

4SA0/4SB0

Pilot-operated 5-port valve



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Pilot-Operated 5-Port Solenoid (M)4S_BOR Series

Ultra-compact 5-port solenoid valve Ideal for driving cylinders up to ø25

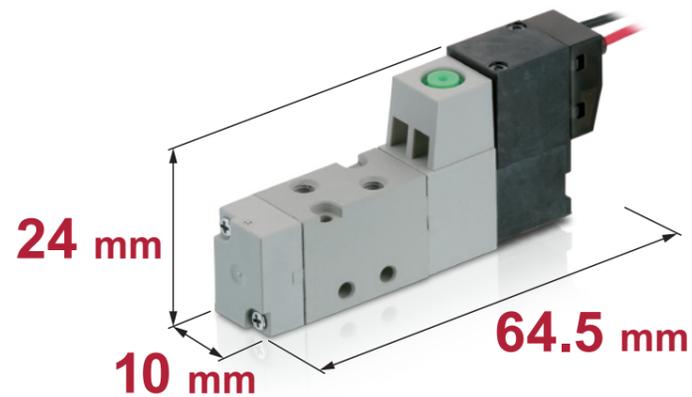
Pilot-operated 5-port valve



4SA/B0

Achieves ultra-compact solenoid valves

This size can drive cylinders up to ø25.



Direct piping single 5-port valve
Actual size

Equipped with a power-saving coil, it has been renewed to the 4SR series.

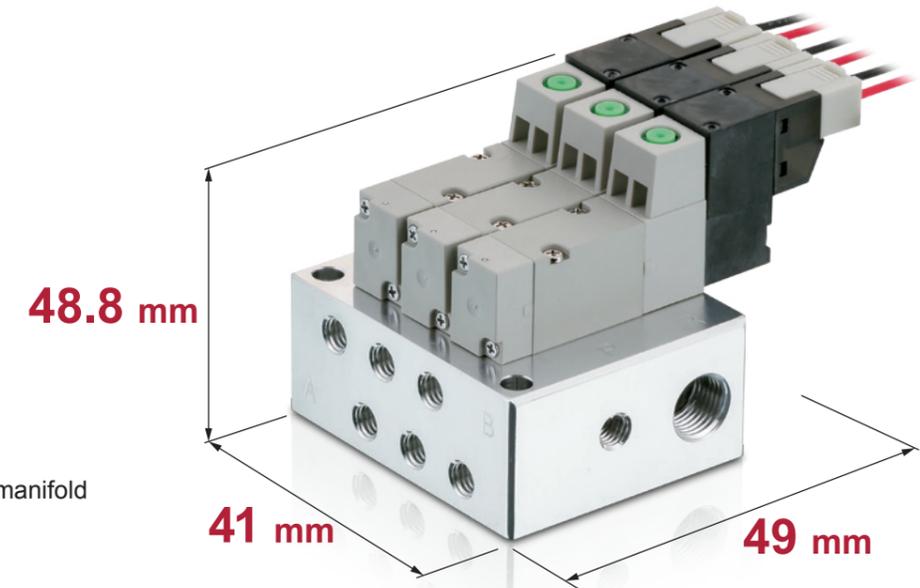
Power-saving coil

Previous model 4S	Renewed model 4SR
24 VDC	0.7 w
	0.3 w

Low-heat, power-saving built-in circuit option

Manifold installation possible even in extremely limited spaces

Since individual wiring is used, there are no wiring blocks, allowing for space-saving installation even with manifolds. Contributes to space-saving of solenoid valve manifolds, such as for end-effector control of compact robots.



Base piping 3-station manifold
Actual size

Pilot-operated 5-port valve

4SA/B0

Supports reduced wiring for PLC control

D-sub connector

A lineup featuring a general-purpose 25P D-sub connector is available.

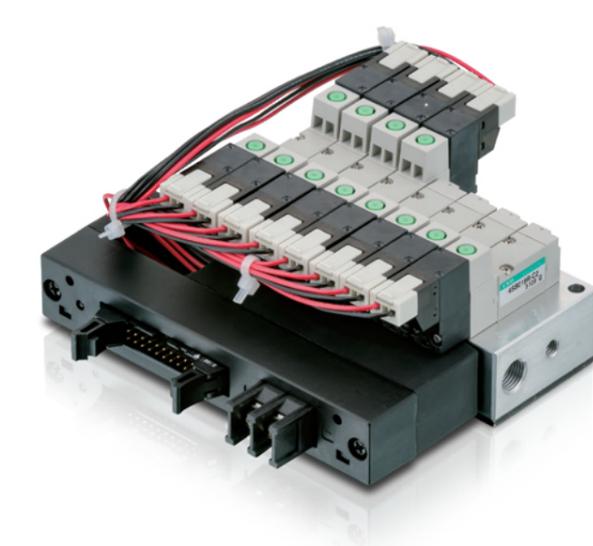
Switching position classification	Maximum number of stations
Single	20 stations
Double	10 stations

Flat cable connector

MIL connector

A lineup of connectors compliant with the general-purpose 20P MIL standard (MIL-C-83503) is available.

Switching position classification	Maximum number of stations
Single	16 stations
Double	8 stations

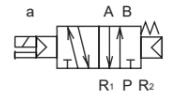
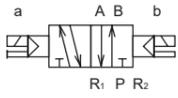
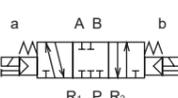
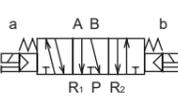
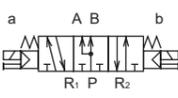


Compatible with global standards



Ending

Ending

Series name / Piping method	Number of ports	Position Number of solenoids Circuit diagram code	Valve capacity			Voltage (V)	Switching position							A/B port connection bore				Wire connection					Description page
			Effective Cross-sectional area S [mm ²]	Flow rate characteristics C [dm ³ / (s·bar) ^{*1}]	Applicable Cylinder Bore		2 Single position	2-position double	3-position closed center	3-position exhaust center	3-position pressure center	Mix manifold	Barb fitting		Female thread		Ø4 Push-in fitting	Grommet lead wire	C-type connector	D-type connector	D-sub connector	Flat cable connector	
													Ø4 Barb fitting	Ø6 Barb fitting	M3	M5							
Single unit	5-port	● 2-position single 	1.1	-	ø6 to ø25	DC 24 DC 12	●	●	●	●	●		●		●		●	●	●			1224	
		● 2-position double 	-	0.29 to 0.33			●	●	●	●	●			●		●	●	●					1224
Individual wiring manifold	5-port	● 3-position Closed center 	1.1	-		DC 24 DC 12	●	●	●	●	●	●	●	●		●	●	●				1232	
		● 3-position Exhaust center 	-	0.29 to 0.30			●	●	●	●	●	●	●	●	●	●	●	●	●	●			
Reduced wiring manifold	5-port	● 3-position Pressure center 	-	0.29 to 0.30	DC 24 DC 12	●	●	●	●	●	●	●	●	●				●	●			1236	

*1 : Conversion between effective area S and sonic conductance C is $S \approx 5.0 \times C$.

* For details on wire connection and other options, see the next page.

Pilot-operated 5-port valve

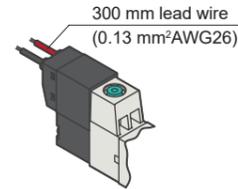
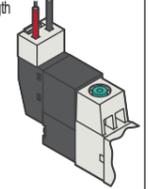
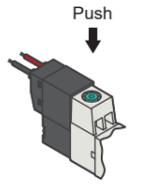
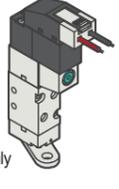
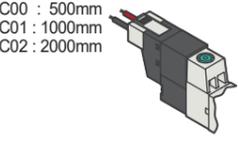
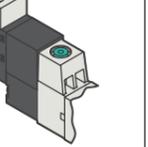
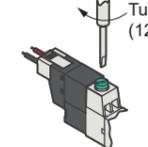
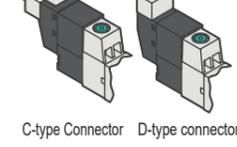
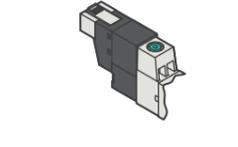
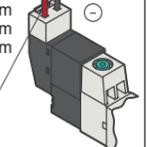
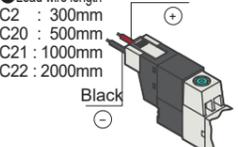
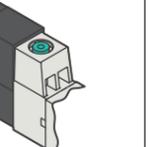
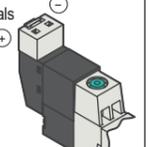
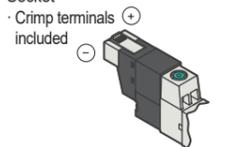
4SA/B0

Pilot-operated 5-port Valve

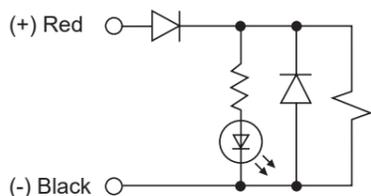
4SA/B0

4SA0/4SB0 Series

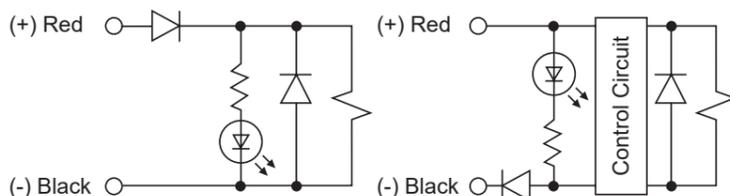
MEMO

Wire connection		Manual device	Other options	
Single valve and individually wired manifold	Reduced wiring manifold			
Blank Grommet lead wire  300 mm lead wire (0.13 mm ² AWG26)	D D-type connector with lead wire  ● Lead wire length D : 300mm D00 : 500mm D01 : 1000mm D02 : 2000mm	C4 T31 D-sub connector, side mount With surge suppressor and lamp	Blank Non-lock type  Push	P Mounting plate  For 4SA010R only Can be mounted
C C-type connector with lead wire  ● Lead wire length C : 300mm C00 : 500mm C01 : 1000mm C02 : 2000mm	D1 D-type connector With socket  Socket and crimp terminals included	D4 T30 D-sub connector, top mount With surge suppressor and lamp	M1 Lock type  Push Turn (120°)	E Built-in type with low heat generation and power saving circuit  C-type Connector D-type connector
C1 C-type connector with socket  Socket and crimp terminals included	D2 D-type connector with lead wire, surge suppressor, and lamp  ● Lead wire length D2 : 300mm D20 : 500mm D21 : 1000mm D22 : 2000mm Black (-) Red (+)	C4 T50 Flat cable Connector With surge suppressor and lamp		
C2 C-type connector with lead wire, surge suppressor, and lamp  ● Lead wire length C2 : 300mm C20 : 500mm C21 : 1000mm C22 : 2000mm Red (+) Black (-)	D2N D-type connector With surge suppressor and lamp 			
C2N C-type Connector With surge suppressor and lamp 	D3 D-type connector With socket Surge suppressor With lamp  Socket Crimp terminals included			
C3 C-type connector with socket, surge suppressor, and lamp  Socket Crimp terminals included				

Internal circuit diagram with surge suppressor and lamp



Circuit diagram for built-in low-heat-generation and power-saving circuit type



* Caution : Models with built-in surge suppressor, lamp, low heat generation, and power-saving circuits have polarity.
 * The surge suppressor uses a diode.

Pilot-operated 5-port valve

4SA/B0

Ending

Pilot-operated 5-port valve

4SA/B0

Ending



Single unit
Pilot-operated 5-port valve
Direct piping / Sub-plate piping
4SA0/4SB0 Series

● Applicable Cylinder Bore : $\phi 6$ to $\phi 25$

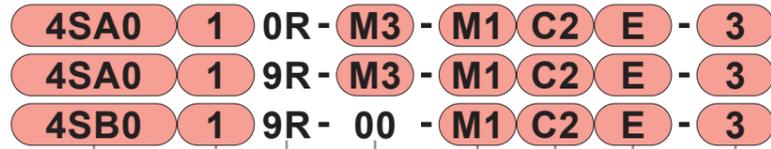


For detailed compatible model numbers, please refer to our company website.

