3PA/3PB

Pneumatic valve

Direct acting 3-port valve

Overview

The 3P$^{A}_{B}$ series valves are direct acting universal pressurized 3-port valves usable with a working pressure of 0.7 MPa to low vacuum. Contributes to the construction of systems for low pressure/vacuum.
Suitable for operating cylinders of φ16 to φ40

Features

Space saving
Compact design with a valve width of 15 to 22 mm.
Contributes to reduction of the size of devices, etc., being assembled.

Large flow rate
The pressure balance poppet valve structure enables a large flow rate with a compact body.

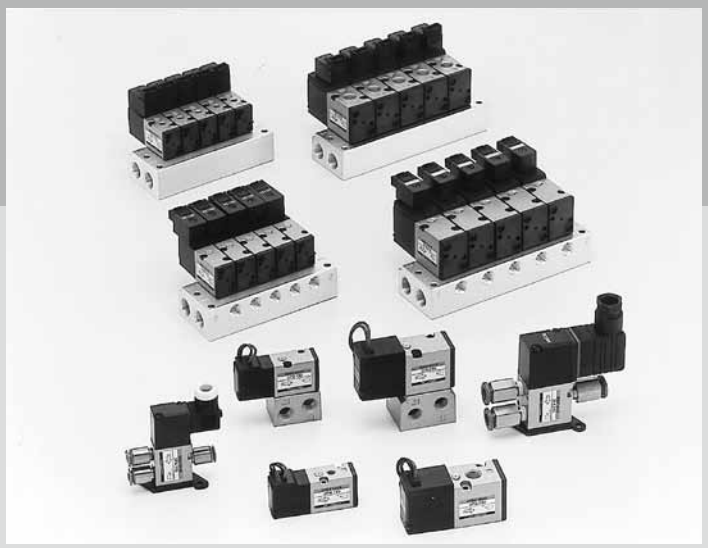
Weight of equipment reduced
Aluminum and resin used in core areas.
Contributes to reduction of the weight of devices being assembled.

Easy maintenance
The direction of piping, wiring, and manual override is the same.
Maintenance is easy.

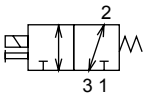
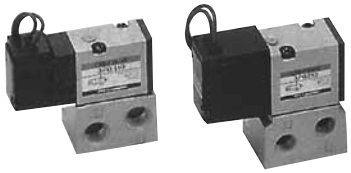
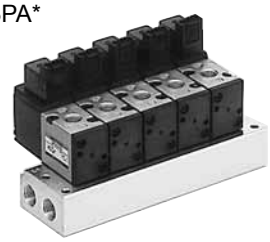
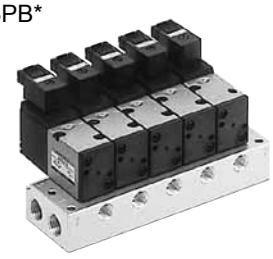
Energy saving
A 1.8 W low energy consumption design that realizes direct connections with electronic control and enables direct drive of the PLC.

Selectable electrical connections
Series are available for lead wire, terminal box, C type connectors, and D type connectors.
Combinations with lamp and surge suppressor are also available.

Resource saving
Can be used with no lubrication.



CONTENTS

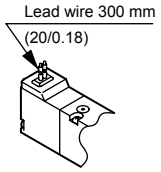
Piping method/series appearance			Model No.		Position Number of solenoid valves JIS symbol	Valve performance: Flow characteristics C [dm³/(s·bar)] *1	Valve performance: Applicable cylinder bore size	Voltage (V)	Switching position: 2-position single	Switching position: Mix manifold
Single unit	Body piping	3PA1 3PA2 	3-port	3PA1	● Universal  * Port numbers 1, 2, and 3 are Port 1: P, NC Port 2: A, COM Port 3: R, NO	0.34 to 0.38	φ16 to φ40	100 AC 200 AC 24 DC Option 110 AC 220 AC 12 DC	●	
				3PA2		0.98 to 1.1			●	
	Sub-plate piping	3PB1 3PB2 		3PB1		0.33 to 0.42			●	
				3PB2		0.90 to 1.0			●	
Individual wiring manifold	Body piping	M3PA* 	3-port	M3PA1		0.37 to 0.47	φ16 to φ40	100 AC 200 AC 24 DC Option 110 AC 220 AC 12 DC	●	●
				M3PA2		0.93 to 1.1			●	●
	Sub-plate piping	M3PB* 		M3PB1		0.31 to 0.36			●	●
				M3PB2		0.86 to 0.94			●	●

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

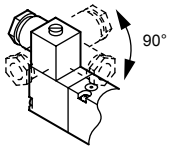
A port size						Electrical connections				Page
Female thread			Push-in fitting							
M5	Rc1/8	Rc1/4	φ4	φ6	φ8	Grommet lead wire	Compact terminal box	C type connector	D type connector	
●			●	●		●	●	●	●	1562
	●			●	●	●	●	●	●	
	●					●	●	●	●	1562
	●	●				●	●	●	●	
●			●	●		●	●	●	●	1570
	●			●	●	●	●	●	●	
	●		●	●		●	●	●	●	1570
	●			●	●	●	●	●	●	

Electrical connections

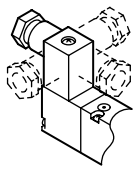
Blank Grommet lead wire



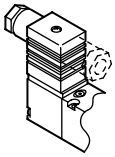
B Compact terminal box



L Compact terminal box lamp

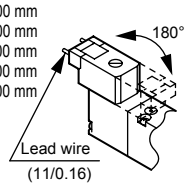


LS Compact terminal box, with surge suppressor/ lamp

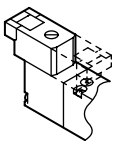


C C type connector lead wire

● Lead wire length
C : 300 mm
C00 : 500 mm
C01 : 1000 mm
C02 : 2000 mm
C03 : 3000 mm

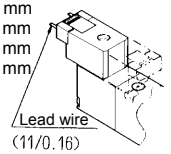


C1 C type connector without lead wire

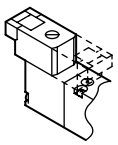


C2 C type connector with lead wire with surge suppressor/lamp

● Lead wire length
C2 : 300 mm
C20 : 500 mm
C21 : 1000 mm
C22 : 2000 mm
C23 : 3000 mm

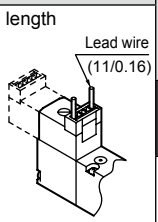


C3 C type connector without lead wire with surge suppressor and indicator lamp

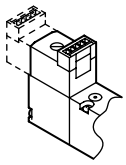


D D type connector lead wire

● Lead wire length
D : 300 mm
D00 : 500 mm
D01 : 1000 mm
D02 : 2000 mm
D03 : 3000 mm

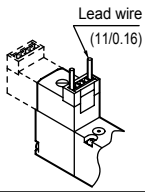


D1 D type connector without lead wire

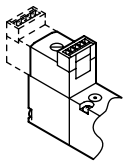


D2 D type connector lead wire with surge suppressor and indicator lamp

● Lead wire length
D2 : 300 mm
D20 : 500 mm
D21 : 1000 mm
D22 : 2000 mm
D23 : 3000 mm

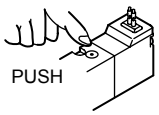


D3 D type connector without lead wire with surge suppressor and indicator lamp



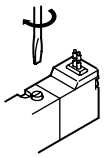
Manual override

Blank Non-locking



This will operate while the switch is being pressed.

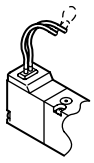
M1 Locking



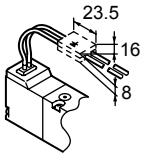
The unit will operate at approximately 90° in the ON direction.
Note that normally this should be returned to OFF.

Others/options

S Surge suppressor attached

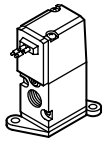


DC (grommet lead wire)



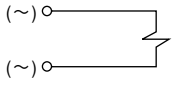
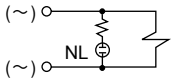
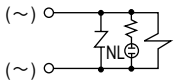
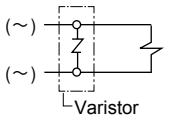
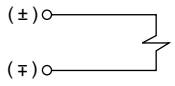
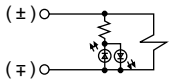
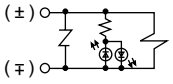
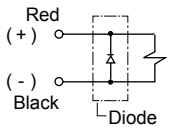
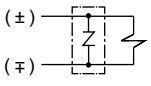
Suppression connector

P With mounting plate

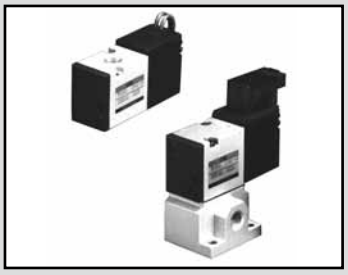


* Refer to the following page for electric connection circuit diagrams.

Electric connection circuit diagram

Voltage type	Option	Wiring circuit	Wiring method
AC	-		Grommet lead wire Terminal box (B) C type connector (C/C0*/C1) D type connector (D/D0*/D1)
	With indicator lamp		Terminal box (L)
	With surge suppressor and indicator lamp		Terminal box (LS) C type connector (C2/C2*/C3) D type connector (D2/D2*/D3)
	Surge suppressor attached (Option)		Surge suppressor attached (S)
DC	-		Grommet lead wire Terminal box (B) C type connector (C/C0*/C1) D type connector (D/D0*/D1)
	With indicator lamp		Terminal box (L) However, 3PA1/3PB1 are equipped with a surge suppressor and lamp.
	Surge suppressor/ with indicator lamp		Terminal box (LS) C type connector (C2/C2*/C3) D type connector (D2/D2*/D3)
	Surge suppressor attached (Option)	 Diode has polarity.	Grommet lead wire (The option code "S" will be attached with surge suppressor.)
		 Varistor * Varistor has no polarity.	Surge suppressor attached (S)

MEMO



Single valve; body piping/sub-plate piping
Direct acting 3-port pneumatic valve

3PA/3PB Series

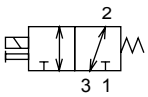
● Cylinder bore size: φ16 to φ40

CE Refer to the Ending for details.

RoHS CAD

JIS symbol

● 2-port/universal



Port numbers 1, 2, and 3 are
Port 1: P, NC
Port 2: A, COM
Port 3: R, NO

Common specifications

1 MPa = 10 bar

Descriptions	Content
Valve and operation	Direct acting poppet valve
Working fluid	Compressed air, low vacuum
Max. working pressure MPa	0.70 (≈100 psi, 7 bar)
Min. working pressure KPa	-100 (≈-15 psi, -1 bar)
Proof pressure MPa	1.05 (≈150 psi) (low vacuum: -101 KPa (≈-15 psi))
Max. working pressure differential MPa	0.70 (≈100 psi, 7 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
Degree of protection	Dust-proof
Vibration resistance m/s^2	50 or less
Shock resistance m/s^2	300 or less
Atmosphere	Cannot be used in corrosive gas environment.

Electrical specifications

Descriptions			3PA1 3PB1	3PA2 3PB2
Rated voltage V	AC		100, 200 (50/60 Hz)	
	DC		24	
Voltage fluctuation range			±10%	
Starting current A	AC	100 V	0.032 / 0.027	0.068 /0.054
	AC	200 V	0.016 / 0.014	0.034 / 0.027
	DC	24 V	-	-
Holding current A	AC	100 V	0.028 / 0.022	0.041 / 0.032
	AC	200 V	0.014 / 0.011	0.021 / 0.016
	DC	24 V	0.075	0.075
Power consumption W (With indicator lamp)	AC	100 V	1.8 / 1.4 (2.0 / 1.6)	2.2 / 1.8 (2.4 / 2.0)
	AC	200 V	1.8 / 1.4 (2.0 / 1.6)	2.2 / 1.8 (2.4 / 2.0)
	DC	24 V	1.8 (2.0)	1.8 (2.0)
Thermal class			B (molded coil)	
Temperature rise °C			30 (86°F)	

Reference: 100 VAC 50/60 Hz can be used with a rated voltage of 110 VAC 60 Hz and 200 VAC 50/60 Hz can be used with 220 VAC 60 Hz.

Individual specifications

Descriptions	3PA1	3PA2	3PB1	3PB2
Port size *1	M5 (φ4, φ6 Push-in fitting)	Rc1/8 (φ6, φ8 Push-in fitting)	Rc1/8	Rc1/8, 1/4
Response time *2 ms	20 or less	20 or less	20 or less	20 or less
Weight g	54	127	84	175

*1: ( ) shows options. As G and NPT threads can also be used for piping port screws, contact CKD for details.
*2: The response time is the value at 0.5 MPa supply pressure, with no lubrication, and with the power ON. It depends on the pressure and the lubricant quality.

Flow characteristics

Model No.	Port 1→2		Port 2→1		Port 2→3		Port 3→2	
	C[dm^3/(s·bar)]	b	C[dm^3/(s·bar)]	b	C[dm^3/(s·bar)]	b	C[dm^3/(s·bar)]	b
3PA1	0.34	0.29	0.35	0.42	0.38	0.43	0.35	0.32
3PA2	0.98	0.17	1.0	0.34	1.1	0.28	1.0	0.20
3PB1	0.37	0.05	0.33	0.21	0.41	0.28	0.42	0.08
3PB2	0.90	0.19	0.97	0.39	1.0	0.26	0.94	0.27

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

Ozone-proof specifications (Ending Page 5)

** - Voltage - **P11**

How to order single valve

● Body piping

3PA1 1 0 - M5 - M1 LS ◯ - 3

● Sub-plate piping

3PB2 1 0 - 08 - M1 LS ◯ - 3

● Solenoid valve for manifold (sub-plate piping)

3PB1 1 9 - 00 - M1 B ◯ - 3 * Gasket/ mounting screw attached

Ⓐ Model No.
Solenoid position
2-position single

Ⓑ Port size

Ⓒ Manual override

Ⓓ Electrical connections
* For the circuit diagram with surge suppressor/lamp refer to page 1560.
*4

Ⓔ Other options

Ⓕ Voltage

[Table 1] Compact terminal box L/LS compatibility table

Code	Content			3PA1	3PA2	3PB1	3PB2	Surge suppressor
L	Without lead wire	With indicator lamp	AC	●	●	●	●	
			DC		●		●	
		With surge suppressor/ indicator lamp	AC					
			DC	●		●		Integrated
LS	Without lead wire	With surge suppressor/ indicator lamp	AC	●	●	●	●	Integrated
			DC		●		●	Integrated

⚠ Precautions for model No. selection

*1 : For GS4, screw push-in fitting GWS4-M5-S into the 1, 2, and 3 ports.
*2 : For GS6, screw push-in fitting GWS6-M5-S (3PA1)/GWJS6-6 (3PA2) into the 1, 2, and 3 ports.
*3 : For GS8, screw push-in fitting GWS8-6 into the 1, 2, and 3 ports.
*4 : The lead wire used is AWG 20 to 24 size.
*5 : The surge suppressor for attachment is a suppression connector when the grommet lead wire is 24 VDC or less. (Refer to page 1559.)
*6 : The surge suppressor can only be selected when the grommet lead wire or compact terminal box "B" has been selected for the electrical connections.

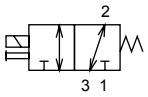
[Example of model No.]
3PA210-06-M1BP-3
Ⓐ Model: 3PA2 (body piping)
Solenoid position : 2-position single
Ⓑ Port size : Rc1/8
Ⓒ Manual override : Locking manual override
Ⓓ Electrical connections : Terminal box
Ⓔ Other options : With mounting plate
Ⓕ Voltage : 24 VDC

	Code	Content		Ⓐ Model No. Body piping 3PA1	Body piping 3PA2	Sub-plate piping 3PB1	Sub-plate piping 3PB2
Ⓑ Port size	M5	M 5		●			
	06	Rc1/8			●	●	●
	08	Rc1/4					●
	GS4	φ4 Push-in fitting	*1	●			
	GS6	φ6 Push-in fitting	*2	●	●		
	GS8	φ8 Push-in fitting	*3		●		
Ⓒ	Blank	Non-locking manual override		●	●	●	●
	M1	Locking manual override		●	●	●	●
Ⓓ Electrical connections	Grommet lead wire						
	Blank	Grommet lead wire (300 mm)		●	●	●	●
	Compact terminal box						
	B	Without lead wire		●	●	●	●
	L	Without lead wire	Refer to [Table 1] at left for details.				
	LS	No lead wire, with surge suppressor/lamp					
	C type connector (lead wire lateral direction)						
	C	Lead wire (300 mm)		●	●	●	●
	C00	Lead wire (500 mm)		●	●	●	●
	C01	Lead wire (1000 mm)		●	●	●	●
	C02	Lead wire (2000 mm)		●	●	●	●
	C03	Lead wire (3000 mm)		●	●	●	●
	C1	Without lead wire		●	●	●	●
	C2	Lead wire (300 mm), surge suppressor/indicator lamp		●	●	●	●
	C20	Lead wire (500 mm), surge suppressor/indicator lamp		●	●	●	●
	C21	Lead wire (1000 mm), surge suppressor/indicator lamp		●	●	●	●
	C22	Lead wire (2000 mm), surge suppressor/indicator lamp		●	●	●	●
	C23	Lead wire (3000 mm), surge suppressor/indicator lamp		●	●	●	●
	C3	Lead/no lead wire, surge suppressor/indicator lamp		●	●	●	●
	D type connector (lead wire upward direction)						
	D	Lead wire (300 mm)		●	●	●	●
	D00	Lead wire (500 mm)		●	●	●	●
	D01	Lead wire (1000 mm)		●	●	●	●
	D02	Lead wire (2000 mm)		●	●	●	●
	D03	Lead wire (3000 mm)		●	●	●	●
	D1	Without lead wire		●	●	●	●
	D2	Lead wire (300 mm), surge suppressor/indicator lamp		●	●	●	●
	D20	Lead wire (500 mm), surge suppressor/indicator lamp		●	●	●	●
	D21	Lead wire (1000 mm), surge suppressor/indicator lamp		●	●	●	●
	D22	Lead wire (2000 mm), surge suppressor/indicator lamp		●	●	●	●
	D23	Lead wire (3000 mm), surge suppressor/indicator lamp		●	●	●	●
	D3	No lead wire, with surge suppressor/indicator lamp		●	●	●	●
Ⓔ	Blank	Without mounting plate		●	●		
	P	With mounting plate		●	●		
	S	Surge suppressor attached	*5, *6	●	●	●	●
Ⓕ Voltage	1	Standard	100 VAC 50/60 Hz	●	●	●	●
	2	Standard	200 VAC 50/60 Hz	●	●	●	●
	3	Standard	24 VDC	●	●	●	●
	AC110V	Option	110 VAC 50/60 Hz	●	●	●	●
	AC220V	Option	220 VAC 50/60 Hz	●	●	●	●
	4	Option	12 VDC	●	●	●	●
* Other custom order products							
AC24V				●	●	●	●
AC115V				●	●	●	●
AC120V				●	●	●	●

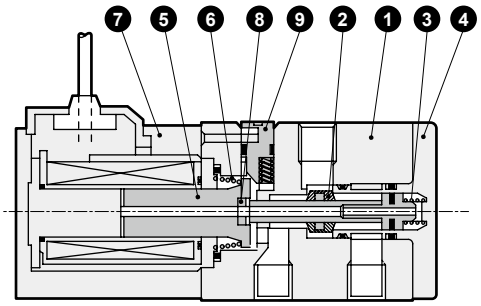
Internal structure and parts list

3PA110

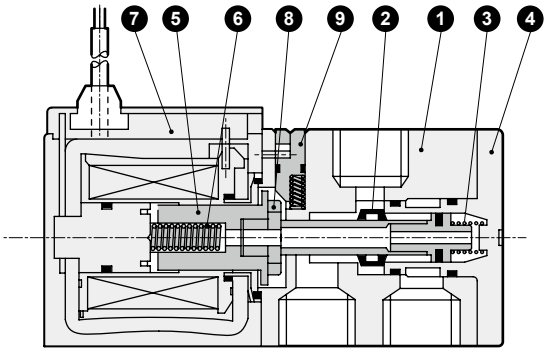
● 2-position single



* Port numbers 1, 2, and 3 are
Port 1: P, NC
Port 2: A, COM
Port 3: R, NO



3PA210



Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (stem assembly)	-
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	Stainless steel
6	Plunger spring	Stainless steel
7	Coil assembly	-
8	Knock	Resin
9	Manual button	Resin

Repair parts list

No./part name / Model No.	5 6 7 8 Coil assembly *
3PA110	3P1 - electrical connections - COIL - voltage ↑ Blank for grommet lead wire
3PA210	3P2 - electrical connections - COIL - voltage ↑ Blank for grommet lead wire

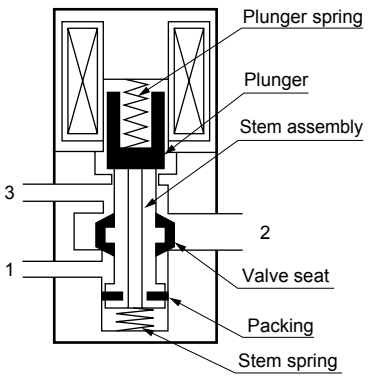
* 1: The plunger assembly is attached with the coil assembly. As there are limitations with the combinations of coils and plungers, do not replace these.
* 2: The compact terminal box and connector of the coil assembly will come assembled and attached with the options indicated with How to order.
* 3: When combining a coil assembly into a valve, contact CKD for precautions regarding the work.

Operational principl

3P Series structure is a pressure balanced type poppet valve, which is not affected by the working pressure and achieves a low wattage large flow rate performance. Port can be pressurized from any of ports 1, 2, or 3. The stem assembly valve seat and packing have the same diameter, so each port pressure differential is canceled by the stem assembly's through hole and pressure is balanced at both ON and OFF.

● When not energized

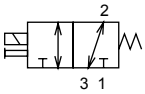
The stem assembly is pushed toward port 1 side by the plunger spring force transmitted by the plunger.
Port 1 is closed due to the stem assembly valve seat and packing. Ports 2 and 3 are opened.



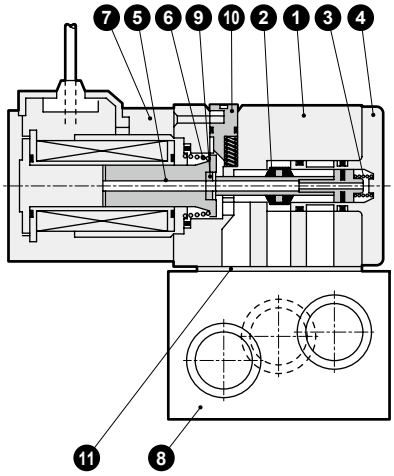
Internal structure and parts list

3PB110

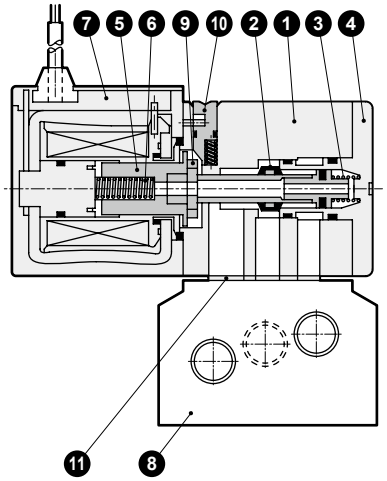
● 2-position single



* Port numbers 1, 2 and 3 are
Port 1: P, NC
Port 2: A, COM
Port 3: R, NO



3PB210



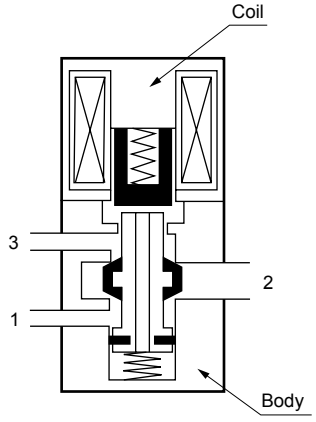
Main parts list

No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	Valving element (stem assembly)	-
3	Valve spring	Stainless steel
4	Cap	Resin
5	Plunger	Stainless steel
6	Plunger spring	Stainless steel
7	Coil assembly	-
8	Sub-plate	Aluminum alloy die-casting
9	Knock	Resin
10	Manual button	Resin
11	Gasket	Nitrile rubber

Repair parts list

No./part name / Model No.	5 6 7 9 Coil assembly *
3PB110	3P1 - electrical connections - COIL - voltage Blank for grommet lead wire
3PB210	3P2 - electrical connections - COIL - voltage Blank for grommet lead wire

* 1: The plunger assembly is attached with the coil assembly. As there are limitations with the combinations of coils and plungers, do not replace these.
* 2: The compact terminal box and connector of the coil assembly will come assembled and attached with the options indicated with How to order.
* 3: When combining a coil assembly into a valve, contact CKD for precautions regarding the work.



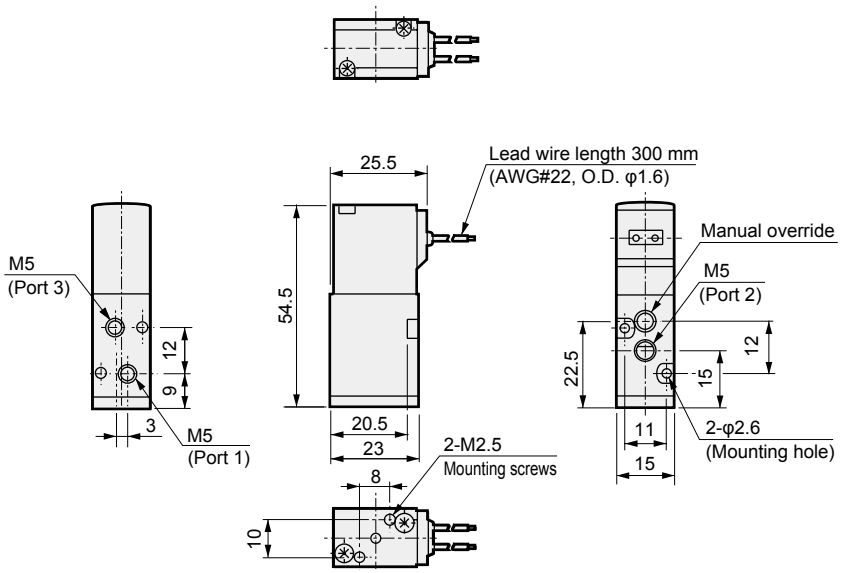
● When energized

When energizing the coil, the plunger is adsorbed toward the coil side, while the stem assembly is moved by the stem spring force and Ports 1 and 2 are opened. Port 3 is closed.

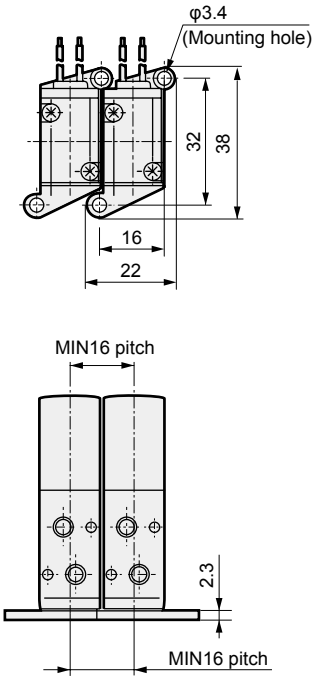
Dimensions CAD

3PA110-M5

● 2-position single: grommet lead wire

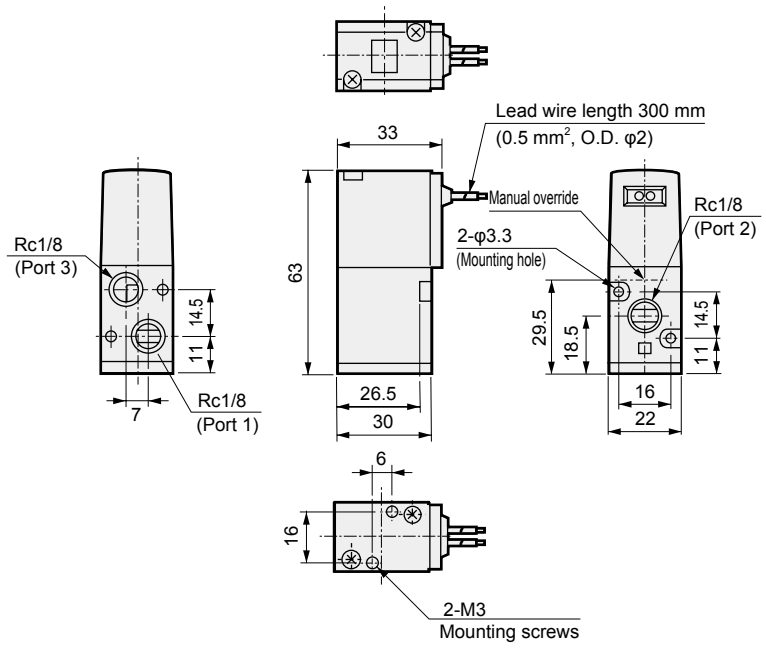


● With mounting plate: (P)

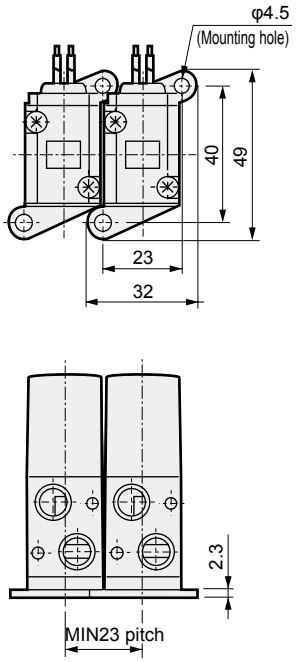


3PA210-06

● 2-position single: grommet lead wire



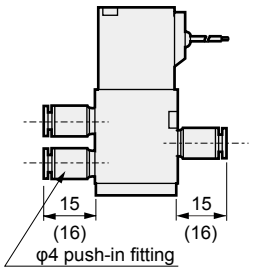
● With mounting plate: (P)



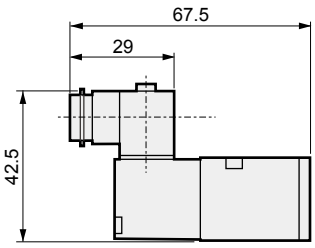
Dimensions

For 3PA1

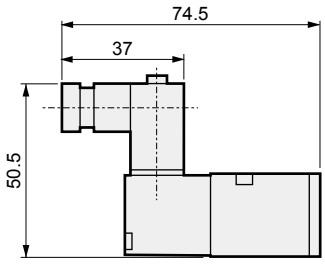
● φ4, φ6 push-in fitting: (GS4/GS6)



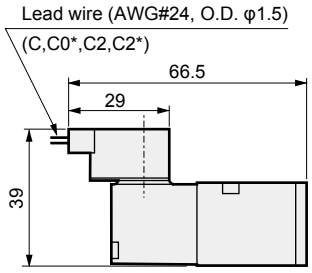
● Terminal box: (B)



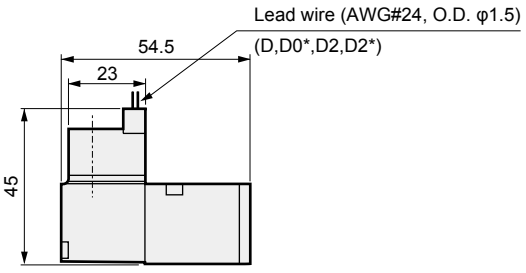
● Terminal box with lamp: (L/LS)



● C type connector: (C/C1/C2/C3)



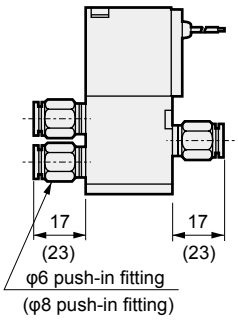
● D type connector: (D/D1/D2/D3)



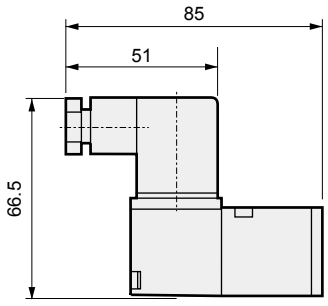
● Locking manual override: (M1)

For 3PA2

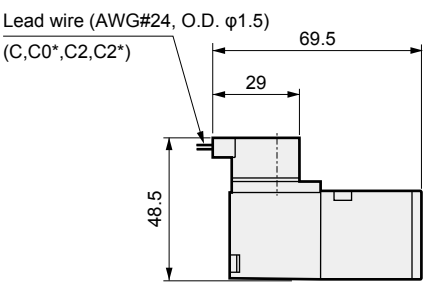
● φ6, φ8 push-in fitting: (GS6/GS8)



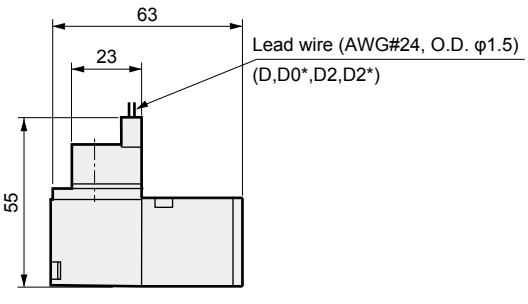
● Terminal box: (B/L/LS)



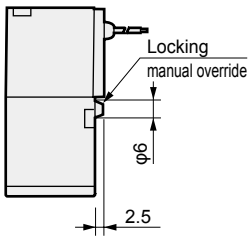
● C type connector: (C/C1/C2/C3)



● D type connector: (D/D1/D2/D3)



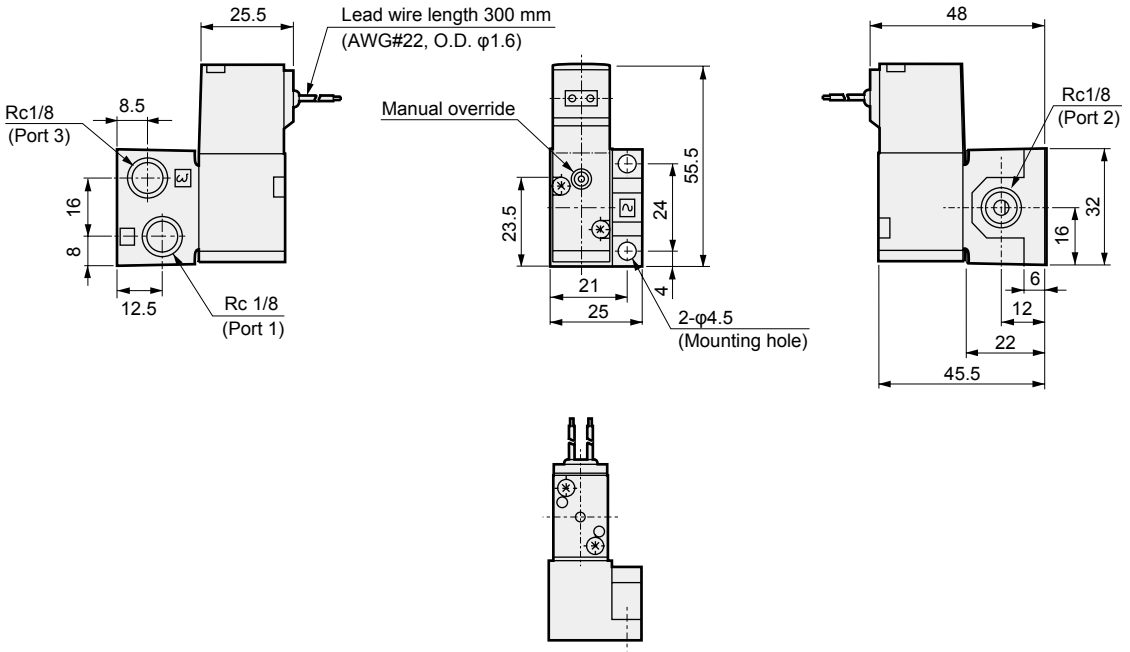
● Locking manual override: (M1)



Dimensions CAD

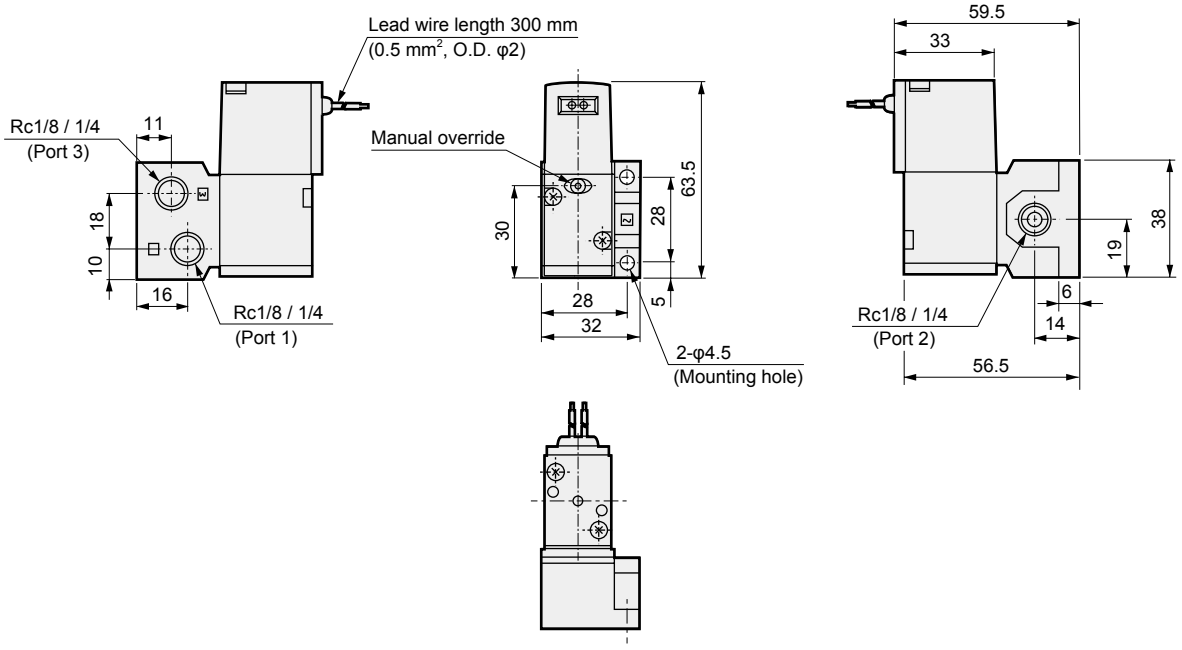
3PB110-06

● 2-position single: grommet lead wire



3PB210-06
08

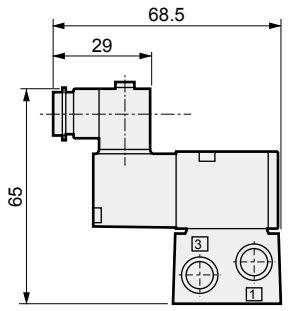
● 2-position single: grommet lead wire



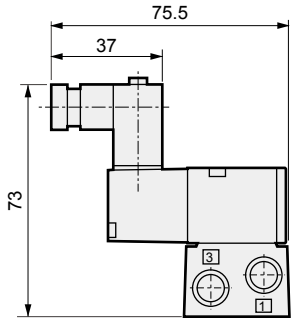
Dimensions

For 3PB1

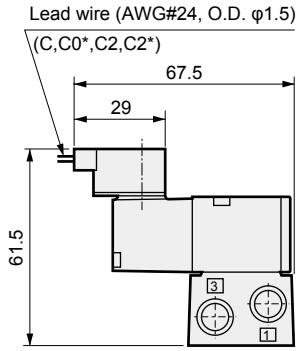
● Terminal box: (B)



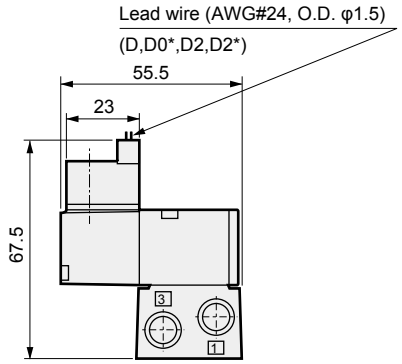
● Terminal box with lamp: (L/LS)



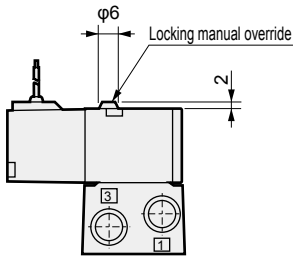
● C type connector: (C/C1/C2/C3)



● D type connector: (D/D1/D2/D3)

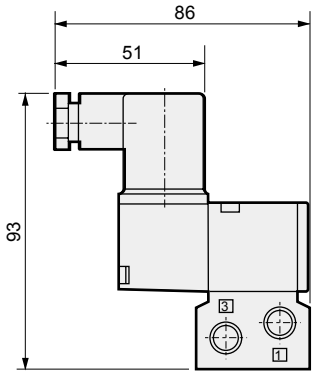


● Locking manual override: (M1)

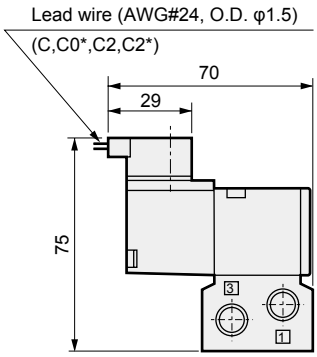


For 3PB2

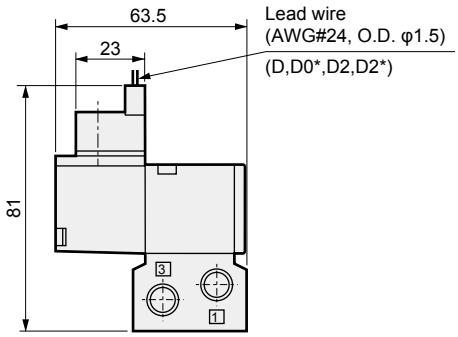
● Terminal box: (B/L/LS)



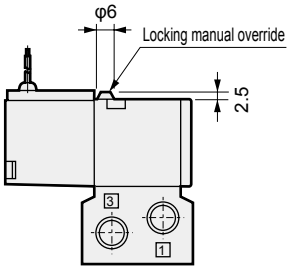
● C type connector: (C/C1/C2/C3)

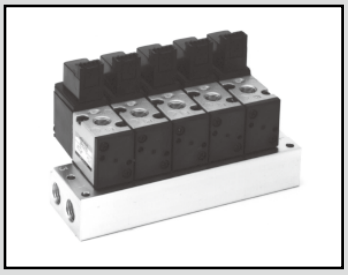


● D type connector: (D/D1/D2/D3)



● Locking manual override: (M1)





Individual wiring manifold body piping / sub-plate piping
Direct acting 3-port pneumatic valve

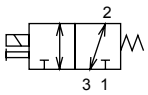
M3PA/M3PB Series

● Cylinder bore size: φ16 to φ40

Refer to the Ending for details.

JIS symbol

● 2-port/universal



Port numbers 1, 2, and 3 are
Port 1: P, NC
Port 2: A, COM
Port 3: R, NO
.

