rc 3/4	4750
	W8000-20-W	Rc 3/4	10000
	W8000-25(-A32)-W	Rc1(Rc1 1/4)	10000
Air filter (F)	F1000-6-W	Rc 1/8	460
	F1000-8-W	Rc 1/4	610
	F3000-8-W	Rc 1/4	1230
	F3000-10-W	Rc 3/8	1500
	F4000-8-W	Rc 1/4	1320
	F4000-10-W	Rc 3/8	2140
	F4000-15(-A20)-W	Rc 1/2 (Rc 3/4)	3000
	F8000-20-W	Rc 3/4	6400
	F8000-25(-A32)-W	Rc1(Rc1 1/4)	6800

Part name	Model No.	Port size	Max. flow rate ℓ/min (ANR)
Regulator (R)	R1000-6-W	Rc 1/8	770
	R1000-8-W	Rc 1/4	1350
	R3000-8-W	Rc 1/4	2000
	R3000-10-W	Rc 3/8	2600
	R4000-8-W	Rc 1/4	2500
	R4000-10-W	Rc 3/8	4400
	R4000-15-W	Rc 1/2 (Rc 3/4)	5000
	R8000-20-W	Rc 3/4	14000
	R8000-25(-A32)-W	Rc1(Rc1 1/4)	11000
Lubricator (L)	L1000-6-W	Rc 1/8	550
	L1000-8-W	Rc 1/4	700
	L3000-8-W	Rc 1/4	1100
	L3000-10-W	Rc 3/8	2250
	L4000-8-W	Rc 1/4	1000
	L4000-10-W	Rc 3/8	1700
	L4000-15(-A20)-W	Rc 1/2 (Rc 3/4)	2700
	L8000-20-W	Rc 3/4	6300
	L8000-25(-A32)-W	Rc1(Rc1 1/4)	10000

(Note)
Max. flow rate: Flow rates for FRL, FR, and R when primary pressure is 0.7 MPa, set pressure is 0.5 MPa, and pressure drop is 0.1 MPa. Flow rate for F when primary pressure is 0.7 MPa and pressure drop is 0.02 MPa. Flow rate for L when primary pressure is 0.5 MPa and pressure drop is 0.03 MPa.

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 59 for general precautions for using valves.

Product-specific cautions: Pilot operated 3, 4, 5-port valve 4K Series

Design/selection

1. Surge suppressor

⚠ CAUTION

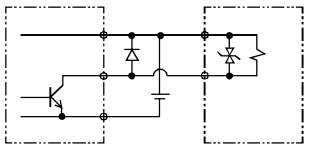
■ The surge suppressor attached with the solenoid valve is intended to protect the output contacts for the solenoid valve drive. There is no significant protection for the other peripheral devices, and devices could be damaged or could malfunction due to a surge. As well, surges generated by other devices may be absorbed and cause damage such as burning. When using the surge suppressor built-in (electrical connection code: L, LS, C*, D*), be aware of the following points.

(1) The surge suppressor functions to limit solenoid valve surge voltage, which can reach several hundred volts, to a low voltage level that the output contact can withstand. Depending on the output circuit used, this may be insufficient and could result in damage or malfunction. Check whether the surge suppressor can be used within the surge voltage limit of the solenoid valve in use, the output device's withstand pressure and circuit structure, and by the degree of return delay time. When necessary, provide other surge countermeasures. The inverse voltage surge generated when OFF can be suppressed to the following levels.

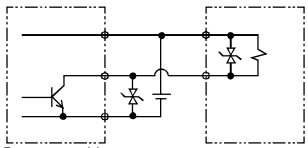
Specification voltage	Inverse voltage when OFF
12 VDC	Approx. 27 V
24 VDC	Approx. 47 V

(2) If the output unit is an NPN, a surge voltage equaling the voltage shown in the table above plus the power supply voltage may be applied to the output transistor. Make sure to implement a contact protection circuit to avoid the risk.

[Output transistor protection circuit: Installation example 1]



[Output transistor protection circuit: Installation example 2]



(3) If another device or solenoid valve is connected in parallel to the solenoid valve, the inverse voltage surge generated when the valve is OFF would apply to those devices. Even in the case of a solenoid valve with 24 VDC surge suppressor, a surge voltage may reach negative tens of volts for some models. This inverse voltage may cause damage or malfunction to other components connected in parallel. Avoid parallel connection of devices susceptible to inverse polarity voltages, e.g., LED indicators. When driving several solenoid valves in parallel, the surge from other solenoid valves may enter the surge suppressor of one solenoid valve, and it may burn depending on the current value. When driving several solenoid valves with surge suppressors in parallel, surge current could concentrate at the surge suppressor with the lowest limit voltage and cause similar burning. Due to the variations in surge suppressor limit voltage that exist even among solenoid valves of the same model No., in the worst case the surge suppressor may burn out. Avoid driving several solenoid valves in parallel.

(4) The surge suppressor incorporated in the solenoid valve will often be short-circuited if it is damaged by overvoltage or overcurrent from other solenoid valves. Where there is a failed surge suppressor, if a large current flows when the output is ON, in the worst case scenario, the output circuit or solenoid valve could be damaged or ignited. Do not continue energizing in a state of failure. Additionally, to prevent large currents from continuing to flow, connect an overcurrent protection circuit to the power supply and drive circuit, or use a power supply with overcurrent protection.

Use/maintenance

⚠ CAUTION

■ Do not block the PR port.
Pilot pressure will not be discharged and will fail to operate.

■ Continuous energizing for long periods may accelerate degradation of the solenoid valve. Consult with CKD when energizing this device continuously.
Furthermore, use caution under the following working conditions, as with continuous energization:
· When performing continuous energizing for a long period of time or when the energized time in a single day will be longer than the non-energized time Install with an eye to heat dissipation.

■ The service life may become shorter when using AC voltage with dry air (atmospheric dew point of -20°C or less). Use of DC voltage is recommended with dry air. Consult with CKD when using AC voltage.