4SA0/4SB0 Series
Single valve

Model No. Notation

- Solenoid valve for manifold (direct piping)
- Solenoid valve for manifold (subplate piping)



- 1 Model number
- 2 Switching position classification
- 3 Connection port size
- 4 Manual device
- 5 Wire connection
- 6 Others Options
- 7 Voltage

2 Switching position classification

Code	Content
1	2-position single
2	2-position double
3	3-position Closed Center
4	3-position Exhaust Center
5	3-position Pressure Center

3 Connection port size

Code	Content	1 Model number	
		Direct piping	Sub-plate piping
Port name	P, A, B Ports R ₁ , R ₂ Port	4SA0	4SB0
M3	M3	●	
M5	M5		●
T4	$\phi 4$ barbed fitting M3	●	
00	Single valve for base mounting		●

*1 : Fittings The M3 compliance is as follows.
FTS4-M3, GWS3-M3-S

*2 : "T4" is screwed into the A and B ports using the barb fitting FTS4-M3.

4 Manual device

Code	Content
Blank	Non-lock type Manual device
M1	Lock type Manual device

5 Wire connection

Type	Lead wire (mm)	Surge Suppressor	Lamp	Code
Grommet lead wire	300			Blank
C-type connector (Lead wire horizontal direction)	300			C
	500			C00
	1000			C01
	2000			C02
	* With socket			C1
	300	●	●	C2
	500	●	●	C20
	1000	●	●	C21
	2000	●	●	C22
	* Without socket	●	●	C2N
* With socket	●	●	C3	
For T31 For T50	●	●	C4	

Type	Lead wire (mm)	Surge Suppressor	Lamp	Code
D-type connector (Lead wire upward direction)	300			D
	500			D00
	1000			D01
	2000			D02
	* With socket			D1
	300	●	●	D2
	500	●	●	D20
	1000	●	●	D21
	2000	●	●	D22
	* Without socket	●	●	D2N
* With socket	●	●	D3	
For T30	●	●	D4	

*1 : Refer to P. 1222 for the circuit diagram with surge suppressor/lamp.

*2 : The lead wire used is AWG26 size.
(7/0.16, outer diameter $\phi 1.35$, 0.13 mm²)

*3 : "C4" and "D4" are only for solenoid valve Discrete for 4SB0 manifolds.
The reduced wiring socket assembly (length of 270 mm) will be provided.

6 Other options

Code	Content
Blank	No options
P	With mounting plate (Compatible with 4SA010R only)
A	Compatible with ozone cutting oil
E	Built-in type with low heat generation and power saving circuit

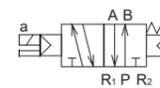
*1 : Can be selected for wire connection C2, C2N, C3, D2, D2N, D3, and voltage 3 (24 VDC).

7 Voltage

Code	Content
3	24 VDC
4	12 VDC

Circuit diagram code

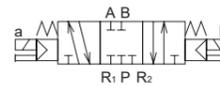
- 5-port valve
- 2-position single



- 2-position double



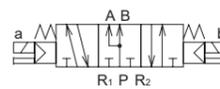
- 3-position Closed Center



- 3-position Exhaust Center



- 3-position Pressure Center



Common specifications

Item	Content
Valve type and operating method	Pilot-operated soft spool valve
Fluid used	Compressed air
Max. Operating Pressure MPa	0.7
Min. Operating Pressure MPa	0.2
Proof Pressure MPa	1.05
Ambient temperature °C	5 to 55
Fluid temperature °C	5 to 55
Lubrication	Not required
Protection structure	Dustproof
Vibration resistance m/s ²	50 or less
Shock resistance m/s ²	300 or less
Atmosphere	Do not use in corrosive gas atmospheres

*1 : 4SA0 is a pilot atmosphere release type. For 4SB0, the pilot exhaust is centralized with port R.

Electrical specifications

Item	Standard	Content	
		DC 24	DC 12
Rated Voltage V	DC 24	DC 12	DC 24
Voltage fluctuation range	±10 %		
Holding current A (*2)	0.025 (0.029)	0.050 (0.058)	(0.013)
Power Consumption W	0.6(0.7)	0.6(0.7)	(0.3)
Insulation class	B		
Temperature rise °C	50	40	

*2 : The values in parentheses are for units with surge suppressors and indicator lamps. Additionally, units with low-heat and power-saving circuits are available with indicator lamps only.

Model-specific specifications

Item	4SA0	4SB0
Connection P, A, B ports	M3	$\phi 4$ barbed fitting
Connection port size R ₁ , R ₂ Port	M3	M5

Performance and Characteristics by Model

Item	Switching position classification	4SA0	4SB0
Response	2-position	15 or less	
Time (*3) ms	3-position	30 or less	

*3 : The response times are values with supply pressure of 0.5 MPa, without lubrication, and with the power ON. They depend on the pressure and the lubricant quality.

Mass

Item	Switching position classification	4SA0	4SB0
Weight g	2-position	23	43
	Double	35	55
	3-position	39	59

Flow rate characteristics

Model number	Switching position classification	Connection port size	P → A/B			A/B → R			S(mm ²)		
			C[dm ³ / (s·bar)]	b	Q[L/min(ANR)]	C[dm ³ / (s·bar)]	b	Q[L/min(ANR)]			
4SA0	2-position	P, A, B ports : M3, $\phi 4$ barbed fitting R ₁ , R ₂ Port : M3	-	-	65	-	-	65	1.1		
	Closed Center		-	-		-	-				
	3-position		Exhaust center	-		-	-			-	
4SB0	2-position	M5	0.32	0.20	77	0.30	0.21	72	-		
			Closed Center	0.32	0.19	76	0.29	0.11	66	-	
			3-position	Exhaust center	0.31	0.18	73	0.29	0.22	70	-
			Pressure Center	0.33	0.20	79	0.29	0.21	70	-	

*5 : Conversion between effective area S and sonic conductance C is approximately $S \approx 5.0 \times C$.

Pilot-operated 5-port valve

Pilot-operated 5-port valve

4SA/B0

4SA/B0

Ending

Ending

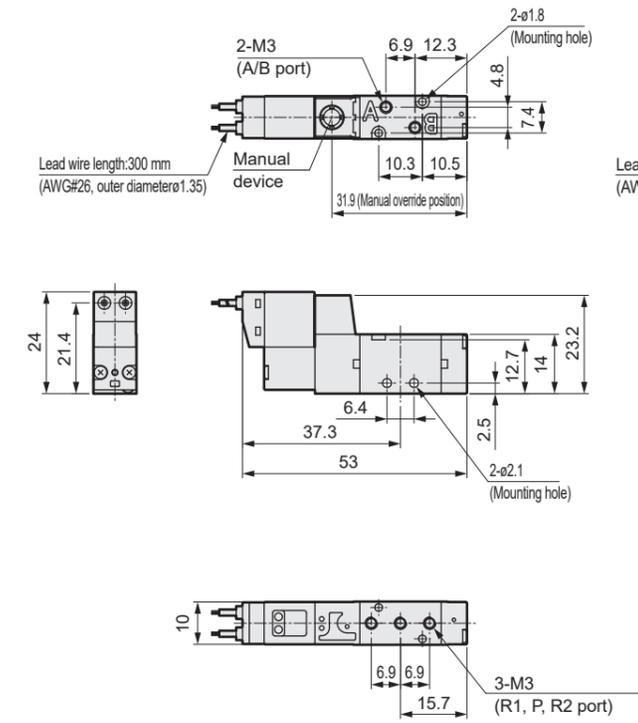
4SA0 Series

Single valve ; direct piping

Overall dimension drawing

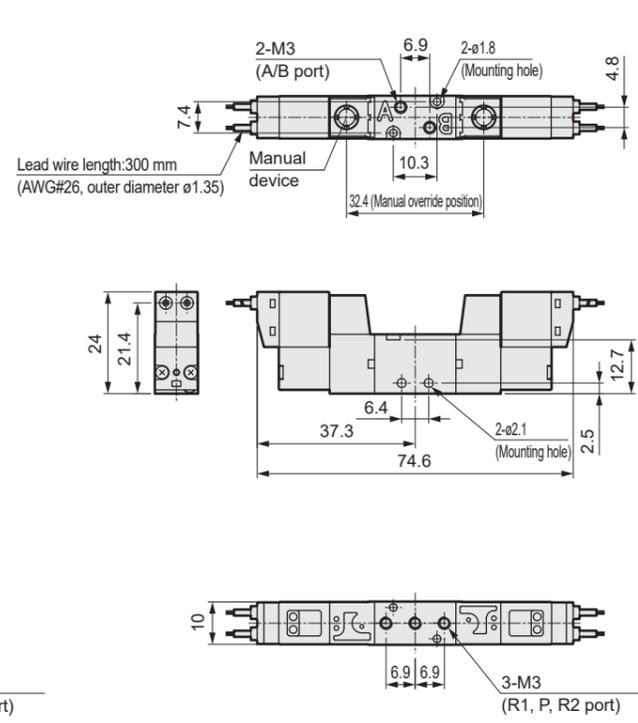
4SA010R-M3

●2-position single : Grommet lead wire



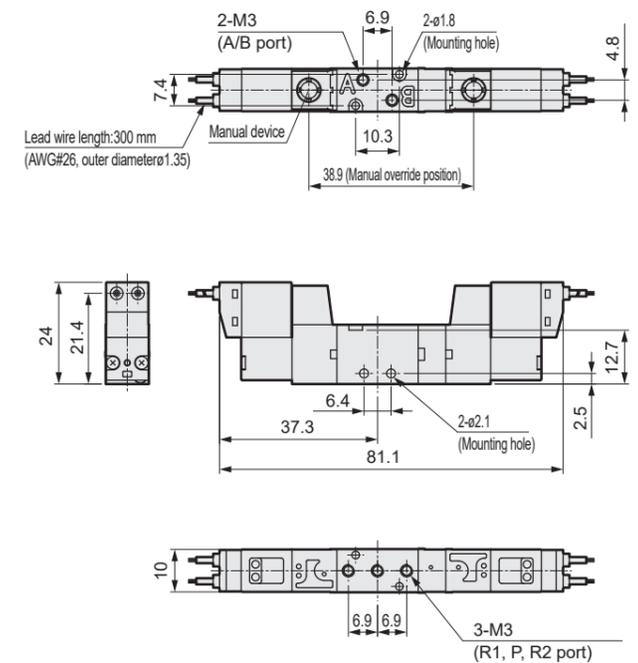
4SA020R-M3

●2-position double : Grommet lead wire

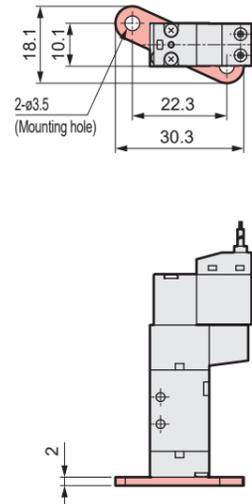


4SA030R-M3

●3-position : Grommet lead wire



● Mounting plate : P (2-position single only)

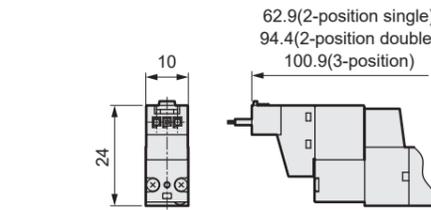


4SA0 Series

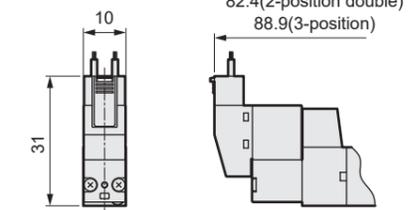
Single valve ; direct piping

Overall dimension drawing

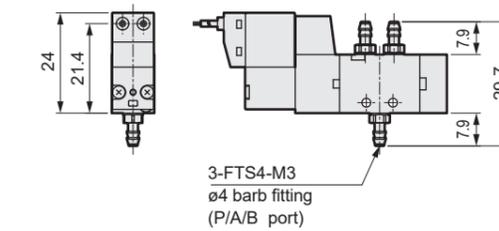
● Low exoergic/energy circuit type : (E)
C-type Connector