Common specifications

1 MPa = 10 bar

Descriptions	Content
Manifold method	Sub-plate integrated
Station No.	2 to 20 stations
Valve and operation	Direct acting poppet valve
Working fluid	Compressed air, low vacuum
Max. working pressure MPa	0.70 (≈100 psi, 7 bar)
Min. working pressure KPa	-100 (≈-15 psi, -1 bar)
Proof pressure MPa	1.05 (≈0.15 psi) (low vacuum: -101 kPa (≈-15 psi))
Max. working Press Diff. (MPa)	0.70 (≈100 psi, 7 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
Degree of protection	Dust-proof
Shock resistance m/s²	50 or less
Shock resistance m/s²	300 or less
Atmosphere	Cannot be used in corrosive gas environment.

Electrical specifications

Descriptions			3PA1 3PB1	3PA2 3PB2
Rated voltage V	AC		100, 200 (50 / 60 Hz)	
	DC		24	
Voltage fluctuation range			±10%	
Starting current A	AC	100 V	0.032 / 0.027	0.068 / 0.054
	AC	200 V	0.016 / 0.014	0.034 / 0.027
	DC	24 V	-	-
Holding current A	AC	100 V	0.028 / 0.022	0.041 / 0.032
	AC	200 V	0.014 / 0.011	0.021 / 0.016
	DC	24 V	0.075	0.075
Power consumption W (With indicator lamp)	AC	100 V	1.8 / 1.4 (2.0 / 1.6)	2.2 / 1.8 (2.4 / 2.0)
	AC	200 V	1.8 / 1.4 (2.0 / 1.6)	2.2 / 1.8 (2.4 / 2.0)
	DC	24 V	1.8 (2.0)	1.8 (2.0)
Thermal class			B (molded coil)	
Temperature rise °C			30 (86°F)	

Reference: 100 VAC 50/60 Hz can be used with a rated voltage of 110 VAC 60 Hz and 200 VAC 50/60 Hz can be used with 220 VAC 60 Hz.

Individual specifications

Descriptions		M3PA1	M3PA2	M3PB1	M3PB2
Manifold		Port 2 : Individual Port 1/3: Common	Port 2 : Individual Port 1/3: Common	Port 2 : Individual Port 1/3: Common Port 2/3: Individual Port 1 : Common Port 1/2: Individual Port 3 : Common	Port 2 : Individual Port 1/3: Common Port 2/3: Individual Port 1 : Common Port 1/2: Individual Port 3 : Common
Port size *1	Port 1	Rc1/4	Rc1/4	Common: Rc1/4 Individual: Rc1/8	Common: Rc1/4 Individual: Rc1/8
	Port 2	M 5 (φ4, φ6 push-in fitting)	Rc1/8 (φ6, φ8 push-in fitting)	Rc1/8 (φ4, φ6 push-in fitting)	Rc1/8 (φ6, φ8 push-in fitting)
	Port 3	Rc 1/4	Rc 1/4	Common: Rc1/4 Individual: Rc1/8	Common: Rc1/4 Individual: Rc1/8
Response time *2 ms		20 or less	20 or less	20 or less	20 or less
Weight (n: station No.) g		104×n+48	184×n+46	102×n+48	182×n+45

*1: As G and NPT threads can also be used for piping port screws, contact CKD for details.
*2: The response time is the value at 0.5 MPa supply pressure, with no lubrication, and with the power ON. It depends on the pressure and the lubricant quality.

Ozone-proof specifications (Ending Page 5)

** - Voltage - P11

Flow characteristics

Model No.	Port 1→2		Port 2→1		Port 2→3		Port 3→2	
	C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b
M3PA1	0.38	0.17	0.37	0.46	0.47	0.45	0.40	0.18
M3PA2	0.93	0.25	1.0	0.35	1.1	0.32	0.97	0.31
M3PB1	0.36	0.22	0.32	0.43	0.33	0.48	0.31	0.24
M3PB2	0.86	0.25	0.93	0.38	0.94	0.22	0.88	0.27

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

How to order individual wiring manifold

● Solenoid valve for manifold (body piping)

3PA1 1 9 - M5 - M1 B ◯ —— 3 * Gasket/mounting screw attached

● Solenoid valve for manifold (sub-plate piping)

3PB1 1 9 - 00 - M1 B ◯ —— 3 * Gasket/mounting screw attached

● Manifold

M 3PB1 1 0 - 06 - M1 B ◯ - 7 - 3 - 5 2

S1 MP

Indicate the valve function based quantity display position for when using a mix manifold. Refer to the following page.

Ⓐ Model No.

Ⓑ Solenoid position

Ⓒ Port size

* : The values of port size port 1/3 are,
(1) 1/3 = Rc1/4 common
(2) 1 = Rc1/4 common, 3 = Rc1/8 individual
(3) 1 = Rc1/8 individual, 3 = Rc1/4 common

Ⓔ Electrical connections
* For the circuit diagram with surge suppressor/lamp, refer to page 1560.
*4

● For how to order masking plates, refer to the next page.

Ⓓ Manual override

Ⓕ Other options

Ⓖ Station No.

Ⓗ Voltage

Ⓐ Model No.	Body piping		Sub-plate piping	
	3PA1	3PA2	3PB1	3PB2

	Code	Content				
Ⓑ	1	2-position single	●	●	●	●
	8	Mix manifold (for multiple solenoid positions)	●	●	●	●

Ⓒ Port size		Port 2 individual	Port 1/3			
	M5	M 5	(1)			
	06	Rc1/8		(1)	(1)	(1)
	GS4	φ4 push-in fitting *1	(1)		(1)	
	GS6	φ6 push-in fitting *2	(1)	(1)	(1)	(1)
	GS8	φ8 push-in fitting *3		(1)		(1)
	06Y	Rc1/8 (rear piping)			(1)	(1)
	06A	Rc1/8			(2)	(2)
	06B	Rc1/8			(3)	(3)

Ⓓ						
	Blank	Non-locking manual override	●	●	●	●
	M1	Locking manual override	●	●	●	●

Ⓔ Electrical connections						
Grommet lead wire						
	Blank	Grommet lead wire (300 mm)	●	●	●	●
Compact terminal box						
	B	Without lead wire	●	●	●	●
	L	Without lead wire	Refer to [Table 1] at left for details.			
	LS	No lead wire, with surge suppressor/lamp				
C type connector (lead wire lateral direction)						
	C	Lead wire (300 mm)	●	●	●	●
	C00	Lead wire (500 mm)	●	●	●	●
	C01	Lead wire (1000 mm)	●	●	●	●
	C02	Lead wire (2000 mm)	●	●	●	●
	C03	Lead wire (3000 mm)	●	●	●	●
	C1	Without lead wire	●	●	●	●
	C2	Lead wire (300 mm), surge suppressor/indicator lamp	●	●	●	●
	C20	Lead wire (500 mm), surge suppressor/indicator lamp	●	●	●	●
	C21	Lead wire (1000 mm), surge suppressor/indicator lamp	●	●	●	●
	C22	Lead wire (2000 mm), surge suppressor/indicator lamp	●	●	●	●
	C23	Lead wire (3000 mm), surge suppressor/indicator lamp	●	●	●	●
	C3	No lead wire, with surge suppressor/indicator lamp	●	●	●	●
D type connector (lead wire upward direction)						
	D	Lead wire (300 mm)	●●●●			
	D00	Lead wire (500 mm)	●	●	●	●
	D01	Lead wire (1000 mm)	●	●	●	●
	D02	Lead wire (2000 mm)	●	●	●	●
	D03	Lead wire (3000 mm)	●	●	●	●
	D1	Without lead wire	●	●	●	●
	D2	Lead wire (300 mm), surge suppressor/indicator lamp	●	●	●	●
	D20	Lead wire (500 mm), surge suppressor/indicator lamp	●	●	●	●
	D21	Lead wire (1000 mm), surge suppressor/indicator lamp	●	●	●	●
	D22	Lead wire (2000 mm), surge suppressor/indicator lamp	●	●	●	●
	D23	Lead wire (3000 mm), surge suppressor/indicator lamp	●	●	●	●
	D3	No lead wire, with surge suppressor/indicator lamp	●	●	●	●

Ⓕ						
	Blank	No option	●	●	●	●
	S	Surge suppressor attached *5, *6	●	●	●	●

Ⓖ Stn No.						
	2	2 stations	●	●	●	●
	to	to				
	20	20 stations				

Ⓗ Voltage						
	1	Standard	100 VAC(50/60 Hz)	●	●	●	●
	2		200 VAC(50/60 Hz)	●	●	●	●
	3		DC 24 V	●	●	●	●
	AC110V	Option	110 VAC 50/60 Hz	●	●	●	●
	AC220V		220 VAC 50/60 Hz	●	●	●	●
	4		DC 12 V	●	●	●	●

* Other custom order products				
AC24V	●	●	●	●
AC115V	●	●	●	●
AC120V	●	●	●	●

[Table 1] Compact terminal box L/LS compatibility table

Code	Content			3PA1	3PA2	3PB1	3PB2	Surge suppressor
L	Without lead wire	With indicator lamp	AC	●	●	●	●	
			DC		●		●	
		Surge suppressor, indicator lamp	AC					
			DC	●		●		Integrated
LS	Without lead wire	Surge suppressor, indicator lamp	AC	●	●	●	●	Integrated
			DC		●		●	Integrated

⚠ Precautions for model No. selection

*1 : For GS4, screw push-in fitting GWS4-M5-S (3PA1)/GWJS4-6 (3PB1) into the 2 port.
*2 : For GS6, screw push-in fitting GWS6-M5-S (3PA1)/GWJS6-6(3PA2)/GWJS6-6(3PB1) into the 2 port.
*3 : For GS8, screw push-in fitting GWS8-6(3PA2, 3PB2) into Port 2.
*4 : The lead wire used is AWG20 to 24 size.
*5 : The surge suppressor for attachment is a suppression connector for 24 VDC or less. (Refer to page 1559.)
*6 : The surge suppressor can only be selected when the grommet lead wire or compact terminal box "B" has been selected for the electrical connections.

[Example of model No.]

M3PA210-06-S-7-1

Ⓐ Model: M3PA2 (body piping)
Ⓑ Solenoid position : 2-position single
Ⓒ Port size : Port 2 Rc1/8
Ⓓ Manual override : Non-locking manual override
Ⓔ Electrical connections: Grommet lead wire
Ⓕ Other options : Surge suppressor attached
Ⓖ Station No. : 7 stations
Ⓗ Voltage : 100 VAC

How to order masking plate kit

3PA1 -MP-KIT * Gasket/mounting screw attached

Ⓐ Model No.

Ⓐ Model No.
3PA1
3PB1
3PA2
3PB2

How to order mix manifold

M 3PB1 8 0 - 06 - M1 B ( ) - 7 - 3 - S1 MP **5 2**

Mix manifold "8"

S1 = 1 to 5, MP = 6 to 7

How to fill in form for ordering a mix manifold

(1) List the quantity for each function (solenoid position) at the end of How to order. The functions and codes are as shown below.

Example: 2-position single → S1

- S1 MP **5 2**

List the quantity

Code	Function (solenoid position)
S1	2-position single
MP	Masking plate

(2) List the function (solenoid position) and layout position in the field for remarks.

Solenoid position code = ○ , ○ th station (where the left side is the 1st station when the piping port is facing forward.)

Example: S1 = 1 to 5 (1st to 5th stations are 2-position single)

[Example of model No.]

For 7 stations

1	2	3	4	5	6	7	····· Layout position
2-position single	2-position single	2-position single	2-position single	2-position single	Masking plate	Masking plate	
S1	S1	S1	S1	S1	MP	MP	····· Code

2-position single (S1) : 5 pcs (1st to 5th stations)
Masking plate : 2 pcs (6th, 7th stations)

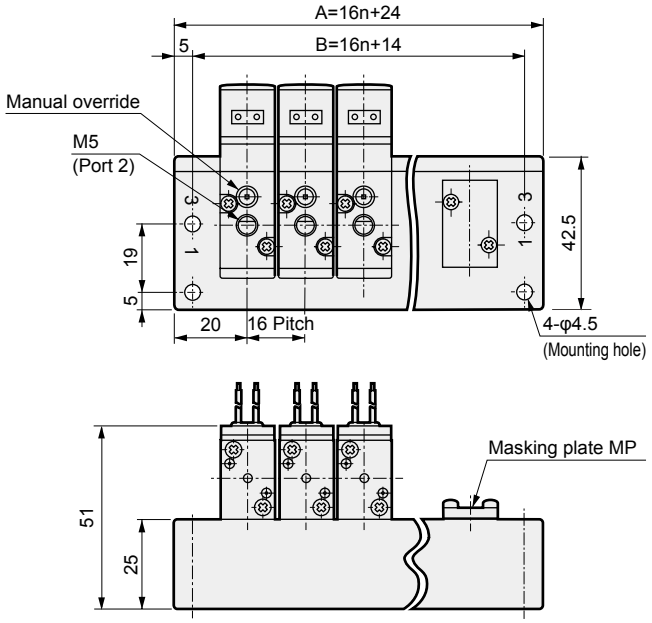
M3PB180-06-M1-B-7-3 - S1 MP **5 2**

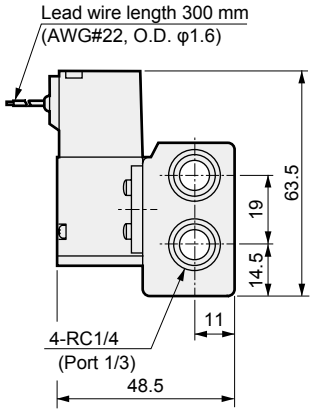
S1=1 to 5 MP=6 to 7

Dimensions CAD

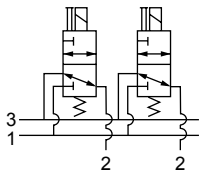
M3PA180-M5

● Port 2 - individual piping, port 1/3 - common piping: grommet lead wire





JIS symbol

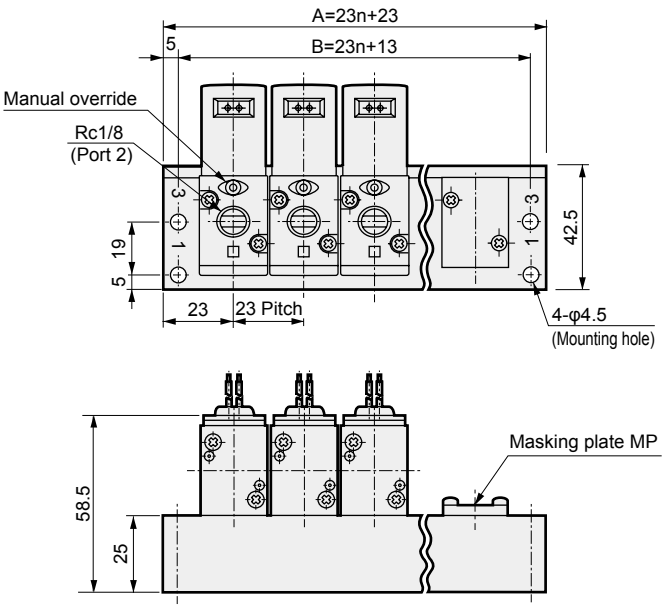


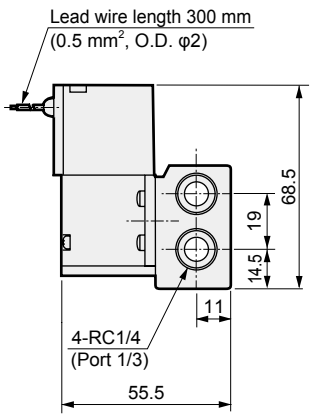
■ Model No. of single unit solenoid valve unit for manifold **3PA119-M5-**option-voltage

Station No.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296	312	328	344
B	46	62	78	94	110	126	142	158	174	190	206	222	238	254	270	286	302	318	334

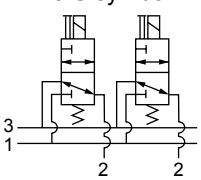
M3PA280-06

● Port 2 - individual piping, port 1/3 - common piping: grommet lead wire





JIS symbol



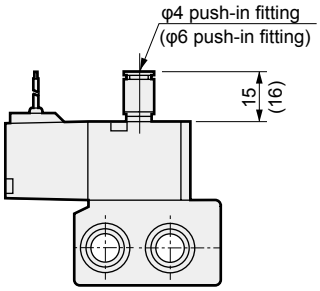
■ Model No. of single unit solenoid valve unit for manifold **3PA219-06-**option-voltage

Station No.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	69	92	115	138	161	184	207	230	253	276	299	322	345	368	391	414	437	460	483
B	59	82	105	128	151	174	197	220	243	266	289	312	335	358	381	404	427	450	473

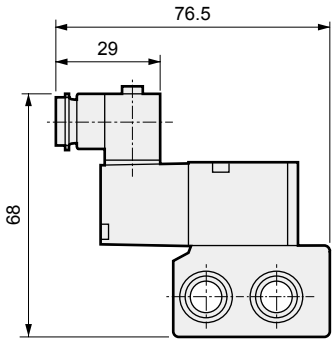
Dimensions

For M3PA1

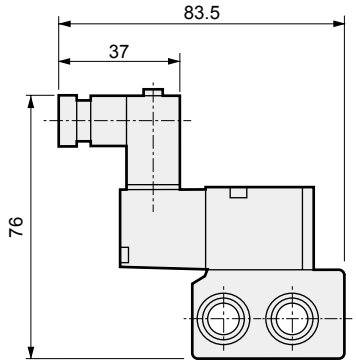
● φ4, φ6 push-in fitting: (GS4/GS6)



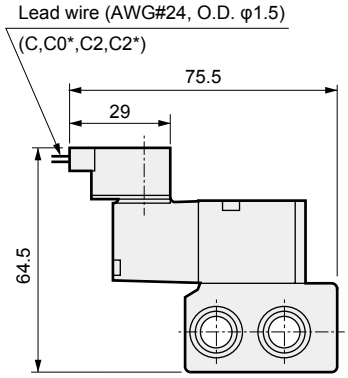
● Terminal box: (B)



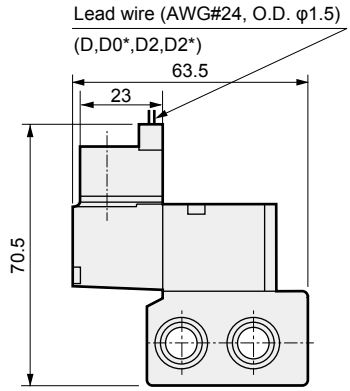
● Terminal box with lamp: (L/LS)



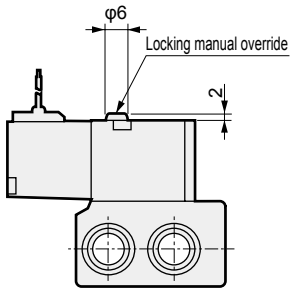
● C type connector: (C/C1/C2/C3)



● D type connector: (D/D1/D2/D3)

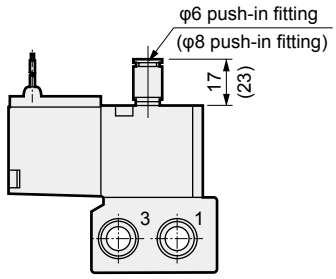


● Locking manual override: (M1)

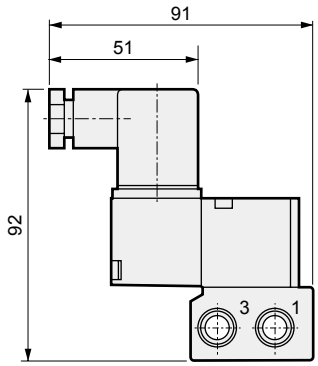


For M3PA2

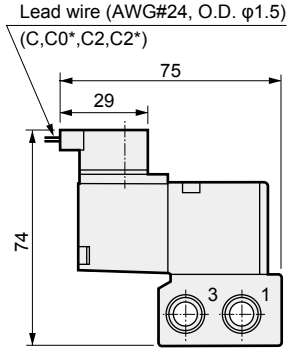
● φ6, φ8 push-in fitting: (GS6/GS8)



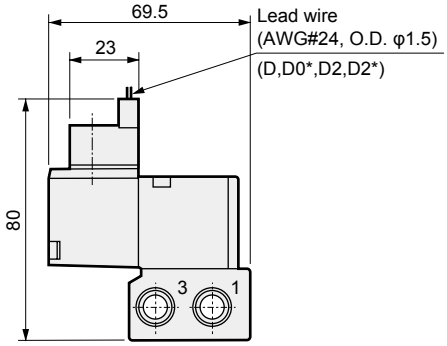
● Terminal box: (B/L/LS)



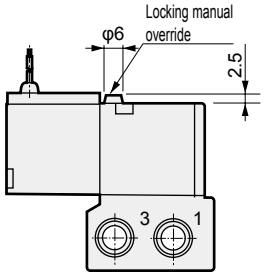
● C type connector: (C/C1/C2/C3)



● D type connector: (D/D1/D2/D3)



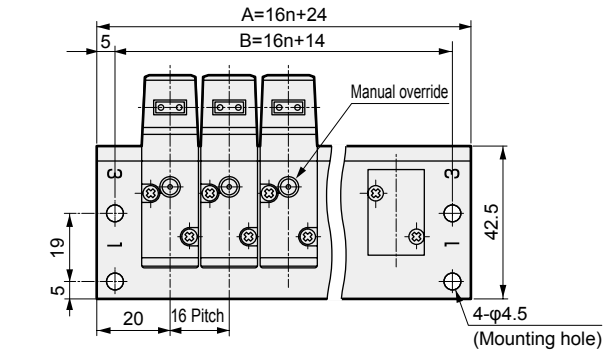
● Locking manual override: (M1)

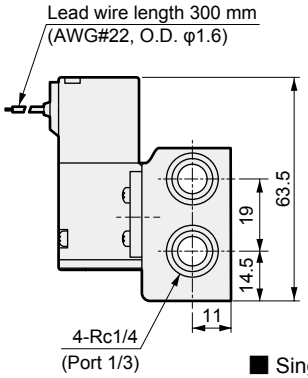


Dimensions CAD

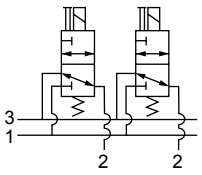
M3PB180-06

● Port 2 - individual piping, port 1/3 - common piping: grommet lead wire

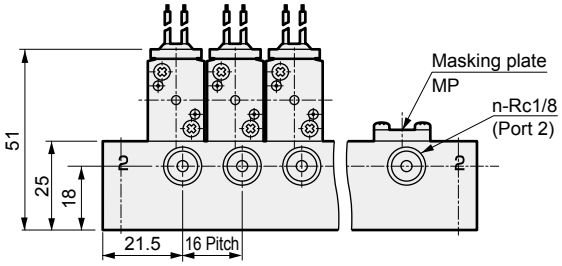




JIS symbol

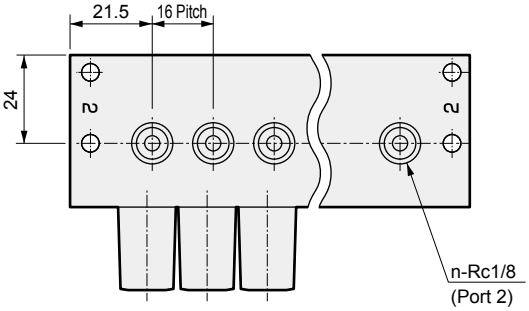


■ Single solenoid valve model No. for manifold
3PB119-00-option - voltage



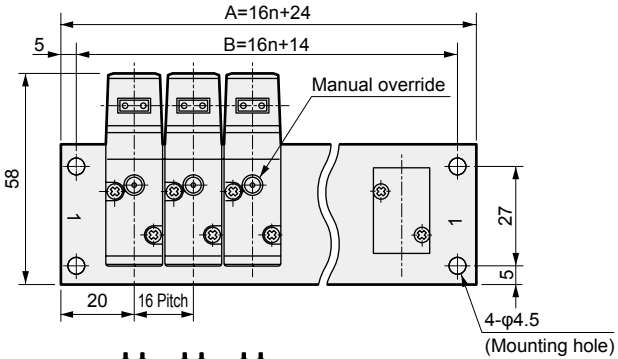
M3PB180-06Y

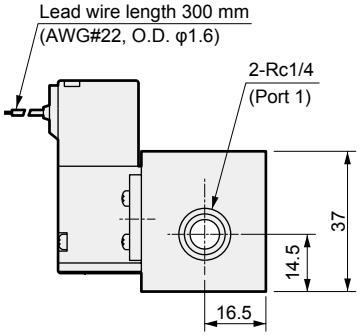
● Port 2 - rear piping, port 1/3 - common piping

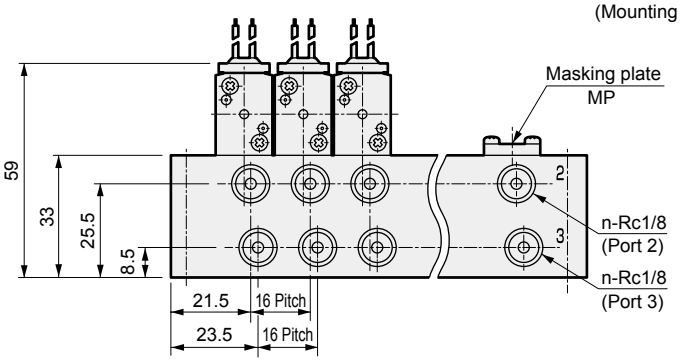


M3PB180-06A

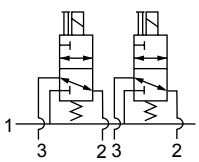
● Port 2/3 - individual piping, port 1 - common piping: grommet lead wire







JIS symbol



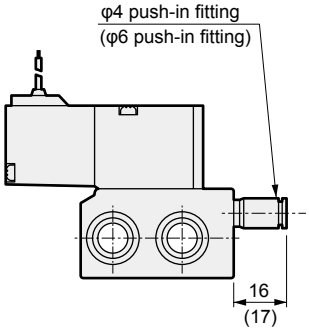
■ Single solenoid valve model No. for manifold
3PB119-00- option - voltage

Station No.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296	312	328	344
B	46	62	78	94	110	126	142	158	174	190	206	222	238	254	270	286	302	318	334

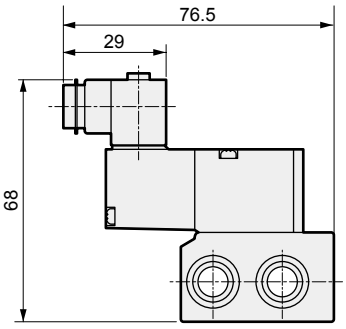
Dimensions

For M3PB1

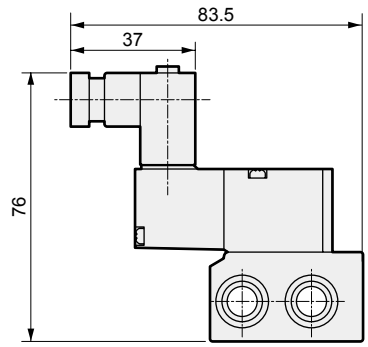
● φ4, φ6 push-in fitting: (GS4/GS6)



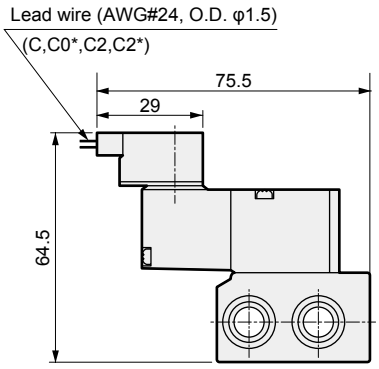
● Terminal box: (B)



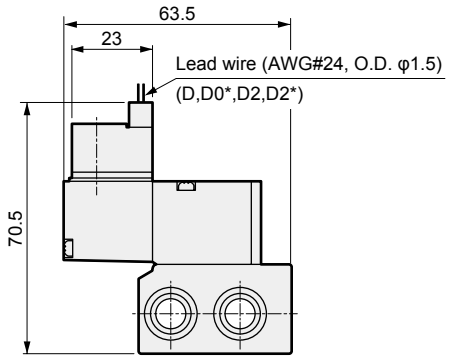
● Terminal box with lamp: (L/LS)



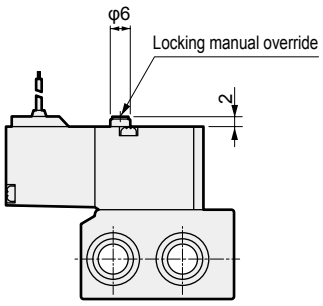
● C type connector: (C/C1/C2/C3)



● D type connector: (D/D1/D2/D3)



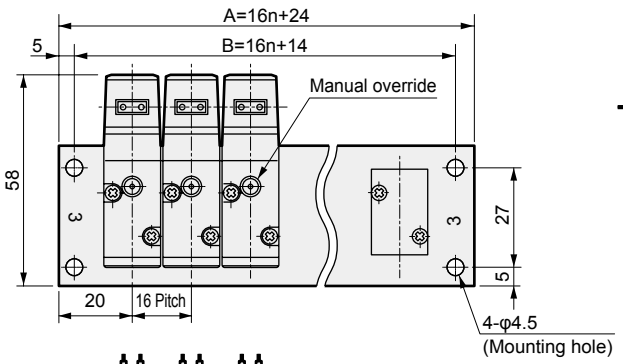
● Locking manual override: (M1)

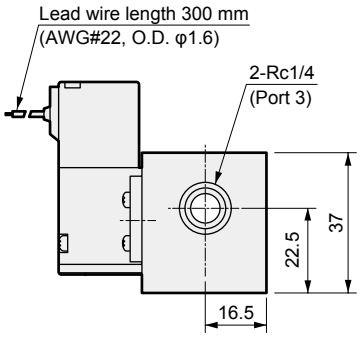


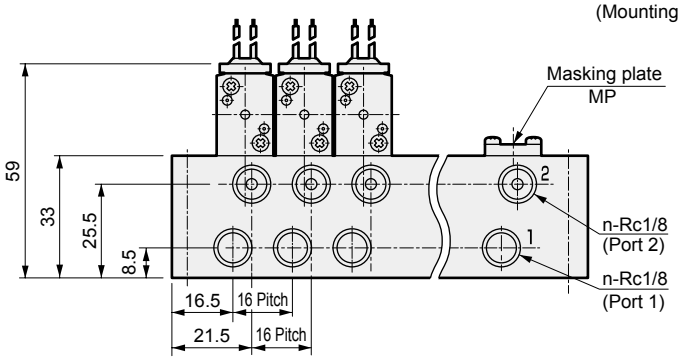
M3PB180-06B

CAD

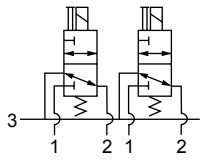
● Port 1/2 - individual piping, port 3 - common piping: grommet lead wire







JIS symbol



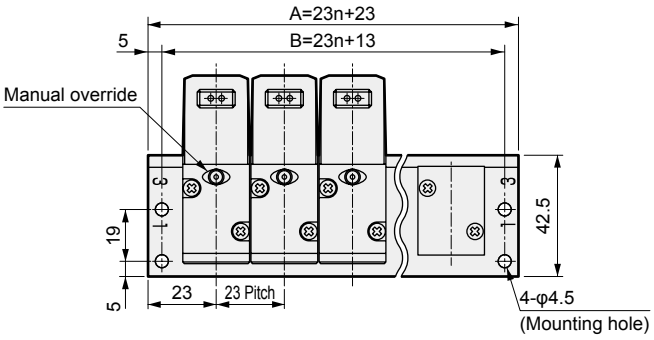
■ Model No. of single unit solenoid valve unit for manifold
3PB119-00-option-voltage

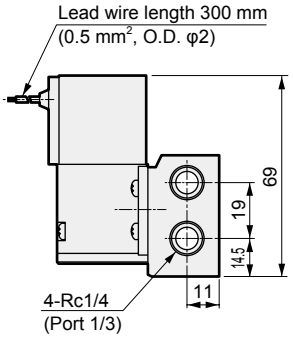
Station No.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	56	72	88	104	120	136	152	168	184	200	216	232	248	264	280	296	312	328	344
B	46	62	78	94	110	126	142	158	174	190	206	222	238	254	270	286	302	318	334

Dimensions CAD

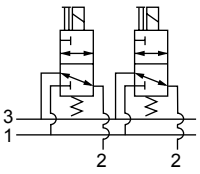
M3PB280-06

● Port 2 - individual piping, port 1/3 - common piping: grommet lead wire

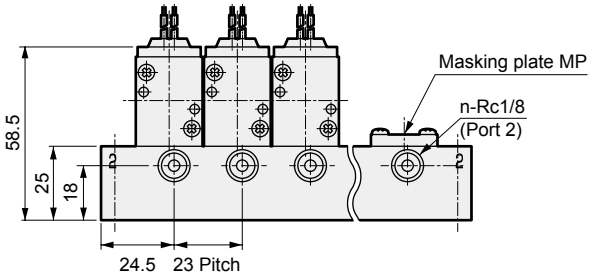




JIS symbol

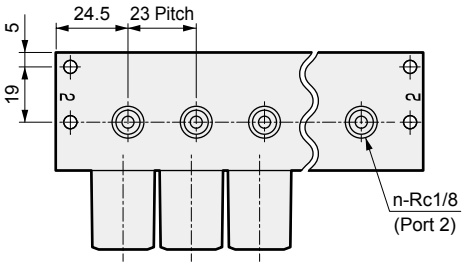


■ Single solenoid valve model No. for manifold
3PB219-00- option - voltage



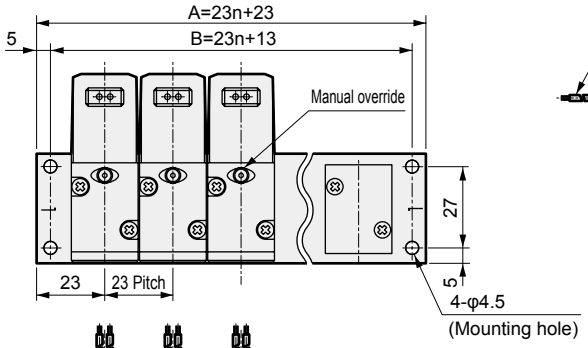
M3PB280-06Y

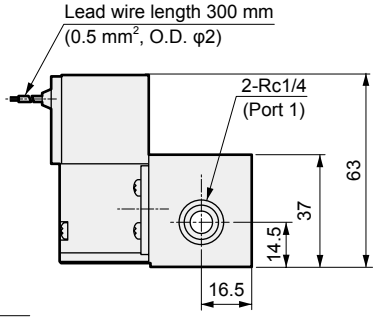
● Port 2 - rear piping, port 1/3 - common piping

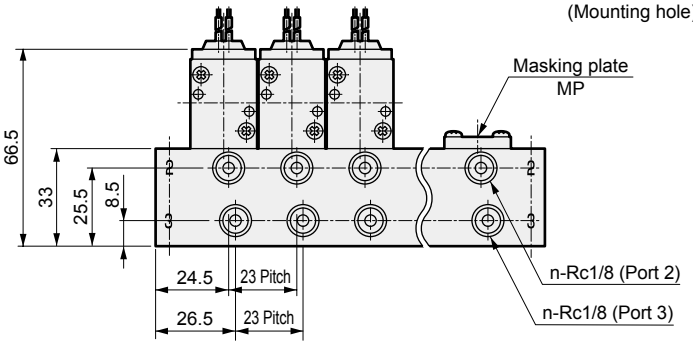


M3PB280-06A

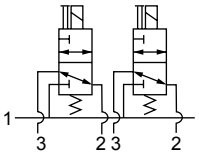
● Port 2/3 - individual piping, port 1 - common piping: grommet lead wire







JIS symbol



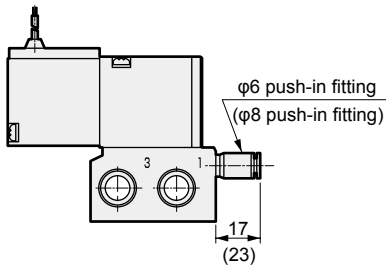
■ Single solenoid valve model No. for manifold
3PB219-00- option - voltage

Station No.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	69	92	115	138	161	184	207	230	253	276	299	322	345	368	391	414	437	460	483
B	59	82	105	128	151	174	197	220	243	266	289	312	335	358	381	404	427	450	473

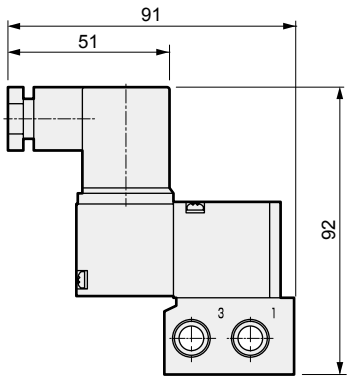
Dimensions

For M3PB2

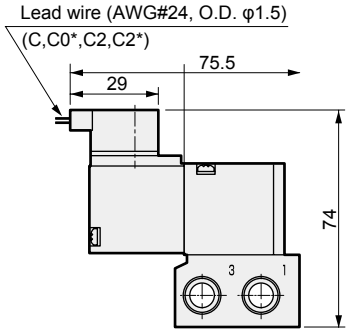
● φ6, φ8 push-in fitting: (GS6/GS8)



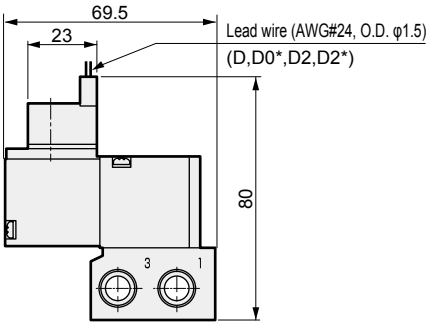
● Terminal box: (B/L/LS)



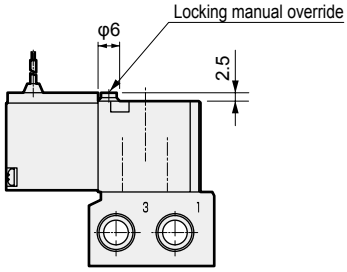
● C type connector: (C/C1/C2/C3)



● D type connector: (D/D1/D2/D3)



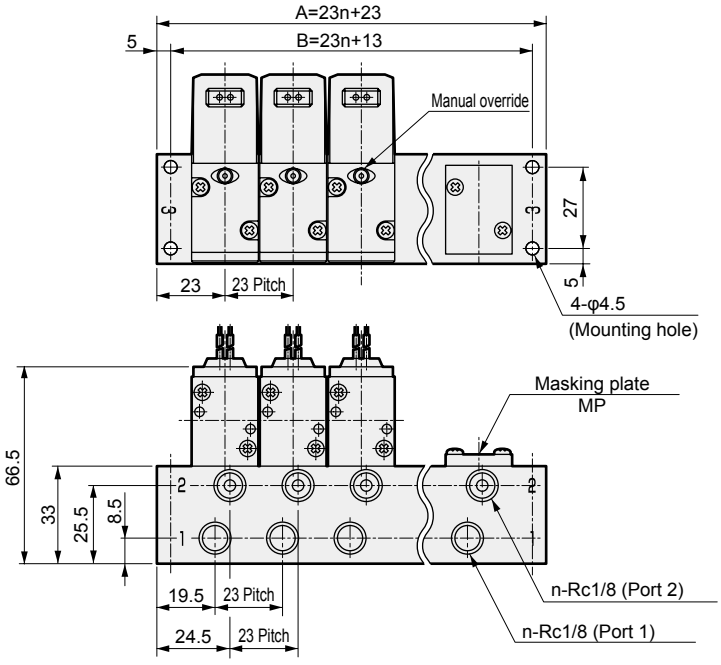
● Locking manual override: (M1)

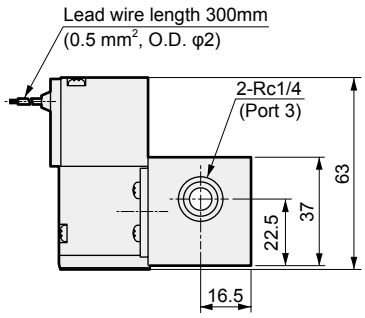


M3PB280-06B

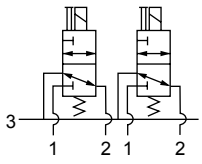
CAD

● Port 1/2 - individual piping, port 3 - common piping: grommet lead wire





JIS symbol



■ Single solenoid valve model No. for manifold
3PB219-00- option - voltage

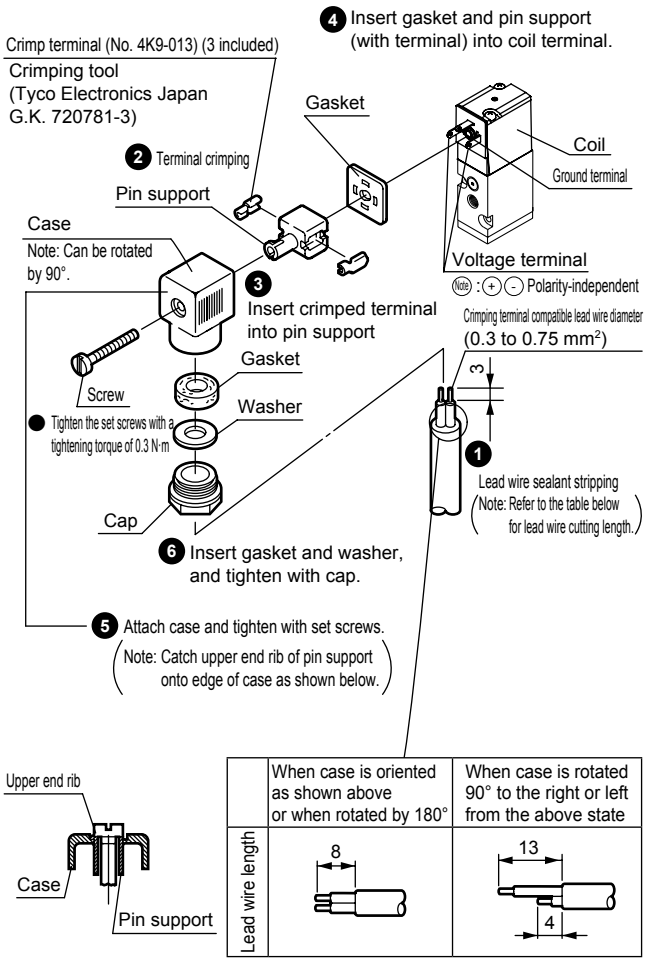
Station No.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
A	69	92	115	138	161	184	207	230	253	276	299	322	345	368	391	414	437	460	483
B	59	82	105	128	151	174	197	220	243	266	289	312	335	358	381	404	427	450	473

Terminal box wiring/connector connection method

Refer to the figure below when wiring the compact terminal box or the C and D connectors.

Compact terminal box wiring method (3P*1B)

Wire with steps ❶ to ❻.

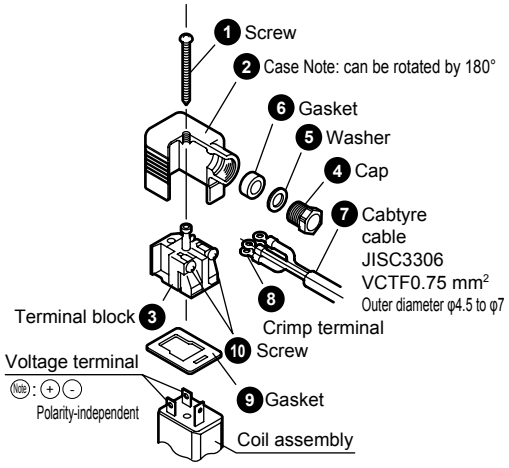


	When case is oriented as shown above or when rotated by 180°	When case is rotated 90° to the right or left from the above state
Lead wire length	8	13 / 4

Terminal box wiring method (3P*2B, L, LS)

Wire the terminal box with steps 1) to 3) referring to the figure below.

1) On the cabtyre cable ❼, pass through the cap ❹, washer ❺ and gasket ❻ in order, and insert this into the case ❷.
2) When using a crimping terminal, prepare the cabtyre cable ❼ at an appropriate length as illustrated and crimp the crimping terminal ❽ on the end thereof.
3) From the terminal block ❸, remove the screws ❿, position the crimp terminal ❽ (loosen and crimp when using a Y type terminal), and fasten the screws ❿ again.
   (Note) Fasten the screw with a tightening torque of 0.5 Nm ± 15%.



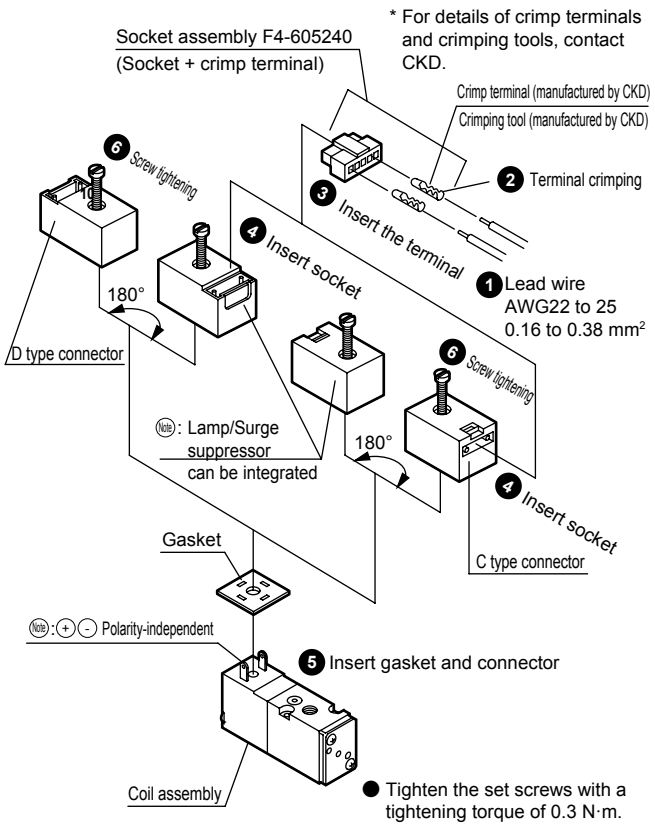
Remarks:
- ● It is possible to wire the terminals with bare wires. In this case, fasten the screw ❿, place the lead wire in the bracket, and fasten the screw again.
- ● The orientation of the cord can be changed by pulling out the terminal block from the case, rotating it by 180°, and returning the block to the case.
- ● The crimp terminals ❽listed in the table below can be used.
  Furthermore, insulate the bare terminals of the terminals in the table below.
  In addition, use sheathed terminals for those equivalent to the table below.

Nichifu Terminal Industries Co., Ltd.		Fuji Terminal Industry Co., Ltd.		J.S.T. Mfg Co., Ltd.	
O terminal	Y terminal	O terminal	Y terminal	O terminal	Y terminal
0.3-3 1.25-3 1.25-3S	0.3-3 1.25Y-3 1.25Y-3.5	1.25-3	1.25-YAS3 1.25-YAS3.5	0.5-3 1.25-3	0.25-B3A 1.25-C3A

When using a product from a different manufacturer, be sure to use an equivalent item.

How to wire C type/D type connectors (3P*1/3P*2)

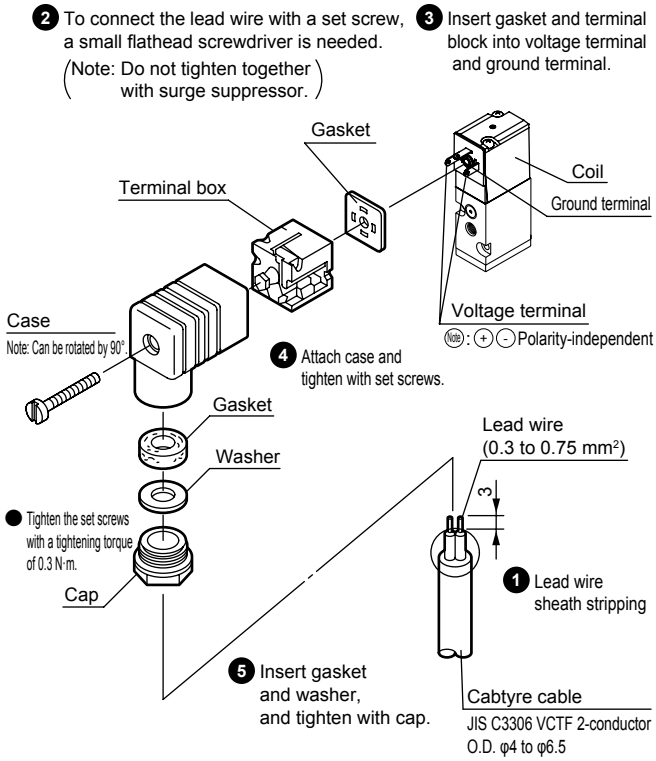
Wire with steps ❶ to ❻.



The power consumption of the 24 VDC model with lamp will be 2.0 W instead of 1.8 W.

How to wire compact terminal box with lamp (3P*1L, LS types)

Wire with steps ❶ to ❺.



Safety Precautions

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

Product-specific cautions: Direct acting 3-port pneumatic valve 3PA/3PB series

Design/selection

1. Common

⚠CAUTION

■ The applications will differ from solenoid valves for vacuum retention. When pads are being used, install a filter between the pad and the valve to prevent foreign matter from entering the unit.

■ Do not use this as a solenoid valve for emergency cutoff. If left pressurized for a long time, the starting response could be delayed.

■ When using the unit with vacuum, be sure to select the direct current (DC) specifications.
In addition, install a vacuum filter on the intake port.

2. Surge suppressor

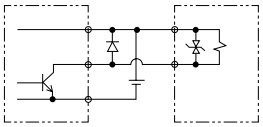
■ The surge suppressor attached with the solenoid valve is intended to protect the output contacts for the solenoid valve drive. There is no significant protection for the other peripheral devices, and devices could be damaged or could malfunction due to a surge. As well, surges generated by other devices may be absorbed and cause damage such as burning. Note 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.

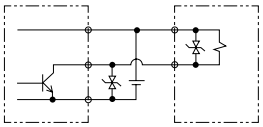
Specification voltage	Inverse voltage when OFF
12 VDC	Approx. 27 V
24 VDC	Approx. 47 V

(2) If the output unit is an NPN, a surge voltage equaling the voltage shown in the table at left plus the power supply voltage may be applied to the output transistor.

[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.

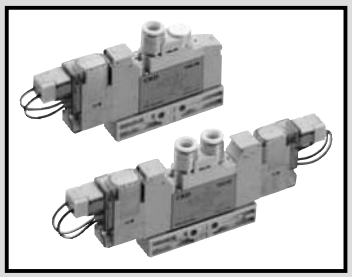
Use/maintenance

⚠CAUTION

■ Continuous energizing for long periods may accelerate degradation of the solenoid valve. Furthermore, use with caution under the working conditions listed on the right, as with continuous energization.

· When energized time exceeds non-energized time in intermittent energizing
· When one energizing session exceeds 30 minutes in intermittent energizing

Consider heat dissipation when installing the product.
Contact CKD when energizing this device continuously.



Single valve
Body piping

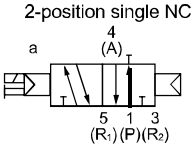
3GA1/2/3 / 4GA1/2/3 Series

● Cylinder bore size: φ20 to φ100

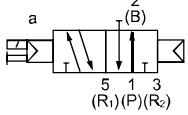
JIS symbol

● 3-port valve

2-position single NC

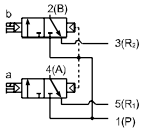


2-position single NO

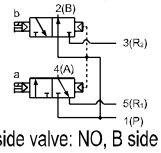


● Two 3-port valves integrated

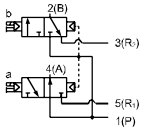
(A side valve: NC, B side valve: NC)



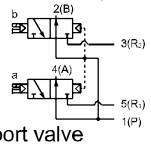
(A side valve: NC, B side valve: NO)



(A side valve: NO, B side valve: NC)

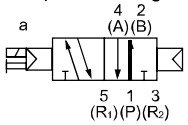


(A side valve: NO, B side valve: NO)

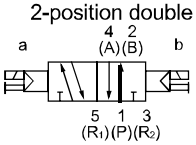


● 5-port valve

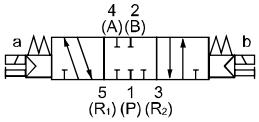
2-position single



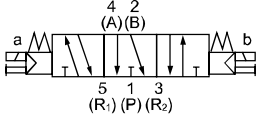
2-position double



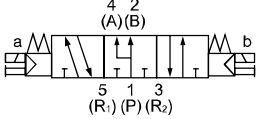
3-position all ports closed



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	0.7 (≈100 psi, 7 bar)
Min. working pressure MPa	0.2 (≈29 psi, 2 bar)
Proof pressure MPa	1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C	-5 (23°F) to 55 (131°F) (no freezing)
Fluid temperature °C	5 (41°F) to 55 (131°F)
Manual override	Lock/no lock common (standard)
Pilot exhaust method	Main valve/pilot valve common exhaust
Lubrication *1	Not required
Degree of protection *2	Dust-proof
Vibration resistance m/s²	50 or less
Shock resistance m/s²	300 or less
Atmosphere	Corrosive gas environment prohibited

*1: Use turbine oil Class 1 ISO VG32 for lubrication. Excessive or intermittent lubrication results in unstable operation.

*2: Avoid water drops or oil, etc., during use. IP65 (jet-proof) applies for DIN terminal box specifications. However, the specified outer diameter of the applicable cord and tightening torque must be used for fixing in place.

Electrical specifications

Descriptions		Content					
Rated voltage V		DC24	DC12	DC5	DC3	AC100	AC200
Voltage fluctuation range		±10%					
Holding current A (*3)	Standard	0.015 (0.017)	0.030 (0.034)	0.072 (0.082)	0.120 (0.136)	0.009 (0.009)	0.006 (0.006)
	Low exoergic/energy circuit	0.005	0.010	-		-	
Power consumption W (*3)	Standard	0.35(0.40)		0.35(0.40)		-	
	Low exoergic/energy circuit	0.1		-		-	
Apparent power VA (*3, 4)	Standard	-		-		0.93 (0.98)	1.40
Thermal class		B					
Surge suppressor		Option					
Indicator		Lamp (option)					

*3: Values in ( ) apply when lamp is included. In addition, the type with low exoergic/energy-saving circuit is only available with lamp.

*4: 200 VAC is the value of DIN terminal box (with lamp).

Individual specifications

Port size		3GA1, 4GA1	3GA2, 4GA2	3GA3, 4GA3
Rc thread, M5	A/B port	Barbed fitting φ1.8 push-in fitting φ1.8, φ4, φ6 M5	Push-in fitting φ4, φ6, φ8 Rc1/8	Push-in fitting φ6, φ8, φ10 Rc1/4
	P/R1/R2 port	M5	Rc1/8	Rc1/4
NPT thread, M5	A/B Port	Push-in fitting φ1/8", φ5/32"	Push-in fitting φ1/4", φ5/16" 1/8NPT	Push-in fitting φ5/16", φ3/8" 1/4NPT (*5)
	P/R1/R2 port	M5	1/8NPT	1/4NPT (*5)
G thread	A/B Port	-	Push-in fitting φ4, φ6, φ8 G1/8	-
	P/R1/R2 port	-	G1/8	-

*5: Available as custom-order.

Descriptions			3GA1		3GA2		3GA3		4GA1		4GA2		4GA3	
			ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF	ON	OFF
Response time ms	Two 3-port valves integrated		9	12	12	29	-	-	-	-	-	-	-	-
	2-position	Single	12	12	19	19	25	28	12	12	19	19	25	28
		Double	-	-	-	-	-	-	9	-	18	-	24	-
	3-position	ABR connection	-	-	-	-	-	-	8	15	17	30	23	45

Values with lamp/surge suppressor are shown. The response times are the values with supply pressure of 0.5 MPa at 20°C without lubrication. They depend on the pressure and the lubricant quality.

Descriptions				3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
Weight g	2-position	Single	Grommet lead wire	48(41)	104(74)	142(100)	48(41)	109(79)	151(109)
			E type connector	50(43)	106(76)	144(102)	50(43)	111(81)	153(111)
			DIN terminal box	-	141(111)	177(135)	-	146(116)	186(144)
		Double	Grommet lead wire	-	-	-	65(58)	127(97)	174(128)
			E type connector	-	-	-	69(62)	131(101)	178(132)
			DIN terminal box	-	-	-	-	169(139)	214(168)
	3-position	All ports closed	Grommet lead wire	-	-	-	67(60)	139(109)	183(141)
			E type connector	-	-	-	71(64)	143(113)	187(145)
			DIN terminal box	-	-	-	-	181(151)	223(181)

· Values in ( ) do not include the pipe adaptor. Values for the E type connector include the socket assembly (with 300 mm lead wire). For the EJ type connector, add 16 g/connector to the E type connector weight.

· The weight of the two 3-port valves integrated is the same as that of 2-position double.

Flow characteristics

Model No.	Solenoid position		P→A/B		A/B→R1/R2	
			C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b
3GA1 4GA1	Two 3-port valves integrated		0.98	0.45	0.71	0.34
	2-position		1.2	0.47	0.72	0.37
	3-position	All ports closed	1.1	0.39	0.70	0.34
		ABR connection	1.1	0.33	0.72	0.34
		PAB connection	1.3	0.61	0.72	0.36
3GA2 4GA2	Two 3-port valves integrated		1.8	0.29	2.3	0.32
	2-position		2.4	0.33	2.8	0.30
	3-position	All ports closed	2.2	0.28	2.5	0.28
		ABR connection	2.3	0.26	2.8	0.27
		PAB connection	2.5	0.38	2.4	0.30
3GA3 4GA3	2-position		3.4	0.29	4.0	0.24
	3-position	All ports closed	3.1	0.27	3.4	0.28
		ABR connection	3.1	0.33	4.1	0.20
		PAB connection	3.5	0.43	3.4	0.32

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

Ozone-proof specifications · Coolant proof specifications

Can be selected with “How to order” Item Ⓔ option “A” on page 14.

Clean-room specifications

● Anti-dust generation structure for use in cleanrooms

** - Voltage - **P7***

Specifications for rechargeable battery (Catalog No. CC-1226A)

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

** - Voltage - **P4**

CE marking specifications

** - Voltage - **ST**

3GA1/2/3 / 4GA1/2/3 Series

Single valve; body piping

How to order

4GA1 1 0 R - C6 - E2 - 1

3GA1 1 0 R - C6 - E2 - 1

Discrete valve for mounting base

4GA1 1 9 R - C6 - E2 H - 3

Discrete 3 port valve for mounting base

3GA1 1 9 R - C6 - E2 H - 3

Ⓑ Solenoid position

Ⓐ Model No.

Ⓒ Port size

Ⓓ Electrical connections
Refer to page 11 for the circuit diagram with surge suppressor/lamp.

Ⓔ Option

Ⓕ Voltage

Precautions for model No. selection

*1 : For the 3GA normally closed, the piping connection 2 (B) and 3 (R2) ports are plugged. For 3GA normally open type, avoid plugging the 5 (R1) port. Otherwise, malfunctions may result.
*2 : Dimensions are the same as the respective 2-position double solenoid.
*3 : 4G3 is a custom order product.
*4 : 3-position all ports closed and PAB connection are not provided with the exhaust check valve. Refer to page 751 for details on the exhaust check valve.
5 : E2 type and E2*J type connectors support 12/24 VDC only. In addition, surgeless "S" and low exoergic/ energy-saving circuit "E" cannot be selected together.
*6 : Surgeless specifications.
*7 : A filter is built into the P-port as standard.
*8 : Only the DIN terminal box is supported.

Code	Content		Ⓐ Model No. 3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
Ⓑ Solenoid position								
1	2-position single					●	●	●
2	2-position double					●	●	●
3	3-position all ports closed					●	●	●
4	3-position ABR connection					●	●	●
5	3-position PAB connection					●	●	●
1	2-position single normally closed *1		●	●	●			
11	2-position single normally open *1		●	●	●			
66	Two 3-port valves integrated *2	A side valve: Normally closed B side valve: Normally closed	●	●				
67	Two 3-port valves integrated *2	A side valve: Normally closed B side valve: Normally open	●	●				
76	Two 3-port valves integrated *2	A side valve: Normally open B side valve: Normally closed	●	●				
77	Two 3-port valves integrated *2	A side valve: Normally open B side valve: Normally open	●	●				
Ⓒ Port size								
Port	4(A)/2(B) port		P/R1/R2 port (1) = M5, (2) = Rc1/8, (3) = Rc1/4					
CF	φ1.8 barbed fitting (compatible tube UP-9102-**)		(1)			(1)		
C18	φ1.8 push-in fitting (compatible tube UP-9402-**)		(1)			(1)		
C4	φ4 push-in fitting		(1)	(2)		(1)	(2)	
C6	φ6 push-in fitting		(1)	(2)	(3)	(1)	(2)	(3)
C8	φ8 push-in fitting			(2)	(3)		(2)	(3)
C10	φ10 push-in fitting				(3)			(3)
M5	M5		(1)			(1)		
06	Rc1/8			(2)			(2)	
08	Rc1/4				(3)			(3)
Port	4(A)/2(B) port		P/R1/R2 port (1) = M5, (5) = 1/8NPT, (6) = 1/4NPT					
C3N	φ1/8" push-in fitting		(1)			(1)		
C4N	φ5/32" push-in fitting		(1)			(1)		
C6N	φ1/4" push-in fitting			(5)			(5)	
C8N	φ5/16" push-in fitting (*3)			(5)	(6)		(5)	(6)
C10N	φ3/8" push-in fitting (*3)				(6)			(6)
06N	1/8NPT			(5)			(5)	
08N	1/4 NPT (*3)				(6)			(6)
Port	4(A)/2(B) port		P/R1/R2 port (8) = G1/8					
C4G	φ4 push-in fitting			(8)			(8)	
C6G	φ6 push-in fitting			(8)			(8)	
C8G	φ8 push-in fitting			(8)			(8)	
06G	G1/8			(8)			(8)	
Ⓓ Electrical connections								
Refer to the electrical connection list on next page.								
Ⓔ Option								
Blank	Non-locking/locking common manual override		●	●	●	●	●	●
M	Non-locking manual override		●	●	●	●	●	●
H	With exhaust check valve (*4)		●	●	●	●	●	●
P	With mounting plate		●	●	●	●	●	●
A	Ozone/coolant proof		●	●	●	●	●	●
S	Surgeless (*5)		●	●	●	●	●	●
E	Low exoergic/energy saving circuit (*5), (*6)		●	●	●	●	●	●
F	A/B port filter integrated (*7)		●	●	●	●	●	●
Ⓕ Voltage								
1	100 VAC (rectifier integrated)		●	●	●	●	●	●
2	200 VAC (rectifier integrated) (*8)			●	●		●	●
3	24 VDC		●	●	●	●	●	●
4	12 VDC		●	●	●	●	●	●
7	3 VDC		○	○	○	○	○	○
8	5 VDC		○	○	○	○	○	○

is not available.
○ indicates a custom order.

[Electrical connections list]

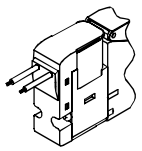
Ⓓ Electrical connections		Ⓐ Model No. 3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
Blank	Grommet lead wire (300 mm) (*9)	●	●	●	●	●	●
B	DIN terminal box (Pg7) With surge suppressor/lamp (*10)		●	●		●	●
BN	DIN term. box (Pg7) (no terminal box) + surge suppressor *10		●	●		●	●
E type connector (upward/lateral common)							
E0	Lead wire (300 mm) (*11)	●	●	●	●	●	●
E00	Lead wire (500 mm) (*11)	●	●	●	●	●	●
E01	Lead wire (1000 mm) (*11)	●	●	●	●	●	●
E02	Lead wire (2000 mm) (*11)	●	●	●	●	●	●
E03	Lead wire (3000 mm) (*11)	●	●	●	●	●	●
E0N	Without lead wire (without socket)	●	●	●	●	●	●
E1	Without lead wire (socket/terminal attached) (*11)	●	●	●	●	●	●
E2	Lead wire (300 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E20	Lead wire (500 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E21	Lead wire (1000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E22	Lead wire (2000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E23	Lead wire (3000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E2N	No lead wire (without socket), surge suppressor/indicator lamp	●	●	●	●	●	●
E3	No lead wire (with socket/terminal), surge suppressor/indicator lamp	●	●	●	●	●	●
EJ type connector (socket with cover, upward/lateral common)							
E01J	Lead wire (1000 mm) (*11)	●	●	●	●	●	●
E02J	Lead wire (2000 mm) (*11)	●	●	●	●	●	●
E03J	Lead wire (3000 mm) (*11)	●	●	●	●	●	●
E21J	Lead wire (1000 mm), surge suppressor, indicator lamp	●	●	●	●	●	●
E22J	Lead wire (2000 mm), surge suppressor, indicator lamp	●	●	●	●	●	●
E23J	Lead wire (3000 mm), surge suppressor, indicator lamp	●	●	●	●	●	●

*9 : Grommet lead wire specifications are compatible with DC voltage only.
*10: AC voltages and 12/24 VDC are supported. In addition, a lamp comes with the terminal box.
*11: AC voltage is with a rectifier circuit.

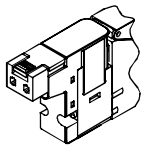
Electrical connections

Blank Grommet lead wire

● Lead wire length
300 mm

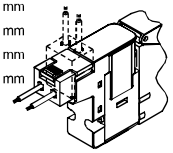


E1 E3 E type connector with socket/terminal

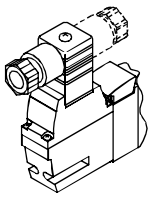


E0 E2 E type connector

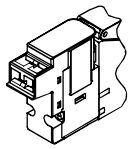
● Lead wire length
300 mm
500 mm
1000 mm
2000 mm
3000 mm



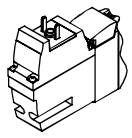
B DIN terminal box



E0N E2N E type connector without socket

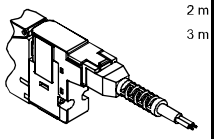


BN DIN terminal box without terminal box



E0*J E2*J EJ type connector

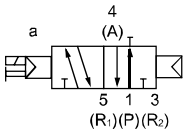
● Lead wire length
1 m
2 m
3 m

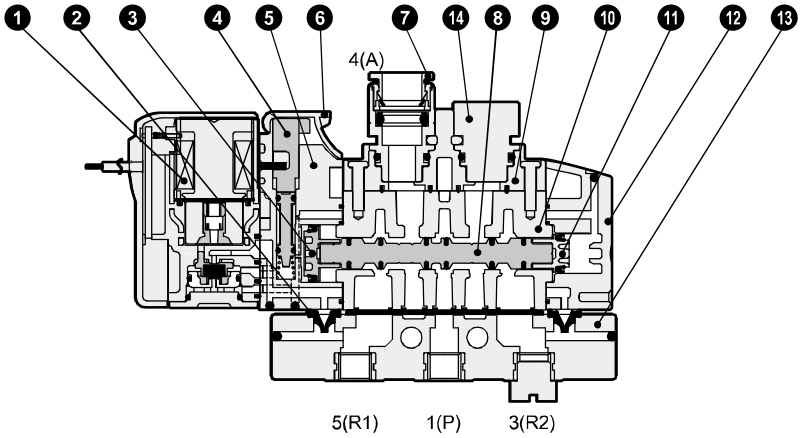


Internal structure and parts list

3GA110R

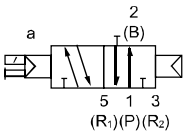
● 2-position single: Normally closed
Grommet lead wire (blank)

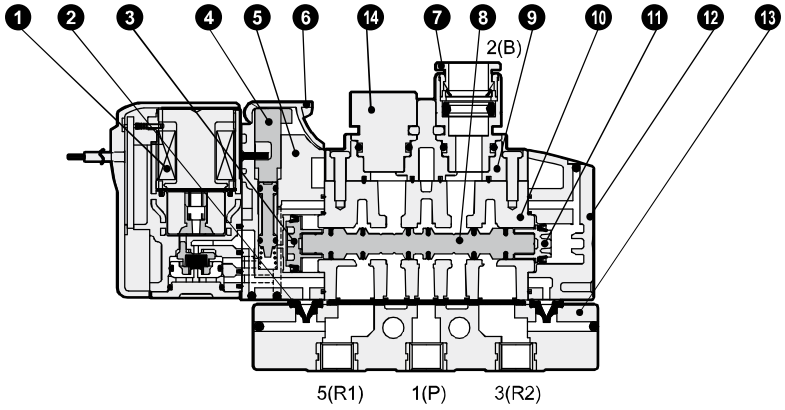




3GA1110R

● 2-position single: Normally open
Grommet lead wire (blank)

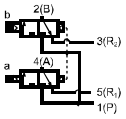




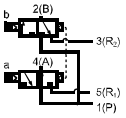
3GA1 66/67/76/77 0R

● Two 3-port valves integrated
Grommet lead wire (blank)

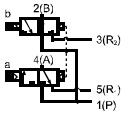
A side valve: Normally closed,
B side valve: Normally closed



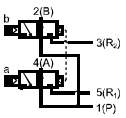
A side valve: Normally open,
B side valve: Normally closed

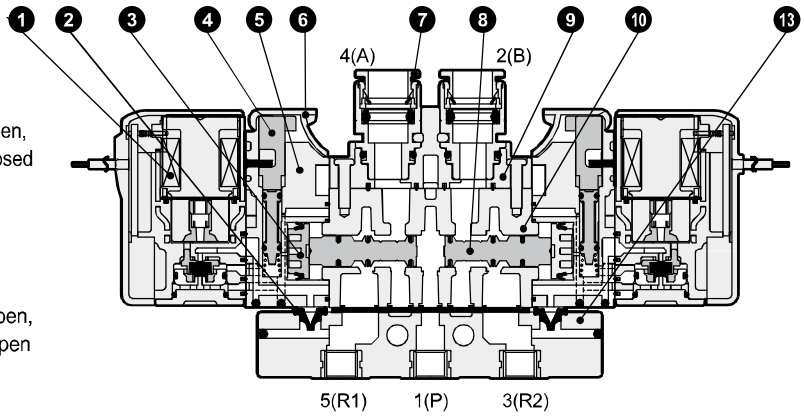


A side valve: Normally closed,
B side valve: Normally open



A side valve: Normally open,
B side valve: Normally open





Main parts list

No.	Part name	Material
1	Coil assembly	-
2	Pilot exhaust check valve	Hydrogenated nitrile rubber
3	Piston D assembly	-
4	Manual override	Resin
5	Piston chamber	Resin
6	Manual protection cover	Resin
7	Cartridge push-in fitting or barbed fitting	-
8	Spool assembly	-
9	Fitting adaptor	Resin
10	Body	Aluminum alloy die-casting
11	Piston S assembly	-
12	Cap	Resin
13	Pipe adaptor	Resin
14	Plug cartridge	Aluminum

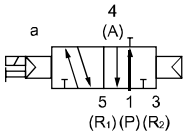
Parts list

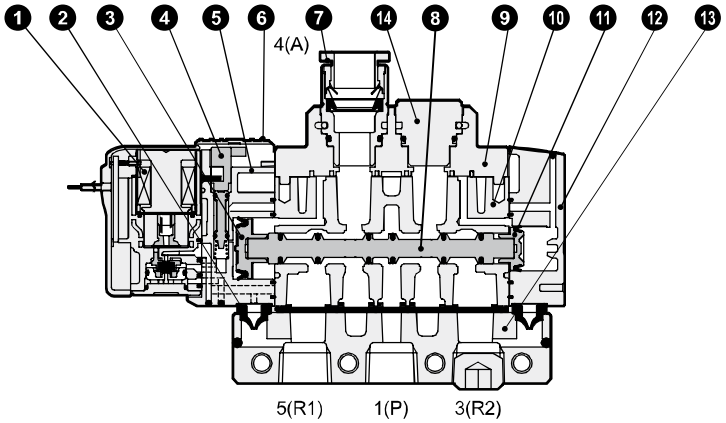
No.	Part name		Model No.
1	Coil assembly		4GR - electrical connections - □ - COIL - voltage Blank: Standard A: Ozone specifications S: Surgeless E: Low exergic/ energy saving circuit Blank: Grommet lead wire
7	Cartridge push-in fitting and related parts	φ1.8 barbed	4G1R-JOINT-CF
		φ1.8 axial	4G1R-JOINT-C18
		φ4 straight	4G1R-JOINT-C4
		φ6 straight	4G1R-JOINT-C6
		Plug cartridge	4G1R-JOINT-CPG
		φ1/8" straight	4G1R-JOINT-C3N
		φ5/32" straight	4G1R-JOINT-C4N

Internal structure and parts list

3GA210R/3GA310R

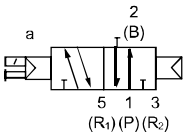
● 2-position single: Normally closed
Grommet lead wire (blank)

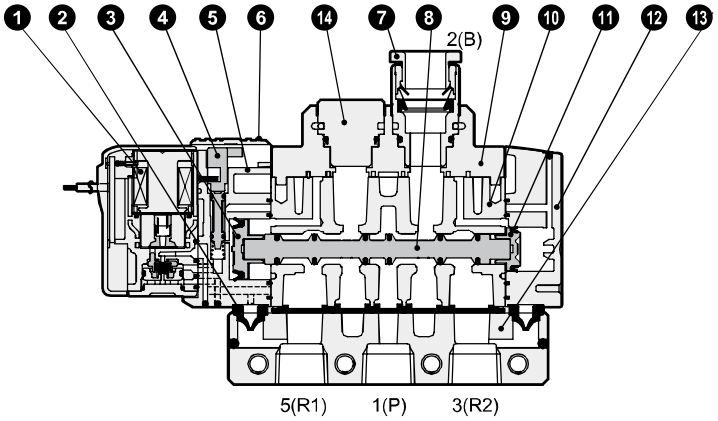




3GA2110R/3GA3110R

● 2-position single: Normally open
Grommet lead wire (blank)

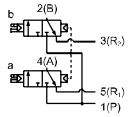




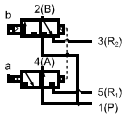
3GA2 $^{66}_{67}_{76}_{77}$ 0R

● Two 3-port valves integrated
Grommet lead wire (blank)

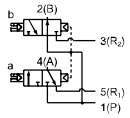
A side valve: Normally closed,
B side valve: Normally closed



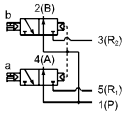
A side valve: Normally open,
B side valve: Normally closed

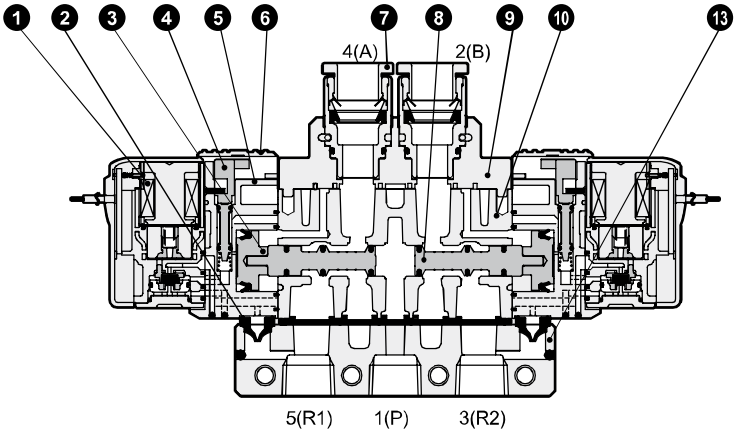


A side valve: Normally closed,
B side valve: Normally open



A side valve: Normally open,
B side valve: Normally open





Main parts list

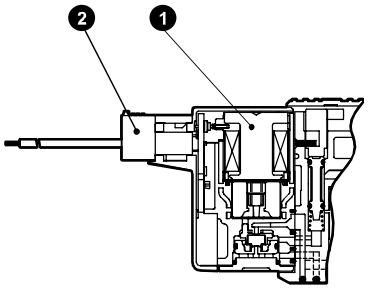
No.	Part name	Material
1	Coil assembly	-
2	Pilot exhaust check valve	Hydrogenated nitrile rubber
3	Piston assembly	-
4	Manual override	Resin
5	Piston chamber	Resin
6	Manual protection cover	Resin
7	Cartridge push-in fitting	-
8	Spool assembly	-
9	Fitting adaptor	Resin
10	Body	Aluminum alloy die-casting
11	Piston S assembly	-
12	Cap	Resin
13	Pipe adaptor	Aluminum alloy die-casting
14	Plug cartridge	Aluminum

Parts list

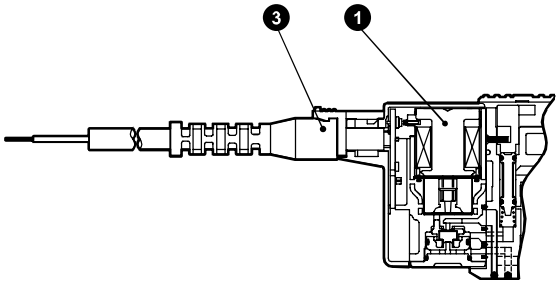
No.	Part name			Model No.
1	Coil assembly			4GR - electrical connections - □ - COIL - voltage Blank: Standard A: Ozone specifications S: Surgeless E: Low exergic/ energy saving circuit Blank: Grommet lead wire
7	Cartridge push-in fitting and related parts	3G2	φ4 straight	4G2R-JOINT-C4
			φ6 straight	4G2R-JOINT-C6
			φ8 straight	4G2R-JOINT-C8
			Plug cartridge	4G2R-JOINT-CPG
			φ1/4" straight	4G2R-JOINT-C6N
			φ5/16" straight	4G2R-JOINT-C8N
		3G3	φ6 straight	4G3R-JOINT-C6
			φ8 straight	4G3R-JOINT-C8
			φ10 straight	4G3R-JOINT-C10
			Plug cartridge	4G3R-JOINT-CPG
			φ5/16" straight	4G3R-JOINT-C8N
			φ3/8" straight	4G3R-JOINT-C10N

Internal structure and parts list (electrical connections section)

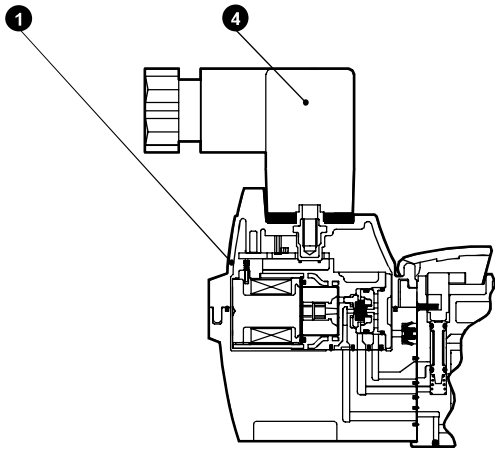
● E type connector E□□



● EJ type connector E□□J



● DIN terminal box B



Main parts list

No.	Part name	Material
1	Coil assembly	
2	E type connector socket assembly	-
3	Socket assembly with cover	-
4	DIN terminal box assembly	-

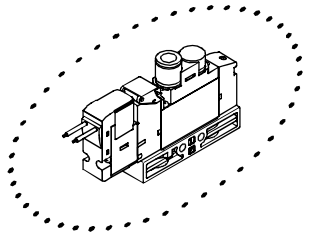
Parts list

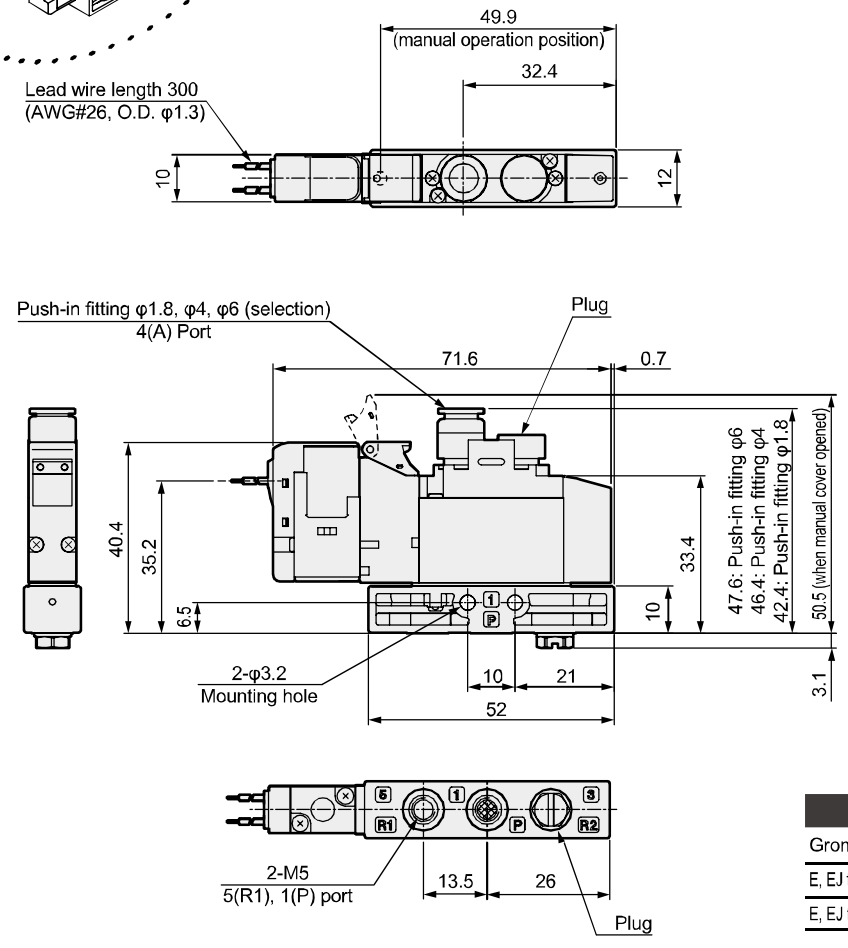
No.	Part name	Model No.
1	Coil assembly	4GR-[electrical connections]-□-COIL-[voltage] Blank: Standard A: Ozone specifications S: Surgeless E: Low exoergic/energy saving circuit E* : E type connector E*J : Socket with cover B* : DIN terminal box B includes the DIN terminal box BN does not include the DIN terminal box
2	E type connector socket assembly	4GR-SOCKET-ASSY-E**-[Voltage]
3	Socket assembly with cover	4GR-SOCKET-ASSY-E**J
4	DIN terminal box assembly	4GR-TERMINAL-BOX-[Voltage]

Dimensions CAD

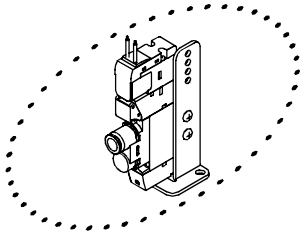
3GA110R * NPT thread and G thread specifications are listed on pages 52 to 59.