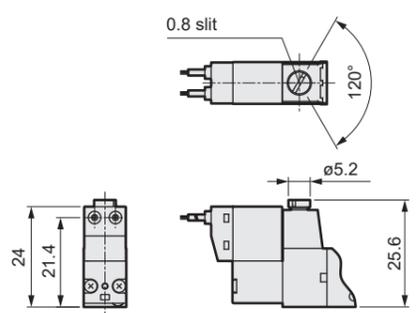
D-type connector



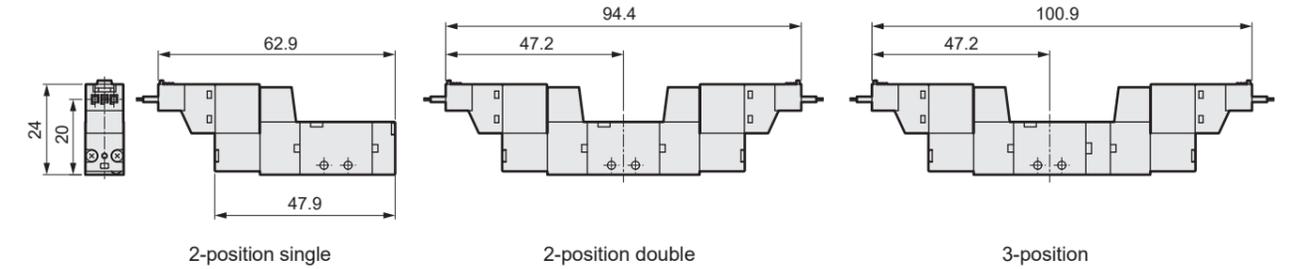
● $\phi 4$ barb fitting : (T4)



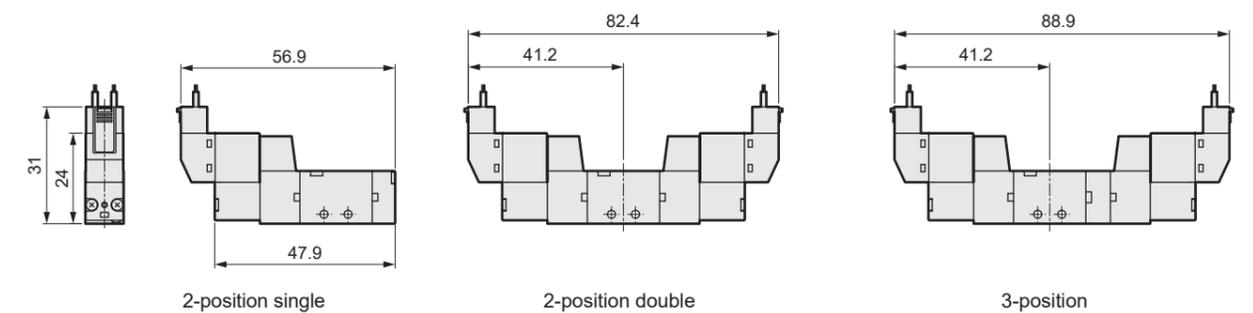
● Lock-type manual device : (M1)



● C-type connector : (C, C0, C1, C2, C2, C3)



● D-type connector : (D, D0, D1, D2, D2, D3)



Pilot-operated 5-port valve

4SA/B0

Ending

1227

CKD

Ending

1226

CKD

Ending

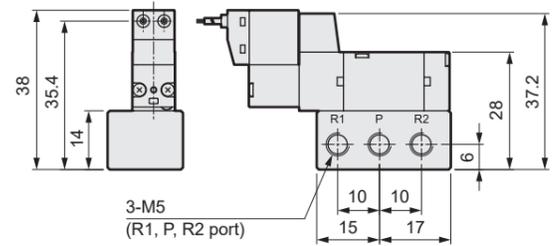
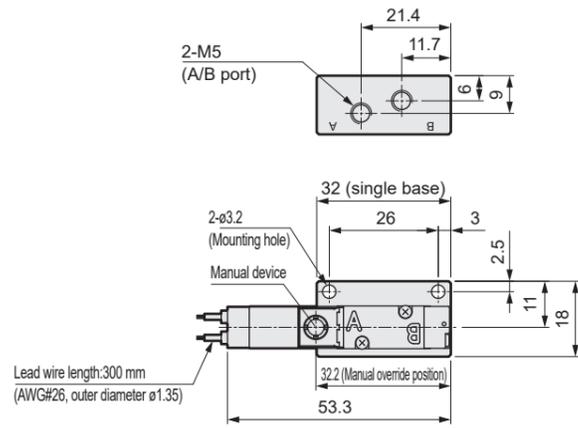
4SB0 Series

Single valve ; subplate piping

Overall dimension drawing

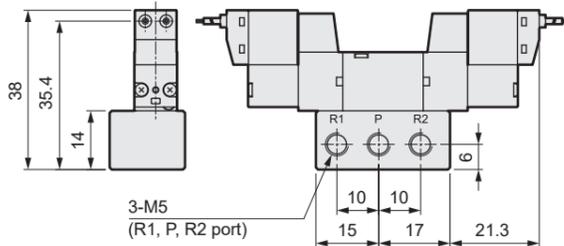
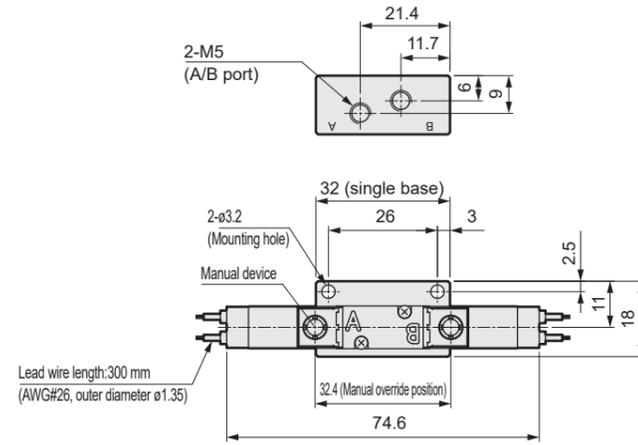
4SB010R-M5

●2-position single : Grommet lead wire



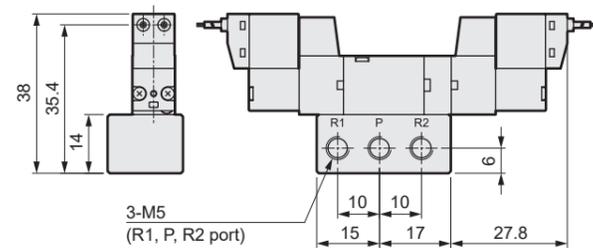
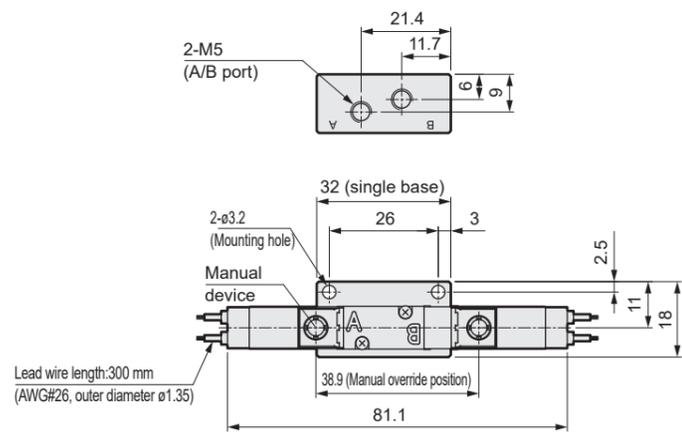
4SB020R-M5

●2-position double : Grommet lead wire



4SB030R-M5

●3-position : Grommet lead wire

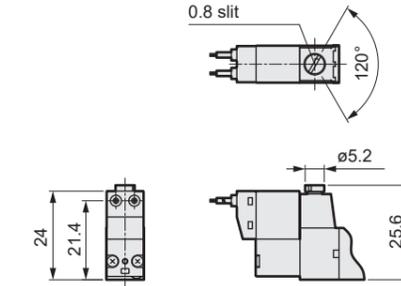


4SB0 Series

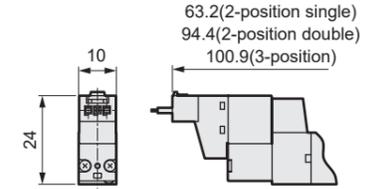
Single valve ; subplate piping

Overall dimension drawing

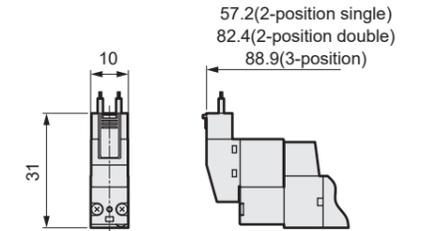
●Lock-type manual device : (M1)



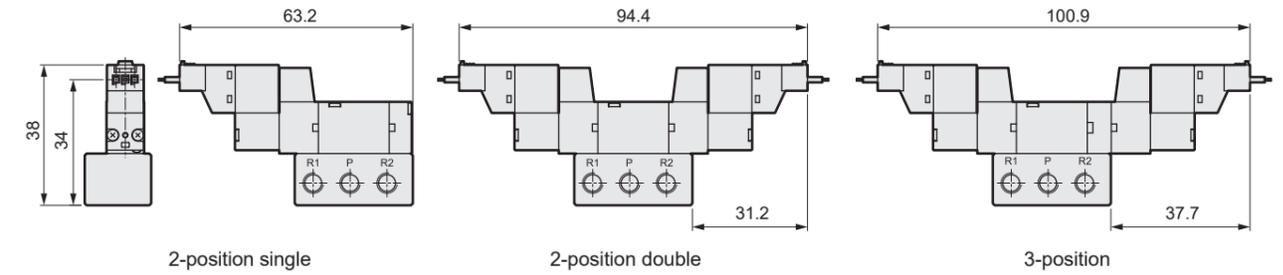
● Low exoergic/energy circuit type : (E)
C-type Connector



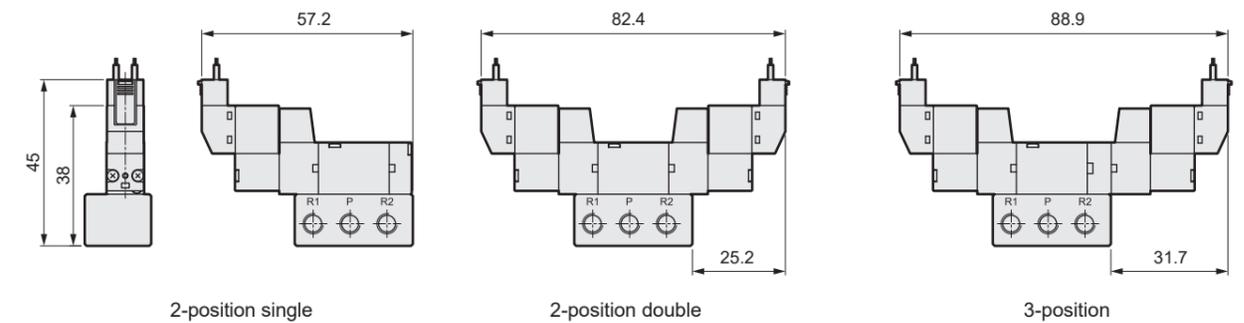
D-type connector



●C-type connector : (C, C0□, C1, C2, C2□, C3)



●D-type connector : (D, D0□, D1, D2, D2□, D3)