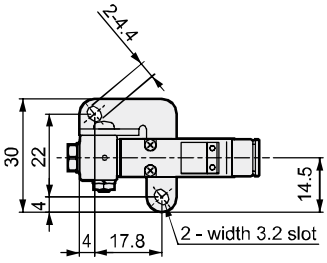
● 2-position single: Normally closed grommet lead wire (blank)

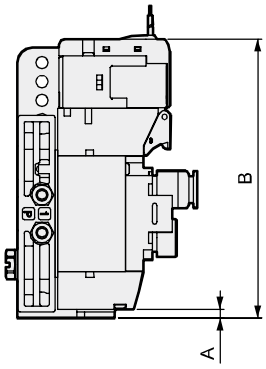




● Mounting plate (P)

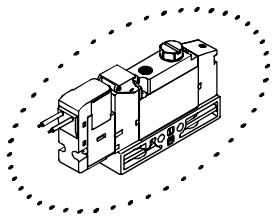


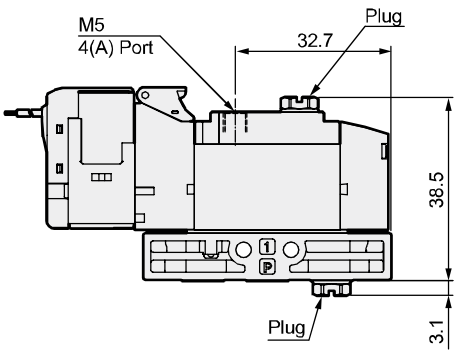




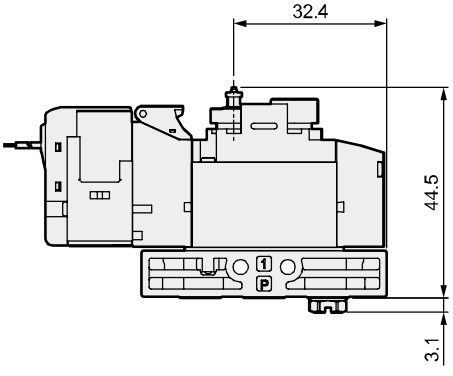
Electrical connections	A	B
Grommet lead wire	2.2	73.8
E, EJ type connector (upward direction), DC voltage		82
E, EJ type connector (upward direction), AC voltage		85.5

● M5 female thread (M5)



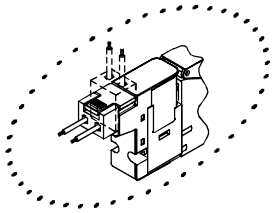


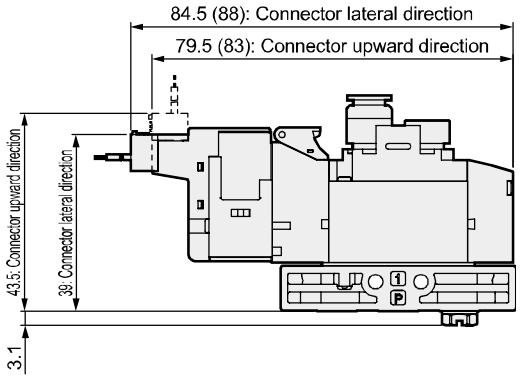
● φ1.8 barbed fitting (CF)



Dimensions

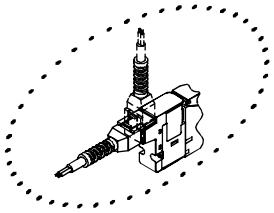
● E type connector (E)

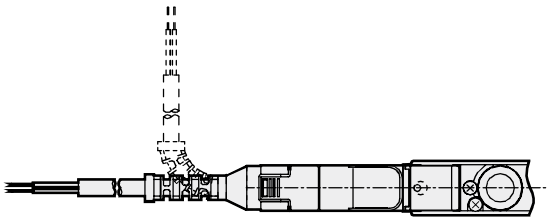


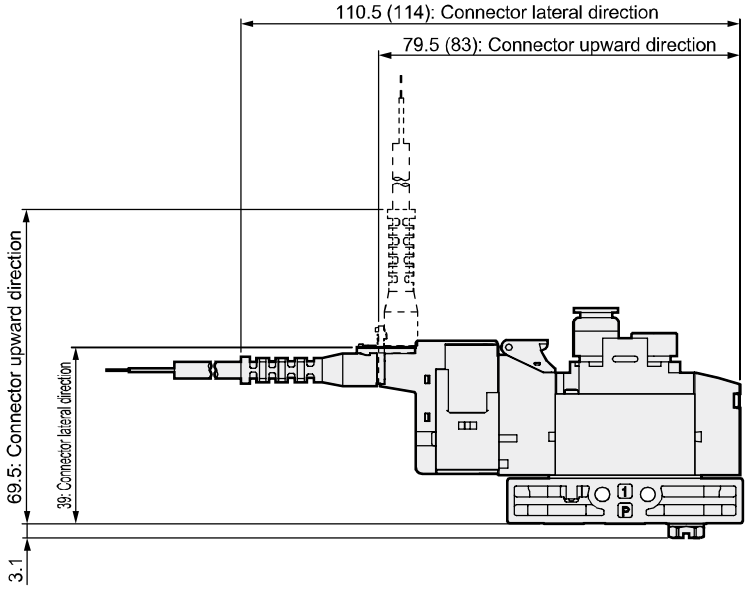


Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)





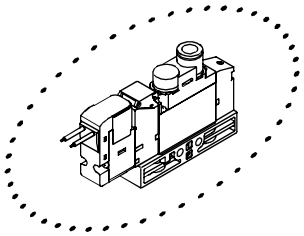


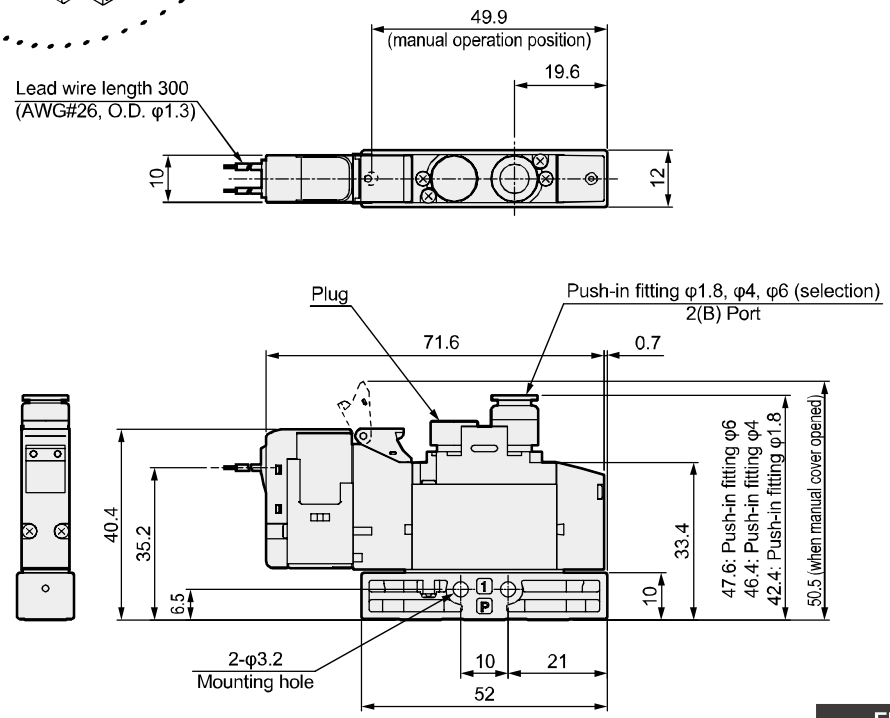
Note: Values in ( ) are for AC voltage.

Dimensions CAD

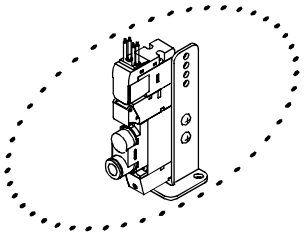
3GA1110R * NPT thread and G thread specifications are listed on pages 52 to 59.

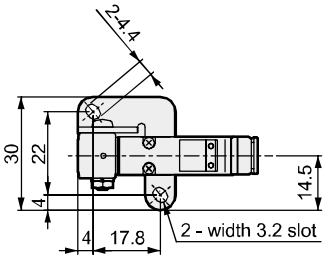
● 2-position single normally open grommet lead wire (blank)

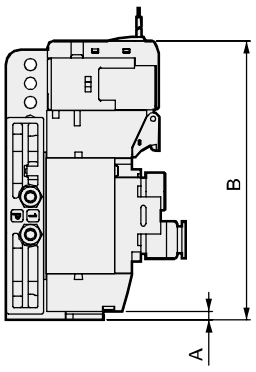




● Mounting plate (P)

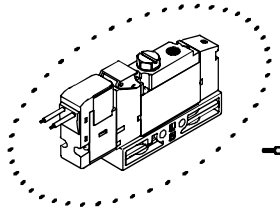


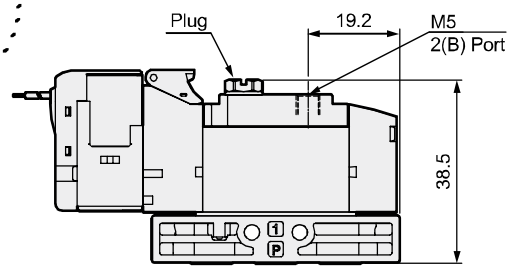




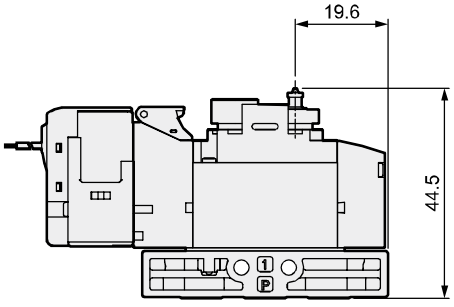
Electrical connections	A	B
Grommet lead wire	2.2	73.8
E, EJ type connector (upward direction), DC voltage		82
E, EJ type connector (upward direction), AC voltage		85.5

● M5 female thread (M5)



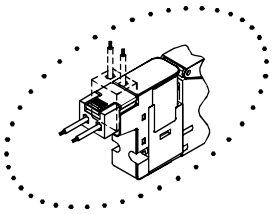


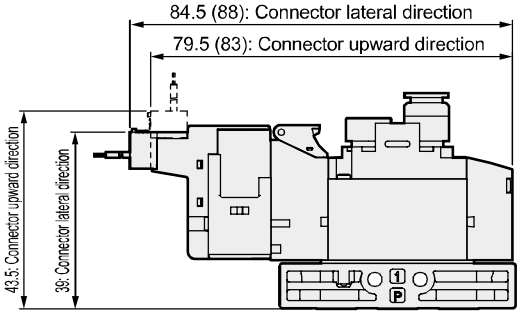
● φ1.8 barbed fitting (CF)



Dimensions

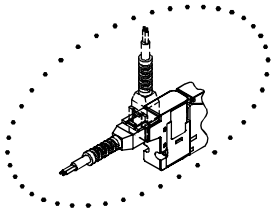
● E type connector (E)

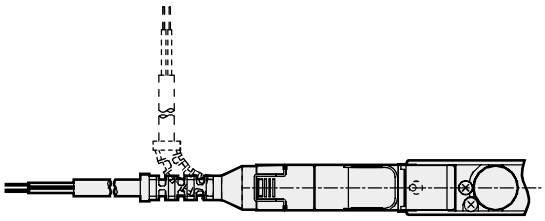


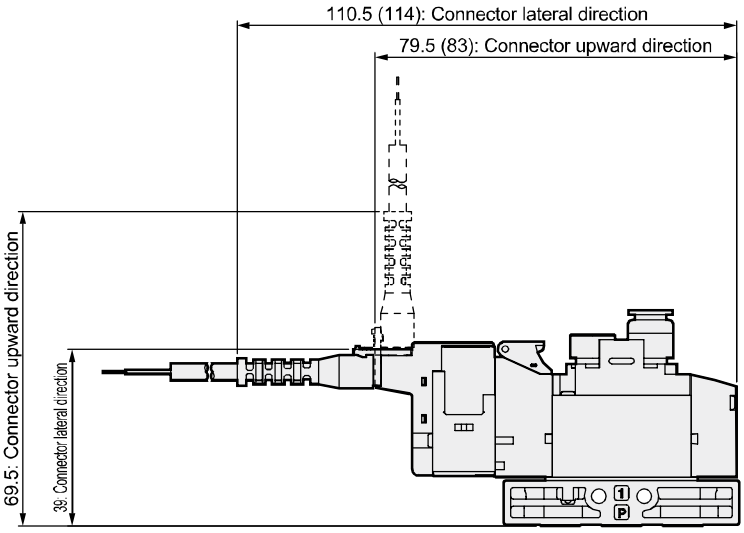


Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)





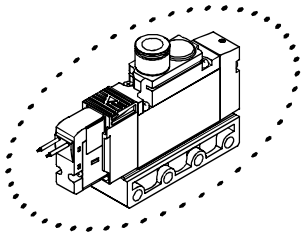


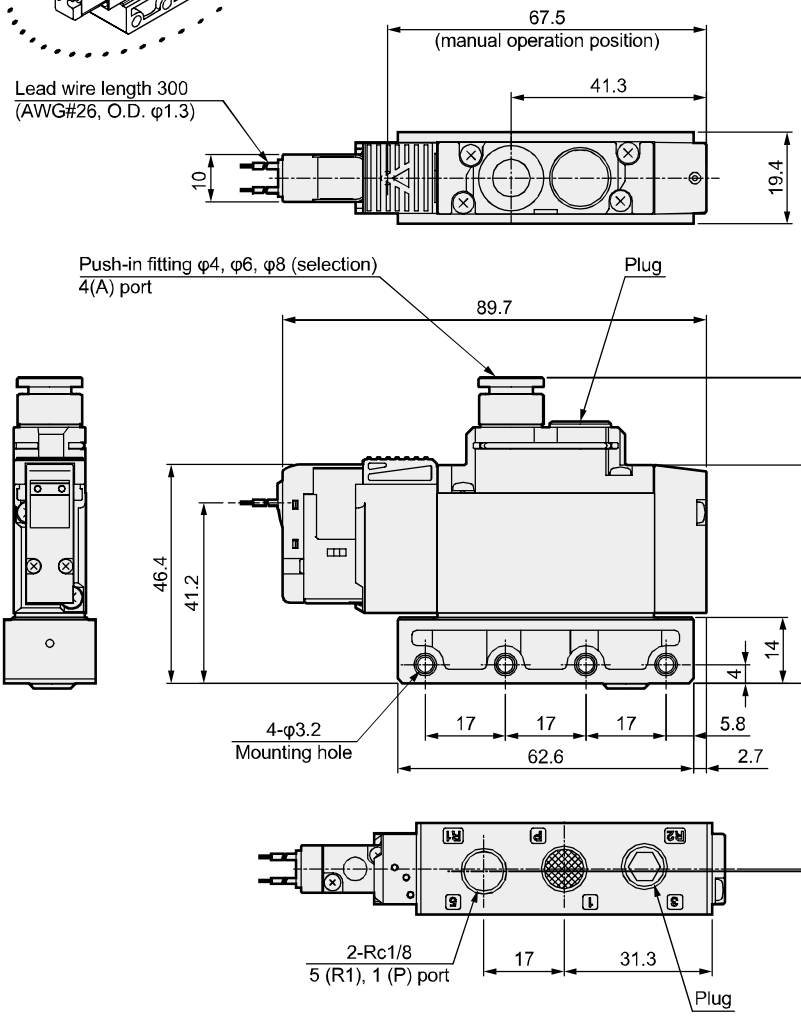
Note: Values in ( ) are for AC voltage.

Dimensions CAD

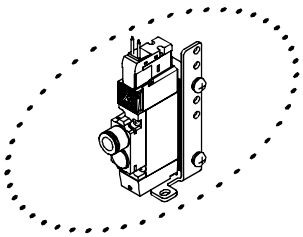
3GA210R * NPT thread and G thread specifications are listed on pages 52 to 59.

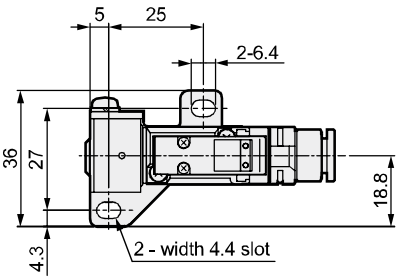
● 2-position single normally closed grommet lead wire (blank)

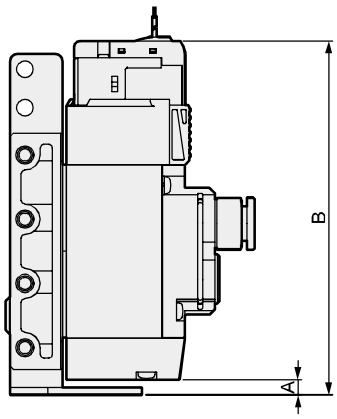




● Mounting plate (P)

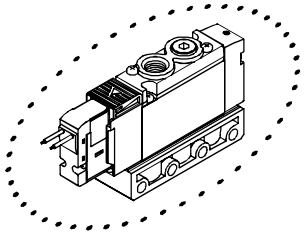


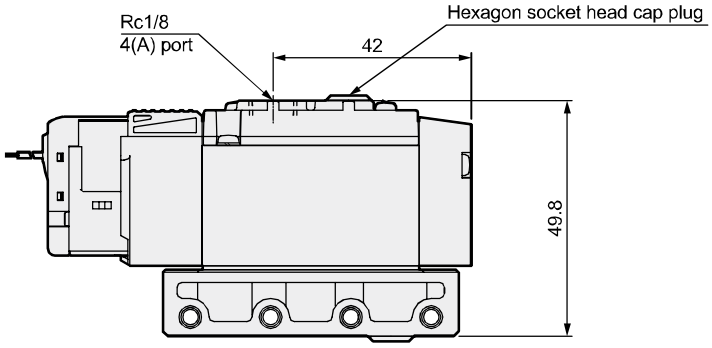




Electrical connections	A	B
Grommet lead wire	4	93.7
E, EJ type connector (upward direction), DC voltage		102
E, EJ type connector (upward direction), AC voltage		105.5
DIN terminal box (inner direction)		112.7

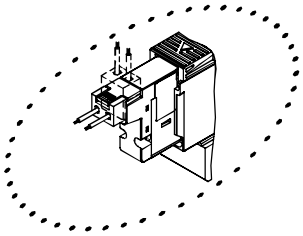
● Rc1/8 female thread (06)

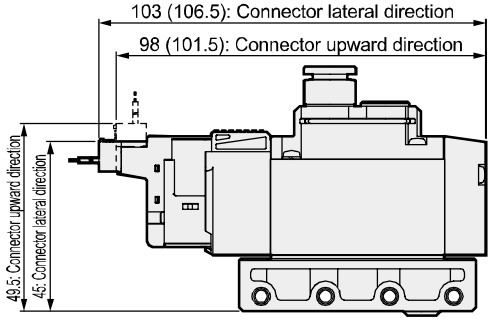




Dimensions

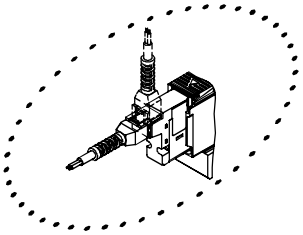
● E type connector (E)

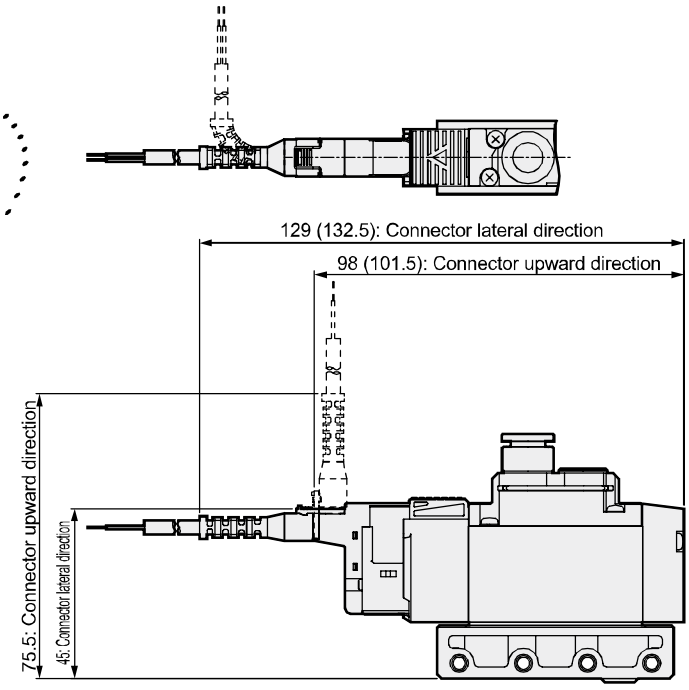




Note: Values in ( ) are for AC voltage.

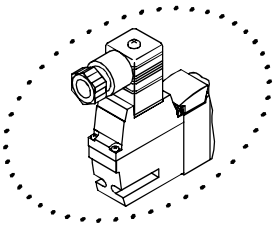
● EJ type connector (E**J)

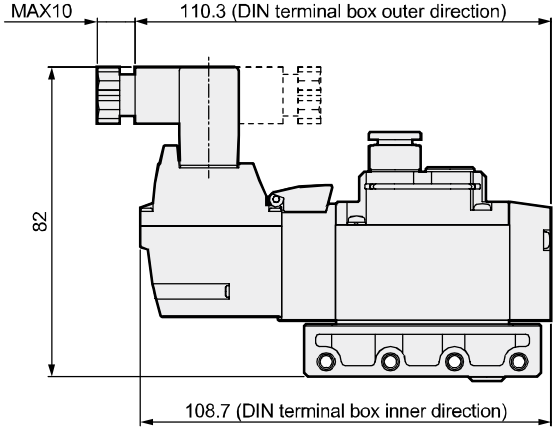




Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)



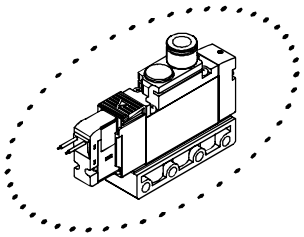


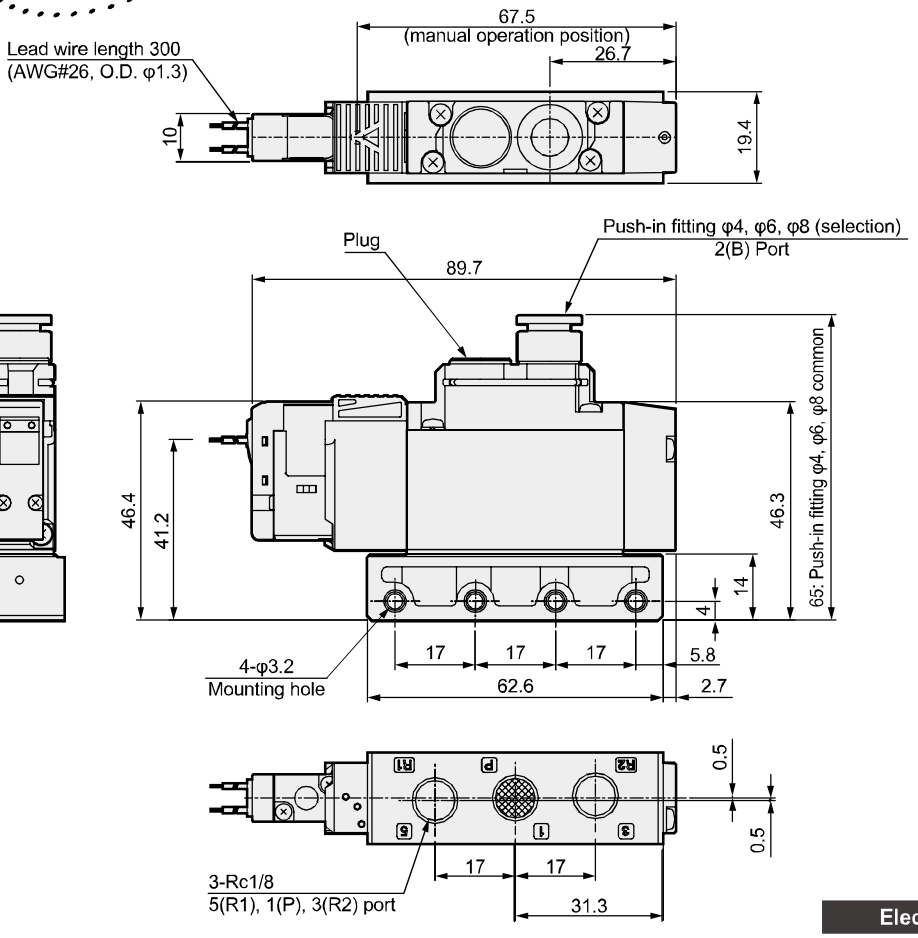
Note: DIN terminal box assembly is shipped facing inward.

Dimensions CAD

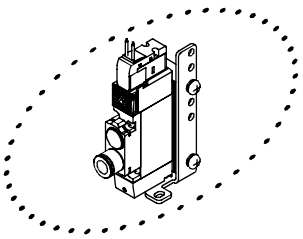
3GA2110R * NPT thread and G thread specifications are listed on pages 52 to 59.

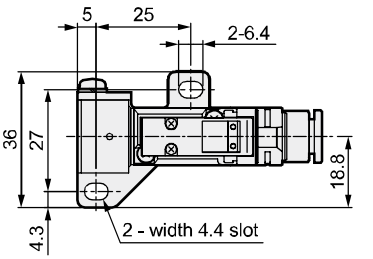
● 2-position single normally open grommet lead wire (blank)

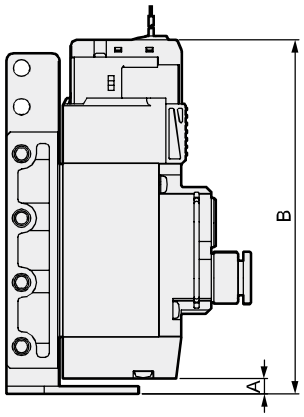




● Mounting plate (P)

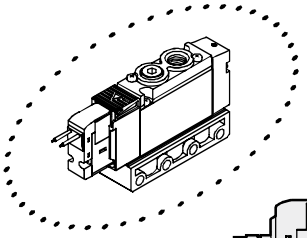


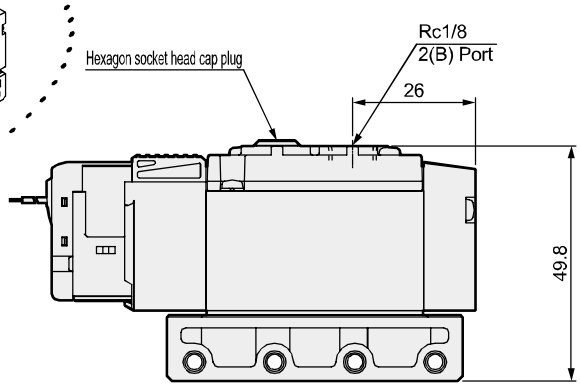




Electrical connections	A	B
Grommet lead wire	4	93.7
E, EJ type connector (upward direction), DC voltage		102
E, EJ type connector (upward direction), AC voltage		105.5
DIN terminal box (inner direction)		112.7

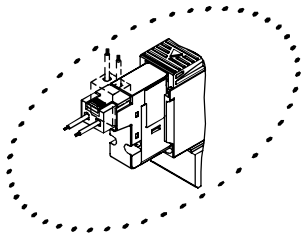
● Rc1/8 female thread (06)

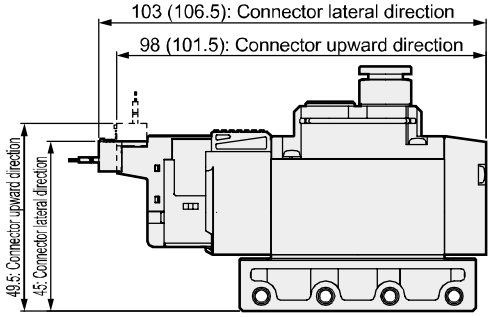




Dimensions

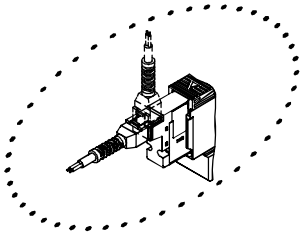
● E type connector (E)

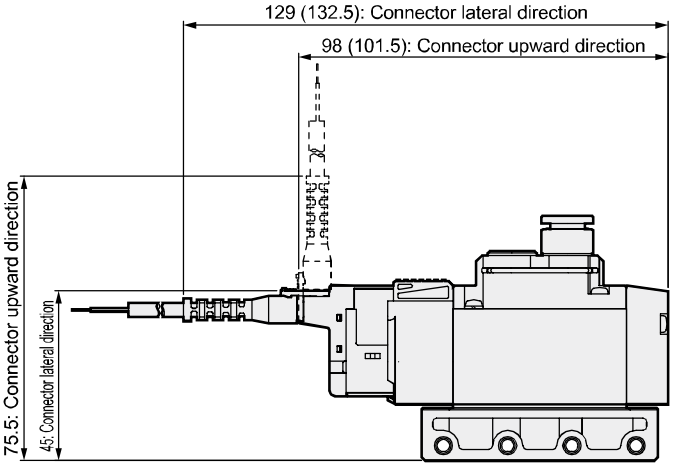




Note: Values in ( ) are for AC voltage.

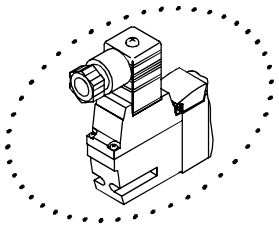
● EJ type connector (E**J)

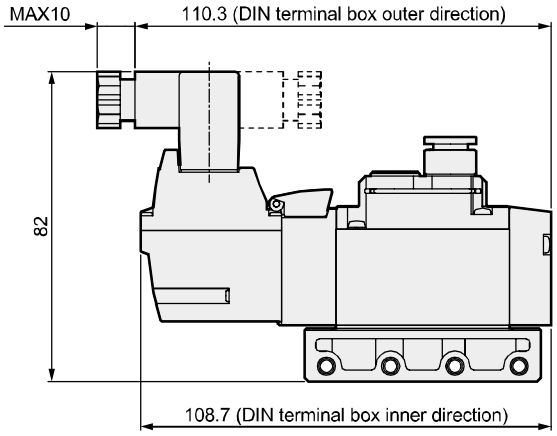




Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)



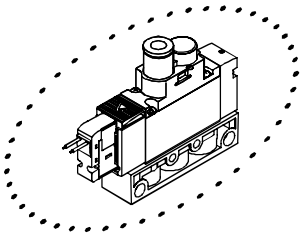


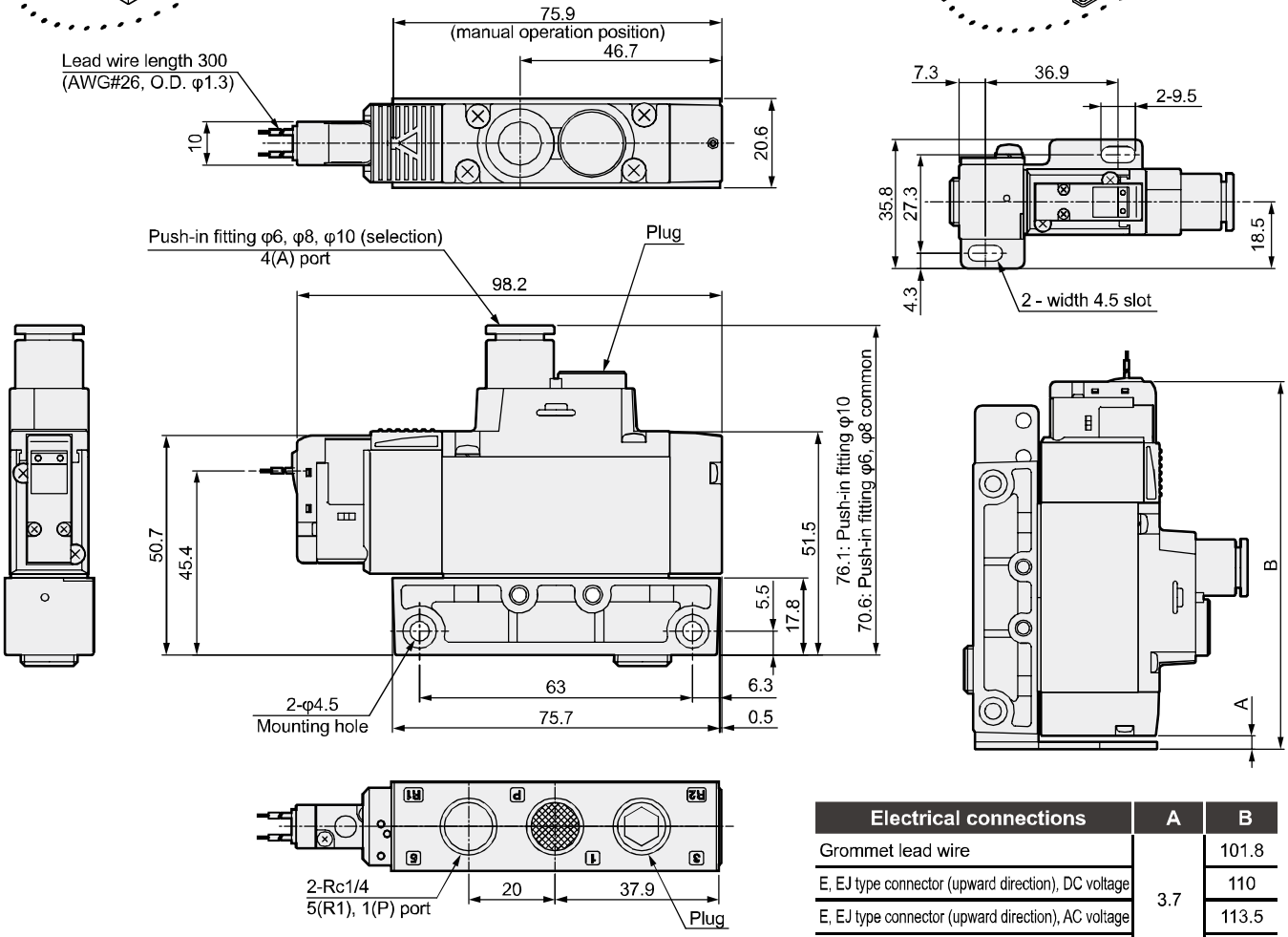
Note: DIN terminal box assembly is shipped facing inward.

Dimensions CAD

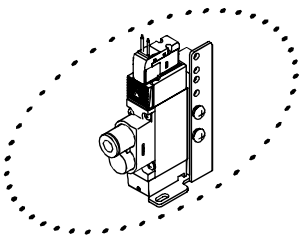
3GA310R * NPT thread and G thread specifications are listed on pages 52 to 59.

● 2-position single: Normally closed grommet lead wire (blank)



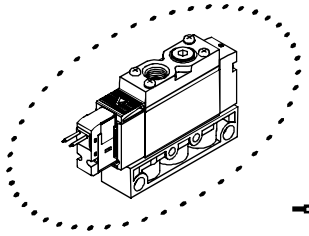


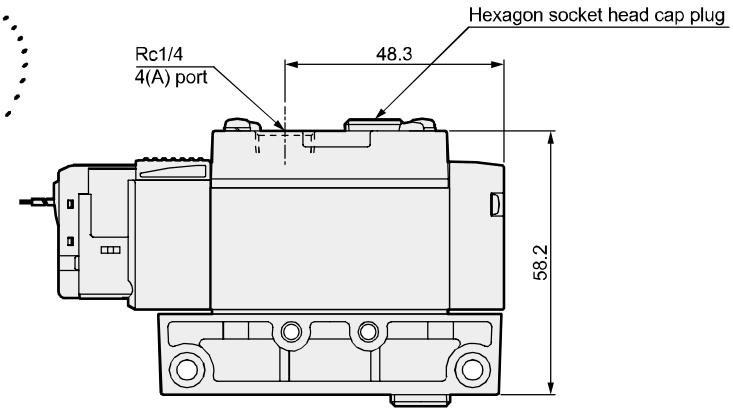
● Mounting plate (P)



Electrical connections	A	B
Grommet lead wire	3.7	101.8
E, EJ type connector (upward direction), DC voltage		110
E, EJ type connector (upward direction), AC voltage		113.5
DIN terminal box (inner direction)		120.9

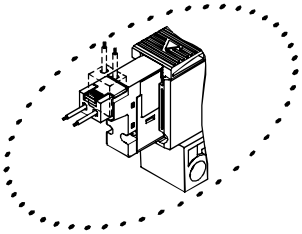
● Rc1/4 female thread (08)

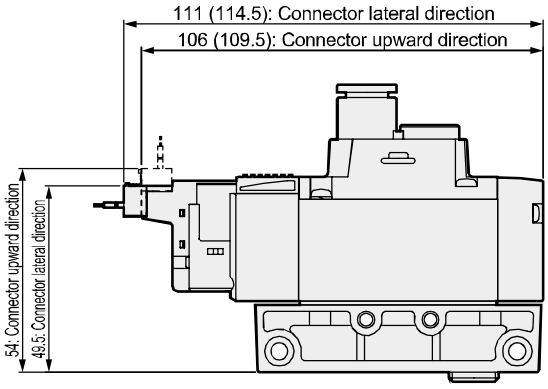




Dimensions

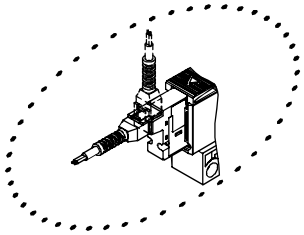
● E type connector (E)

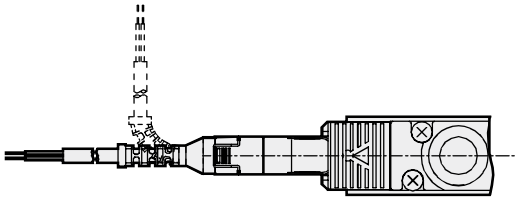


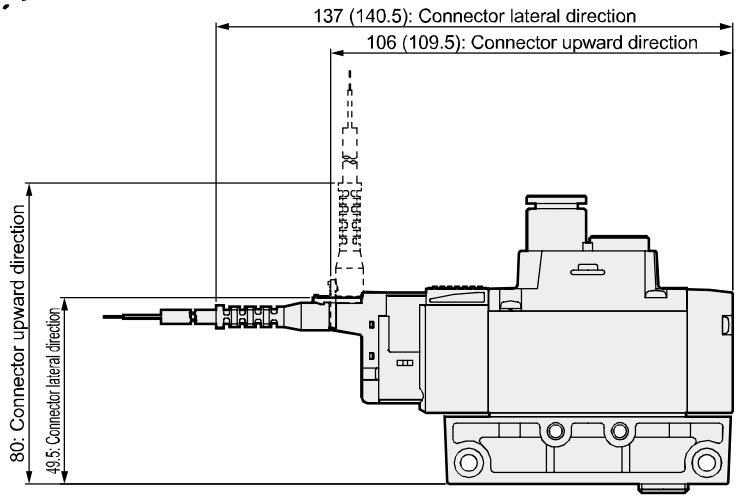


Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)

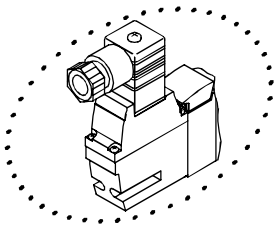


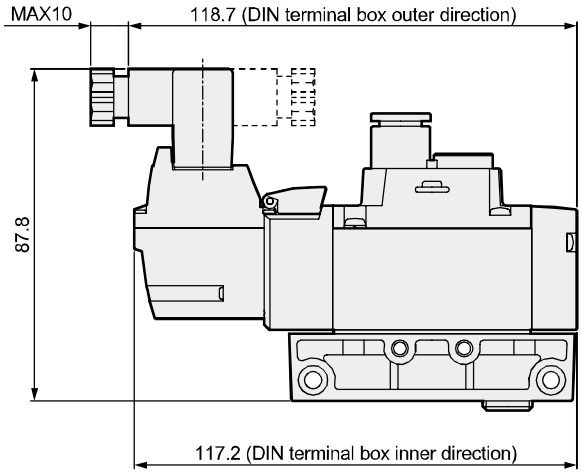




Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)



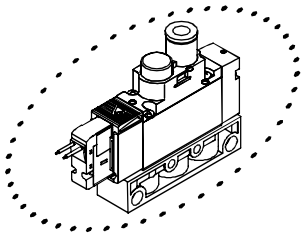


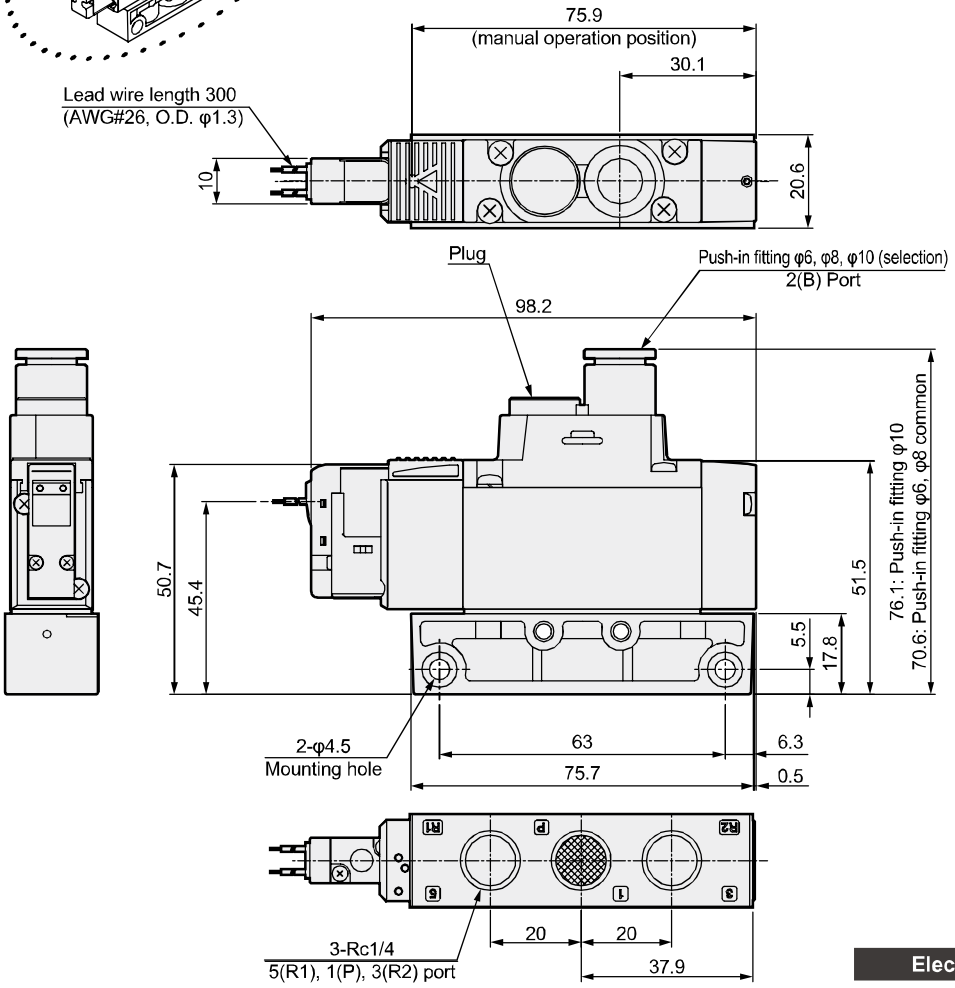
Note: DIN terminal box assembly is shipped facing inward.

Dimensions CAD

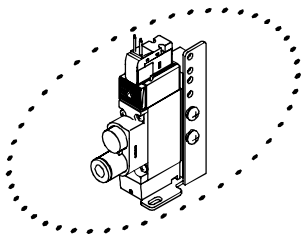
3GA3110R * NPT thread and G thread specifications are listed on pages 52 to 59.

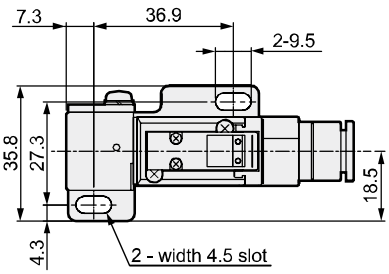
● 2-position single: Normally open grommet lead wire (blank)

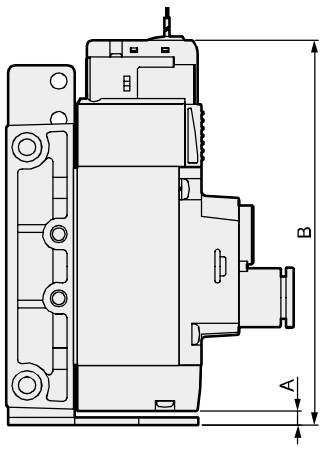




● Mounting plate (P)

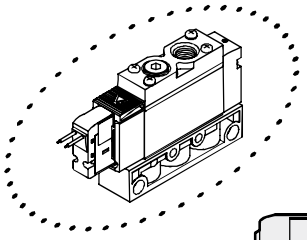


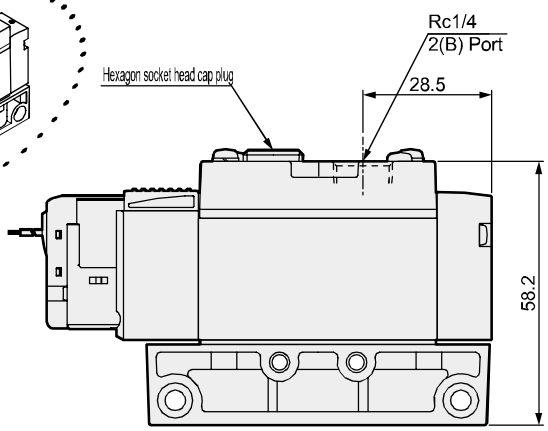




Electrical connections	A	B
Grommet lead wire	3.7	101.8
E, EJ type connector (upward direction), DC voltage		110
E, EJ type connector (upward direction), AC voltage		113.5
DIN terminal box (inner direction)		120.9

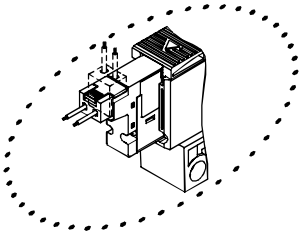
● Rc1/4 female thread (08)

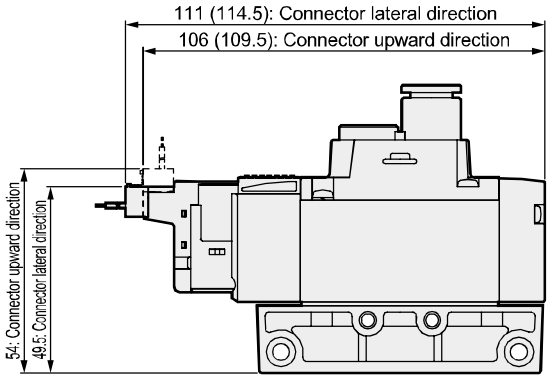




Dimensions

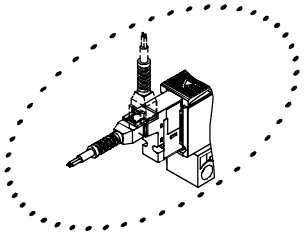
● E type connector (E)

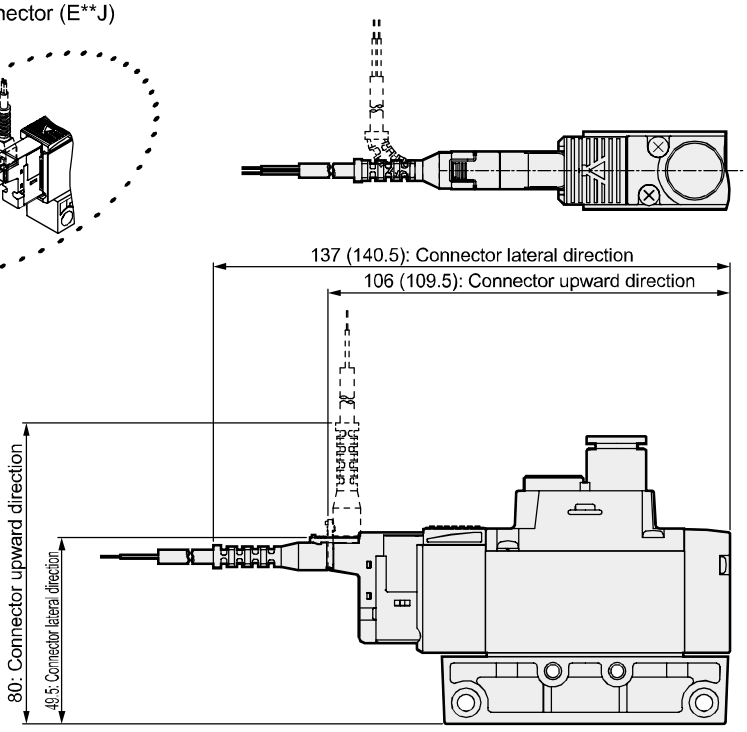




Note: Values in ( ) are for AC voltage.