Pilot-operated 5-port valve

4SA/B0

Ending

1229

Pilot-operated 5-port valve

4SA/B0

Ending

1228

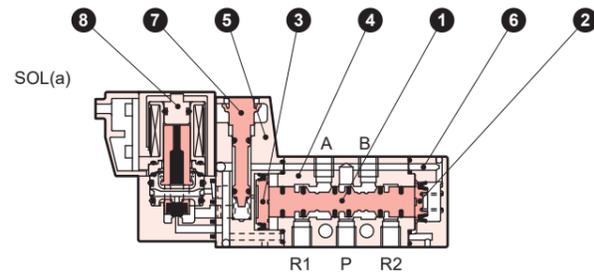
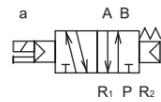
4SA0 Series

Single valve ; direct piping

Internal structure diagram and materials

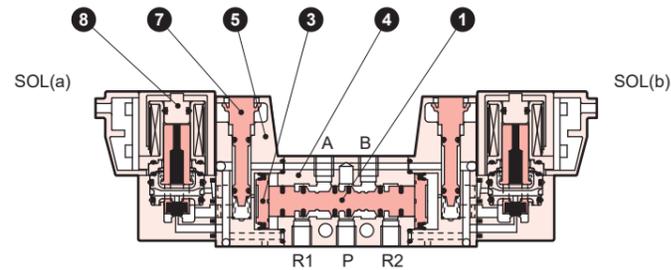
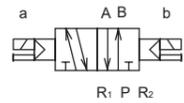
4SA010R

●2-position single



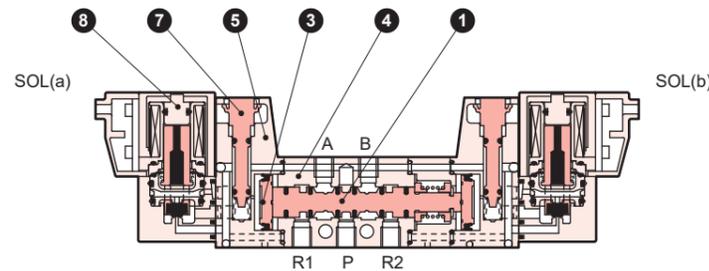
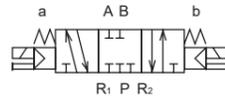
4SA020R

●2-position double



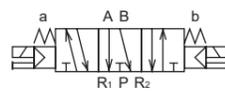
4SA030R

●3-position
Closed Center



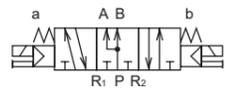
4SA040R

●3-position
Exhaust center



4SA050R

●3-position
Pressure Center



List of main components

Part number	Component name	Material
1	Spool assembly	-
2	Piston S Assembly	-
3	Piston D Assembly	-
4	Body	Aluminum
5	Piston Chamber	Resin
6	Cap	Resin
7	Manual device	Resin
8	Coil Assembly	-

For maintenance parts, please visit the CKD equipment product website (<https://www.ckd.co.jp/kiki/en/>) → "Model Number" → Maintenance parts .

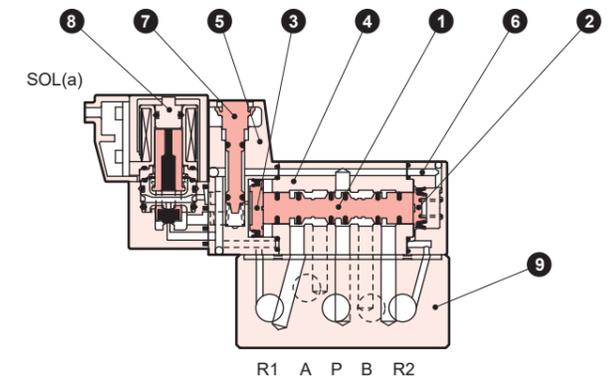
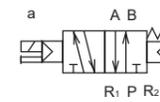
4SB0 Series

Single valve ; subplate piping

Internal structure diagram and materials

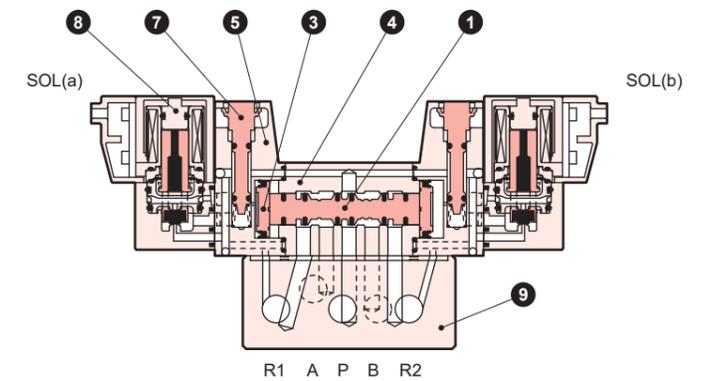
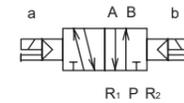
4SB010R

●2-position single



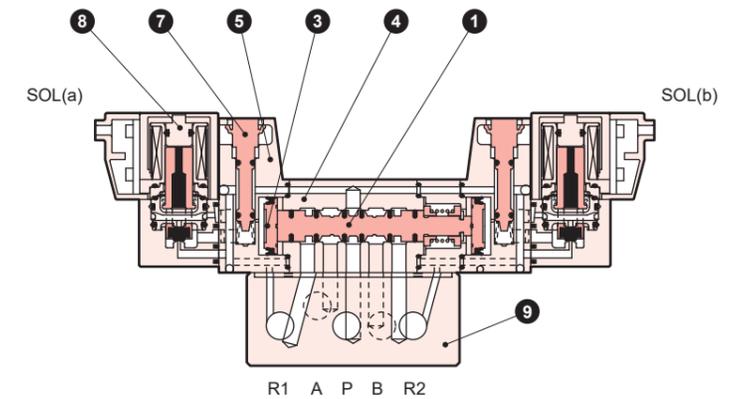
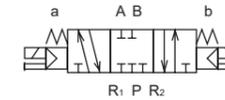
4SB020R

●2-position double



4SB030R

●3-position
Closed Center



4SB040R

●3-position
Exhaust center



4SB050R

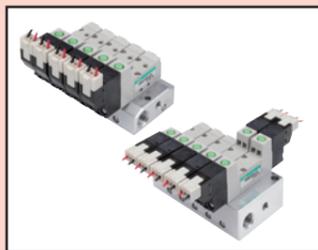
●3-position
Pressure Center



List of main components

Part number	Component name	Material
1	Spool assembly	-
2	Piston S Assembly	-
3	Piston D Assembly	-
4	Body	Aluminum
5	Piston Chamber	Resin
6	Cap	Resin
7	Manual device	Resin
8	Coil Assembly	-
9	Subplate	Aluminum

For maintenance parts, please visit the CKD equipment product website (<https://www.ckd.co.jp/kiki/en/>) → "Model Number" → Maintenance parts .



Individual wiring manifold
Pilot-operated 5-port valve
Direct piping / Sub-plate piping

M4SA0/M4SB0 Series

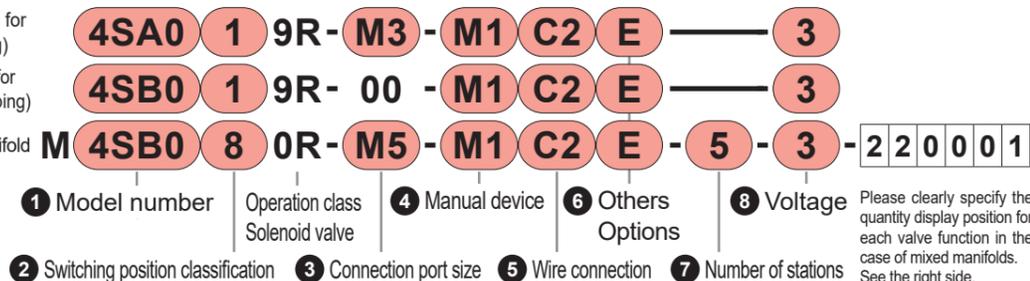
● Applicable Cylinder Bore : $\phi 6$ to $\phi 25$



For detailed compatible model numbers, please refer to our company website.

Model No. Notation

- Single solenoid valve for manifold (body piping)
- Single solenoid valve for manifold (sub-plate piping)
- Individual wiring manifold



Please clearly specify the quantity display position for each valve function in the case of mixed manifolds. See the right side.

2 Switching position classification

Code	Content
1	2-position single
2	2-position double
3	3-position Closed Center
4	3-position Exhaust Center
5	3-position Pressure Center
8	Mix manifold

*1 : Select when there are multiple solenoid positions.

3 Connection port size

Code	Content		1 Model number	
	A, B ports	P port R port	Direct piping	Sub-plate piping
M3	M3		●	
M5	M5			●
GS4	$\phi 4$ Push-in fitting	M5 Rc1/8		●
T4	$\phi 4$ barbed fitting		●	●
T6	$\phi 6$ Barb fitting			●
PM5	M5			●
PGS4	$\phi 4$ Push-in fitting	Rc1/8 Rc1/8		●
PT4	$\phi 4$ barbed fitting			●
PT6	$\phi 6$ Barb fitting			●
00	Single valve for base mounting			●

4 Manual device

Code	Content
Blank	Non-lock type Manual device
M1	Lock type Manual device

- *1 : Fittings The M3 compliance is as follows. FTS4-M3, GWS3-M3-S
- *2 : For M4SA0, barbed fitting FTS4-M3 screws into port A/B for "T4".
- *3 : For "GS4", push-in fitting GWS4-M5-S screws into port A/B.
- *4 : For M4SB0, for "T4" and "T6", FTS4-M5 and FTS6-M5 thread into port A/B.

5 Wire connection

Type	Lead wire (mm)	Surge Suppressor	Lamp	Code	Type	Lead wire (mm)	Surge Suppressor	Lamp	Code
Grommet Lead wire	300			Blank	D-type connector (Lead wire upward direction)	300			D
	500			C		500			D00
	1000			C01		1000			D01
	2000			C02		2000			D02
C-type connector (Lead wire Horizontal direction)	* With socket			C1	* With socket			D1	
	300	●	●	C2	300	●	●	D2	
	500	●	●	C20	500	●	●	D20	
	1000	●	●	C21	1000	●	●	D21	
	2000	●	●	C22	2000	●	●	D22	
	* Without socket	●	●	C2N	* Without socket	●	●	D2N	
	* With socket	●	●	C3	* With socket	●	●	D3	

*1 : The circuit diagram for the surge suppressor with lamp is P. 1222.

6 Other options

Code	Content
Blank	No options
A	Ozone, Compatible with cutting oil
E	Low heat generation Power-saving circuit Built-in type

*1 Available for electrical connections C2, C2N, C3, D2, D2N, D3, and voltage 3 (24VDC).

7 Number of stations

Code	Content
2	Double
to	to
20	20 stations

8 Voltage

Code	Content
3	24 VDC
4	12 VDC

Manifold base Model No. Notation

Direct piping **B4SA0 - M3 - 5**

Sub-base piping **B4SB0 - M5 - 5**

Note) Precautions when mounting valve on manifold base
The mounting screws included with the valve are equivalent to M1.7 tapping screws. Therefore, the manifold base is not threaded for mounting the valve. During the initial installation, the valve is mounted by tapping the threads. Additionally, applying a small amount of grease (such as CRC or turbine oil) to the tip of the screw will allow for smoother installation.