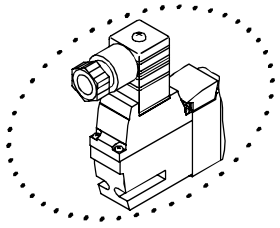
● EJ type connector (E**J)

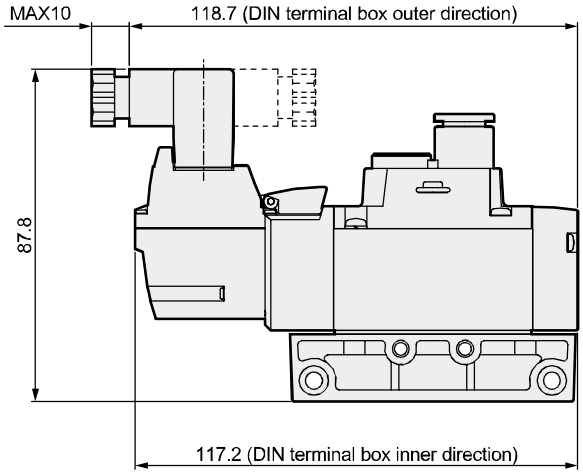




Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)



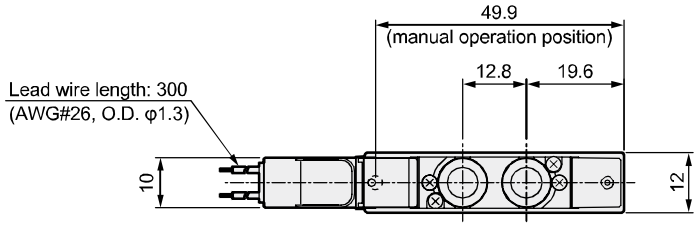


Note: DIN terminal box assembly is shipped facing inward.

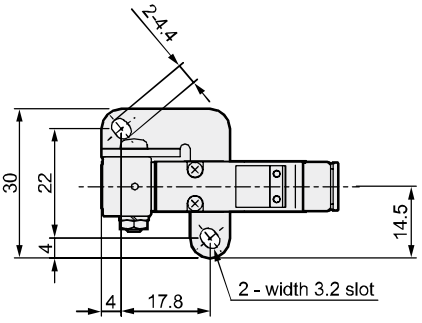
Dimensions Port size; NPT thread

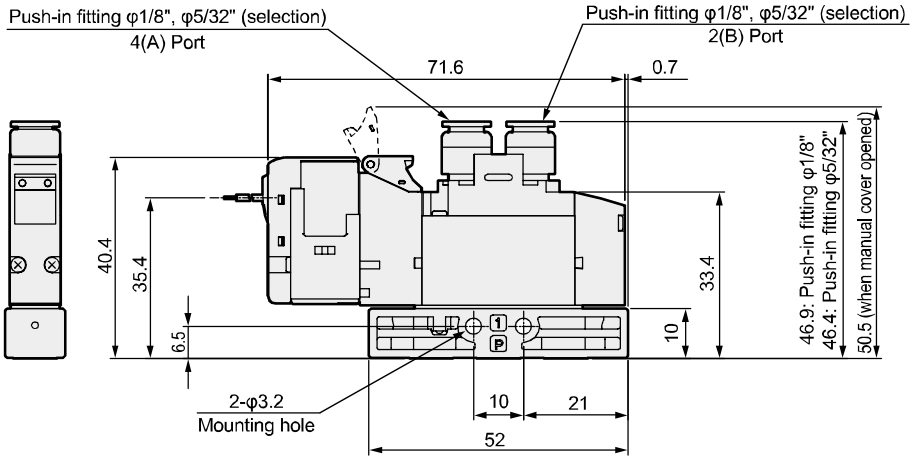
3GA1 1/11/66/67/76/77 0R, 4GA1 1/2/3/4/5 OR

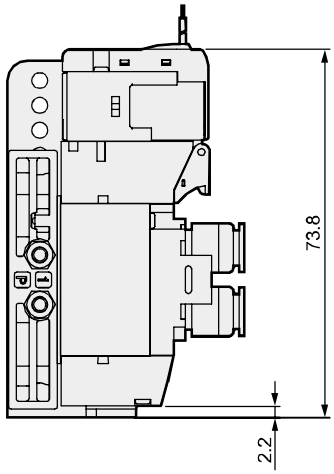
● 2-position single grommet lead wire (blank)

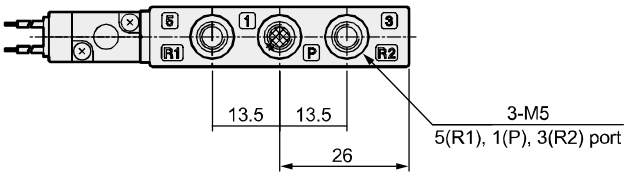


● Mounting plate (P)



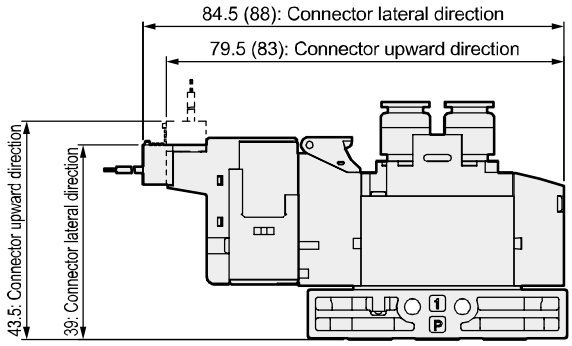






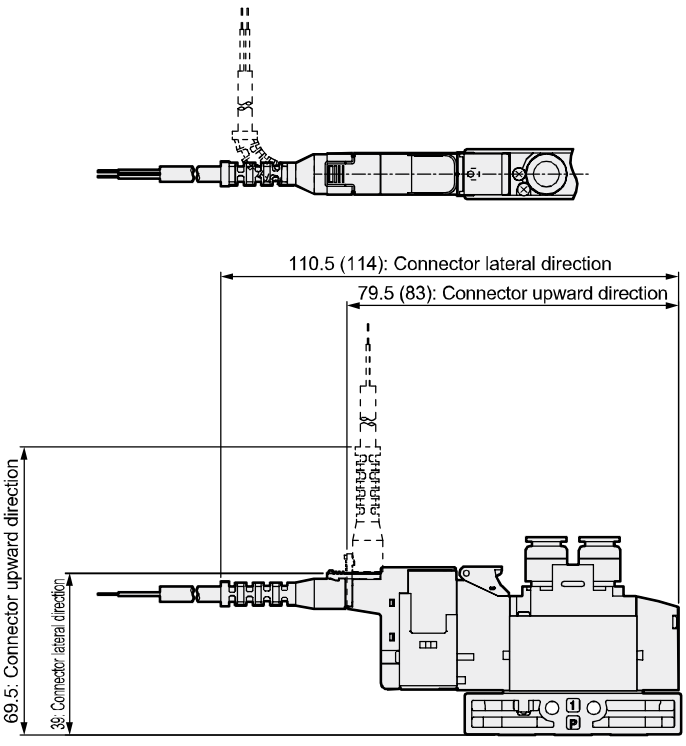
Dimensions Port size; NPT thread

● E type connector (E)



Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)



Note: Values in ( ) are for AC voltage.

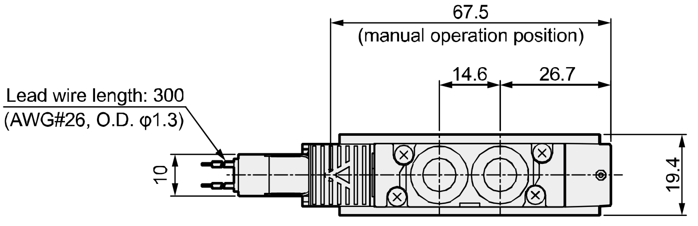
3GA2/4GA2 Series

Single valve; body piping

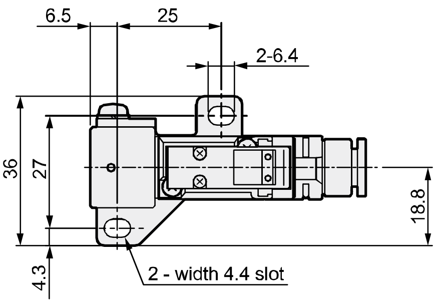
Dimensions Port size; NPT thread

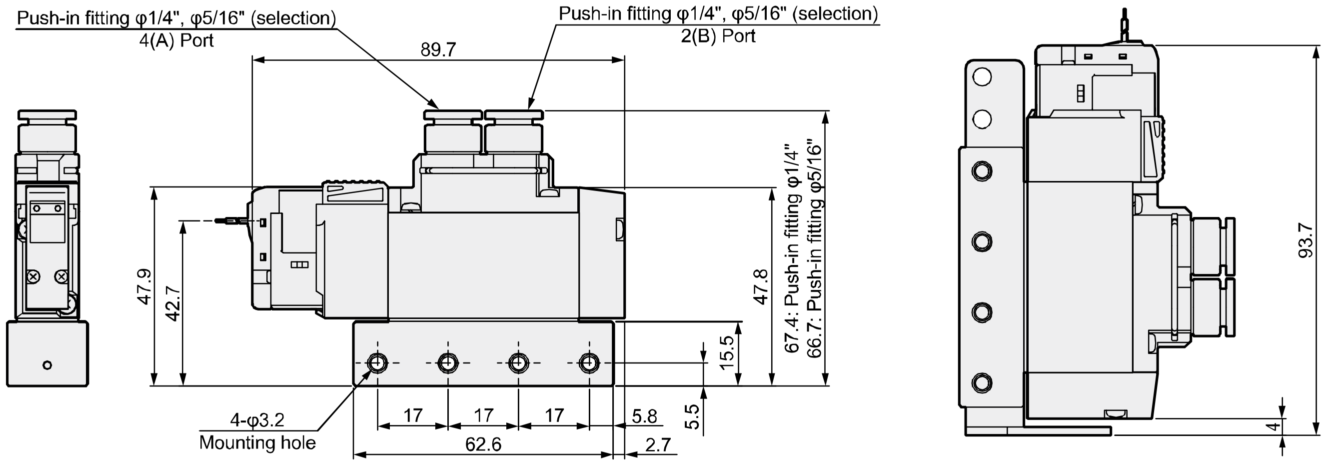
3GA2 1 / 11 / 66 / 67 / 76 / 77 0R, 4GA2 1 / 2 / 3 / 4 / 5 OR

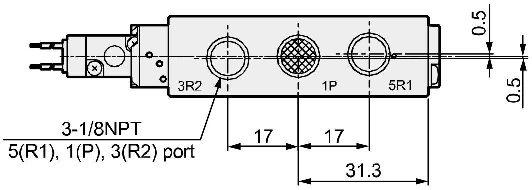
● 2-position single grommet lead wire (blank)



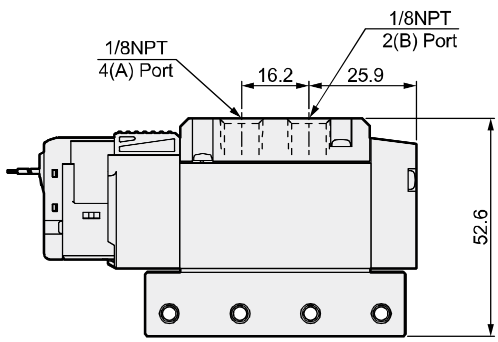
● Mounting plate (P)





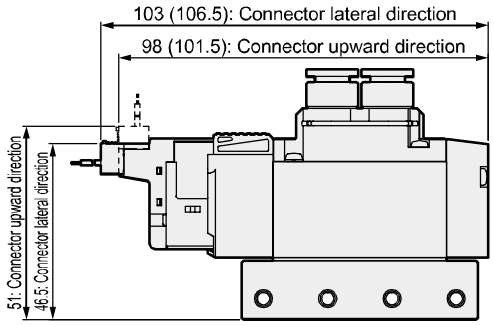


● 1/8NPT female thread (06N)



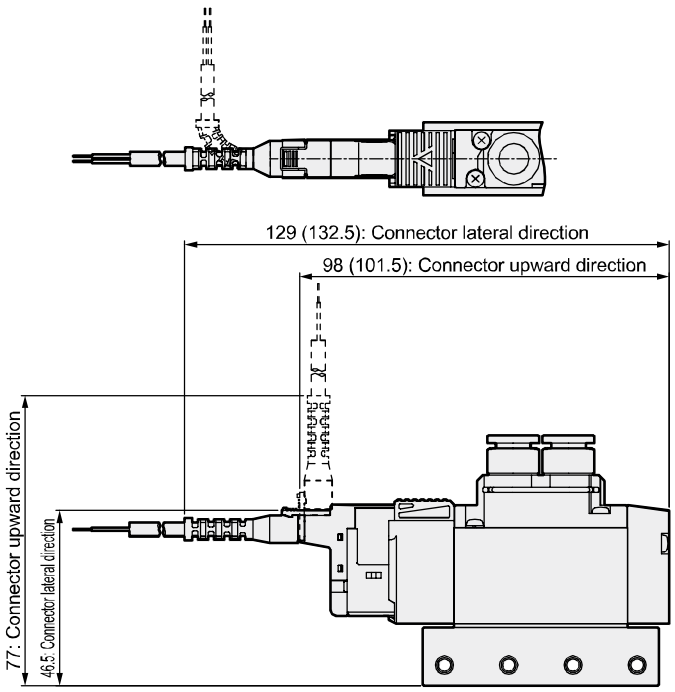
Dimensions Port size; NPT thread

● E type connector (E)



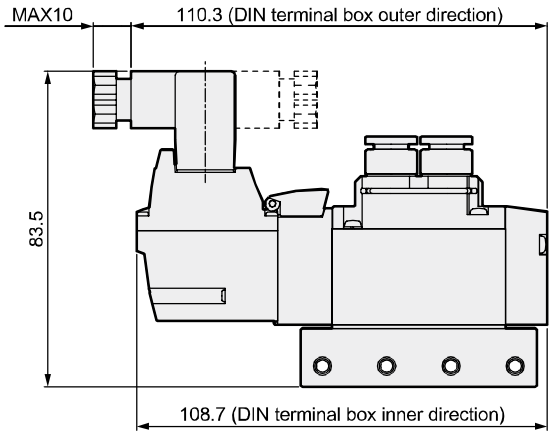
Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)



Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)

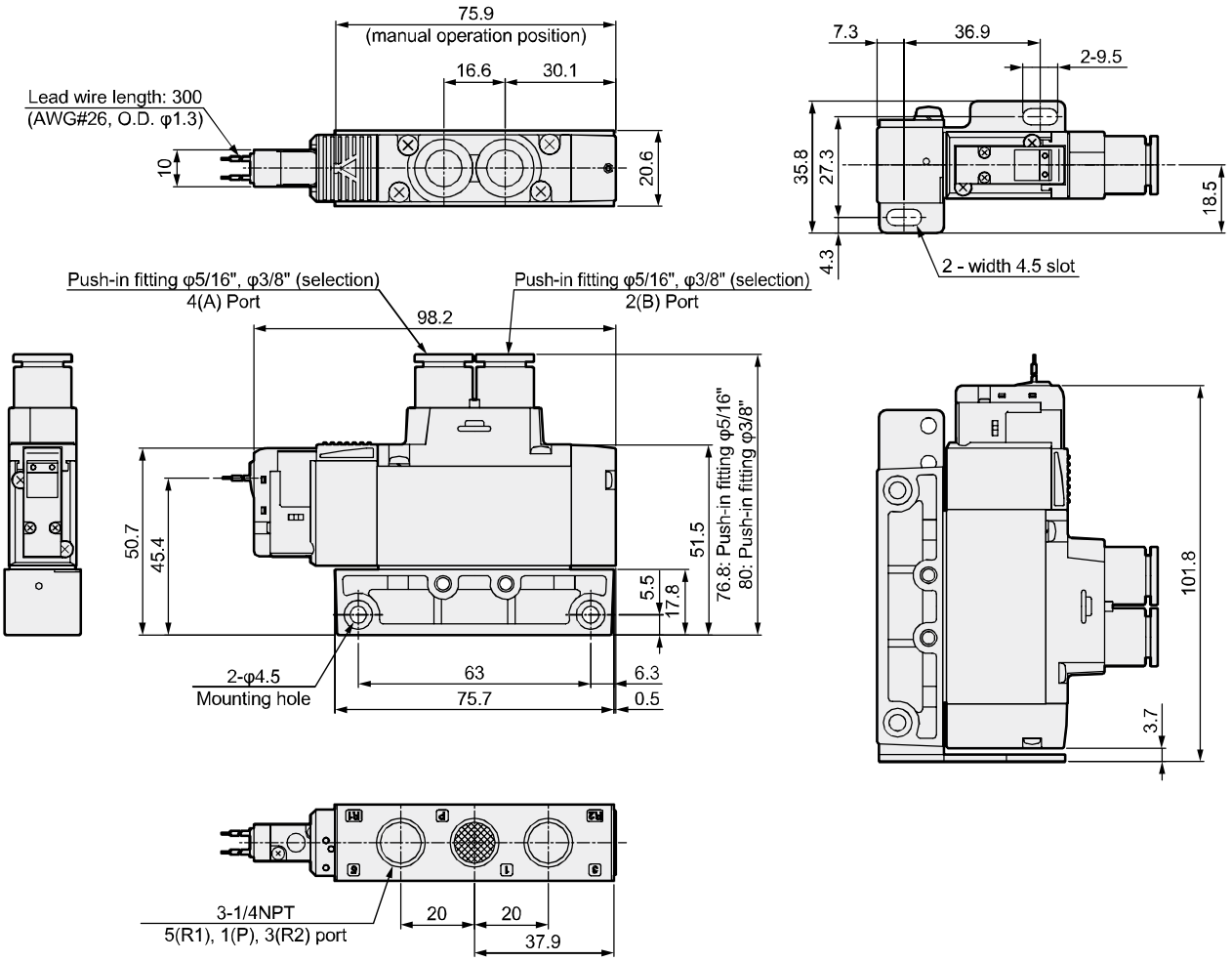


Note: DIN terminal box assembly is shipped facing inward.

Dimensions Port size; NPT thread

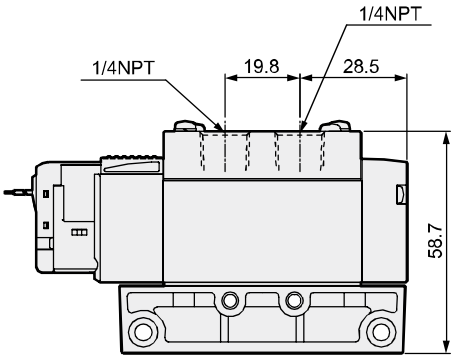
3GA3[1/11]0R, 4GA3[1/2/3/4/5]0R

● 2-position single grommet lead wire (blank)



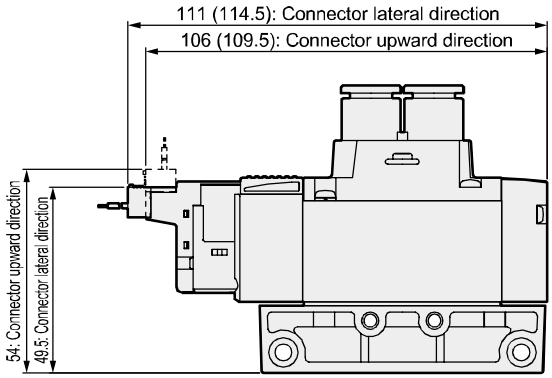
● Mounting plate (P)

● 1/4NPT female thread (08N)



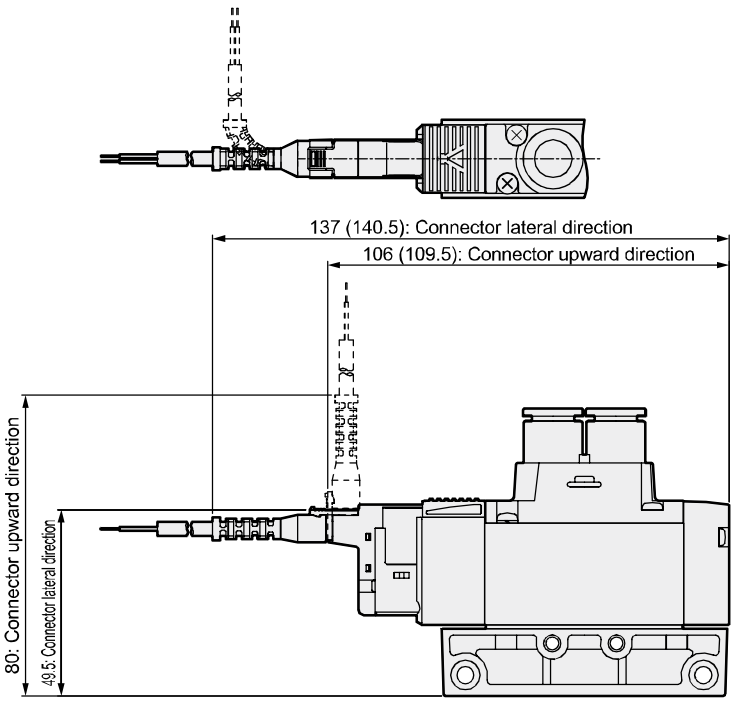
Dimensions Port size; NPT thread

● E type connector (E)



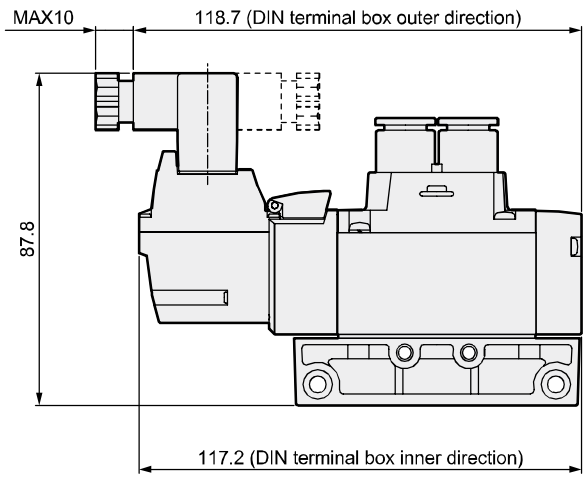
Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)



Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)



Note: DIN terminal box assembly is shipped facing inward.

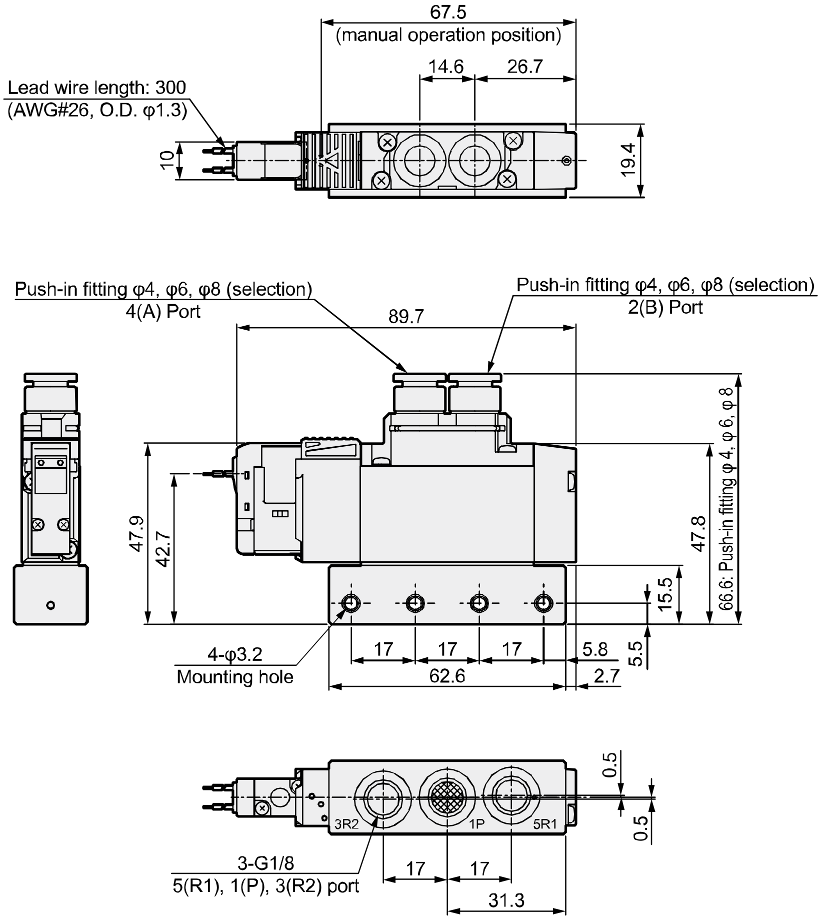
3GA2/4GA2 Series

Single valve; body piping

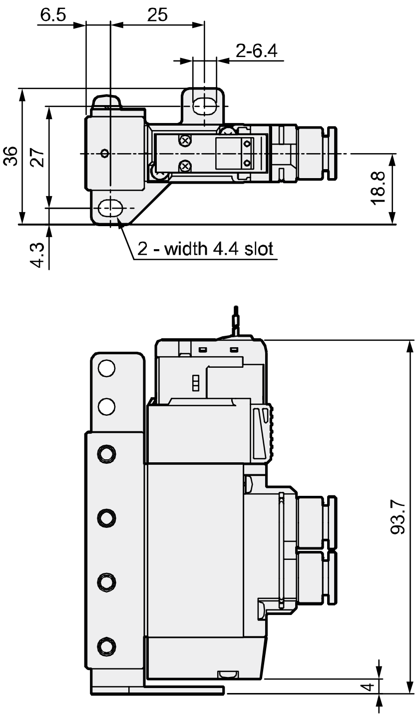
Dimensions Port size; G thread

3GA2 (1, 11, 66, 67, 76, 77) 0R, 4GA2 (1, 2, 3, 4, 5) OR

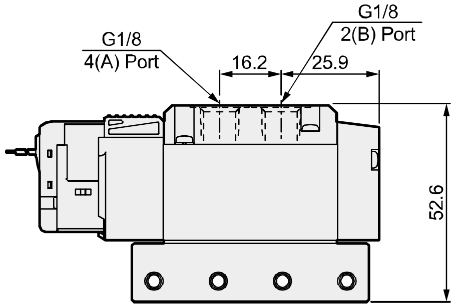
● 2-position single grommet lead wire (blank)



● Mounting plate (P)

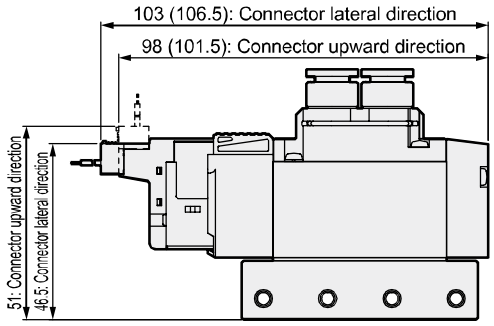


● G1/8 female thread (06G)



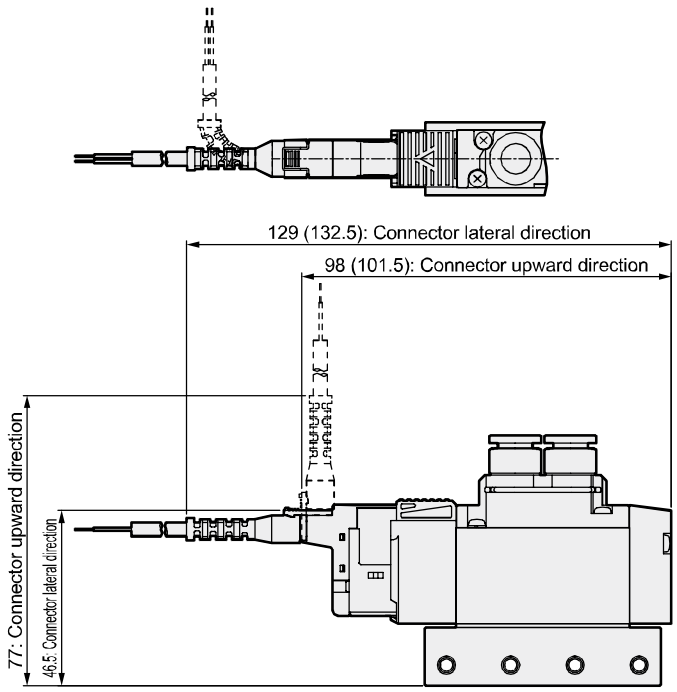
Dimensions Port size; G thread

● E type connector (E)



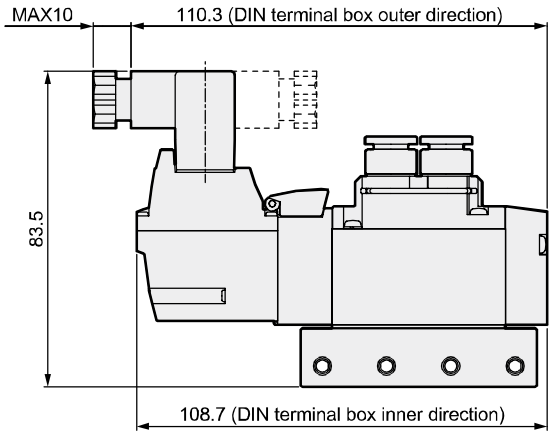
Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)

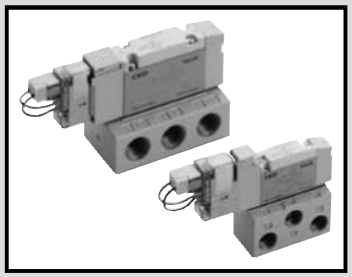


Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)



Note: DIN terminal box assembly is shipped facing inward.



Single valve
Base piping

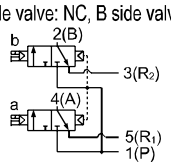
3GB1/2 / 4GB1/2/3 Series

● Cylinder bore size: φ20 to φ100

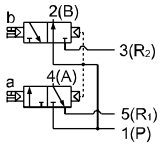
JIS symbol

● Two 3-port valves integrated

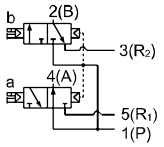
(A side valve: NC, B side valve: NC)



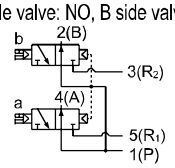
(A side valve: NC, B side valve: NO)



(A side valve: NO, B side valve: NC)

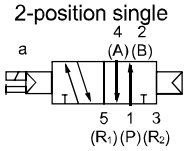


(A side valve: NO, B side valve: NO)

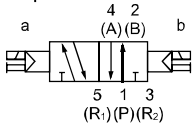


● 5-port valve

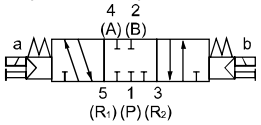
2-position single



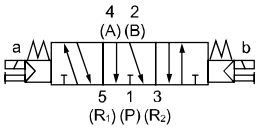
2-position double



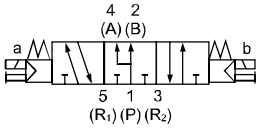
3-position all ports closed



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		0.7 (≈100 psi, 7 bar)
Min. working pressure MPa		0.2 (≈29 psi, 2 bar) (*3)
Proof pressure MPa		1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C		-5 (23°F) to 55 (131°F) (no freezing)
Fluid temperature °C		5 (41°F) to 55 (131°F)
Manual override		Non-locking/locking common (standard)
Pilot exhaust method	Internal pilot	Main valve/pilot valve common exhaust
	External pilot	Main valve/pilot valve individual exhaust
Lubrication *1		Not required
Degree of protection *2		Dust-proof
Vibration resistance m/s²		50 or less
Shock resistance m/s²		300 or less
Atmosphere		Cannot be used in corrosive gas environments

*1 Use turbine oil Class 1 ISO VG32 for lubrication. Excessive or intermittent lubrication results in unstable operation.

*2 Avoid dripping water or oil, etc., during use.
IP65 (jet-proof) applies for DIN terminal box specifications. However, the specified outer diameter of the applicable cord and tightening torque must be used for fixing in place.

*3 The working pressure range is 0 to 0.7 MPa when the external pilot (option code: K) is selected. Set the external pilot pressure between 0.2 and 0.7 MPa.

Electrical specifications

Descriptions		Content					
Rated voltage V		DC24	DC12	DC5	DC3	AC100	AC200
Voltage fluctuation range		±10%					
Holding current A (*4)	Standard	0.015 (0.017)	0.030 (0.034)	0.072 (0.082)	0.120 (0.136)	0.009 (0.009)	0.006 (0.006)
	Low exoergic/energy circuit	0.005	0.010	-		-	
Power consumption W (*4)	Standard	0.35(0.40)		0.35(0.40)		-	
	Low exoergic/energy circuit	0.1		-		-	
Apparent power VA (*4, 5)	Standard	-		-		0.93 (0.98)	1.40
Thermal class		B					
Surge suppressor		Option					
Indicator		Lamp (option)					

*4: Values in ( ) apply when lamp is included. In addition, the type with low exoergic/energy-saving circuit is only available with lamp.

*5: 200 VAC is the value of DIN terminal box with lamp.

Individual specifications

Port size		3GB1, 4GB1	3GB2, 4GB2	4GB3
Rc thread	A/B port	Rc1/8	Rc1/4	Rc1/4, Rc3/8
	P/R1/R2 port	Rc1/8	Rc1/4	Rc1/4, Rc3/8
NPT thread (*5)	A/B port	1/8NPT	1/4NPT	1/4NPT, 3/8NPT
	P/R1/R2 port	1/8NPT	1/4NPT	1/4NPT, 3/8NPT
G thread (*5)	A/B port	G1/8	G1/4	-
	P/R1/R2 port	G1/8	G1/4	-

*5: Available as custom-order.

Descriptions			3GB1/4GB1		3GB2/4GB2		4GB3	
			ON	OFF	ON	OFF	ON	OFF
Response time ms	Two 3-port valves integrated		9	12	12	29	-	-
	2-position	Single	12	12	19	19	25	28
		Double	9	-	18	-	24	-
	3-position	ABR connection	8	15	17	30	23	45

Values with a lamp/surge suppressor are shown. The response times are the values with supply pressure of 0.5 MPa at 20°C without lubrication. They depend on the pressure and the lubricant quality.

Descriptions				3GB1/4GB1	3GB2/4GB2	4GB3
Weight g	2-position	Single	Grommet lead wire	80 (38)	156 (74)	215 (96)
			E type connector	82 (40)	158 (76)	217 (98)
			DIN terminal box	-	193 (111)	249 (130)
		Double	Grommet lead wire	97 (55)	173 (91)	233 (114)
			E type connector	101 (59)	177 (95)	237 (118)
			DIN terminal box	-	216 (134)	273 (154)
	3-position	All ports closed	Grommet lead wire	98 (56)	184 (102)	242 (123)
			E type connector	102 (60)	188 (106)	246 (127)
			DIN terminal box	-	227 (145)	282 (163)

- Values in parenthesis ( ) do not include the single sub-plate. Values for the E type connector include the socket assembly (with 300 mm lead wire). For the EJ type connector, add 16 g/connector to the E type connector weight.
- The weight of the two 3-port valves integrated is the same as that of 2-position double.

Flow characteristics

Model No.	Solenoid position		P→A/B		A/B→R1/R2	
			C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b
3GB1 4GB1	Two 3-port valves integrated		0.92	0.08	1.1	0.26
	2-position		1.3	0.27	1.2	0.22
	3-position	All ports closed	1.1	0.31	1.1	0.27
		ABR connection	1.1	0.31	1.3	0.29
		PAB connection	1.4	0.30	1.1	0.26
3GB2 4GB2	Two 3-port valves integrated		1.7	0.42	2.1	0.26
	2-position		2.6	0.20	2.6	0.19
	3-position	All ports closed	2.3	0.32	2.2	0.22
		ABR connection	2.2	0.23	2.6	0.16
		PAB connection	2.4	0.10	2.4	0.22
4GB3	2-position		4.3	0.24	4.2	0.24
	3-position	All ports closed	3.3	0.40	3.4	0.27
		ABR connection	3.3	0.36	4.2	0.18
		PAB connection	4.5	0.28	3.4	0.30

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

Ozone-proof specifications · Coolant proof specifications

Can be selected with "How to order" Item Ⓔ option "A" on page 62.

Clean-room specifications

● Anti-dust generation structure for use in cleanrooms

** - Voltage - **P7***

Specifications for rechargeable battery (Catalog No. CC-1226A)

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

** - Voltage - **P4**

CE marking specifications

** - Voltage - **ST**

3GB1/2 / 4GB1/2/3 Series

Single valve; base piping

How to order

4GB1 1 0 R - 06 - E2 - 3

3GB1 66 0 R - 06 - E2 - 3

Discrete valve for mounting base

4GB1 1 9 R - 00 - E2 H - 3

3 port discrete valve for mounting base

3GB1 66 9 R - 00 - E2 H - 3

Ⓑ Solenoid position

Ⓐ Model No.

Ⓒ Port size

Ⓓ Electrical connections
Refer to page 11 for the circuit diagram with surge suppressor/lamp.

Ⓔ Option

Ⓕ Voltage

Code	Content		Ⓐ Model No. 3GB1	3GB2	4GB1	4GB2	4GB3
Ⓑ Solenoid position							
1	2-position single				●	●	●
2	2-position double				●	●	●
3	3-position all ports closed				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
66	Two 3-port valves integrated *1	A side valve: Normally closed B side valve: Normally closed	●	●			
67	Two 3-port valves integrated *1	A side valve: Normally closed B side valve: Normally open	●	●			
76	Two 3-port valves integrated *1	A side valve: Normally open B side valve: Normally closed	●	●			
77	Two 3-port valves integrated *1	A side valve: Normally open B side valve: Normally open	●	●			
Ⓒ Port size							
Port	4(A)/2(B) port		P/R1/R2 port (2) = Rc1/8 (3) = Rc1/4 (4) =Rc3/8				
06	Rc1/8		(2)		(2)		
08	Rc1/4			(3)		(3)	(3)
10	Rc3/8						(4)
Port	4(A)/2(B) port		P/R1/R2 port (5) = 1/8NPT, (6) = 1/4NPT, (7) = 3/8NPT				
06N	1/8NPT (*2)		(5)		(5)		
08N	1/4 NPT (*2)			(6)		(6)	(6)
10N	3/8NPT (*2)						(7)
Port	4(A)/2(B) port		P/R1/R2 port (8) = G1/8, (9) = G1/4				
06G	G1/8 (*2)		(8)		(8)		
08G	G1/4 (*2)			(9)		(9)	
00	Discrete valve for mounting base		●	●	●	●	●
Ⓓ Electrical connections							
Blank	Grommet lead wire (300 mm) (*8)		●	●	●	●	●
B	DIN terminal box (Pg7)	with surge suppressor/lamp (*9)		●		●	●
BN	DIN term. box (Pg7) (no terminal box)	+ surge suppressor *9		●		●	●
E type connector (upward/lateral common)							
E0	Lead wire (300 mm) (*10)		●	●	●	●	●
E00	Lead wire (500 mm) (*10)		●	●	●	●	●
E01	Lead wire (1000 mm) (*10)		●	●	●	●	●
E02	Lead wire (2000 mm) (*10)		●	●	●	●	●
E03	Lead wire (3000 mm) (*10)		●	●	●	●	●
E0N	Without lead wire (without socket) (*10)		●	●	●	●	●
E1	Without lead wire (socket/terminal attached) (*10)		●	●	●	●	●
E2	Lead wire (300 mm), surge suppressor/indicator lamp		●	●	●	●	●
E20	Lead wire (500 mm), surge suppressor/indicator lamp		●	●	●	●	●
E21	Lead wire (1000 mm), surge suppressor/indicator lamp		●	●	●	●	●
E22	Lead wire (2000 mm), surge suppressor/indicator lamp		●	●	●	●	●
E23	Lead wire (3000 mm), surge suppressor/indicator lamp		●	●	●	●	●
E2N	No lead wire (without socket), surge suppressor/indicator lamp		●	●	●	●	●
E3	No lead wire (with socket/terminal), surge suppressor/indicator lamp		●	●	●	●	●
EJ type connector (socket with cover, upward/lateral common)							
E01J	Lead wire (1000 mm) (*10)		●	●	●	●	●
E02J	Lead wire (2000 mm) (*10)		●	●	●	●	●
E03J	Lead wire (3000 mm) (*10)		●	●	●	●	●
E21J	Lead wire (1000 mm), surge suppressor/indicator lamp		●	●	●	●	●
E22J	Lead wire (2000 mm), surge suppressor/indicator lamp		●	●	●	●	●
E23J	Lead wire (3000 mm), surge suppressor/indicator lamp		●	●	●	●	●
Ⓔ Option							
Blank	Non-locking/locking common manual override		●	●	●	●	●
M	Non-locking manual override		●	●	●	●	●
H	With exhaust check valve (*3)		●	●	●	●	●
K	External pilot				●	●	●
A	Ozone/coolant proof		●	●	●	●	●
S	Surgeless (*4)		●	●	●	●	●
E	Low exoergic/energy saving circuit (*4), (*5)		●	●	●	●	●
F	A/B-port filter built in (*6)		●	●	●	●	●
Ⓕ Voltage							
1	100 VAC (rectifier integrated)		●	●	●	●	●
2	200 VAC (rectifier integrated) (*7)			●		●	●
3	24 VDC		●	●	●	●	●
4	12 VDC		●	●	●	●	●
7	3 VDC		○	○	○	○	○
8	5 VDC		○	○	○	○	○

is not available.