Number of stations

Code	Content
2	Double
to	to
20	20 stations

Masking plate Model No. Notation

Direct piping **4SA0R - MP**

Sub-base piping **4SB0R - MP**

Circuit diagram code

- 5-port valve
- 2-position single



- 2-position double



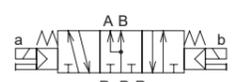
- 3-position Closed Center



- 3-position Exhaust Center



- 3-position Pressure Center



Common specifications

Item	Content
Manifold type	Integrated manifold type
Types of Manifold	Common supply, common exhaust (*1)
Number of stations	2 to 20 stations
Valve type and operating method	Pilot-operated soft spool valve
Fluid used	Compressed air
Max. Operating Pressure MPa	0.7
Min. Operating Pressure MPa	0.2
Proof Pressure MPa	1.05
Ambient temperature °C	5 to 55
Fluid temperature °C	5 to 55
Lubrication	Not required
Protection structure	Dustproof
Vibration resistance m/s ²	50 or less
Shock resistance m/s ²	300 or less
Atmosphere	Do not use in corrosive gas atmospheres

Specifications and mass by model

Item	M4SA0	M4SB0
Connection port size (*4)	P port	M 5
	A, B ports	M 3
	R port	M 5 Rc1/8
Manifold base	P port : M 5	20 n + 36
Mass calculation formula (n : number of valves) g	P port : Rc1/8	21 n + 26

*4 : For the port size of ports P and A/B, there are options other than those listed above. Refer to section 3 on the previous page.

Performance and Characteristics by Model

Item	Switching position classification	M4SA0	M4SB0
Response Time (*5) ms	2-position		15 or less
	3-position		30 or less

*5 : The response times are values with supply pressure of 0.5 MPa, without lubrication, and with the power ON. They depend on the pressure and the lubricant quality.

Flow rate characteristics

Model number	Switching position classification	Connection port size	P → A/B			A/B → R			S (mm ²)
			C [dm ³ / (s·bar)]	b	Q [L/min (ANR)]	C [dm ³ / (s·bar)]	b	Q [L/min (ANR)]	
M4SA0	2-position	P port : M5, A, B ports : M3	-	-	65	-	-	65	1.1
	3-position	R port : Rc1/8	-	-	-	-	-	-	-
M4SB0	2-position	P port : M5, Rc1/8	0.30	0.15	70	0.30	0.21	72	-
	3-position	A, B ports : M5, R port : Rc1/8	0.29	0.14	67	0.30	0.20	72	-

*6 : When using the T4 specification (with $\phi 4$ barb fittings), the flow rate will be restricted by the effective cross-sectional area of the fitting, so please take care.

*7 : The conversion between effective cross-sectional area S and sonic conductance C is $S \approx 5.0 \times C$.

[Mixer manifold]

● Method for specifying combination contents
Combination manifold Enter 8 of 2 wire. When selecting this option, clearly specify the function code (see right table) and arrangement number (numbering from 1 on the left up to the specified number of stations) in the remarks section below the standard model number, as shown in the example.

Code	Function
S1	2-position single
S2	2-position double
S3	3-position Closed Center
S4	3-position Exhaust Center
S5	3-position Pressure Center
MP	Masking plate

1	2	3	4	5	6	7
Single	Double	3-position Closed Center	3-position Closed Center	3-position Double	3-position Single	3-position Exhaust center
(S1)	(S2)	(S3)	(S3)	(S2)	(S1)	(S4)

Example
The model number for a 7-station combination manifold with the arrangement shown in the left figure, using A, B, and P ports of M5 size and 24 VDC, is **M4SB080-M5-C02-7-3-222100**
S1 = 1.6 S2 = 2.5 S3 = 3.4 S4 = 7
Code Position

● For mixed manifolds, when using 10 or more actuators of the same model number, please specify using the codes in the table below.

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

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

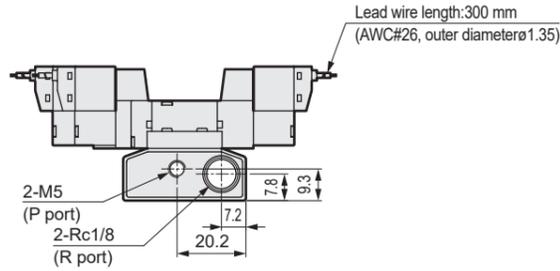
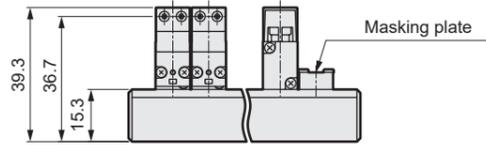
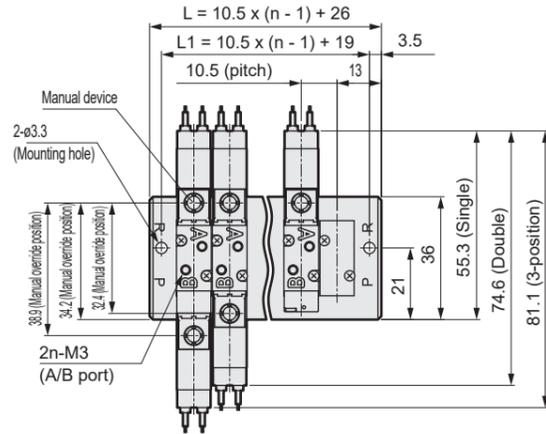
M4SA0/M4SB0 Series

Individual wiring manifold ; direct piping / sub-plate piping

Overall dimension drawing

M4SA0□0R-M3

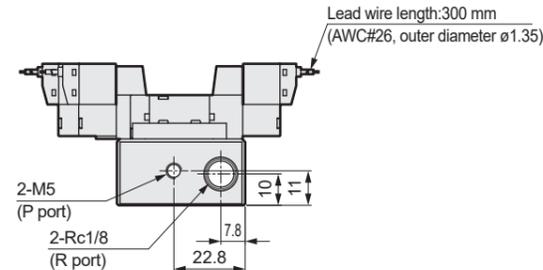
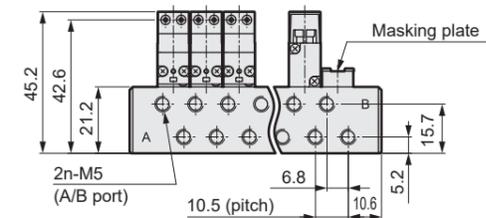
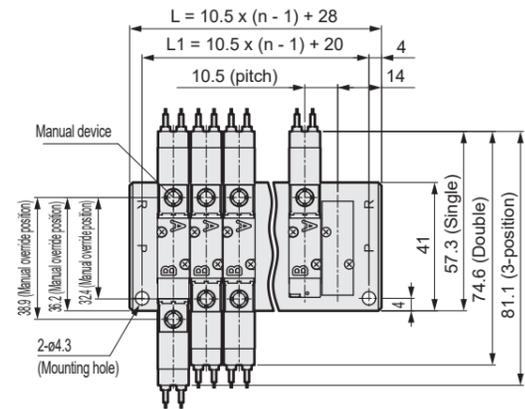
●Direct piping type A : grommet lead wire



Number of stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	29.5	40	50.5	61	71.5	82	92.5	103	113.5	124	134.5	145	155.5	166	176.5	187	197.5	208	218.5
L	36.5	47	57.5	68	78.5	89	99.5	110	120.5	131	141.5	152	162.5	173	183.5	194	204.5	215	225.5

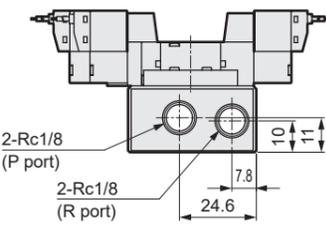
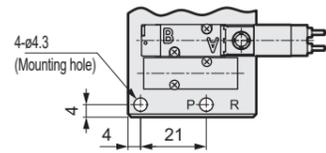
M4SB0□0R-M5

●Sub-plate piping type B (P port M5) : grommet lead wire



Number of stations	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	30.5	41	51.5	62	72.5	83	93.5	104	114.5	125	135.5	146	156.5	167	177.5	188	198.5	209	219.5
L	38.5	49	59.5	70	80.5	91	101.5	112	122.5	133	143.5	154	164.5	175	185.5	196	206.5	217	227.5

●P port Rc1/8



Lead wire length:300 mm (AWC#26, outer diameter 1.35)

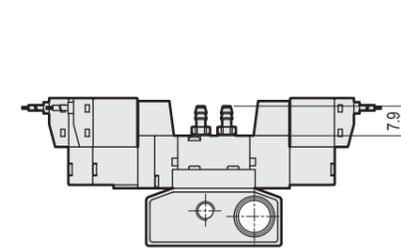
M4SA0/M4SB0 Series

Individual wiring manifold ; direct piping / sub-plate piping

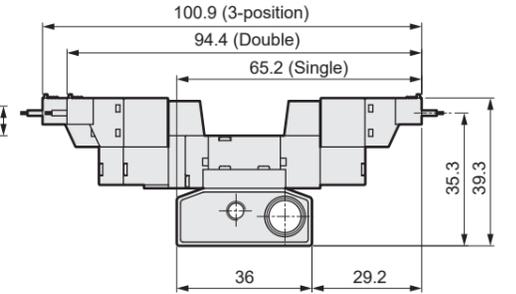
Overall dimension drawing

Direct piping type A

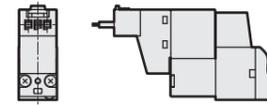
●ø4 barb fitting : (T4)



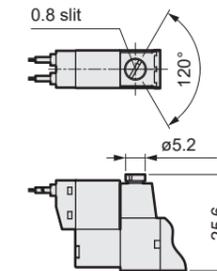
●C-type connector : (C, C0□, C1, C2, C2□, C3)



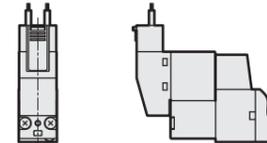
● Low exoergic/energy circuit type : (E)
C-type Connector



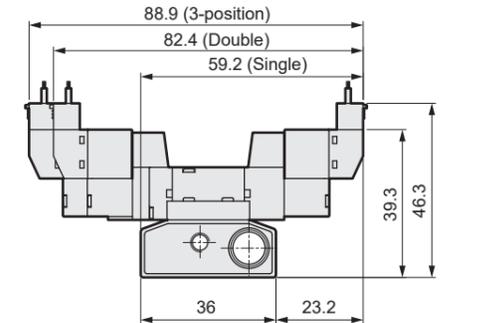
● Lock-type manual device : (M1)



D-type connector

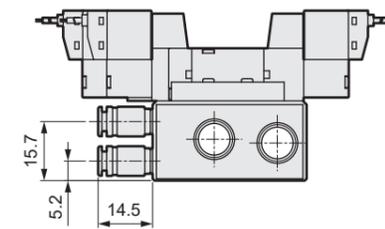


●D-type connector : (D, D0□, D1, D2, D2□, D3)

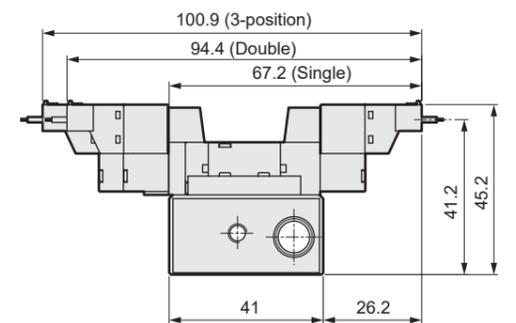


Sub-plate piping type B

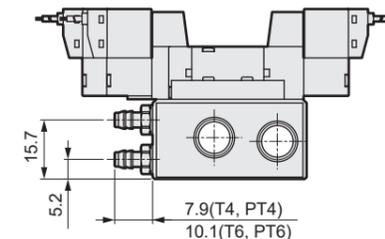
●ø4 Push-in fitting : (GS4, PGS4)



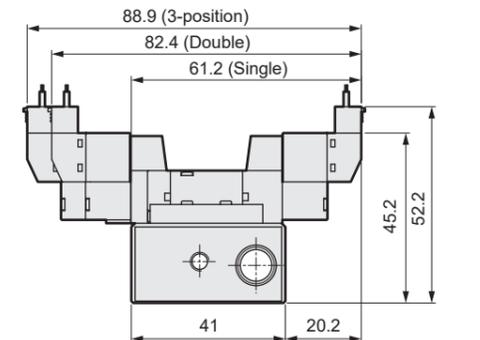
●C-type connector : (C, C0□, C1, C2, C2□, C3)



●ø4, ø6 barb fittings : (T4, T6, PT4, PT6)



●D-type connector : (D, D0□, D1, D2, D2□, D3)





Reduced wiring manifold
Pilot-operated 5-port valve
Sub-plate piping

M4SB0 Series

● Applicable Cylinder Bore : $\phi 6$ to $\phi 25$

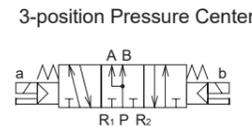
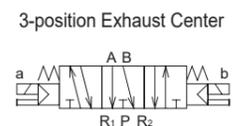
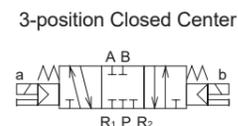
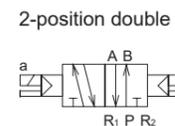
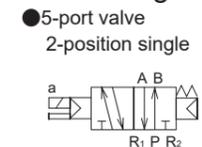


For detailed compatible model numbers, please refer to our company website.