○ indicates a custom order.

⚠ Precautions for model No. selection

*1 : Not compatible with combination with external pilot (K). Dimensions are the same as those of the respective 2-position double solenoid.

*2 : Custom order.

*3 : 3-position all ports closed and PAB connection are not provided with the exhaust check valve. Refer to page 751 for details on the exhaust check valve.

4 : E2 type and E2*J type connectors support 12/24 VDC only. In addition, surgeless "S" and low exoergic/energy-saving circuit "E" cannot be selected together.

*5 : Surgeless specifications.

*6 : A filter is built into the P-port as standard.

*7 : DIN terminal box only is supported.

*8 : Grommet lead wire specifications are compatible with DC voltage only.

*9 : AC voltages and 12/24 VDC are supported. In addition, a lamp comes with the terminal box.

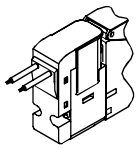
*10: AC voltage is with a rectifier circuit.

Electrical connections

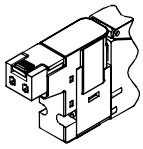
Discrete valve/individual wiring manifold

Blank Grommet lead wire

● Lead wire length
300 mm

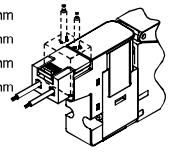


E1 E3 E type connector with socket/terminal

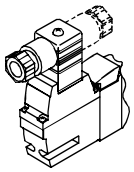


E0 E2 E type connector

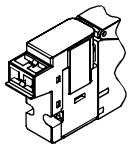
● Lead wire length
300 mm
500 mm
1000 mm
2000 mm
3000 mm



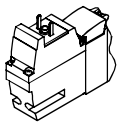
B DIN terminal box



E0N E2N E type connector without socket

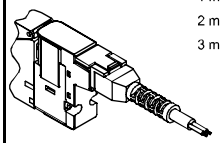


BN DIN terminal box without terminal box



E0*J E2*J EJ type connector

● Lead wire length
1 m
2 m
3 m

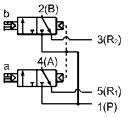


Internal structure and parts list

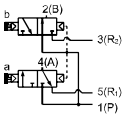
3GB1 $^{66}_{67}{}^{}_{76}{}^{}_{77}$ 0R

● Two 3-port valves integrated
Grommet lead wire (blank)

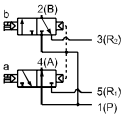
A side valve: Normally closed,
B side valve: Normally closed
NC/NC



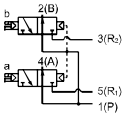
A side valve: Normally closed,
B side valve: Normally open
NC/NO

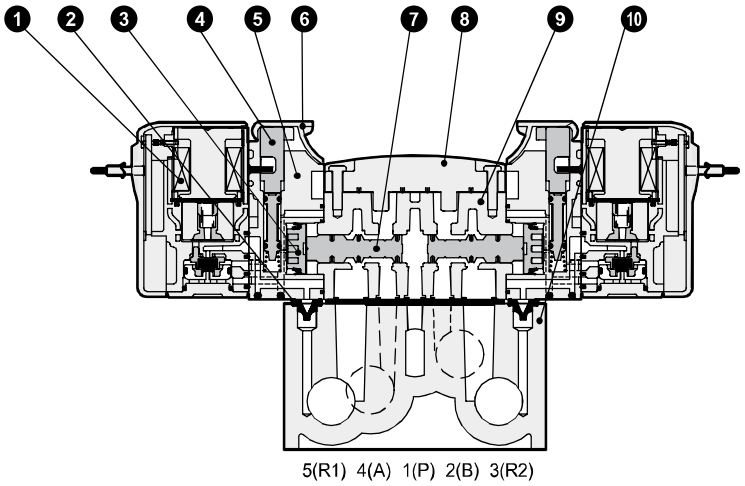


A side valve: Normally open,
B side valve: Normally closed
NO/NC



A side valve: Normally open,
B side valve: Normally open
NO/NO

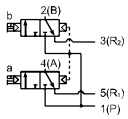




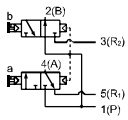
3GB2 $^{66}_{67}{}^{}_{76}{}^{}_{77}$ 0R

● Two 3-port valves integrated
Grommet lead wire (blank)

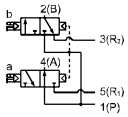
A side valve: Normally closed,
B side valve: Normally closed
NC/NC



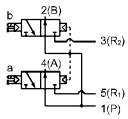
A side valve: Normally closed,
B side valve: Normally open
NC/NO

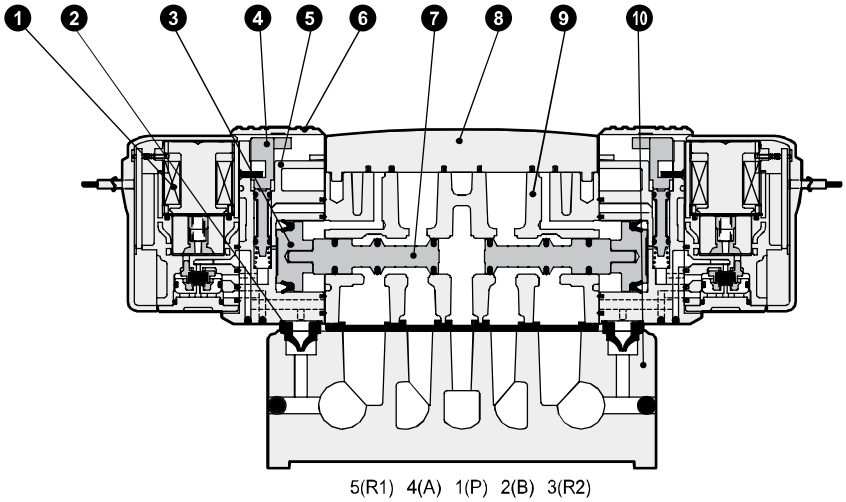


A side valve: Normally open,
B side valve: Normally closed
NO/NC



A side valve: Normally open,
B side valve: Normally open
NO/NO





Main parts list

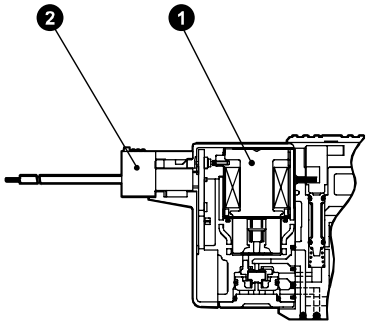
No.	Part name	Material
1	Coil assembly	-
2	Pilot exhaust check valve	Hydrogenated nitrile rubber
3	Piston assembly	-
4	Manual override	Resin
5	Piston chamber	Resin
6	Manual protection cover	Resin
7	Spool assembly	-
8	Plate	Resin
9	Body	Aluminum alloy die-casting
10	Discrete sub-plate	Aluminum alloy die-casting

Parts list

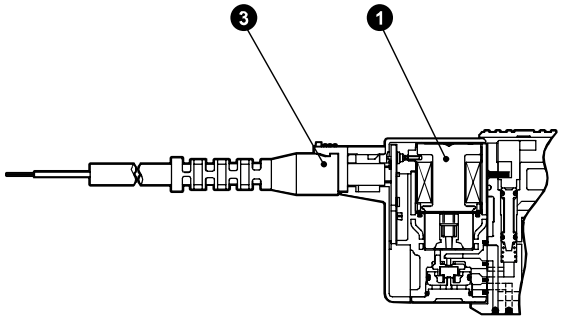
No.	Part name	Model No.
1	Coil assembly	4GR-[electrical connections]-□-COIL-[voltage] □: Blank: Standard, A: Ozone specification, S: Surgeless, E: Low exergic/energy saving circuit [electrical connections]: Blank: Grommet lead wire

Electrical connections internal structure and parts list

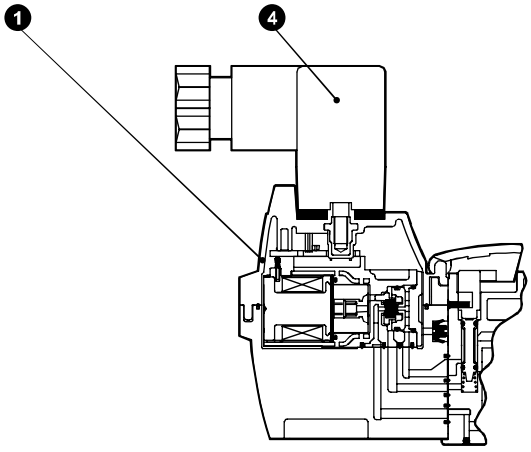
● E type connector E□□



● EJ type connector E□□J



● DIN terminal box B



Main parts list

No.	Part name	Material
1	Coil assembly	
2	E type connector socket assembly	-
3	Socket assembly with cover	-
4	DIN terminal box assembly	-

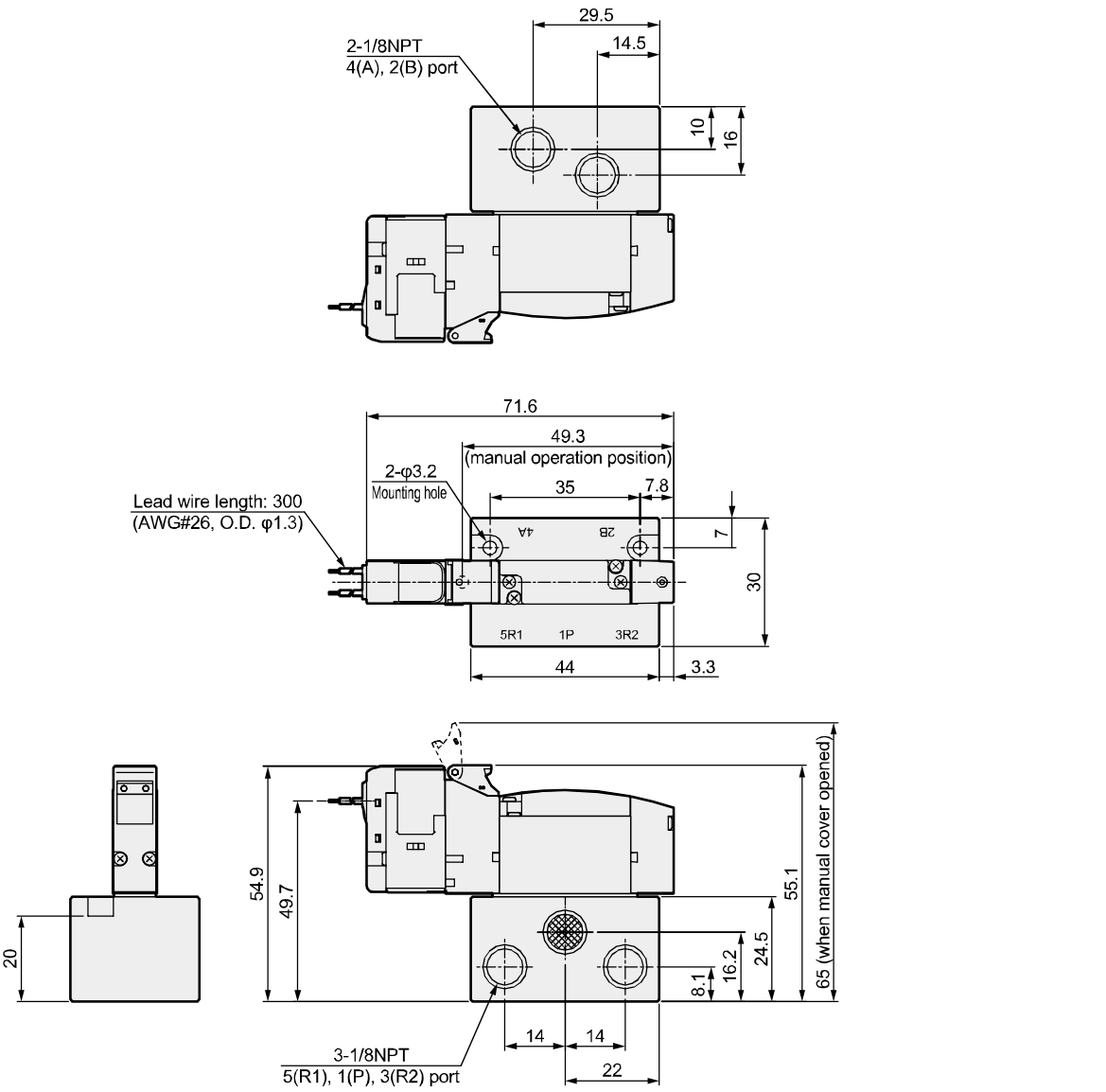
Parts list

No.	Part name	Model No.
1	Coil assembly	4GR-[electrical connections]-□-COIL-[voltage] Blank: Standard A: Ozone specification S: Surgeless E: Low exoergic/ energy saving circuit E*: E type connector E*J: Socket with cover type B: DIN terminal box B includes the DIN terminal box BN does not include the DIN terminal box
2	E type connector socket assembly	4GR-SOCKET-ASSY-E**-[Voltage]
3	Socket assembly with cover	4GR-SOCKET-ASSY-E**J
4	DIN terminal box assembly	4GR-TERMINAL-BOX-[Voltage]

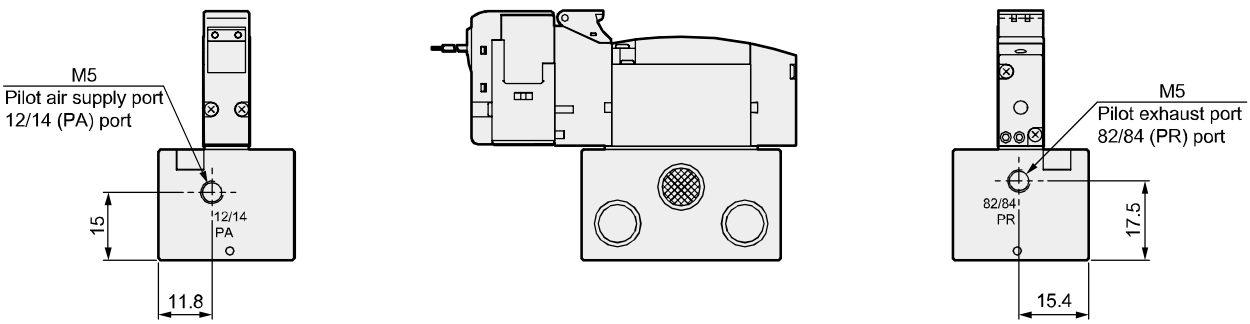
Dimensions Port size; NPT thread

3GB1 65/67/76/77 0R, 4GB1 1/2/3/4/5 OR

● 2-position single grommet lead wire (blank)

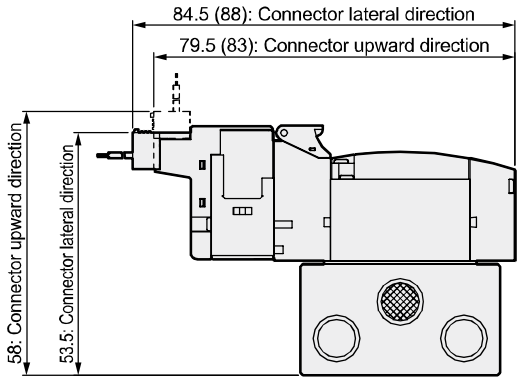


● External pilot (K)



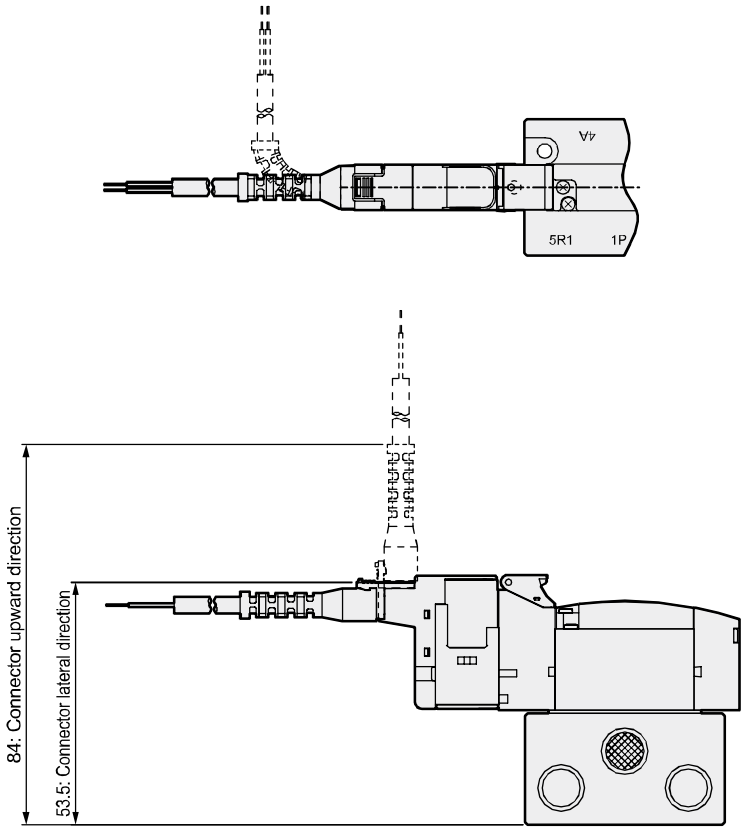
Dimensions Port size; NPT thread

● E type connector (E)



Note: Values in ( ) are for AC voltage.

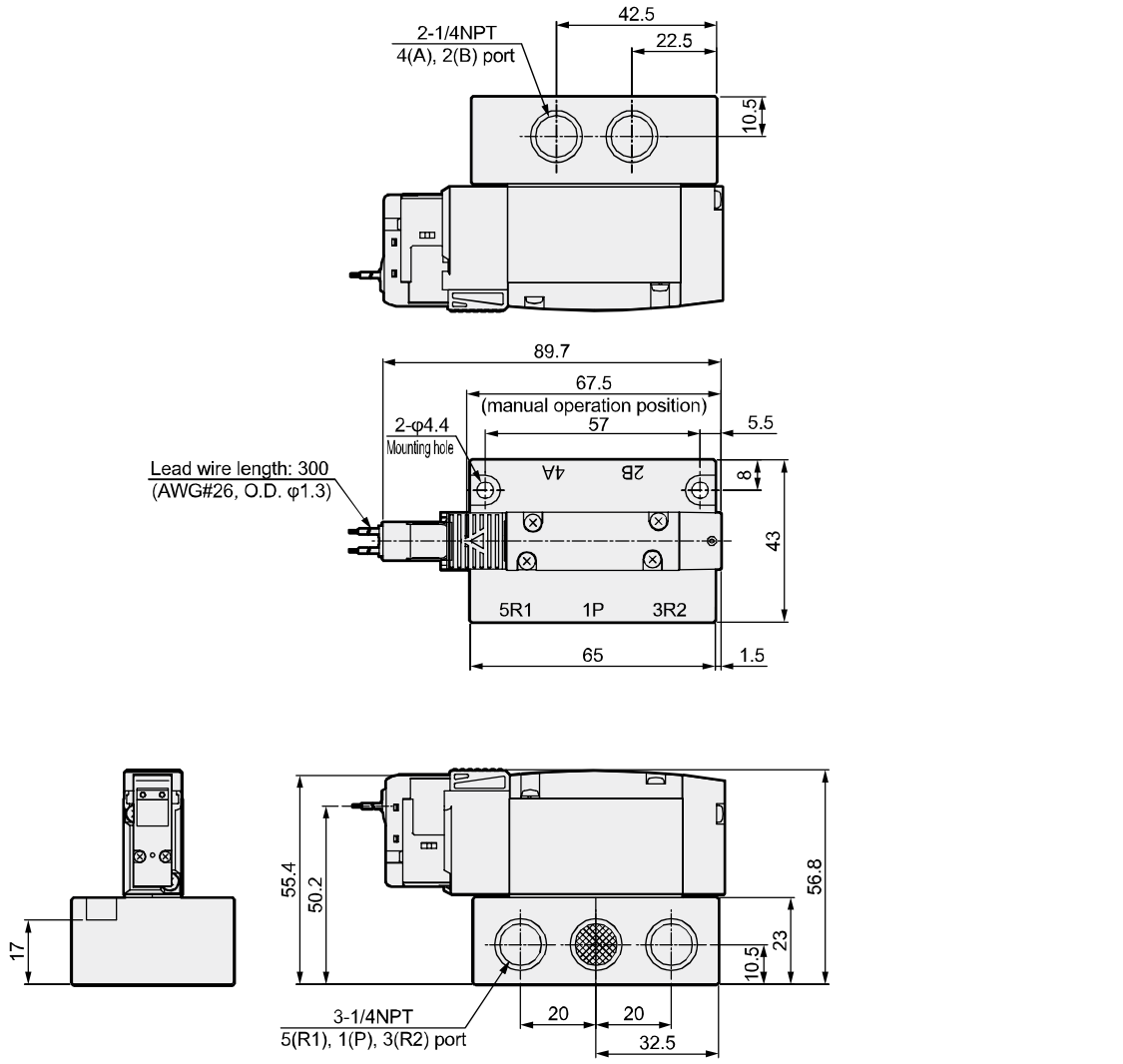
● EJ type connector (E**J)



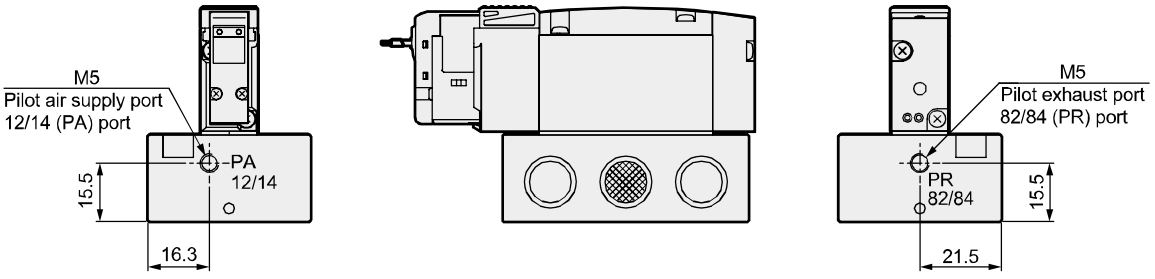
Dimensions Port size; NPT thread

3GB2$^{66}_{67}_{76}_{77}$0R, 4GB2$^{1}_{2}_{3}_{4}_{5}$0R

● 2-position single grommet lead wire (blank)

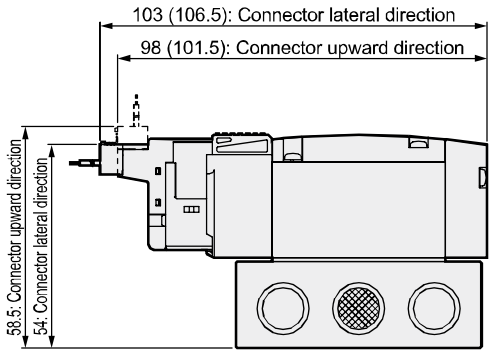


● External pilot (K)



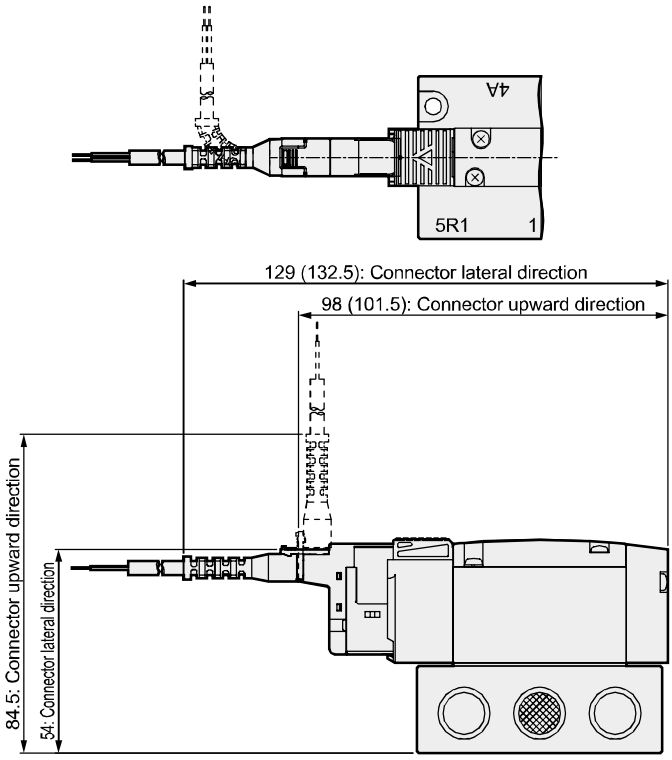
Dimensions Port size; NPT thread

● E type connector (E)



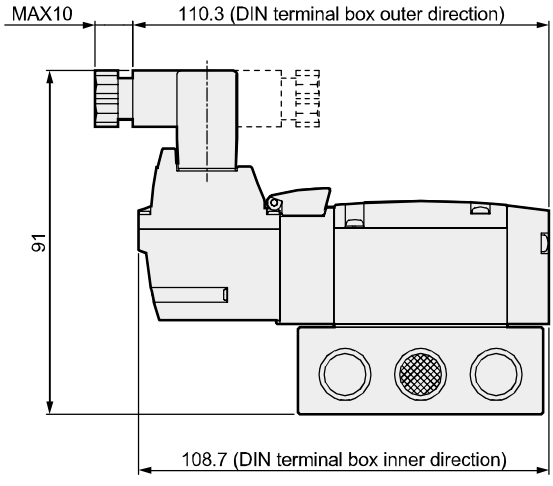
Note: Values in ( ) are for AC voltage.

● EJ type connector (E**J)



Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)

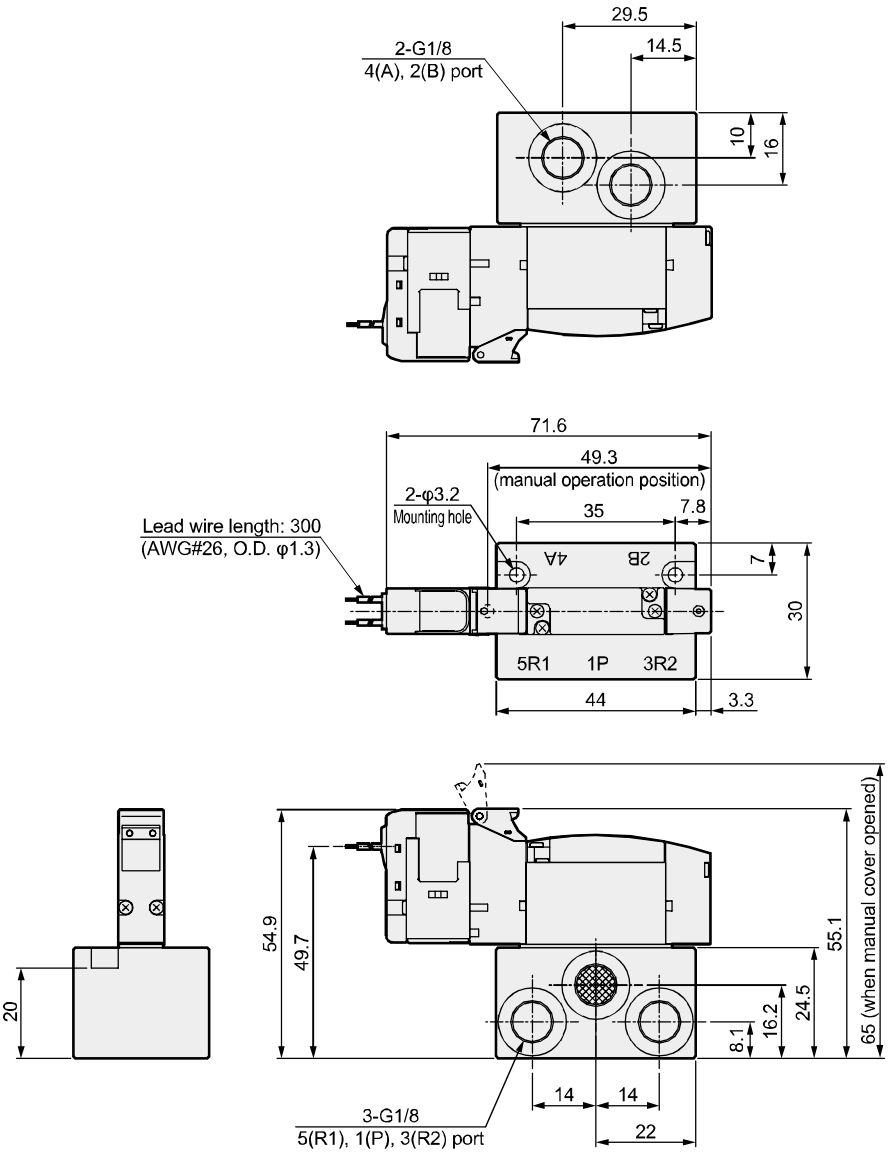


Note: DIN terminal box assembly is shipped facing inward.

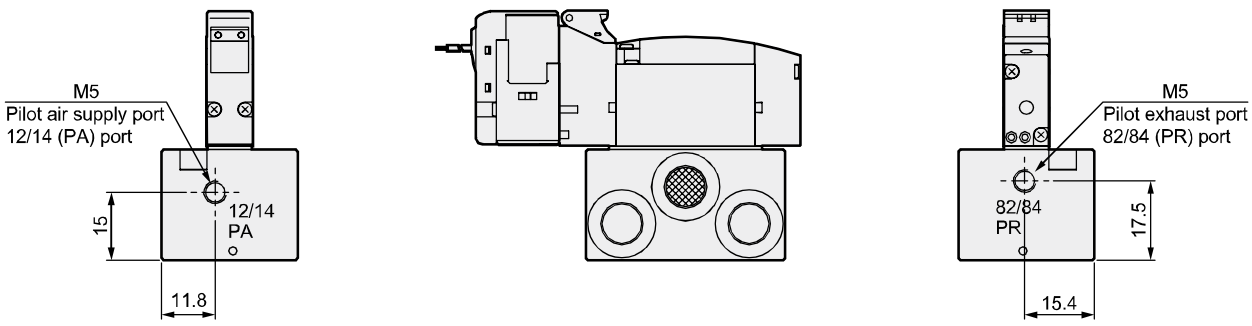
Dimensions Port size; G thread

3GB1$^{65}_{67}_{76}_{77}$0R, 4GB1$^{1}_{2}_{3}_{4}_{5}$OR

● 2-position single grommet lead wire (blank)

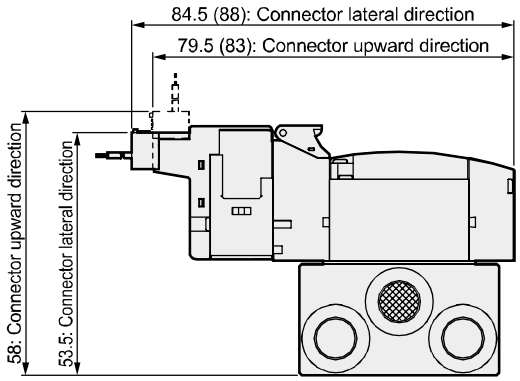


● External pilot (K)



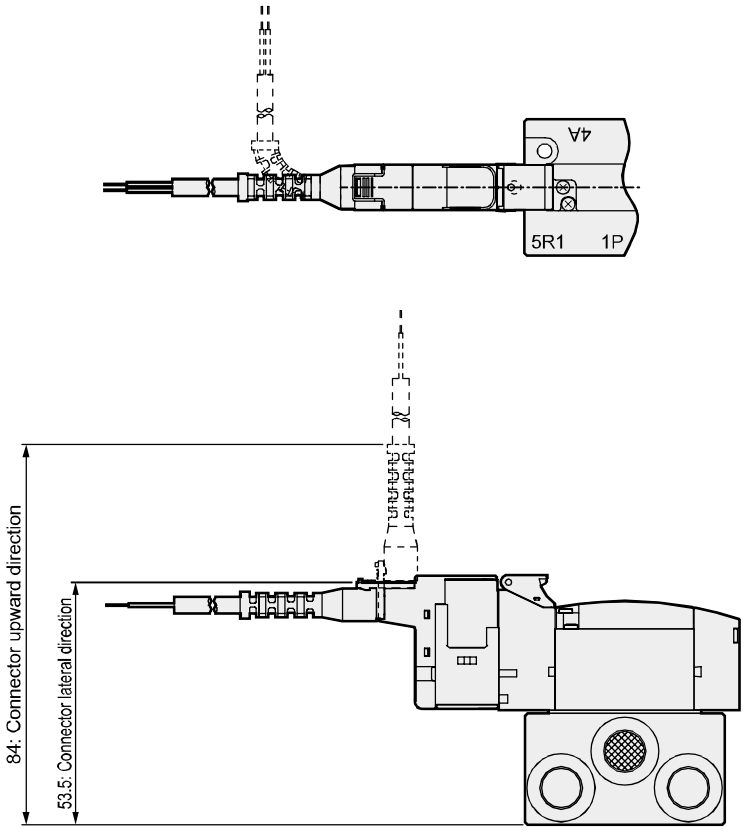
Dimensions Port size; G thread

● E type connector (E)



Note: Values in ( ) are for AC voltage.

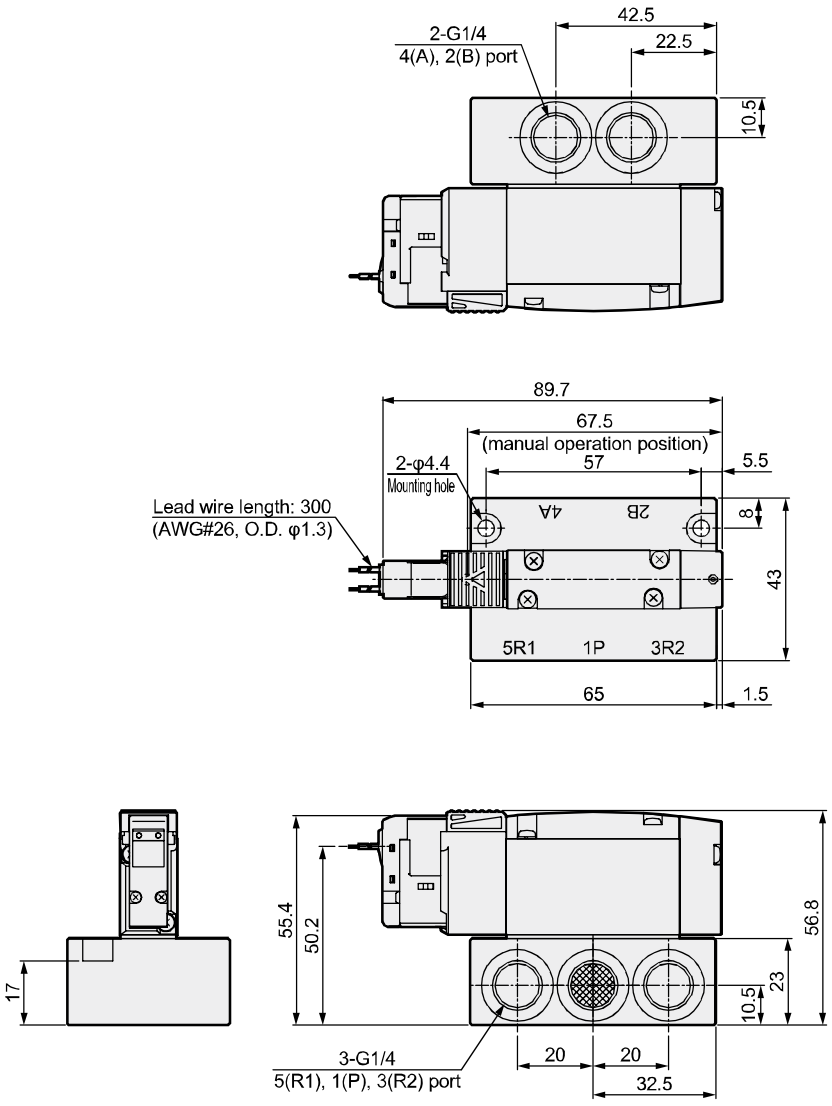
● EJ type connector (E**J)



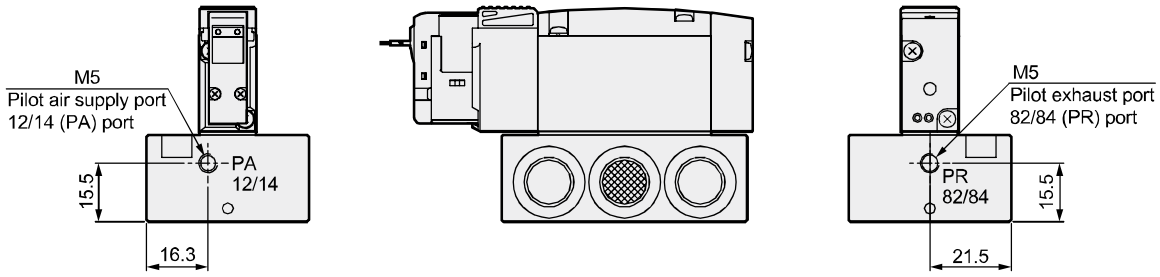
Dimensions Port size; G thread

3GB2 66/67/76/77 0R, 4GB2 1/2/3/4/5 OR

● 2-position single grommet lead wire (blank)

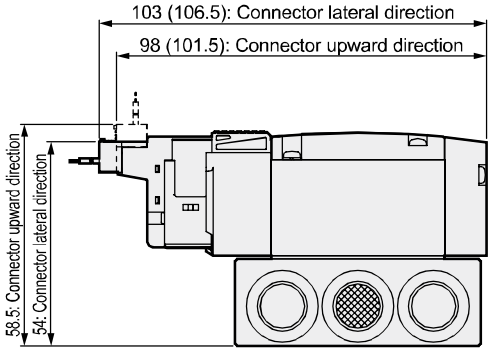


● External pilot (K)



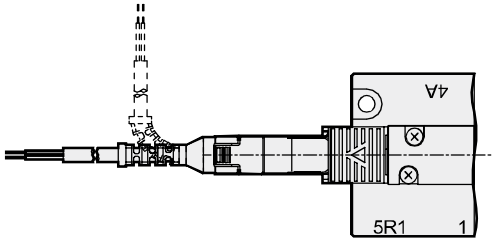
Dimensions Port size; G thread

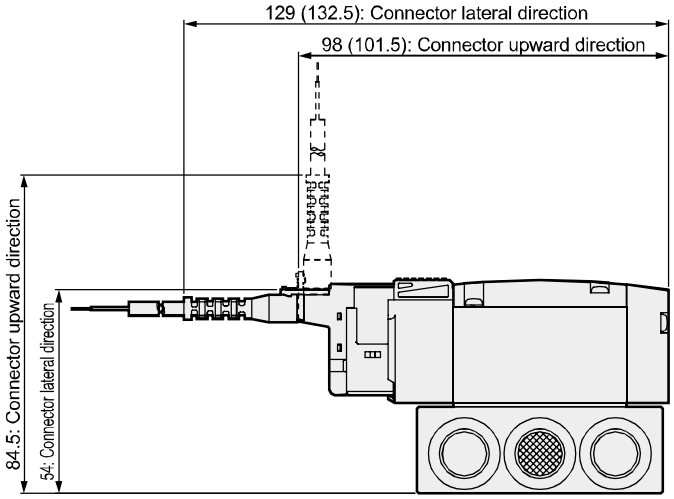
● E type connector (E)



Note: Values in ( ) are for AC voltage.

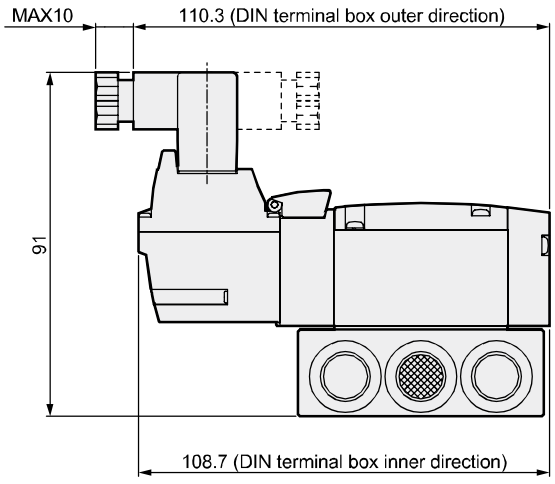
● EJ type connector (E**J)



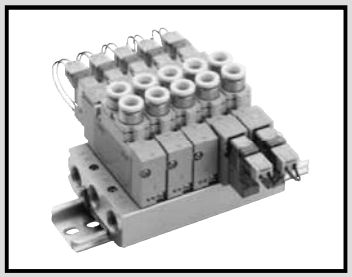


Note: Values in ( ) are for AC voltage.

● DIN terminal box (B)



Note: DIN terminal box assembly is shipped facing inward.



Individual wiring manifold
Body piping
Direct mount/DIN rail mount

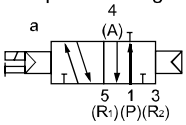
M3GA1/2/3-(D) / M4GA1/2/3-(D) Series

● Cylinder bore size: φ20 to φ100

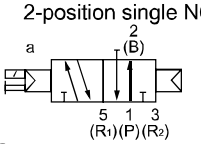
JIS symbol

● 3-port valve

2-position single NC

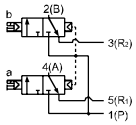


2-position single NO

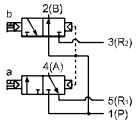


● Two 3-port valves integrated

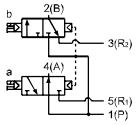
(A side valve: NC, B side valve: NC)



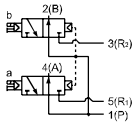
(A side valve: NC, B side valve: NO)



(A side valve: NO, B side valve: NC)

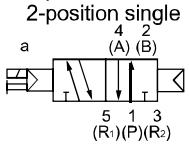


(A side valve: NO, B side valve: NO)

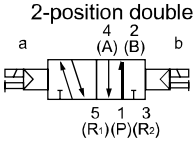


● 5-port valve

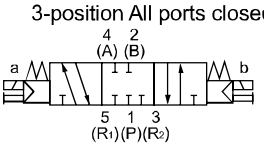
2-position single



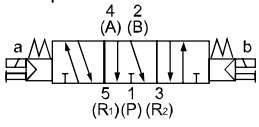
2-position double



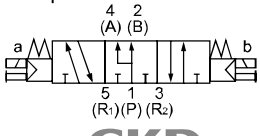
3-position All ports closed



3-position A/B/R connection



3-position P/A/B connection



Manifold common specifications

Descriptions		Content
Manifold		Integrated base
Mounting method		Direct mount/DIN rail mount
Supply and exhaust method		Common supply/common exhaust (With internal exhaust check valve)
Pilot exhaust method	Internal pilot	Main valve/pilot valve common exhaust (Pilot exhaust check valve built-in)
	External pilot	Main valve/pilot valve individual exhaust
Piping direction		Valve top direction
Valve and operation		Pilot operated soft spool valve
Working fluid		Compressed air
Max. working pressure MPa		0.7 (≈100 psi, 7 bar)
Min. working pressure MPa		0.2 (≈29 psi, 2 bar) (*3)
Proof pressure MPa		1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C		-5 (23°F) to 55 (131°F) (no freezing)
Fluid temperature °C		5 (41°F) to 55 (131°F)
Manual override		Non-locking/locking common type (standard)
Lubrication (*1)		Not required
Degree of protection (*2)		Dust-proof
Vibration resistance m/s^2		50 or less
Shock resistance m/s^2		300 or less
Atmosphere		Cannot be used in corrosive gas environments

*1: Use turbine oil Class 1 ISO VG32 for lubrication. Excessive or intermittent lubrication results in unstable operation.
*2: Avoid dripping water or oil, etc., during use. IP65 (jet-proof) applies for DIN terminal box specifications. However, the specified outer diameter of the applicable cord and tightening torque must be used for fixing in place.
*3: The working pressure range is 0 to 0.7 MPa when the external pilot (option code: K) is selected. Set the external pilot pressure between 0.2 and 0.7 MPa.