M4SB0 Series

Space-saving wiring manifold ; sub-plate piping

Circuit diagram code



Common specifications

Item	Content
Manifold type	Integrated manifold type
Types of Manifold	Centralized air supply, centralized exhaust (*1)
Number of stations	4 to 20 stations (*2)
Valve type and operating method	Pilot-operated soft spool valve
Fluid used	Compressed air
Max. Operating Pressure MPa	0.7
Min. Operating Pressure MPa	0.2
Proof Pressure MPa	1.05
Ambient temperature °C	5 to 55
Fluid temperature °C	5 to 55
Lubrication	Not required
Protection structure	Dustproof
Vibration resistance m/s ²	50 or less
Shock resistance m/s ²	300 or less
Atmosphere	Do not use in corrosive gas atmospheres

Electrical specifications

Item	Content	
Rated Voltage (V)	DC 24	DC 12
Voltage fluctuation range	±10%	
Holding Current (A)	0.029	0.058
Power Consumption (W)	0.7	0.7
Insulation class	B	
Temperature rise °C	50	

*1 : For 4SB0, pilot exhaust is centralized at the R port.
*2 : When the electrical connections are C4T31 and C4T30, single For solenoid No. up to 20 stations, C4T50, No. up to 16 stations single solenoid.

Model No. Notation

- Solenoid valve for manifold (subplate piping)
- Reduced wiring Manifold



1 Switching position classification 2 Connection port size 3 Manual device 4 Wire connection 5 Others Options 6 Number of stations 7 Voltage

Please clearly specify the quantity display position for each valve function in the case of mixed manifolds. See the right side.

1 Switching position classification

Code	Content
1	2-position single
2	2-position double
3	3-position Closed Center
4	3-position Exhaust Center
5	3-position Pressure Center
8	Mix manifold

*1 : Select when there are multiple solenoid positions.

2 Connection port size

Code	Content		
	Port name	A, B ports	P port R port
M5	M5		
GS4	ø4 Push-in fitting	M 5	Rc1/8
T4	ø4 barbed fitting		
T6	ø6 Barb fitting		
PM5	M5		
PGS4	ø4 Push-in fitting	Rc1/8	Rc1/8
PT4	ø4 barbed fitting		
PT6	ø6 Barb fitting		
00	Single valve for base mounting		

*1 : For "GS4", screw the Push-in fitting GWS4-M5-S into ports A and B.
*2 : For "T4" and "T6", FTS4-M5 and FTS6-M5 thread into port A/B.

3 Manual device

Code	Content	
Blank	Non-locking manual device	
M1	Locking manual device	

4 Wire connection

* The model number for the cable with a D-sub connector is P. 1241.

Type	Surge Suppressor	Lamp	Code	
C-type connector (For T31, T50)	●	●	C4	
D-type connector (For T30)	●	●	D4	
D-sub connector Horizontal type	●	●	C4T31	
D-sub connector Upward type	●	●	D4T30	
Flat cable Connector type	●	●	C4T50	

*1 : Refer to P. 1222 for the circuit diagram with surge suppressor/lamp. Only the solenoid valve Discrete for "4SB0" manifold is available.
*2 : Included with the reduced wiring socket assembly (length of 270 mm).

5 Other options

Code	Content
Blank	No options
A	Ozone and cutting oil compatible

6 Number of stations

Code	Content
4	Quadruple
to	to
20	20 stations

*1 : When the 4 wire connection is "C4T31" or "CT30", the maximum number of single solenoids is 20 ; when it is "C4T50", the maximum number of single solenoids is 16.

7 Voltage

Code	Content
3	24 VDC
4	12 VDC

Masking plate Model No. Notation

Direct piping **4SA0R - MP**

Sub-base piping **4SB0R - MP**

Specifications and mass by model

Item	M4SB0	
Connection	P port	M 5, Rc1/8
port size (*4)	A, B ports	M 5
	R port	Rc1/8
Manifold base	P port : M 5	20 n + 146
Mass calculation formula (n : number of valves) g	P port : Rc1/8	21 n + 136

*4 : For the port size of ports P and A/B, there are options other than those listed above. Refer to section 2 on the previous page.

*5 : The manifold mass includes the electrical components.

Performance and Characteristics

Item	Switching position classification	M4SB0
Response Time (*6) ms	2-position	15 or less
	3-position	30 or less

*6 : Response time is the value at ON under a supply pressure of 0.5 MPa and without lubrication. It varies depending on pressure and the quality of the lubricating oil.

Flow rate characteristics

Switching position classification	Connection port size	P → A/B			A/B → R		
		C [dm ³ / (s·bar)]	b	Q [L/min(ANR)]	C [dm ³ / (s·bar)]	b	Q [L/min(ANR)]
2-position	P port : M5, Rc1/8	0.30	0.15	70	0.30	0.21	72
3-position	A, B ports : M5, R port : Rc1/8	0.29	0.14	67	0.30	0.20	72

*7 : When using T4 specification (with ø4 barb fittings), please note that flow rate is restricted due to the effective cross-sectional area of the fittings.

*8 : Conversion between effective cross-sectional area S and sonic conductance C is approximately S ≈ 5.0 x C.

[Mixer manifold]

● Method for specifying combination contents
Combination manifold Enter 8 of ● in the blank.
When selecting this option, clearly specify the function code (see right table) and arrangement number (numbering from 1 on the left up to the specified number of stations) in the remarks section below the standard model number, as shown in the example.

Code	Function
S1	2-position single
S2	2-position double
S3	3-position Closed Center
S4	3-position Exhaust Center
S5	3-position Pressure Center
MP	Masking plate

1	2	3	4	5	6	7
Single	Double	3-position Closed Center	3-position Closed Center	2-position Double	2-position Single	3-position Exhaust center
(S1)	(S2)	(S3)	(S3)	(S2)	(S1)	(S4)

Example
The model number for a 7-station combination manifold with the arrangement shown in the left figure, using A, B, and P ports of M5 size and 24 VDC, is
M4SB080-M5-C4T50-7-3-222100
S1 = 1,6 S2 = 2,5 S3 = 3,4 S4 = 7
Code Position

● For mixed manifolds, when using 10 or more actuators of the same model number, please specify using the codes in the table below.

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

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

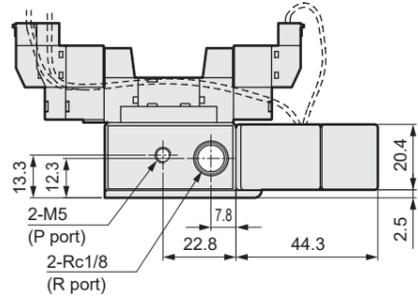
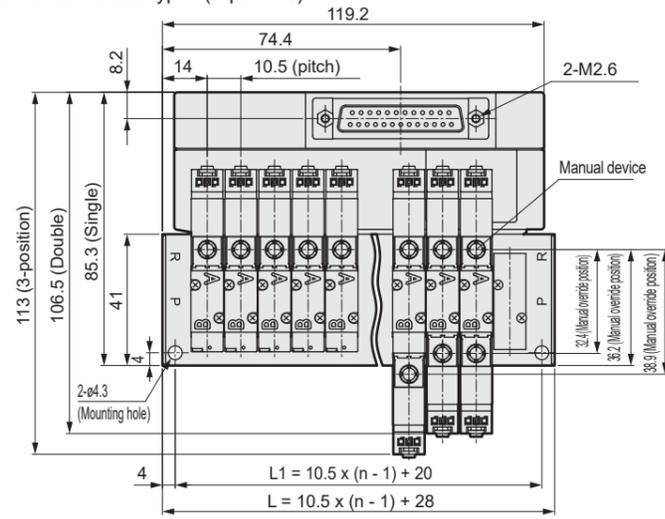
M4SB0 Series

Space-saving wiring manifold ; sub-plate piping

Overall dimension drawing

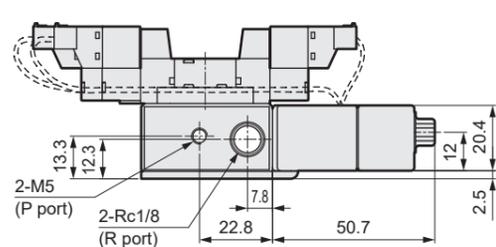
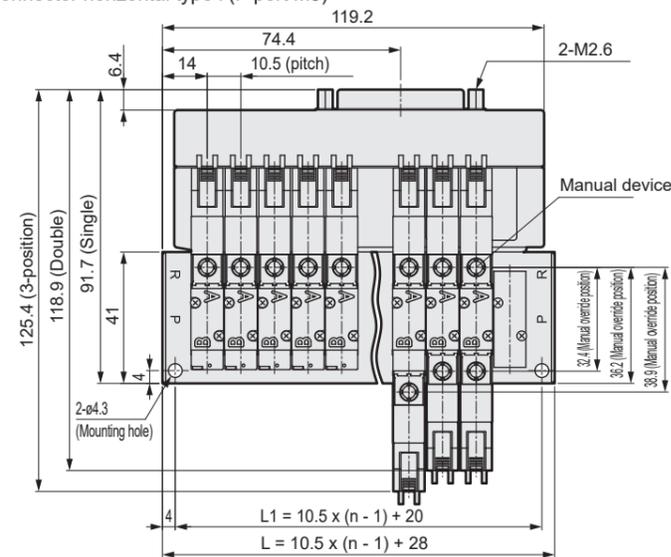
M4SB0□0R-M5-D4T30

●D-sub connector vertical type : (P port M5)



M4SB0□0R-M5-C4T31

●D-sub connector horizontal type : (P port M5)



Number of stations	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L1	51.5	62	72.5	83	93.5	104	114.5	125	135.5	146	156.5	167	177.5	188	198.5	209	219.5
L	59.5	70	80.5	91	101.5	112	122.5	133	143.5	154	164.5	175	185.5	196	206.5	217	227.5

M4SB0 Series

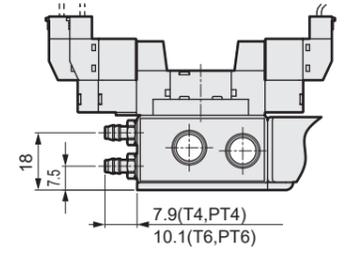
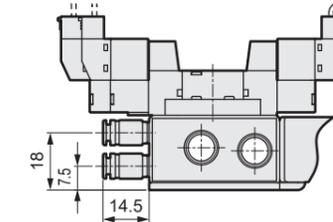
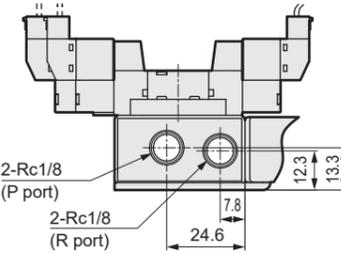
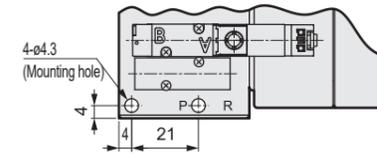
Space-saving wiring manifold ; sub-plate piping

Overall dimension drawing

●A, B ports M5, P port 1/8 : (PM 5)

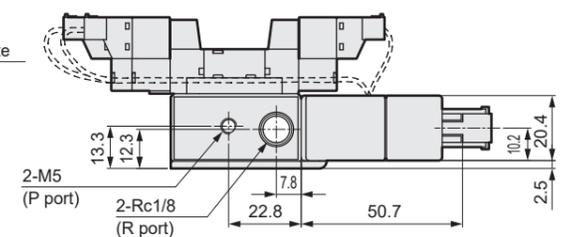
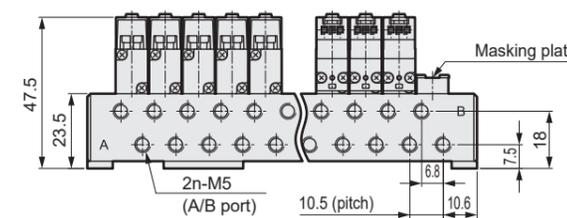
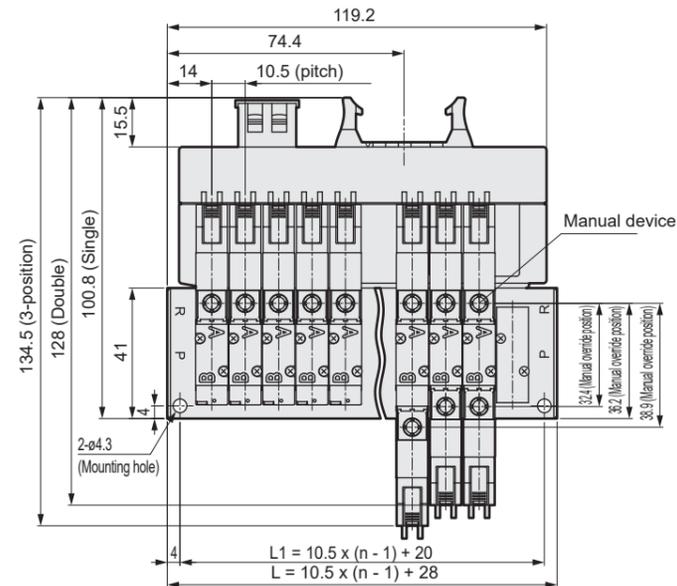
●φ4 Push-in fitting : (GS4, PGS4)

●φ4, φ6 barb fittings : (T4, T6, PT4, PT6)



M4SB0□0R-M5-C4T50

●Flat cable connector type : (P port M5)



Number of stations	4	5	6	7	8	9	10	11	12	13	14	15	16
L1	51.5	62	72.5	83	93.5	104	114.5	125	135.5	146	156.5	167	177.5
L	59.5	70	80.5	91	101.5	112	122.5	133	143.5	154	164.5	175	185.5

Pilot-operated 5-port valve

4SA/B0

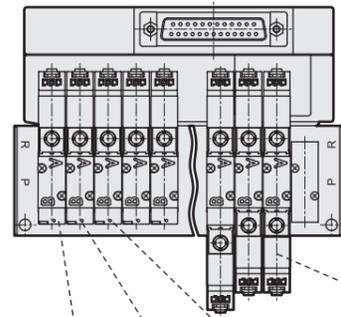
Pilot-operated 5-port valve

4SA/B0

DSubconnector type : Wiring method T30, T31

T30, T31 About connectors

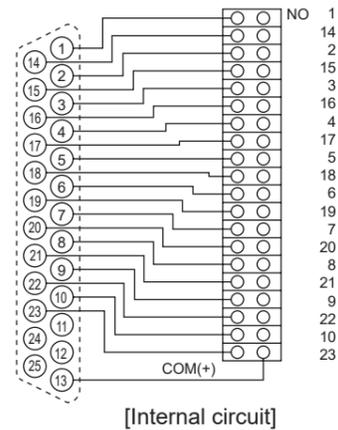
The connectors used for wiring methods T30 and T31 are generally called D-sub connectors and are widely used in FA and OA equipment. In particular, the 25P type is the specified connector for the RS232C standard adopted as a PC communication function. Note that the manifold number of stations is set in order from the left, with the b-side solenoid side (or the cap side for single solenoids) facing the front.



Number of manifold stations First unit Second unit Third unit ... nStation

Connector type T30, T31 Precautions when using

- ① Signal arrays of the PC output unit must match signal arrays of the valve side.
- ② A voltage drop may occur due to simultaneous energizing or cable length. Confirm that the voltage drop for the solenoid is within 10 % of the rated voltage.
- ③ These are +COM specifications.



T30, T31 connector pin array (example)

Note) The numbers 1a, 1b, 2a, 2b... in Valve NO. represent the 1st, 2nd, etc., manifold stations, and the letters a and b indicate the a-side solenoid and b-side solenoid, respectively.



● For single solenoid valve (Supports up to manifold max. station number of 20 stations)

Pin NO.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve NO.	1a	3a	5a	7a	9a	11a	13a	15a	17a	19a			COM(+)
Pin NO.	14	15	16	17	18	19	20	21	22	23	24	25	
Valve NO.	2a	4a	6a	8a	10a	12a	14a	16a	18a	20a			

● For double solenoid valve (Supports up to manifold max. station number of 10 stations)

Pin NO.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve NO.	1a	2a	3a	4a	5a	6a	7a	8a	9a	10a			COM(+)
Pin NO.	14	15	16	17	18	19	20	21	22	23	24	25	
Valve NO.	1b	2b	3b	4b	5b	6b	7b	8b	9b	10b			

● When mixed (single/double mixture) (Supports max. No. of solenoid valves up to 20 points)

Pin NO.	1	2	3	4	5	6	7	8	9	10	11	12	13
Valve NO.	1a	3a	4a	5a	7a	8a	10a	11b	12b	14a			COM(+)
Pin NO.	14	15	16	17	18	19	20	21	22	23	24	25	
Valve NO.	2a	3b	4b	5a	7b	9a	11a	12a	13a	15a			

D-sub connector cable model number display method



- ① User-side Connection Method
- ② Cable Length

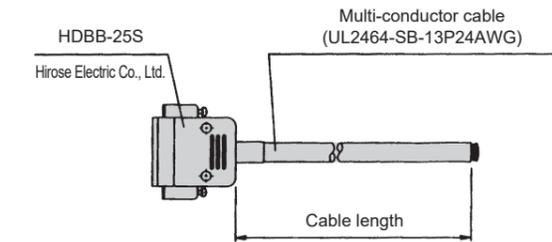
Code	Content
0	Cutting only
1	With round terminal for M3.5 screw

* For all pneumatic valve models Compatible with D-sub connectors of types T30 and T31.

Code	Content
1	1 m
3	3 m
5	5 m

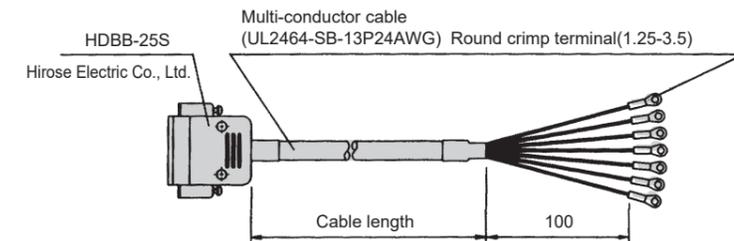
D-sub connector terminal NO. and wire core correspondence

● 4GR-CABLE-D00-⑧



D-sub connector terminal NO.		1	2	3	4	5	6	7	8	9	10	11	12	13
Wire core identification	Insulator color	Orange	Orange	Yellow	Yellow	Green	Green	Gray	Gray	White	White	Orange	Orange	Yellow
	Mark type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	2 types	2 types	2 types
	Mark color	Black	Red	Black										
D-sub connector terminal NO.		14	15	16	17	18	19	20	21	22	23	24	25	
Wire core identification	Insulator color	Yellow	Green	Green	Gray	Gray	White	White	Orange	Orange	Yellow	Yellow	Green	
	Mark type	2 types	3 types	3 types	3 types	3 types								
	Mark color	Red	Black											

● 4GR-CABLE-D01-⑧



D-sub connector terminal NO.		1	2	3	4	5	6	7	8	9	10	11	12	13
Wire core identification	Insulator color	Orange	Orange	Yellow	Yellow	Green	Green	Gray	Gray	White	White	Orange	Orange	Yellow
	Mark type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	1 type	2 types	2 types	2 types
	Mark color	Black	Red	Black										
Mark tube NO.		1	2	3	4	5	6	7	8	9	10	11	12	13
D-sub connector terminal NO.		14	15	16	17	18	19	20	21	22	23	24	25	
Wire core identification	Insulator color	Yellow	Green	Green	Gray	Gray	White	White	Orange	Orange	Yellow	Yellow	Green	
	Mark type	2 types	3 types	3 types	3 types	3 types								
	Mark color	Red	Black											
Mark tube NO.		14	15	16	17	18	19	20	21	22	23	24	25	

* Can be used for up to 24 points. Unused points should be cut off before use.

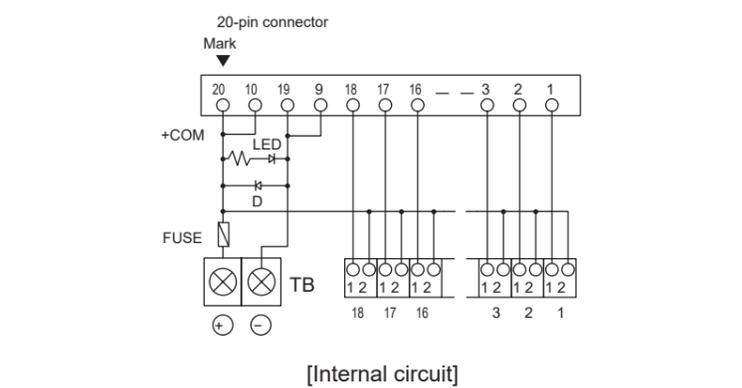
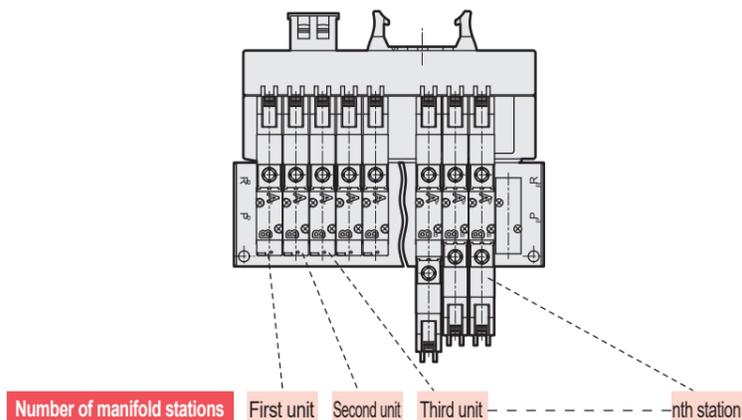
Flat Cable Connector Type : Wiring Method T50

T50 About connectors

The connector used for Wiring Method T50 complies with MIL standards (MIL-C-83503). Wiring work is facilitated by flat cable crimping. Although pin numbering varies by PLC manufacturer, the function allocation remains the same. Arrange based on the connector and the triangle mark (▼) in the table below. In both plug and socket cases, ▼ the mark is the reference. Note that for manifold banks, the b-side solenoid side (or cap side for single solenoid) is set as the front, with banks arranged sequentially from left to right.

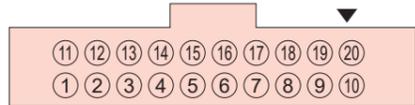
Connector type T50 Precautions when using

- Signal arrays of the PLC output unit must match signal arrays of the valve side. Direct connections with the PLC are limited. Use the dedicated cable for each PLC manufacturer.
- When connecting the T50 type to a general output unit, use the + terminal (20, 10) of the 20P connector as the plus side common, and use the NPN transistor output open collector type for the drive circuit.
- Never connect this manifold to the input unit, as major breakdowns could occur in this components and in the ambient components. Be sure to connect the manifold to the output unit.
- A voltage drop may occur due to simultaneous energizing or cable length. Confirm that the voltage drop for the solenoid is within 10 % of the rated voltage.