Electrical specifications

Descriptions		Content					
Rated voltage V		DC24	DC12	DC5	DC3	AC100	AC200
Voltage fluctuation range		±10%					
Holding current A (*4)	Standard	0.015 (0.017)	0.030 (0.034)	0.072 (0.082)	0.120 (0.136)	0.009 (0.009)	0.006 (0.006)
	Low exoergic/energy circuit	0.005	0.010	-		-	
Power consumption W (*4)	Standard	0.35 (0.40)		0.35 (0.40)		-	
	Low exoergic/energy circuit	0.1		-		-	
Apparent power VA (*4) (*5)	Standard	-		-		0.93 (0.98)	1.40
Thermal class		B					
Surge suppressor		Option					
Indicator		Lamp (option)					

*4: Values in ( ) apply when lamp is included. In addition, the type with low exoergic/energy-saving circuit is only available with lamp.
*5: 200 VAC is the value of DIN terminal box (with lamp).

Individual specifications

Descriptions			M3GA1/M4GA1		M3GA2/M4GA2		M3GA3/M4GA3	
			Direct mount	DIN rail mount	Direct mount	DIN rail mount	Direct mount	DIN rail mount
Max. station No.		Standard (Internal pilot)	20 stations	16 stations	20 stations	16 stations	20 stations	16 stations
		External pilot	12 stations	12 stations				
Port size	Rc thread, M5	A/B Port	Barbed fitting φ1.8 Push-in fitting φ1.8, φ4, φ6 M5		Push-in fitting φ4,φ6,φ8 Rc1/8		Push-in fitting φ6,φ8,φ10 Rc1/4	
		P/R1/R2 port	Rc1/8		Rc1/4		Rc3/8	
	NPT thread, M5	A/B Port	Push-in fitting φ1/8", φ5/32" M5		Push-in fitting φ1/4", φ5/16" 1/8NPT		Push-in fitting φ5/16", φ3/8" 1/4NPT (*6)	
		P/R1/R2 port	1/8NPT		1/4NPT		3/8NPT (*6)	
	G thread, M5	A/B Port	Push-in fitting φ4, φ6 M5		Push-in fitting φ4, φ6, φ8 G1/8		-	
		P/R1/R2 port	G1/8		G1/4		-	
Manifold base weight calculation formula (n: station No.) g		Standard	23n+52	25n+60	47n+64	49n+92	74n+88	76n+117
		External pilot	36n+105	38n+113	88n+135	90n+163	136n+194	138n+223

*6:Available as custom order.

Refer to "Cautions for Mounting the DIN Rail" (page 754), and select the manifold.
For 10 or over manifold station No. (5 stations for 4G3), use ports on both side for air supply and exhaust.
The manifold base weight is the value for screw specifications.

Flow characteristics

Model No.	Solenoid position		P→A/B		A/B→R1/R2	
			C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b
M3GA1 M4GA1	Two 3-port valves integrated		0.86	0.31	1.1(0.66)	0.19(0.22)
	2-position		0.99	0.20	1.2(0.70)	0.20(0.12)
	3-position	All ports closed	0.94	0.23	1.1 -	0.20 -
		ABR connection	0.93	0.18	1.3(0.70)	0.23(0.02)
		PAB connection	1.1	0.28	1.1 -	0.23 -
M3GA2 M4GA2	Two 3-port valves integrated		1.7	0.40	2.3(1.7)	0.29(0.32)
	2-position		2.3	0.36	2.9(1.7)	0.24(0.33)
	3-position	All ports closed	2.1	0.35	2.5 -	0.32 -
		ABR connection	2.2	0.37	2.9(1.8)	0.32(0.29)
		PAB connection	2.4	0.34	2.5 -	0.33 -
M3GA3 M4GA3	2-position		3.2	0.37	3.8(2.5)	0.13(0.28)
	3-position	All ports closed	2.9	0.35	3.3 -	0.35 -
		ABR connection	3.0	0.34	3.8(2.6)	0.12(0.27)
		PAB connection	3.3	0.30	3.3 -	0.32 -

*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*2: Values in ( ) are with the exhaust check valve.

Ozone-proof specifications · Coolant proof specifications

Can be selected with "How to order" Item Ⓔ option "A" on page 99.

Clean-room specifications

● Anti-dust generation structure for use in cleanrooms

** - Voltage - **P7***

Specifications for rechargeable battery (Catalog No. CC-1226A)

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

** - Voltage - **P4**

CE marking specifications

** - Voltage - **ST**

How to order

Manifold model No.

M 4GA1 1 0R - C6 - E2 H D - ○ - 3

* Be sure to fill in the "Manifold specifications sheet" (pages 206 to 220).

3 port manifold model No.

M 3GA1 1 0R - C6 - E2 H D - ○ - 3

● Single valve for mounting base

4GA1 1 9R - C6 - E2 H — 3

● 3-port discrete valve for mounting base

3GA1 1 9R - C6 - E2 H — 3

Ⓑ Solenoid position

Ⓐ Model No.

Ⓒ Port size

Ⓓ Electrical connections

Ⓔ Option

Ⓕ Mount

Ⓖ Station No.

Ⓗ Voltage

Code	Content		Ⓐ Model No. 3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
Ⓑ Solenoid position								
1	2-position single					●	●	●
2	2-position double					●	●	●
3	3-position all ports closed					●	●	●
4	3-position ABR connection					●	●	●
5	3-position PAB connection					●	●	●
1	2-position single normally closed *1		●	●	●			
11	2-position single normally open *1		●	●	●			
66	Two 3-port valves integrated *1/*2	A valve side: Normally closed B valve side: Normally closed	●	●				
67		A valve side: Normally closed B valve side: Normally open	●	●				
76		A valve side: Normally open B valve side: Normally closed	●	●				
77		A valve side: Normally open B valve side: Normally open	●	●				
8	Mix manifold (when there are multiple solenoid positions)		●	●	●	●	●	●

Port	4(A)/2(B) port	P/R1/R2 port (2) = Rc1/8 (3) = Rc1/4 (4) =Rc3/8					
CF	φ1.8 barbed fitting (compatible tube UP-9102-**)	(2)			(2)		
C18	φ1.8 push-in fitting (compatible tube UP-9402-**)	(2)			(2)		
C4	φ4 push-in fitting	(2)	(3)		(2)	(3)	
C6	φ6 push-in fitting	(2)	(3)	(4)	(2)	(3)	(4)
C8	φ8 push-in fitting		(3)	(4)		(3)	(4)
C10	φ10 push-in fitting			(4)			(4)
CX	Push-in fitting mix *3	(2)	(3)	(4)	(2)	(3)	(4)
M5	M5	(2)			(2)		
06	Rc1/8		(3)			(3)	
08	Rc1/4			(4)			(4)
Port	4(A)/2(B) port	P/R1/R2 port (5) = 1/8NPT, (6) = 1/4NPT, (7) = 3/8NPT					
C3N	φ1/8" push-in fitting	(5)			(5)		
C4N	φ5/32" push-in fitting	(5)			(5)		
C6N	φ1/4" push-in fitting		(6)			(6)	
C8N	φ5/16" push-in fitting		(6)	(7)		(6)	(7)
C10N	φ3/8" push-in fitting			(7)			(7)
CXN	Push-in fitting mix *3	(5)	(6)	(7)	(5)	(6)	(7)
M5N	M5	(5)			(5)		
06N	1/8NPT		(6)			(6)	
08N	1/4 NPT *4			(7)			(7)
Port	4(A)/2(B) port	P/R1/R2 port (8) = G1/8, (9) = G1/4					
C4G	φ4 push-in fitting	(8)	(9)		(8)	(9)	
C6G	φ6 push-in fitting	(8)	(9)		(8)	(9)	
C8G	φ8 push-in fitting		(9)			(9)	
CXG	Push-in fitting mix *3	(8)	(9)		(8)	(9)	
M5G	M5	(8)			(8)		
06G	G1/8		(9)			(9)	

Precautions for model No. selection

*1: Select M4GA*80R when mixing with 3, 5-port valves.
Further, select M3GA*80R when mixing with masking plate.

*2: Not compatible with combination with external pilot (K).
Dimensions are the same as those of the respective 2-position double solenoid.

*3: The push-in fitting cannot be mixed with the single valve's 4(A) or 2(B) port.

*4: Custom order.

		Ⓐ Model No.					
		3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
Ⓓ Electrical connections							
Blank	Grommet lead wire (300 mm) *13	●	●	●	●	●	●
B	DIN terminal box (Pg7) with surge suppressor/lamp *14		●	●		●	●
BN	DIN terminal box (Pg7) (without terminal box) with surge suppressor *14		●	●		●	●
E type connector (upward/lateral common)							
E0	Lead wire (300 mm) *15	●	●	●	●	●	●
E00	Lead wire (500 mm) *15	●	●	●	●	●	●
E01	Lead wire (1000 mm) *15	●	●	●	●	●	●
E02	Lead wire (2000 mm) *15	●	●	●	●	●	●
E03	Lead wire (3000 mm) *15	●	●	●	●	●	●
E0N	Without lead wire (without socket) *15	●	●	●	●	●	●
E1	Without lead wire (socket/terminal attached) *15	●	●	●	●	●	●
E2	Lead wire (300 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E20	Lead wire (500 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E21	Lead wire (1000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E22	Lead wire (2000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E23	Lead wire (3000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E2N	No lead wire (without socket), surge suppressor/indicator lamp	●	●	●	●	●	●
E3	No lead wire (with socket/terminal), surge suppressor/indicator lamp	●	●	●	●	●	●
EJ type connector (socket with cover, upward/lateral common)							
E01J	Lead wire (1000 mm) *15	●	●	●	●	●	●
E02J	Lead wire (2000 mm) *15	●	●	●	●	●	●
E03J	Lead wire (3000 mm) *15	●	●	●	●	●	●
E21J	Lead wire (1000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E22J	Lead wire (2000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
E23J	Lead wire (3000 mm), surge suppressor/indicator lamp	●	●	●	●	●	●
Ⓔ Option							
Blank	Non-locking/locking common manual override	●	●	●	●	●	●
M	Non-locking manual override	●	●	●	●	●	●
H	With exhaust check valve *5	●	●	●	●	●	●
K	External pilot *6	●	●	●	●	●	●
A	Ozone/coolant proof	●	●	●	●	●	●
S	Surgeless *7	●	●	●	●	●	●
E	Low exoergic/energy saving circuit *7, *8	●	●	●	●	●	●
F	A/B port filter built in *9	●	●	●	●	●	●
Z1	Air supply spacer *10	●	●	●	●	●	●
Z2	In-stop valve spacer *10, *11	●	●	●	●	●	●
Z3	Exhaust spacer *10	●	●	●	●	●	●
Ⓕ Mount							
Blank	Direct mount	●	●	●	●	●	●
D	DIN rail mount	●	●	●	●	●	●
Ⓖ Station No.							
2	2 stations	●	●	●	●	●	●
to	to						
20	Refer to page 90 for the max. station number per model.						
Ⓗ Voltage							
1	100 VAC (rectifier integrated)	●	●	●	●	●	●
2	200 VAC (rectifier integrated) *12		●	●		●	●
3	24 VDC	●	●	●	●	●	●
4	12 VDC	●	●	●	●	●	●
7	3 VDC	○	○	○	○	○	○
8	5 VDC	○	○	○	○	○	○

is not available.
○ indicates a custom order.

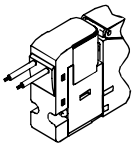
*5 : 3-position all ports closed and PAB connection are not provided with the exhaust check valve specifications (H). Refer to page 751 for details on the exhaust check valve.
*6 : Contact CKD when using a vacuum with the external pilot (K).
7 : E2 type and E2*J type connectors support 12/24 VDC only.
In addition, surgeless "S" and low exoergic/energy-saving circuit "E" cannot be selected together.
*8 : Surgeless specifications.
*9 : A filter is built into the P-port as standard.
*10: Specify the spacer mounting position/quantity in manifold specifications sheet.
Stacking of spacers is not possible.
Combination with the masking plate is not supported.
Refer to pages 186 to 190 for details.
*11: Not compatible with combination with external pilot (K).
*12: DIN terminal box only is supported.
*13: The grommet lead wire specifications are compatible with DC voltage only.
*14: AC voltages and 12/24 VDC are supported. In addition, a lamp comes with the terminal box.
*15: AC voltage is with a rectifier circuit.

Electrical connections

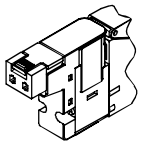
Discrete valve/individual wiring manifold

Blank Grommet lead wire

● Lead wire length
300 mm

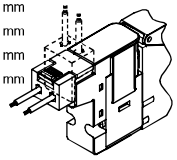


E1 E3 E type connector with socket/terminal

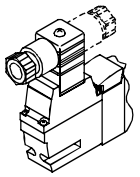


E0 E2 E type connector

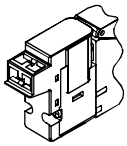
● Lead wire length
300 mm
500 mm
1000 mm
2000 mm
3000 mm



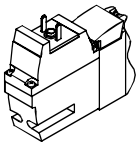
B DIN terminal box



E0N E2N E type connector without socket

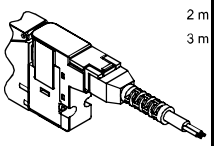


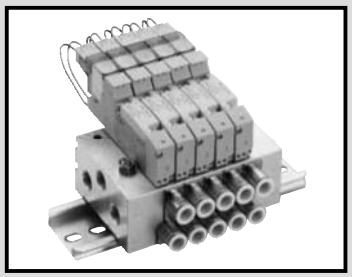
BN DIN terminal box (Without terminal box)



E0*J E2*J EJ type connector

● Lead wire length
1 m
2 m
3 m





Individual wiring manifold
Base piping
Direct mount/DIN rail mount

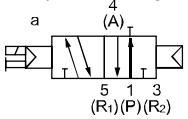
M3GB1/2 / M4GB1/2/3-(D) Series

● Cylinder bore size: φ20 to φ100

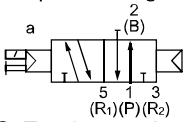
JIS symbol

● 3-port valve

2-position single NC

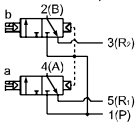


2-position single NO

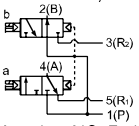


● Two 3-port valves integrated

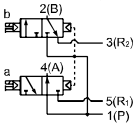
(A side valve: NC, B side valve: NC)



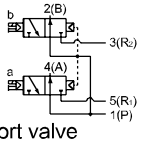
(A side valve: NC, B side valve: NO)



(A side valve: NO, B side valve: NC)

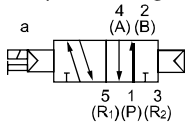


(A side valve: NO, B side valve: NO)

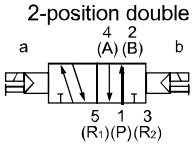


● 5-port valve

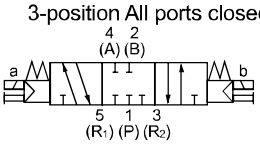
2-position single



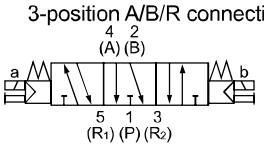
2-position double



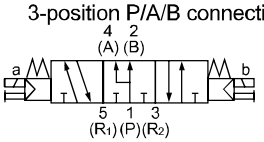
3-position All ports closed



3-position A/B/R connection



3-position P/A/B connection



Manifold common specifications

Descriptions		Content
Manifold		Integrated base
Mounting method		Direct mount/DIN rail mount
Supply and exhaust method		Common supply/common exhaust (With internal exhaust check valve)
Pilot exhaust method	Internal pilot	Main valve/pilot valve common exhaust (Pilot exhaust check valve built-in)
	External pilot	Main valve/pilot valve individual exhaust
Piping direction		Lateral direction from base
Valve and operation		Pilot operated soft spool valve
Working fluid		Compressed air
Max. working pressure MPa		0.7 (≈100 psi, 7 bar)
Min. working pressure MPa		0.2 (≈29 psi, 2 bar) (*3)
Proof pressure MPa		1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C		-5 (23°F) to 55 (131°F) (no freezing)
Fluid temperature °C		5 (41°F) to 55 (131°F)
Manual override		Non-locking/locking common type (standard)
Lubrication (*1)		Not required
Degree of protection (*2)		Dust-proof
Vibration resistance m/s^2		50 or less
Shock resistance m/s^2		300 or less
Atmosphere		Cannot be used in corrosive gas environments

*1: Use turbine oil Class 1 ISO VG32 for lubrication. Excessive or intermittent lubrication results in unstable operation.
*2: Avoid dripping water or oil, etc., during use. IP65 (jet-proof) applies for DIN terminal box specifications. However, the specified outer diameter of the applicable cord and tightening torque must be used for fixing in place.
*3: The working pressure range is 0 to 0.7 MPa when the external pilot (option code: K) is selected. Set the external pilot pressure between 0.2 and 0.7 MPa.

Electrical specifications

Descriptions		Content					
Rated voltage V		DC24	DC12	DC5	DC3	AC100	AC200
Voltage fluctuation range		±10%					
Holding current A (*4)	Standard	0.015 (0.017)	0.030 (0.034)	0.072 (0.082)	0.120 (0.136)	0.009 (0.009)	0.006 (0.006)
	Low exoergic/energy circuit	0.005	0.010	-		-	
Power consumption W (*4)	Standard	0.35 (0.40)		0.35 (0.40)		-	
	Low exoergic/energy circuit	0.1		-		-	
Apparent power VA (*4) (*5)	Standard	-		-		0.93 (0.98)	1.40
Thermal class		B					
Surge suppressor		Option					
Indicator		Lamp (option)					

*4: Values in ( ) apply when lamp is included. In addition, the type with low exoergic/energy-saving circuit is only available with lamp.
*5: 200 VAC is the value of DIN terminal box (with lamp).

Individual specifications

Descriptions			M3GB1/M4GB1		M3GB2/M4GB2		M4GB3	
			Direct mount	DIN rail mount	Direct mount	DIN rail mount	Direct mount	DIN rail mount
Max. station No.		Standard (Internal pilot)	20 stations	16 stations	20 stations	16 stations	20 stations	16 stations
		External pilot	12 stations	12 stations				
Port size	Rc thread, M5	A/B Port	Barbed fitting φ1.8 Push-in fitting φ1.8, φ4, φ6 φ8 (*6) M5		Push-in fitting φ4, φ6, φ8 φ10 (*6) Rc1/8		Push-in fitting φ6, φ8, φ10 Rc1/4	
		P/R1/R2 port	Rc1/8		Rc1/4		Rc3/8	
	NPT thread, M5	A/B Port	Push-in fitting φ1/8", φ5/32" M5		Push-in fitting φ1/4", φ5/16" 1/8NPT		Push-in fitting φ5/16", φ3/8" 1/4NPT (*6)	
		P/R1/R2 port	1/8NPT		1/4NPT		3/8NPT (*6)	
	G thread, M5	A/B Port	Push-in fitting φ4, φ6 M5		Push-in fitting φ4, φ6, φ8 G1/8		-	
		P/R1/R2 port	G1/8		G1/4		-	
Manifold base weight calculation formula (n: station No.) g		Standard	35n+61	36n+115	71n+106	73n+134	113n+170	115n+119
		External pilot	35n+106	36n+114	76n+135	78n+166	118n+194	120n+223

Refer to "Cautions for Mounting the DIN Rail" (page 754), and select the manifold.
For 10 or over manifold station No. (5 stations for 4G3), use ports on both side for air supply and exhaust.
The manifold base weight is the value for screw specifications.
*6: Available as custom order.

Flow characteristics

Model No.	Solenoid position		P→A/B		A/B→R1/R2	
			C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b
M3GB1 M4GB1	Two 3-port valves integrated		0.86	0.35	1.1(0.67)	0.22(0.23)
	2-position		1.1	0.22	1.2(0.70)	0.20(0.10)
	3-position	All ports closed	0.98	0.22	1.1 -	0.24 -
		ABR connection	0.97	0.35	1.3(0.68)	0.22(0.24)
		PAB connection	1.1	0.38	1.1 -	0.21 -
M3GB2 M4GB2	Two 3-port valves integrated		1.7	0.44	2.1(1.6)	0.32(0.30)
	2-position		2.4	0.34	2.7(1.7)	0.24(0.31)
	3-position	All ports closed	2.2	0.34	2.4 -	0.29 -
		ABR connection	2.2	0.34	2.8(1.8)	0.24(0.27)
		PAB connection	2.4	0.29	2.4 -	0.29 -
M4GB3	2-position		3.5	0.34	3.8(2.6)	0.11(0.27)
	3-position	All ports closed	3.1	0.33	3.3 -	0.22 -
		ABR connection	3.0	0.30	3.8(2.7)	0.11(0.22)
		PAB connection	3.6	0.36	3.3 -	0.28 -

*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*2: Values in ( ) are with the exhaust check valve.

Ozone-proof specifications / coolant proof specifications

Can be selected with “How to order” Item Ⓔ option “A” on page 115.

Clean-room specifications

● Anti-dust generation structure for use in cleanrooms

** - Voltage - **P7***

Specifications for rechargeable battery

(Catalog No. CC-1226A)

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

** - Voltage - **P4**

CE marking specifications

** - Voltage - **ST**

How to order

Manifold model No.

M 4GB1 1 0R - C6 - E2 H D - ○ - 3

3-port manifold model No.

M 3GB1 66 0R - C6 - E2 H D - ○ - 3

● Single valve for mounting base

4GB1 1 9R - 00 - E2 H — 3

● 3-port discrete valve for mounting base

3GB1 66 9R - 00 - E2 H — 3

- Ⓑ Solenoid position
- Ⓐ Model No.
- Ⓒ Port size *3 *4
- Ⓓ Electrical connections
- Ⓔ Option
- Ⓕ Mount
- Ⓖ Station No.
- Ⓗ Voltage

Precautions for model No. selection

*1: Select M4GB*80R when mixing with 3, 5-port valves. Further, select M3GB*80R when mixing with masking plate.
*2: Not compatible with combination with external pilot (K). Dimensions are the same as those of the respective 2-position double solenoid.
3: CL radial push-in fitting is compatible only with the single solenoid manifold. Long elbow is for A port and short elbow for B port.
*4: A and B ports are the same size for radial push-in fitting (upward) (downward).
*5: 4G1 C8 and 4G2 C10 do not support push-in fitting mixing.
*6: Custom order.

* Be sure to fill in the "Manifold specifications sheet" (pages 206 to 220).

Code	Content		Ⓐ Model No. 3GB1	3GB2	4GB1	4GB2	4GB3
Ⓑ Solenoid position							
1	2-position single				●	●	●
2	2-position double				●	●	●
3	3-position all ports closed				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
66	Two 3-port valves integrated *1/*2	A valve side: Normally closed B valve side: Normally closed	●	●			
67		A valve side: Normally closed B valve side: Normally open	●	●			
76		A valve side: Normally open B valve side: Normally closed	●	●			
77		A valve side: Normally open B valve side: Normally open	●	●			
8	Mix manifold (when there are multiple solenoid positions)		●	●	●	●	●

Port	4(A)/2(B) port		P/R1/R2 port (2) = Rc1/8 (3) = Rc1/4 (4) = Rc3/8				
Ⓒ Port size							
CF	φ1.8 barbed fitting (compatible tube UP-9102-**)		(2)		(2)		
C18	φ1.8 push-in fitting (compatible tube UP-9402-**)		(2)		(2)		
C4	φ4 push-in fitting		(2)	(3)	(2)	(3)	
C6	φ6 push-in fitting		(2)	(3)	(2)	(3)	(4)
C8	φ8 push-in fitting	*5, *6	(2)	(3)	(2)	(3)	(4)
C10	φ10 push-in fitting	*5, *6		(3)		(3)	(4)
CL18	φ1.8 radial push-in fitting upward (compatible tube UP-9402-**)				(2)		
CL4	Radial φ4 push-in fitting (upward)				(2)		
CL6	Radial φ6 push-in fitting (upward)				(2)	(3)	
CL8	Radial φ8 push-in fitting (upward)					(3)	(4)
CL10	Radial φ10 push-in fitting (upward)						(4)
CD18	φ1.8 radial push-in fitting downward (compatible tube UP-9402-**)		(2)		(2)		
CD4	Radial φ4 push-in fitting (downward)		(2)		(2)		
CD6	Radial φ6 push-in fitting (downward)		(2)	(3)	(2)	(3)	
CD8	Radial φ8 push-in fitting (downward)			(3)		(3)	(4)
CD10	Radial φ10 push-in fitting (downward)						(4)
CX	Push-in fitting mix		(2)	(3)	(2)	(3)	(4)
M5	M5		(2)		(2)		
06	Rc1/8			(3)		(3)	
08	Rc1/4						(4)
Port	4(A)/2(B) port		P/R1/R2 port (5) = 1/8NPT, (6) = 1/4NPT, (7) = 3/8NPT				
C3N	φ1/8" push-in fitting		(5)		(5)		
C4N	φ5/32" push-in fitting		(5)		(5)		
C6N	φ1/4" push-in fitting			(6)		(6)	
C8N	φ5/16" push-in fitting			(6)		(6)	(7)
C10N	φ3/8" push-in fitting						(7)
CL3N	φ1/8" radial push-in fitting (upward)	*6			(5)		
CL4N	φ5/32" radial push-in fitting (upward)	*6			(5)		
CL6N	φ1/4" radial push-in fitting (upward)	*6				(6)	
CL8N	φ5/16" radial push-in fitting (upward)	*6				(6)	
CXN	Push-in fitting mix		(5)	(6)	(5)	(6)	(7)
M5N	M5		(5)		(5)		
06N	1/8NPT			(6)		(6)	
08N	1/4NPT	*6					(7)
Port	4(A)/2(B) port		P/R1/R2 port (8) = G1/8, (9) = G1/4				
C4G	φ4 push-in fitting		(8)	(9)	(8)	(9)	
C6G	φ6 push-in fitting		(8)	(9)	(8)	(9)	
C8G	φ8 push-in fitting			(9)		(9)	
CL4G	Radial φ4 push-in fitting (upward)	*6			(8)		
CL6G	Radial φ6 push-in fitting (upward)	*6			(8)	(9)	
CL8G	Radial φ8 push-in fitting (upward)	*6				(9)	
CXG	Push-in fitting mix		(8)	(9)	(8)	(9)	
M5G	M5		(8)		(8)		
06G	G1/8			(9)		(9)	
00	Discrete valve for mounting base		●	●	●	●	●

		Ⓐ Model No.				
		3GB1	3GB2	4GB1	4GB2	4GB3
Ⓓ Electrical connections						
Blank	Grommet lead wire (300 mm) *17	●	●	●	●	●
B	DIN terminal box (Pg7) with surge suppressor/lamp *18		●		●	●
BN	DIN terminal box (Pg7) (without terminal box) with surge suppressor *18		●		●	●
E type connector (upward/lateral common)						
E0	Lead wire (300 mm) *19	●	●	●	●	●
E00	Lead wire (500 mm) *19	●	●	●	●	●
E01	Lead wire (1000 mm) *19	●	●	●	●	●
E02	Lead wire (2000 mm) *19	●	●	●	●	●
E03	Lead wire (3000 mm) *19	●	●	●	●	●
E0N	Without lead wire (without socket) *19	●	●	●	●	●
E1	Without lead wire (socket/terminal attached) *19	●	●	●	●	●
E2	Lead wire (300 mm) with surge suppressor/indicator lamp	●	●	●	●	●
E20	Lead wire (500 mm) with surge suppressor/indicator lamp	●	●	●	●	●
E21	Lead wire (1000 mm) with surge suppressor/indicator lamp	●	●	●	●	●
E22	Lead wire (2000 mm) with surge suppressor/indicator lamp	●	●	●	●	●
E23	Lead wire (3000 mm) with surge suppressor/indicator lamp	●	●	●	●	●
E2N	Without lead wire (without socket) with surge suppressor/indicator lamp	●	●	●	●	●
E3	Without lead wire (socket/terminal attached) with surge suppressor/indicator lamp	●	●	●	●	●
EJ type connector (socket with cover, upward/lateral common)						
E01J	Lead wire (1000 mm) *19	●	●	●	●	●
E02J	Lead wire (2000 mm) *19	●	●	●	●	●
E03J	Lead wire (3000 mm) *19	●	●	●	●	●
E21J	Lead wire (1000 mm) with surge suppressor/indicator lamp	●	●	●	●	●
E22J	Lead wire (2000 mm) with surge suppressor/indicator lamp	●	●	●	●	●
E23J	Lead wire (3000 mm) with surge suppressor/indicator lamp	●	●	●	●	●
Ⓔ Option						
Blank	Non-locking/locking common manual override	●	●	●	●	●
M	Non-locking manual override	●	●	●	●	●
H	With exhaust check valve *7	●	●	●	●	●
K	External pilot *8	●	●	●	●	●
A	Ozone/coolant proof	●	●	●	●	●
S	Surgeless *9	●	●	●	●	●
E	Low exoergic/energy saving circuit *9, *10	●	●	●	●	●
F	A/B port filter built in *11	●	●	●	●	●
Z1	Air supply spacer *12	●	●	●	●	●
Z2	In-stop valve spacer *12, *13	●	●	●	●	●
Z3	Exhaust spacer *12	●	●	●	●	●
Z6	Spacer pilot check valve *12, *14				●	
Ⓕ Mount						
Blank	Direct mount *15	●	●	●	●	●
D	DIN rail mount	●	●	●	●	●
Ⓖ Station No.						
2	2 stations	●	●	●	●	●
to	to					
20	Refer to page 112 for the max. station number per model.					
Ⓗ Voltage						
1	100 VAC (rectifier integrated)	●	●	●	●	●
2	200 VAC (rectifier integrated) *16		●		●	●
3	24 VDC	●	●	●	●	●
4	12 VDC	●	●	●	●	●
7	3 VDC	○	○	○	○	○
8	5 VDC	○	○	○	○	○

is not available.

○ indicates a custom order.

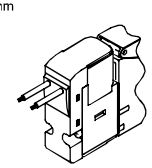
*7 : 3-position all ports closed and PAB connection are not provided with the exhaust check valve specifications (H).
Refer to page 751 for details on the exhaust check valve.
*8 : Contact CKD when using a vacuum with the external pilot (K).
9 : E2 type and E2*J type connectors support 12/24 VDC only.
In addition, surgeless "S" and low exoergic/energy-saving circuit "E" cannot be selected together.
*10: Surgeless specifications.
*11: A filter is built into the P-port as standard.
*12: Specify the spacer mounting position/quantity in manifold specifications sheet.
Stacking of spacers is not possible.
Combination with the masking plate is not supported.
Refer to pages 186 to 190 for details.
*13: Not compatible with combination with external pilot (K).
*14: Combination with radial push-in fittings (upward) is not supported.
*15: The direct mount of M4GB1 cannot be changed to the DIN rail mount after purchasing.
*16: DIN terminal box only is supported.
*17: The grommet lead wire specifications are compatible with DC voltage only.
*18: AC voltages and 12/24 VDC are supported. In addition, a lamp comes with the terminal box.
*19: AC voltage is with a rectifier circuit.

Electrical connections

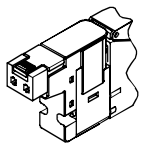
Discrete valve/individual wiring manifold

Blank Grommet lead wire

● Lead wire length
300 mm

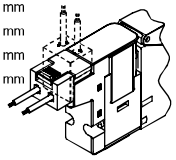


E1 E3 E type connector with socket/terminal

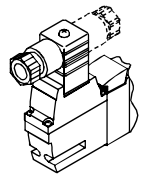


E0 E2 E type connector

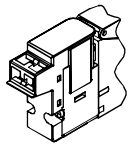
● Lead wire length
300 mm
500 mm
1000 mm
2000 mm
3000 mm



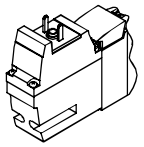
B DIN terminal box



E0N E2N E type connector without socket

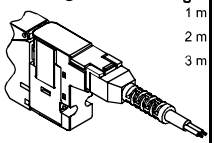


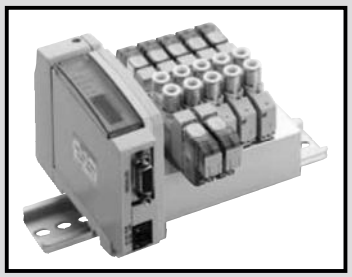
BN DIN terminal box (without terminal box)



E0*J E2*J EJ type connector

● Lead wire length
1 m
2 m
3 m





Reduced wiring manifold
Body piping
Direct mount/DIN rail mount

M3GA1/2/3-T*(D) Series
M4GA1/2/3-T*(D) Series

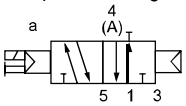
• Cylinder bore size: φ20 to φ100

RoHS CAD

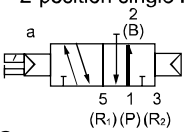
JIS symbol

● 3-port valve

2-position single NC

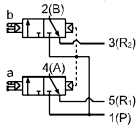


2-position single NO

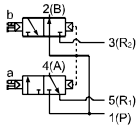


● Two 3-port valves integrated

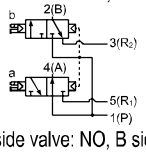
(A side valve: NC, B side valve: NC)



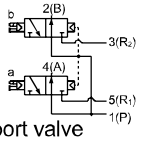
(A side valve: NC, B side valve: NO)



(A side valve: NO, B side valve: NC)

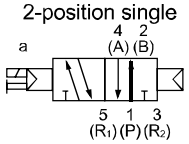


(A side valve: NO, B side valve: NO)

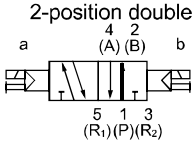


● 5-port valve

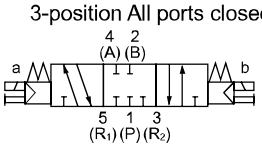
2-position single



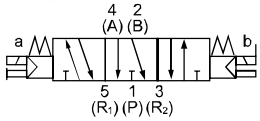
2-position double



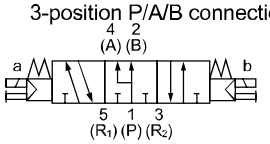
3-position All ports closed



3-position A/B/R connection



3-position P/A/B connection



Manifold common specifications

Descriptions		Content
Manifold		Reduced wiring integrated base
Mounting method		Direct mount/DIN rail mount
Supply and exhaust method		Common supply/common exhaust (With internal exhaust check valve)
Pilot exhaust method	Internal pilot	Main valve/pilot valve common exhaust (Pilot exhaust check valve built-in)
	External pilot	Main valve/pilot valve individual exhaust
Piping direction		Valve top direction
Valve and operation		Pilot operated soft spool valve
Working fluid		Compressed air
Max. working pressure MPa		0.7 (≈100 psi, 7 bar)
Min. working pressure MPa		0.2 (≈29 psi, 2 bar) (*3)
Proof pressure MPa		1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C		-5 (23°F) to 55 (131°F) (no freezing)
Fluid temperature °C		5 (41°F) to 55 (131°F)
Manual override		Non-locking/locking common type (standard)
Lubrication (*1)		Not required
Degree of protection (*2)		Dust-proof
Vibration resistance m/s^2		50 or less
Shock resistance m/s^2		300 or less
Atmosphere		Cannot be used in corrosive gas environments

*1 Use turbine oil Class 1 ISO VG32 for lubrication. Excessive or intermittent lubrication results in unstable operation.
*2 Avoid dripping water or oil, etc., during use.
*3 The working pressure range is 0 to 0.7 MPa when the external pilot (option code: K) is selected. Set the external pilot pressure between 0.2 and 0.7 MPa.

Electrical specifications

Descriptions		Content		
		T1□, T30□, T5□		T6□, T8□
Rated voltage V		DC24	DC12	DC24
Voltage fluctuation range (*4)		±10%		+10%, -5%
Holding current A	Standard	0.017	0.034	0.017
	Low exoergic/energy circuit	0.005	0.010	0.005
Power consumption W	Standard	0.4		
	Low exoergic/energy circuit	0.1		
Thermal class		B		
Surge suppressor (*5)		Zener diode		
Indicator		LED		

*4 : T6□ and T8□ (serial transmission) may experience voltage drops due to internal circuitry, so care should be taken when regulating voltages.
*5 : If low exoergic/energy saving circuit or surgeless types are selected then there will be a diode.

Common specifications

Descriptions		M3GA1/M4GA1	M3GA2/M4GA2	M3GA3/M4GA3
Port size	A/B Port	Barbed fitting φ1.8 Push-in fitting φ1.8, φ4, φ6 M5	Push-in fitting φ4, φ6, φ8 Rc1/8	Push-in fitting φ6, φ8, φ10 Rc1/4
	P/R1/R2 port	Rc1/8	Rc1/4	Rc3/8

T1□, T30□, T5□

Descriptions		M3GA1/M4GA1		M3GA2/M4GA2		M3GA3/M4GA3	
		Direct mount	DIN rail mount	Direct mount	DIN rail mount	Direct mount	DIN rail mount
Max. station No.	Standard (Internal pilot)	20 stations	16 stations	20 stations	16 stations	16 stations	
	External pilot	12 stations					
Manifold base weight Calculation formula (n: Station No.) g	Standard	29n+215	31n+228	54n+264	56n+297	84n+320	86n+354
	External pilot	44n+334	46n+347	96n+433	96n+468	149n+554	151n+583

T6□

Descriptions		M3GA1/M4GA1	M3GA2/M4GA2	M3GA3/M4GA3
		DIN rail mount	DIN rail mount	DIN rail mount
Max. station No.	Standard (Internal pilot)	16 stations	16 stations	16 stations
	External pilot	12 stations		
Manifold base weight Calculation formula (n: Station No.) g	Standard	31n+375	56n+444	86n+501
	External pilot	46n+494	98n+615	151n+731

T8□

Descriptions		M3GA1/M4GA1		M3GA2/M4GA2		M3GA3/M4GA3	
		Direct mount	DIN rail mount	Direct mount	DIN rail mount	Direct mount	DIN rail mount
Max. station No.	Standard (Internal pilot)	20 stations	16 stations	20 stations	16 stations	16 stations	
	External pilot	12 stations					
Manifold base weight Calculation formula (n: Station No.) g	Standard	50n+305	52n+332	57n+259	60n+290	150n+384	153n+416
	External pilot	51n+313	54n+340	102n+336	105n+368	169n+417	173n+449

The manifold base weight is the value for screw connection specifications with DIN rail, wiring block or slave unit.
The max. station number of the manifold is limited by the max. number of solenoid for each of the following wiring specifications.

Flow characteristics

Model No.	Solenoid position		P→A/B		A/B→R1/R2	
			C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b
M3GA1 M4GA1	Two 3-port valves integrated		0.86	0.31	1.1(0.66)	0.19(0.22)
	2-position		0.99	0.20	1.2(0.70)	0.20(0.12)
	3-position	All ports closed	0.94	0.23	1.1 -	0.20 -
		ABR connection	0.93	0.18	1.3(0.70)	0.23(0.02)
		PAB connection	1.1	0.28	1.1 -	0.23 -
M3GA2 M4GA2	Two 3-port valves integrated		1.7	0.40	2.3(1.7)	0.29(0.32)
	2-position		2.3	0.36	2.9(1.7)	0.24(0.33)
	3-position	All ports closed	2.1	0.35	2.5 -	0.32 -
		ABR connection	2.2	0.37	2.9(1.8)	0.32(0.29)
		PAB connection	2.4	0.34	2.5 -	0.33 -
M3GA3 M4GA3	2-position		3.2	0.37	3.8(2.5)	0.13(0.28)
	3-position	All ports closed	2.9	0.35	3.3 -	0.35 -
		ABR connection	3.0	0.34	3.8(2.6)	0.12(0.27)
		PAB connection	3.3	0.30	3.3 -	0.32 -

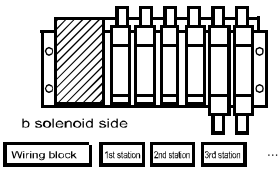
*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C.
*2: Values in ( ) are with the exhaust check valve.

Wiring specifications

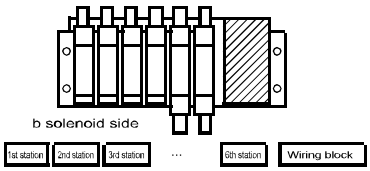
Descriptions	T10□ Common term. block	T11□ Common term. block	T30□ D sub-connector	T50□ Flat cable 20-pin	T51□ Flat cable 20-pin	T52□ Flat cable 10-pin	T53□ Flat cable 26-pin
Connector and terminal block specifications	M3 thread fastening 18 terminals	Clamping 26 terminals	D sub-connector 25-pin	MIL-C-83503 standard compliant pressure welding socket 20-pin	MIL-C-83503 standard compliant pressure welding socket 20-pin	MIL-C-83503 standard compliant pressure welding socket 10-pin	MIL-C-83503 standard compliant pressure welding socket 26-pin
Max. number of solenoids	16 points	24 points	24 points	16 points	18 points	8 points	24 points
Manifold internal wiring	Details on pages 718 to 725						

Wiring block position
Blank: Left side
R: Right side

Left side: T□ a solenoid side

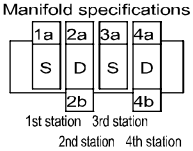


Right side: T□R a solenoid side



Array method
Blank: Standard sequential
W: Double wiring

(Example) For T50□
Manifold specifications



Standard wiring (sequential): Blank

Connector pin No.	1	2	3	4	5	6
Valve solenoid No.	1a	2a	2b	3a	4a	4b

Double wiring: W

Connector pin No.	1	2	3	4	5	6	7	8
Valve solenoid No.	1a	Blank	2a	2b	3a	Blank	4a	4b

Serial transmission slave unit specifications

Descriptions		T6G1 *1	T6C0 *2 T6C1	T6A0 *3 T6A1	T6E0 T6E1	T6J0 *3 T6J1
Network name		CC-Link	CompoBus/S	UNIWIRE SYSTEM	S-LINK	UNIWIRE H SYSTEM
Power supply voltage	Unit side	24 VDC ±10%		24 VDC +10% -5% (Unit power supply/valve power supply common terminal)		
	Valve side	24 VDC +10% -5%				
Current consumption	Unit side	100 mA or less (when all output points are ON)		100 mA or less (when all output points are ON) Load current is not included		
	Valve side	15 mA or less (when all output points are OFF)				
Output points		16 points	T6□0: 8 points T6□1: 16 points			
Occupied number		1 station	T6C0: 1 node address (in 8-point mode) T6C1: 2 node address (8-point mode)	T6A0: Output 8 points T6A1: Output 16 points	T6E0:FAN-in:3 T6E1:FAN-in:3	T6J0: Output 8 points T6J1: Output 16 points
Operation display		LED (power supply and communication status)				

*1: CC-Link is ver. 1.10.
*2: Long-distance communication mode is not supported. Contact CKD for details on support.
*3: Transmission point count of 128 points and transmission distance of 200 m are supported. Contact CKD for other specifications.