T50 connector pin array (example)

Note) The numbers in Valve No. 1a, 1b, 2a, 2b... represent the 1st bank, 2nd bank, etc., and the letters a and b indicate the a-side solenoid and b-side solenoid, respectively.



● For Single Solenoid Valve Cases (Supports up to 16 manifold banks maximum)

Pin No.	11	12	13	14	15	16	17	18	19	20
Valve No.	9a	10a	11a	12a	13a	14a	15a	16a	- Power Supply	+ Power Supply
Pin No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	2a	3a	4a	5a	6a	7a	8a	- Power Supply	+ Power Supply

● For Double Solenoid Valve Cases (Supports up to 8 manifold banks maximum)

Pin No.	11	12	13	14	15	16	17	18	19	20
Valve No.	5a	5b	6a	6b	7a	7b	8a	8b	- Power Supply	+ Power Supply
Pin No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	1b	2a	2b	3a	3b	4a	4b	- Power Supply	+ Power Supply

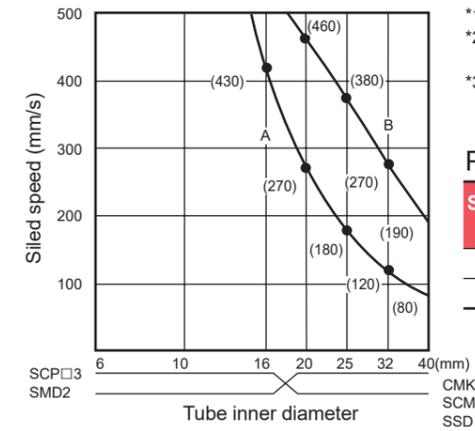
● For Mixed (Single/Double Combined) Cases (Supports up to 16 solenoid points maximum)

Pin No.	11	12	13	14	15	16	17	18	19	20
Valve No.	7a	7b	8a	9a	10a	10b	11a	11b	- Power Supply	+ Power Supply
Pin No.	1	2	3	4	5	6	7	8	9	10
Valve No.	1a	2a	3a	3b	4a	4b	5a	6a	- Power Supply	+ Power Supply

Pneumatic System Equipment Selection Guide

Pneumatic System Equipment Selection Guide

The average cylinder speed can be determined by the combination of the 4SA0/4SB0 Series and the piping system. It is expressed as the average speed calculated by dividing the stroke by the time from when the piston rod starts moving until it completes its travel, with the piston rod mounted upward. When the load factor is 50%, use approximately cylinder speed × 0.5.



Clean Air System Equipment

Item Name	Model Number	Connection Size (*1)	Max Flow Rate [L/min(ANR)] (*2)
F, R, L Kit	K60570-1C-GB	Rc1/8(6A)	200
	C1000-6-W	Rc1/8(6A)	450
F, R Unit	W1000-6-W	Rc1/8(6A)	830
Air Filter (F)	F1000-6-W	Rc1/8(6A)	460
Regulator (R)	B2019-1C	Rc1/8(6A)	500
	R1000-6-W	Rc1/8(6A)	770
Lubricator (L)	A3019-1C	Rc1/8(6A)	100
	L1000-6-W	Rc1/8(6A)	550

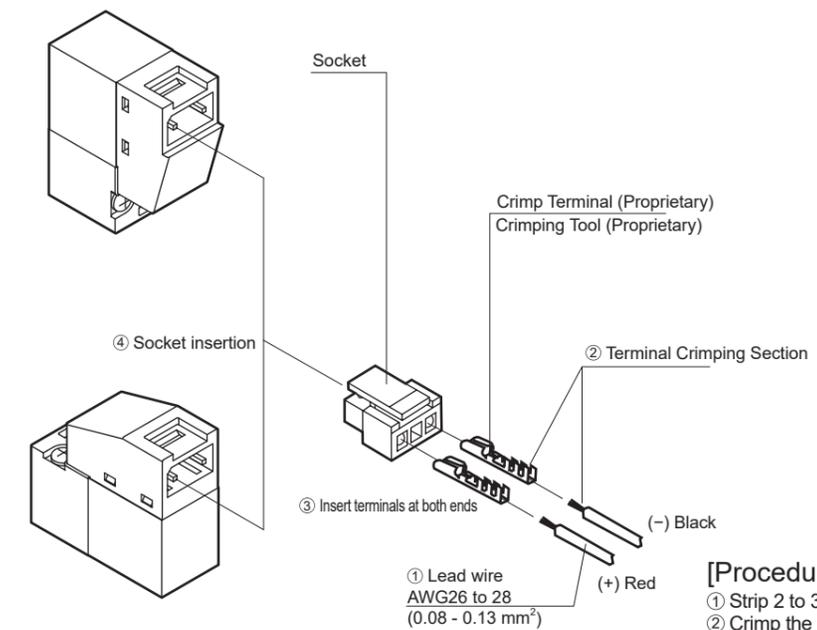
*1 Rc is the same as PT.
 *2 F, R, L Kit, F, R Unit, Regulator
 Inlet Pressure 0.7 MPa, Set Pressure 0.5 MPa, Pressure Drop 0.1 MPa
 *3 Air Filter, Lubricator
 Inlet Pressure 0.7 MPa, Pressure Drop 0.02 MPa

Piping System

System No.	Speed Controller	Silencer	Piping System Piping length between valve and cylinder in ()	Depends on the system Total effective cross-sectional area	Max Flow Rate [L/min(ANR)] P = 0.5 MPa
A	SC-M5	-	ø4 x ø2.5 nylon tube (1 m)	0.5 mm ²	34
B	SC1-6	SL-M5	ø6 x ø4 nylon tube (1 m)	1.3 mm ²	84

Wiring method for Type C and D connectors

(Refer to the figure below ① to ④ for wiring.)



* For crimp terminals and crimping tools, please consult our company separately.

[Procedure]

- Strip 2 to 3 mm of insulation from the lead wire end.
- Crimp the lead wire using the dedicated tool.
- Insert the terminal into the holes at both ends of the socket.
Note) Note : Insertion has a specific direction ; please be careful.
- Insert the socket into the solenoid valve connector section.

For precautions during installation, setup, adjustment, use, and maintenance, Please visit the CKD equipment product website (<https://www.ckd.co.jp/kiki/en/>) → "Model Number" → [Instruction manual].

Pilot-operated 5-port valve

4SA/B0

Pilot-operated 5-port valve

4SA/B0

Ending

Ending



To use this product safely

Please read this before use. For general precautions of valves refer to Intro 29.

Individual precautions: Pilot-operated 5-port valve 4SA0, 4SB0 series

During design and selection

1. surge suppressor

Caution

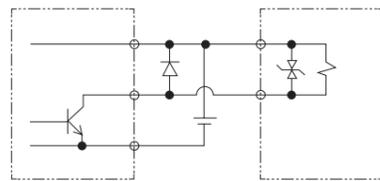
The surge suppressor included with the solenoid valve is intended to protect the output contacts of the solenoid valve driver. It cannot be expected to provide protection for other peripheral equipment, and surge effects may cause damage or malfunction. Conversely, it may absorb surges generated by other equipment, potentially causing damage such as burnout. Please note the following points.

The surge suppressor functions to limit the solenoid valve surge voltage, which can reach several hundred volts, to a low voltage level that the output contacts can withstand. Depending on the output circuit used, this may be insufficient and cause destruction or malfunction. Please determine whether to use it based on the surge voltage limiting level of the solenoid valve in use, the withstand voltage and circuit configuration of the output equipment, and the degree of return delay time. If necessary, implement additional surge countermeasures. Note that solenoid valves with surge suppressors in the 4G series can suppress reverse voltage surges generated at OFF to the levels shown in the table below.

Rated Voltage	Reverse Voltage at OFF
12 VDC	Approx. 27 V
24 VDC	Approx. 47 V

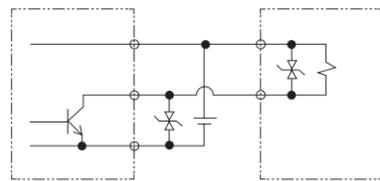
If the output unit is of the NPN type, the output transistor may be subjected to a surge voltage equal to the voltage in the table above plus the power supply voltage. Therefore, please install a contact protection circuit.

[Output transistor protection circuit included Example 1]



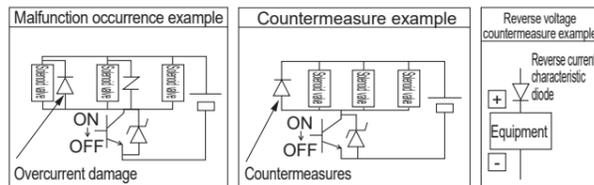
Programmable controller side Valve side

[Output transistor protection circuit included Example 2]



Programmable controller side Valve side

When other equipment or solenoid valves are connected in parallel to a solenoid valve, a reverse voltage surge generated when the solenoid valve is turned OFF is applied to those devices. Even with a solenoid valve with a surge suppressor for 24 VDC, the surge voltage can reach as high as -tens of volts depending on the model, and this reverse polarity voltage may damage or cause malfunctions in other parallel-connected devices. Avoid parallel connection with devices sensitive to reverse polarity voltage (e.g., LED indicators). In addition, in the case of driving multiple solenoid valves in parallel, the surge from other solenoid valves flows into the surge suppressor of one solenoid valve with a surge suppressor, potentially burning out the surge suppressor depending on the current value. Even when driving multiple solenoid valves with surge suppressors in parallel, the surge current may concentrate in the surge suppressor with the lowest limiting voltage, similarly causing burnout. Even with solenoid valves of the same model number, variations in the surge suppressor limiting voltage can lead to burnout in the worst case. Avoid driving multiple solenoid valves in parallel.



If the surge suppressor integrated in a solenoid valve is damaged by overvoltage or overcurrent from a source other than that solenoid valve, it will often enter a short-circuit state. Therefore, after damage occurs, a high current flows when the output is ON, and in the worst case, there is a possibility of damage or fire in the output circuit or solenoid valve. Do not continue energization while in a faulty state. In addition, to prevent a large current from continuing to flow, install an overcurrent protection circuit in the power supply or driving circuit, or use a power supply with overcurrent protection.

2. Low Heat Generation and Power Saving Circuit Built-in Type

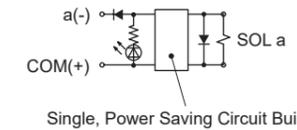
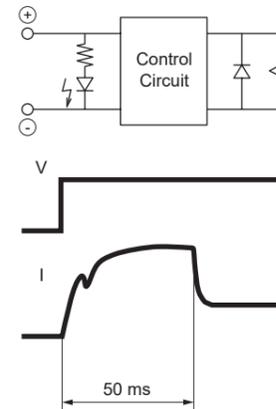
Caution

Do not use in environments where vibration or shock exceeds specifications. This may cause valve malfunction.

The low heat and power saving circuit integrated type has an integrated current control circuit in the valve and is structured to reduce the current value when the coil is held in attraction. Note that the polarity is for plus common only.

Specifications for Low-Heat, Power-Saving Built-In Circuit Type

Item		Content	
Energizing Current A	At Startup	DC 24	0.025
	During Holding	DC 24	0.013
Power Consumption W	At Startup	DC 24	0.7
	During Holding	DC 24	0.3



3. Extreme Properties

Caution

When the low heat and power saving circuit integrated type is selected, it is exclusively for plus common connection. Please pay attention to the connection polarity. For details on Surge Suppressors, please also see "1. Surge Suppressor" on P. 1244.

If a momentary power failure of 30 ms or less occurs in the drive power supply of the solenoid valve, the energized state cannot be maintained. If a disturbance such as a momentary power failure of 30 ms or less occurs in the power supply to the solenoid valve during a continuous energized state, turn off the energization for 50 ms or more to turn the solenoid valve ON again.

For precautions during installation, setup, adjustment, use, and maintenance, Please visit the CKD equipment product website (<https://www.ckd.co.jp/kiki/en/>) → "Model Number" → [Instruction manual].