Serial transmission slave unit specifications

Descriptions		T8G1 T8G2	T8GP1 T8GP2	T8P1 T8P2	T8PP1 T8PP2	T8EC1 T8EC2	T8ECP1 T8ECP2	T8EN1 T8EN2	T8ENP1 T8ENP2
Communication system name		CC-Link ver1.10		PROFIBUS-DP(V0)		EtherCAT		EtherNet/IP	
Power supply voltage	Unit side	24 VDC ±10%							
	Valve side	24 VDC +10%, -5%							
Current consumption	Unit side	60 mA or less (when all output points are ON)		60 mA or less (when all output points are ON)		110 mA or less (when all output points are ON)		120 mA or less (when all output points are ON)	
	Valve side	T8□1: 15 mA or less T8□2: 20 mA or less (When all output points are ON) Load current is not included							
Output points		T8□1: 16 points T8□2: 32 points							
Occupied number		1 station							
Operation display		LED (power supply and communication status)							
Output		NPN output	PNP output	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output

M$^{3}_{4}$GA1/2/3-T*(D) Series

Reduced wiring manifold; body piping

How to order

Manifold model No.

M 4GA1 1 0R - C6 - T30 W H D - ○ - 3

3 port manifold model No.

M 3GA1 1 0R - C6 - T30 W H D - ○ - 3

● Single valve for mounting base

4GA1 1 9R - C6 - A2N ○ H — 3

● 3-port discrete valve for mounting base

3GA1 1 9R - C6 - A2N ○ H — 3

Ⓑ Solenoid position

Ⓐ Model No.

A2N indicates the A type (downward) connector, with lamp/surge suppressor and without lead wire.

Ⓒ Port size

Ⓓ Reduced wiring connection
Zener diode is used as a surge suppressor.

Ⓔ Terminal/connector pin array

Ⓕ Option

Ⓖ Mount

Ⓗ Station No.

Ⓘ Voltage

● Refer to page 721 for the model No. of cables with D sub-connector.
● Refer to page 717 for the model No. of cables for flat cable connector.

⚠ Precautions for model No. selection

*1 Select M4GA*80R when mixing with 3, 5-port valves. Further, select M3GA*80R when mixing with masking plate.
*2 Not compatible with combination with external pilot (K). Dimensions are the same as those of the respective 2-position double solenoid.
*3 The push-in fitting cannot be mixed with the single valve's 4(A) or 2(B) port.
4 Blank...The wiring will be based on the type of valve used. W...All wired for double solenoid valves regardless of the type of valve used.
*5 Spare wiring (A type socket assembly) is included on the cap side for single types. A holder for retaining the socket assembly is included for single unit valves (A2N). Refer to page 194 for details.
*6 3-position all ports closed and PAB connection are not provided with the exhaust check valve specifications (H). Refer to page 751 for details on the exhaust check valve.
*7 Contact CKD when using a vacuum with the external pilot (K).
*8 Surgeless "S" and low exoergic/ energy-saving circuit "E" cannot be selected together.
*9 Surgeless specifications.
*10 A filter is built into the P-port as standard.
*11 Specify the spacer mounting position/quantity in manifold specifications sheet. Stacking of spacers is not possible. Combination with the masking plate is not supported. Refer to pages 186 to 190 for details.
*12 Not compatible with combination with external pilot (K).

* Be sure to fill in the "Manifold specifications sheet" (pages 206 to 220).

Code	Content		Ⓐ Model No. 3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
Ⓑ Solenoid position								
1	2-position single					●	●	●
2	2-position double					●	●	●
3	3-position all ports closed					●	●	●
4	3-position ABR connection					●	●	●
5	3-position PAB connection					●	●	●
1	2-position single normally closed	*1	●	●	●			
11	2-position single normally open	*1	●	●	●			
66	Two 3-port valves integrated *1/*2	A side valve: Normally closed B side valve: Normally closed	●	●				
67		A side valve: Normally closed B side valve: Normally open	●	●				
76		A side valve: Normally open B side valve: Normally closed	●	●				
77		A side valve: Normally open B side valve: Normally open	●	●				
8	Mix manifold (when there are multiple solenoid positions)		●	●	●	●	●	●

Port	4(A)/2(B) port		P/R1/R2 port (2) = Rc1/8, (3) = Rc1/4, (4) = Rc3/8					
Ⓒ Port size								
CF	φ1.8 barbed fitting (compatible tube UP-9102-**)		(2)			(2)		
C18	φ1.8 push-in fitting (compatible tube UP-9402-**)		(2)			(2)		
C4	φ4 push-in fitting		(2)	(3)		(2)	(3)	
C6	φ6 push-in fitting		(2)	(3)	(4)	(2)	(3)	(4)
C8	φ8 push-in fitting			(3)	(4)		(3)	(4)
C10	φ10 push-in fitting				(4)			(4)
CX	Push-in fitting mix	*3	(2)	(3)	(4)	(2)	(3)	(4)
M5	M5		(2)			(2)		
06	Rc1/8			(3)			(3)	
08	Rc1/4				(4)			(4)

Ⓓ Reduced wiring (lamp and surge suppressor provided as standard)	
Refer to the next page for electrical connections.	

Ⓔ Terminal/connector pin array								
Blank	Standard wiring	*4	●	●	●	●	●	●
W	Double wiring	*4	●	●	●	●	●	●
W1	Double wiring (with single spare wiring)	*4, *5	●	●	●	●	●	●
Ⓕ Option								
Blank	Non-locking/locking common manual override		●	●	●	●	●	●
M	Non-locking manual override		●	●	●	●	●	●
H	With exhaust check valve	*6	●	●	●	●	●	●
K	External pilot	*7	●	●	●	●	●	●
A	Ozone/coolant proof		●	●	●	●	●	●
S	Surgeless	*8	●	●	●	●	●	●
E	Low exoergic/energy saving circuit	*8, *9	●	●	●	●	●	●
F	A/B port filter built in	*10	●	●	●	●	●	●
Z1	Air supply spacer	*11	●	●	●	●	●	●
Z2	In-stop valve spacer	*11, *12	●	●	●	●	●	●
Z3	Exhaust spacer	*11	●	●	●	●	●	●
Ⓖ Mount								
Blank	Direct mount		●	●	●	●	●	●
D	DIN rail mount		●	●	●	●	●	●
Ⓗ Station No.								
2	2 stations		●	●	●	●	●	●
to	to							
20	Refer to page 136 for the max. station number per model.							
Ⓘ Voltage								
3	24 VDC		●	●	●	●	●	●
4	12 VDC		●	●	●	●	●	●

is not available.

			Ⓐ Model No.					
			3GA1	3GA2	3GA3	4GA1	4GA2	4GA3
Ⓓ Reduced wiring (lamp and surge suppressor provided as standard) 12/24 VDC								
T10	Common terminal block (M3 thread)	Left-sided specifications	●	●	●	●	●	●
T10R		Right-sided specifications	●	●	●	●	●	●
T11	Common terminal block (clamping)	Left-sided specifications	●	●	●	●	●	●
T11R		Right-sided specifications	●	●	●	●	●	●
T30	D sub-connector	Left-sided specifications	●	●	●	●	●	●
T30R		Right-sided specifications	●	●	●	●	●	●
T50	20-pin flat cable connector (with power supply terminal)	Left-sided specifications	●	●	●	●	●	●
T50R		Right-sided specifications	●	●	●	●	●	●
T51	20-pin flat cable connector (without power supply terminal)	Left-sided specifications	●	●	●	●	●	●
T51R		Right-sided specifications	●	●	●	●	●	●
T52	10-pin flat cable connector (without power supply terminal)	Left-sided specifications	●	●	●	●	●	●
T52R		Right-sided specifications	●	●	●	●	●	●
T53	26-pin flat cable connector (without power supply terminal)	Left-sided specifications	●	●	●	●	●	●
T53R		Right-sided specifications	●	●	●	●	●	●
Ⓓ Serial transmission (lamp/surge suppressor provided as standard) 24 VDC								
T6A0	UNIWIRE SYSTEM	NPN 8 points	●	●	●	●	●	●
T6A1		NPN 16 points	●	●	●	●	●	●
T6C0	CompoBus/S	NPN 8 points	●	●	●	●	●	●
T6C1		NPN 16 points	●	●	●	●	●	●
T6E0	S-LINK	NPN 8 points	●	●	●	●	●	●
T6E1		NPN 16 points	●	●	●	●	●	●
T6G1	CC-Link	NPN 16 points	●	●	●	●	●	●
T6J0	UNIWIRE H SYSTEM	NPN 8 points	●	●	●	●	●	●
T6J1		NPN 16 points	●	●	●	●	●	●
T8G1	CC-Link (thin)	NPN 16 points	●	●	●	●	●	●
T8G2		NPN 32 points	●	●	●	●	●	●
T8GP1		PNP 16 points	●	●	●	●	●	●
T8GP2		PNP 32 points	●	●	●	●	●	●
T8P1	PROFIBUS-DP (thin)	NPN 16 points	●	●	●	●	●	●
T8P2		NPN 32 points	●	●	●	●	●	●
T8PP1		PNP 16 points	●	●	●	●	●	●
T8PP2		PNP 32 points	●	●	●	●	●	●
T8EC1	EtherCAT (thin)	NPN 16 points	●	●	●	●	●	●
T8EC2		NPN 32 points	●	●	●	●	●	●
T8ECP1		PNP 16 points	●	●	●	●	●	●
T8ECP2		PNP 32 points	●	●	●	●	●	●
T8EN1	EtherNet/IP (thin)	NPN 16 points	●	●	●	●	●	●
T8EN2		NPN 32 points	●	●	●	●	●	●
T8ENP1		PNP 16 points	●	●	●	●	●	●
T8ENP2		PNP 32 points	●	●	●	●	●	●
A2N	Without lead wire (without socket)	with surge suppressor/indicator lamp	●	●	●	●	●	●

Ozone-proof specifications · Coolant proof specifications

Can be selected with “How to order” Item Ⓕ option “A” on page 138.

Clean-room specifications

● Anti-dust generation structure for use in cleanrooms

** - Voltage - **P7***

Specifications for rechargeable battery (Catalog No. CC-1226A)

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

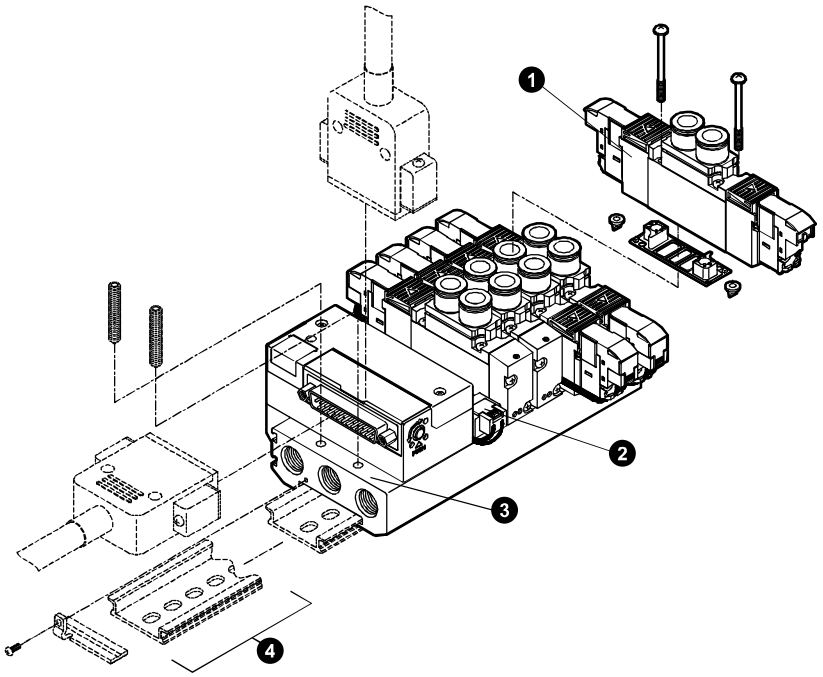
** - Voltage - **P4**

CE marking specifications

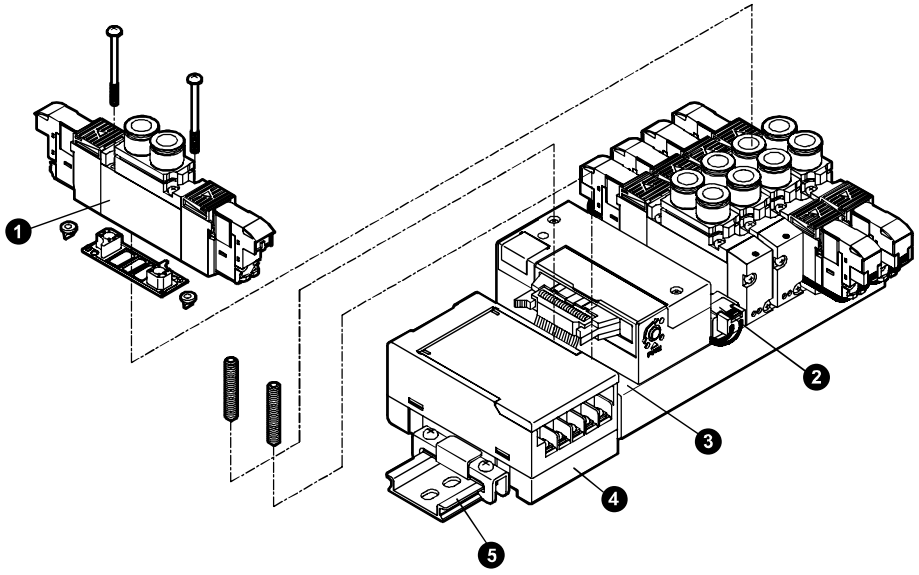
** - Voltage - **ST**

Manifold components explanation and parts list

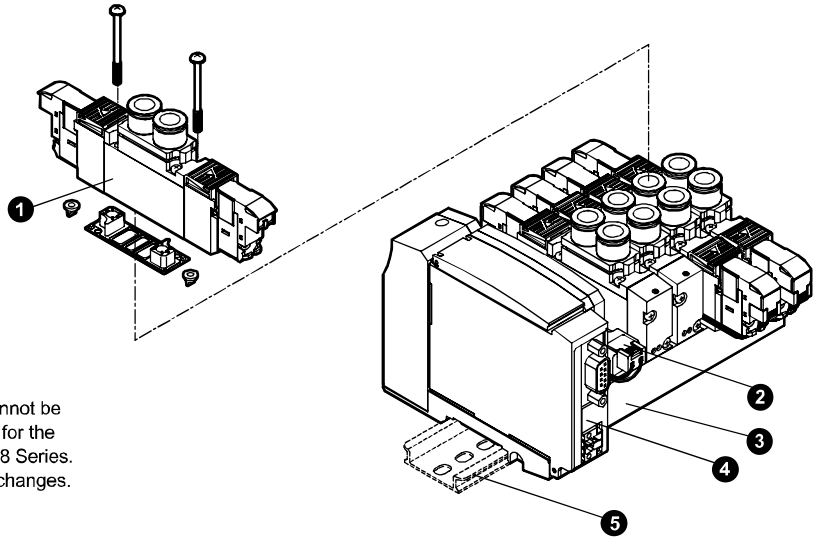
●T30



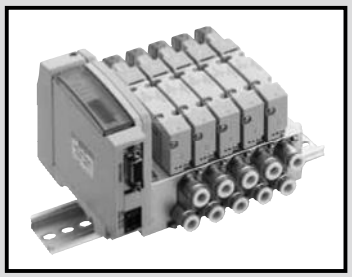
●T6D



●T8*



* Mount (direct, DIN rail) cannot be changed after purchasing for the M4GA2-T8 and M4GA3-T8 Series. M4GA1-T8 Series allows changes.



Reduced wiring manifold
Base piping
Direct mount/DIN rail mount

M3GB1/2-T*(D) Series
M4GB1/2/3-T*(D) Series

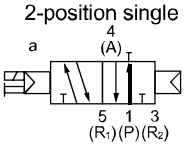
• Cylinder bore size: φ20 to φ100

RoHS CAD

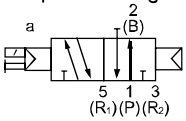
JIS symbol

● 3-port valve

2-position single NC

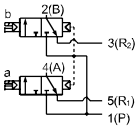


2-position single NO

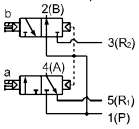


● Two 3-port valves integrated

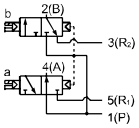
(A side valve: NC, B side valve: NC)



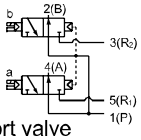
(A side valve: NC, B side valve: NO)



(A side valve: NO, B side valve: NC)

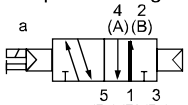


(A side valve: NO, B side valve: NO)

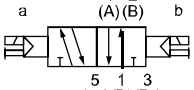


● 5-port valve

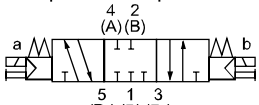
2-position single



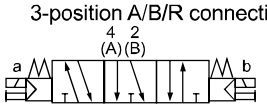
2-position double



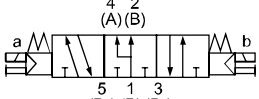
3-position All ports closed



3-position A/B/R connection



3-position P/A/B connection



Manifold common specifications

Descriptions		Content
Manifold		Reduced wiring integrated base
Mounting method		Direct mount/DIN rail mount
Supply and exhaust method		Common supply/common exhaust (With internal exhaust check valve)
Pilot exhaust method	Internal pilot	Main valve/pilot valve common exhaust (Pilot exhaust check valve built-in)
	External pilot	Main valve/pilot valve individual exhaust
Piping direction		Lateral direction from base
Valve and operation		Pilot operated soft spool valve
Working fluid		Compressed air
Max. working pressure MPa		0.7 (≈100 psi, 7 bar)
Min. working pressure MPa		0.2 (≈29 psi, 2 bar) (*3)
Proof pressure MPa		1.05 (≈150 psi, 10.5 bar)
Ambient temperature °C		-5 (23°F) to 55 (131°F) (no freezing)
Fluid temperature °C		5 (41°F) to 55 (131°F)
Manual override		Non-locking/locking common (standard)
Lubrication (*1)		Not required
Degree of protection (*2)		Dust-proof
Vibration resistance m/s²		50 or less
Shock resistance m/s²		300 or less
Atmosphere		Cannot be used in corrosive gas environments

Electrical specifications

Descriptions		Content		
Rated voltage V		T1□, T30□, T5□		T6□, T8□
		DC24	DC12	DC24
V fluctuation range (*4)		±10%		+10%, -5%
Holding current A	Standard	0.017	0.034	0.017
	With low exoergic/ energy saving circuit	0.005	0.010	0.005
Power (W)	Standard	0.4		
	With low exoergic/ energy saving circuit	0.1		
Thermal class		B		
Surge suppressor (*5)		Zener diode		
Indicator		LED		

*1 Use turbine oil Class 1 ISO VG32 for lubrication. Excessive or intermittent lubrication results in unstable operation.
*2 Avoid dripping water or oil, etc., during use.
*3 The working pressure range is 0 to 0.7 MPa when the external pilot (option code: K) is selected. Set the external pilot pressure between 0.2 and 0.7 MPa.
*4 T6□ and T8□ (serial transmission) may experience voltage drops due to internal circuitry, so care should be taken when regulating voltages.
*5 If low exoergic/energy saving circuit or surgeless types are selected then there will be a diode.

Common specifications

Descriptions		M3GB1/M4GB1	M3GB2/M4GB2	M3GB3/M4GB3
Port size	A/B Port	Barbed fitting φ1.8 Push-in fitting φ1.8, φ4, φ6, φ8 (*6) M5	Push-in fitting φ4, φ6, φ8, φ10 (*6) Rc1/8	Push-in fitting φ6, φ8, φ10 Rc1/4
	P/R1/R2 port	Rc1/8	Rc1/4	Rc3/8

*6 Available as custom order.

T1□, T30□, T5□

Descriptions		M3GB1/M4GB1		M3GB2/M4GB2		M3GB3/M4GB3	
		Direct mount	DIN rail mount	Direct mount	DIN rail mount	Direct mount	DIN rail mount
Max. station No.	Standard (Internal pilot)	20 stations	16 stations	20 stations	16 stations	16 stations	
	External pilot	12 stations					
Manifold base weight calculation formula (n: station No.) g	Standard	43n+335	45n+348	80n+398	82n+431	124n+548	126n+582
	External pilot	44n+330	46n+344	88n+433	90n+467	129n+577	131n+606

T6□

Descriptions		M3GB1/M4GB1	M3GB2/M4GB2	M3GB3/M4GB3
		DIN rail mount	DIN rail mount	DIN rail mount
Max. station No.	Standard (Internal pilot)	16 stations	16 stations	16 stations
	External pilot	12 stations		
Manifold base weight calculation formula (n: station No.) g	Standard	45n+495	82n+578	126n+729
	External pilot	46n+491	90n+615	131n+753

T8□

Descriptions		M3GB1/M4GB1		M3GB2/M4GB2		M3GB3/M4GB3	
		Direct mount	DIN rail mount	Direct mount	DIN rail mount	Direct mount	DIN rail mount
Max. station No.	Standard (Internal pilot)	20 stations	16 stations	20 stations	16 stations	16 stations	
	External pilot	12 stations					
Manifold base weight calculation formula (n: station No.) g	Standard	46n+305	49n+332	83n+318	86n+350	128n+384	132n+416
	External pilot	48n+312	51n+339	91n+336	94n+368	146n+417	150n+449

The manifold base weight is the value for screw connection specifications with DIN rail, wiring block or slave unit.
The max. station number of the manifold is limited by the max. number of solenoid for each of the following wiring specifications.

Flow characteristics

Model No.	Solenoid position		P→A/B		A/B→R1/R2	
			C[dm³/(s·bar)]	b	C[dm³/(s·bar)]	b
M3GB1 M4GB1	Two 3-port valves integrated		0.86	0.35	1.1 (0.67)	0.22 (0.23)
	2-position		1.1	0.22	1.2 (0.70)	0.20 (0.10)
	3-position	All ports closed	0.98	0.22	1.1 -	0.24 -
		ABR connection	0.97	0.35	1.3 (0.68)	0.22 (0.24)
		PAB connection	1.1	0.38	1.1 -	0.21 -
M3GB2 M4GB2	Two 3-port valves integrated		1.7	0.44	2.1 (1.6)	0.32 (0.30)
	2-position		2.4	0.34	2.7 (1.7)	0.24 (0.31)
	3-position	All ports closed	2.2	0.34	2.4 -	0.29 -
		ABR connection	2.2	0.34	2.8 (1.8)	0.24 (0.27)
		PAB connection	2.4	0.29	2.4 -	0.29 -
M4GB3	2-position		3.5	0.34	3.8 (2.6)	0.11 (0.27)
	3-position	All ports closed	3.1	0.33	3.3 -	0.22 -
		ABR connection	3.0	0.30	3.8 (2.7)	0.11 (0.22)
		PAB connection	3.6	0.36	3.3 -	0.28 -

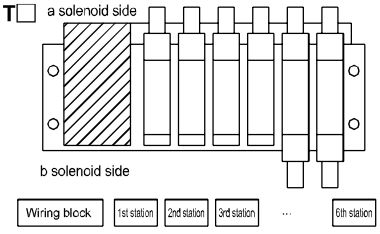
*1: Effective cross-sectional area S and sonic conductance C are converted as S ≈ 5.0 x C. *2: Values in ( ) are with the exhaust check valve.

Wiring specifications

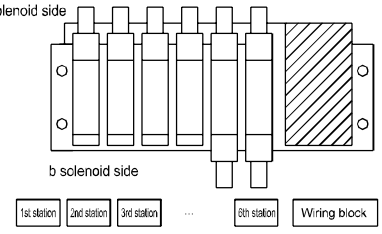
Descriptions	T10□ Common term. block	T11□ Common term. block	T30□ D sub-connector	T50□ Flat cable 20-pin	T51□ Flat cable 20-pin	T52□ Flat cable 10-pin	T53□ Flat cable 26-pin
Connector and terminal block specifications	M3 thread fastening 18 terminals	Clamping 26 terminals	D sub-connector 25-pin	MIL-C-83503 standard compliant pressure welding socket 20-pin	MIL-C-83503 standard compliant pressure welding socket 20-pin	MIL-C-83503 standard compliant pressure welding socket 10-pin	MIL-C-83503 standard compliant pressure welding socket 26-pin
Max. number of solenoids	16 points	24 points	24 points	16 points	18 points	8 points	24 points
Manifold internal wiring	Details on pages 718 to 725						

Wiring block position
Blank: Left side
R: Right side

Left side: T□



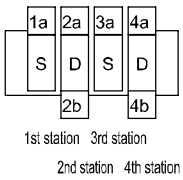
Right side: T□R



Array method
Blank: Standard sequential
W: Double wiring

(Example) For T50□

Manifold specifications



Standard wiring (sequential): Blank

Connector pin No.	1	2	3	4	5	6
Valve solenoid No.	1a	2a	2b	3a	4a	4b

Double wiring: W

Connector pin No.	1	2	3	4	5	6	7	8
Valve solenoid No.	1a	Air	2a	2b	3a	Air	4a	4b

Serial transmission slave unit specifications

Descriptions		T6G1 *1	T6C0 *2 T6C1	T6A0 *3 T6A1	T6E0 T6E1	T6J0 *3 T6J1
Network name		CC-Link	CompoBus/S	UNIWIRE System	S-LINK	UNIWIRE H system
Power supply voltage	Unit side	24 VDC ±10%		24 VDC +10% -5% (Unit power supply/valve power supply common terminal)		
	Valve side	24 VDC +10% -5%				
Current consumption	Unit side	100 mA or less (when all output points are ON)		100 mA or less (when all output points are ON) Load current is not included		
	Valve side	15 mA or less (when all output points are OFF)				
Output points		16 points	T6□0: 8 points T6□1: 16 points			
Occupied number		1 station	T6C0: 1 node address (in 8-point mode) T6C1: 2 node address (8-point mode)	T6A0: Output 8 points T6A1: Output 16 points	T6E0:FAN-in:3 T6E1:FAN-in:3	T6J0: Output 8 points T6J1: Output 16 points
Operation display		LED (power supply and communication status)				

*1: CC-Link is ver. 1.10. *2: Long-distance communication mode is not supported. Contact CKD for details on support.
*3: Transmission point count of 128 points and transmission distance of 200 m are supported. Contact CKD for other specifications.

Serial transmission slave unit specifications

Descriptions		T8G1 T8G2	T8GP1 T8GP2	T8P1 T8P2	T8PP1 T8PP2	T8EC1 T8EC2	T8ECP1 T8ECP2	T8EN1 T8EN2	T8ENP1 T8ENP2
Communication system name		CC-Link ver1.10		PROFIBUS-DP(V0)		EtherCAT		EtherNet/IP	
Power supply voltage	Unit side	24 VDC ±10%							
	Valve side	24 VDC +10%, -5%							
Current consumption	Unit side	60 mA or less (when all output points are ON)		60 mA or less (when all output points are ON)		110 mA or less (when all output points are ON)		120 mA or less (when all output points are ON)	
	Valve side	T8 □ 1: 15 mA or less T8 □ 2: 20 mA or less (when all output points are ON) Load current is not included							
Output points		T8 □ 1: 16 points T8 □ 2: 32 points							
Occupied number		1 station							
Operation display		LED (power supply and communication status)							
Output		NPN output	PNP output	NPN output	PNP output	NPN output	PNP output	NPN output	PNP output

M4GB1/2/3-T*(D) Series

Reduced wiring manifold; base piping

How to order

Manifold model No.

M 4GB1 1 0R- C6 - T30 W H D - ○ - 3

3 port manifold model No.

M 3GB1 66 0R- C6 - T30 W H D - ○ - 3

● Single valve for mounting base

4GB1 1 9R- 00 - A2N ○ H —— 3

● 3-port discrete valve for mounting base

3GB1 66 9R- 00 - A2N ○ H —— 3

Ⓑ Solenoid position

Ⓐ Model No.

Ⓒ Port size
*3
*4

Ⓓ Reduced wiring connection

Ⓔ Terminal/connector pin array

Ⓕ Option

Ⓖ Mount

Ⓗ Station No.

Ⓘ Voltage

● Refer to page 721 for the model No. of cables with D sub-connector.
● Refer to page 717 for the model No. of cables for flat cable connector.

⚠ Precautions for model No. selection

*1 Select M4GB*80R when mixing with 3/5-port valves.
Further, select M3GB*80R when mixing with masking plate.
*2 Not compatible with combination with external pilot (K). Dimensions are the same as those of the respective 2-position double solenoid.
3 CL radial push-in fitting (upward) is compatible only with the single solenoid manifold. Long elbow is for A port and short elbow for B port.
*4 A and B ports are the same size for radial push-in fitting.
*5 4G1 C8 and 4G2 C10 are available as custom orders. In addition, these do not support push-in fitting mixing.
*6 Blank...The wiring will be based on the type of valve used.
W*...All wired for double solenoid valves regardless of the type of valve used.
*7 Spare wiring (A type socket assembly) is included on the cap side for single types. A holder for retaining the socket assembly is included for single unit valves (A2N). Refer to page 194 for details.
*8 3-position all ports closed and PAB connection are not provided with the exhaust check valve specifications (H). Refer to page 751 for details on the exhaust check valve.
*9 Contact CKD when using a vacuum with the external pilot (K).
10 E2 type and E2*J type connectors only support DC 12/24 V. In addition, surgeless "S" and low exoergic/energy-saving circuit "E" cannot be selected together.
*11 Surgeless specifications.
*12 A filter is built into the P-port as standard.
*13 Specify the spacer mounting position/ quantity in manifold specifications sheet. Stacking of spacers is not possible. Combination with the masking plate is not supported. Refer to pages 186 to 190 for details.
*14 Not compatible with combination with external pilot (K).
*15 Combination with radial push-in fittings (upward) is not supported.

Ⓐ Model No.	3GB1	3GB2	4GB1	4GB2	4GB3

Ⓑ Solenoid position

1	2-position single				●	●	●
2	2-position double				●	●	●
3	3-position all ports closed				●	●	●
4	3-position ABR connection				●	●	●
5	3-position PAB connection				●	●	●
66	Two 3-port valves integrated *1, *2	A side valve: Normally closed B side valve: Normally closed	●	●			
67		A side valve: Normally closed B side valve: Normally open	●	●			
76		A side valve: Normally open B side valve: Normally closed	●	●			
77		A side valve: Normally open B side valve: Normally open	●	●			
8	Mix manifold (when there are multiple solenoid positions)		●	●	●	●	●

Ⓒ Port size

Port	4(A), 2(B) port	P/R1/R2 port (2)=Rc1/8 (3)=Rc1/4 (4)=Rc3/8				
CF	φ1.8 barbed fitting (compatible tube UP-9102-**)	(2)		(2)		
C18	φ1.8 push-in fitting (compatible tube UP-9402-**)	(2)		(2)		
C4	φ4 push-in fitting	(2)	(3)	(2)	(3)	
C6	φ6 push-in fitting	(2)	(3)	(2)	(3)	(4)
C8	φ8 push-in fitting *5	(2)	(3)	(2)	(3)	(4)
C10	φ10 push-in fitting *5		(3)		(3)	(4)
CL18	Radial φ1.8 push-in fitting upward (compatible tube UP-9402-**)			(2)		
CL4	Radial φ4 push-in fitting (upward)			(2)		
CL6	Radial φ6 push-in fitting (upward)			(2)	(3)	
CL8	Radial φ8 push-in fitting (upward)				(3)	(4)
CL10	Radial φ10 push-in fitting (upward)					(4)
CD18	Radial φ1.8 push-in fitting downward (compatible tube UP-9402-**)	(2)		(2)		
CD4	Radial φ4 push-in fitting (downward)	(2)		(2)		
CD6	Radial φ6 push-in fitting (downward)	(2)	(3)	(2)	(3)	
CD8	Radial φ8 push-in fitting (downward)		(3)		(3)	(4)
CD10	Radial φ10 push-in fitting (downward)					(4)
CX	Push-in fitting mix	(2)	(3)	(2)	(3)	(4)
M5	M5	(2)		(2)		
06	Rc1/8		(3)		(3)	
08	Rc1/4					(4)
00	Discrete valve for mounting base	●	●	●	●	●

Ⓓ Reduced wiring connection

Refer to the next page for electrical connections.

Ⓔ Terminal/connector pin array

Blank	Standard wiring *6	●	●	●	●	●
W	Double wiring *6	●	●	●	●	●
W1	Double wiring (with single spare wiring) *6, *7	●	●	●	●	●

Ⓕ Option

Blank	Non-locking/locking common manual override	●	●	●	●	●
M	Non-locking manual override	●	●	●	●	●
H	With exhaust check valve *8	●	●	●	●	●
K	External pilot *9	●	●	●	●	●
A	Ozone/coolant proof	●	●	●	●	●
S	Surgeless *10	●	●	●	●	●
E	Low exoergic/energy saving circuit *10, *11	●	●	●	●	●
F	A/B port filter built in *12	●	●	●	●	●
Z1	Air supply spacer *13	●	●	●	●	●
Z2	In-stop valve spacer *13, *14	●	●	●	●	●
Z3	Exhaust spacer *13	●	●	●	●	●
Z6	Spacer pilot check valve *13, *15				●	

Ⓖ Mount

Blank	Direct mount	●	●	●	●	●
D	DIN rail mount	●	●	●	●	●

Ⓗ Station No.

2	2 stations	●	●	●	●	●
to	to					
20	Refer to page 158 for the max. station number per model.					

Ⓘ Voltage

3	24 VDC	●	●	●	●	●
4	12 VDC	●	●	●	●	●

is not available.

			Ⓐ Model No.				
			3GB1	3GB2	4GB1	4GB2	4GB3
Ⓓ Reduced wiring (lamp and surge suppressor provided as standard) 12/24 VDC							
T10	Common terminal block (M3 thread)	Left-sided specifications	●	●	●	●	●
T10R		Right-sided specifications	●	●	●	●	●
T11	Common terminal block (clamping)	Left-sided specifications	●	●	●	●	●
T11R		Right-sided specifications	●	●	●	●	●
T30	D sub-connector	Left-sided specifications	●	●	●	●	●
T30R		Right-sided specifications	●	●	●	●	●
T50	20-pin flat cable connector (with power supply terminal)	Left-sided specifications	●	●	●	●	●
T50R		Right-sided specifications	●	●	●	●	●
T51	20-pin flat cable connector (without power supply terminal)	Left-sided specifications	●	●	●	●	●
T51R		Right-sided specifications	●	●	●	●	●
T52	10-pin flat cable connector (without power supply terminal)	Left-sided specifications	●	●	●	●	●
T52R		Right-sided specifications	●	●	●	●	●
T53	26-pin flat cable connector (without power supply terminal)	Left-sided specifications	●	●	●	●	●
T53R		Right-sided specifications	●	●	●	●	●
Ⓓ Serial transmission (lamp/surge suppressor provided as standard) 24 VDC							
T6A0	UNIWIRE SYSTEM	NPN 8 points	●	●	●	●	●
T6A1		NPN 16 points	●	●	●	●	●
T6C0	CompoBus/S	NPN 8 points	●	●	●	●	●
T6C1		NPN 16 points	●	●	●	●	●
T6E0	S-LINK	NPN 8 points	●	●	●	●	●
T6E1		NPN 16 points	●	●	●	●	●
T6G1	CC-Link	NPN 16 points	●	●	●	●	●
T6J0	UNIWIRE H SYSTEM	NPN 8 points	●	●	●	●	●
T6J1		NPN 16 points	●	●	●	●	●
T8G1	CC-Link (thin)	NPN 16 points	●	●	●	●	●
T8G2		NPN 32 points	●	●	●	●	●
T8GP1		PNP 16 points	●	●	●	●	●
T8GP2		PNP 32 points	●	●	●	●	●
T8P1	PROFIBUS-DP (thin)	NPN 16 points	●	●	●	●	●
T8P2		NPN 32 points	●	●	●	●	●
T8PP1		PNP 16 points	●	●	●	●	●
T8PP2		PNP 32 points	●	●	●	●	●
T8EC1	EtherCAT (thin)	NPN 16 points	●	●	●	●	●
T8EC2		NPN 32 points	●	●	●	●	●
T8ECP1		PNP 16 points	●	●	●	●	●
T8ECP2		PNP 32 points	●	●	●	●	●
T8EN1	EtherNet/IP (thin)	NPN 16 points	●	●	●	●	●
T8EN2		NPN 32 points	●	●	●	●	●
T8ENP1		PNP 16 points	●	●	●	●	●
T8ENP2		PNP 32 points	●	●	●	●	●
A2N	Without lead wire (without socket)	with surge suppressor/indicator lamp	●	●	●	●	●

Ozone-proof specifications · Coolant proof specifications

Can be selected with "How to order" Item Ⓕ option "A" on page 160.

Clean-room specifications

● Anti-dust generation structure for use in cleanrooms

** - Voltage - **P7***

Specifications for rechargeable battery (Catalog No. CC-1226A)

● For use in the rechargeable battery manufacturing process, materials used for air path and sliding section are limited

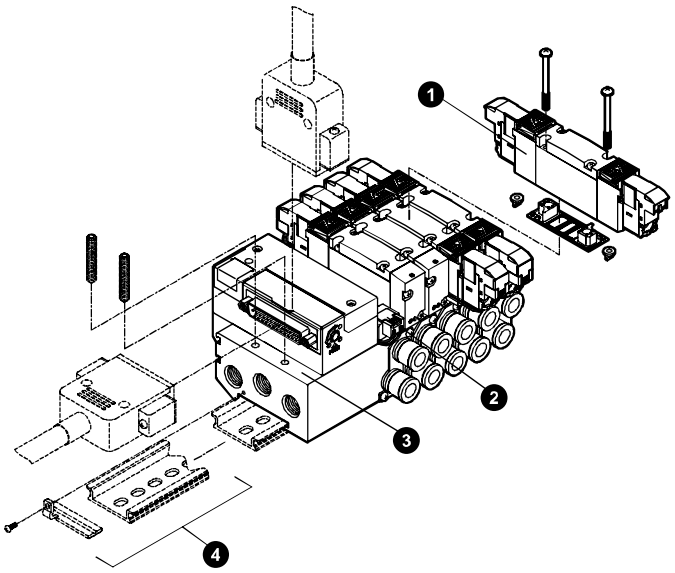
** - Voltage - **P4**

CE marking specifications

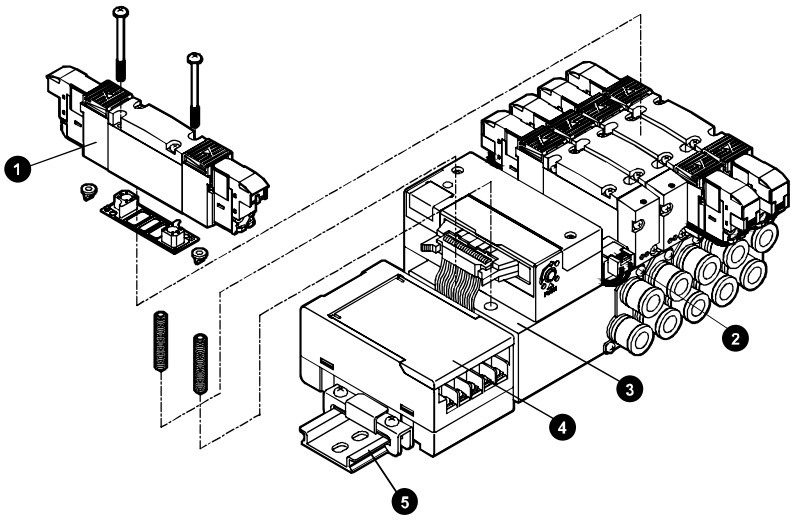
** - Voltage - **ST**

Manifold components explanation and parts list

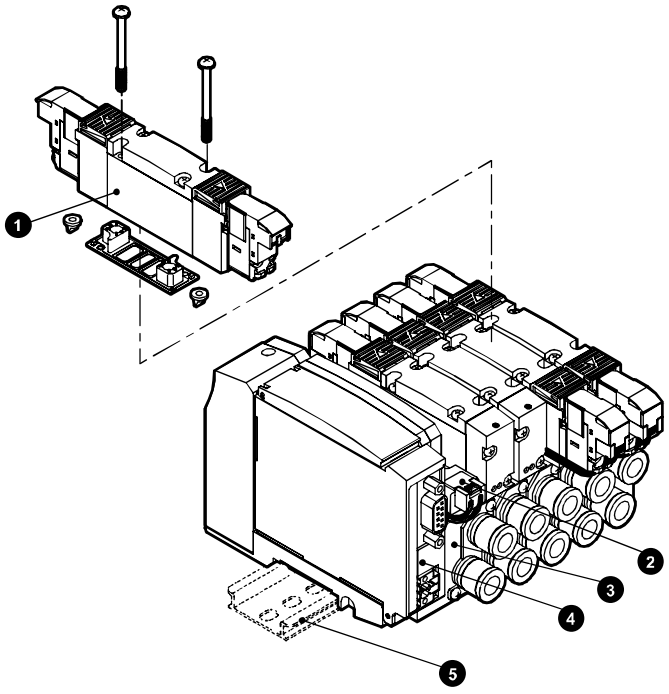
●T30



●T6D



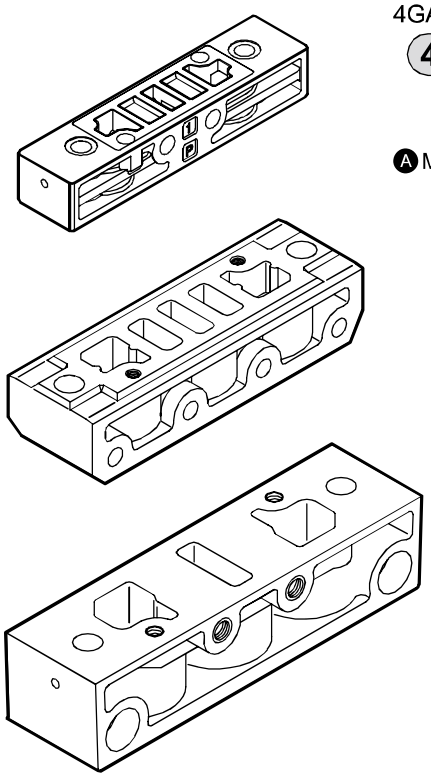
●T8*



* Mount (direct, DIN rail) cannot be changed after purchase of the M4GB2-T8 and M4GB3-T8 Series.
M4GB1-T8 Series allows changes.

Related parts

(5) Sub-plate



4GA Pipe adaptor

4G1 R - ADAPTOR - M5 - ( )

Ⓐ Model No.

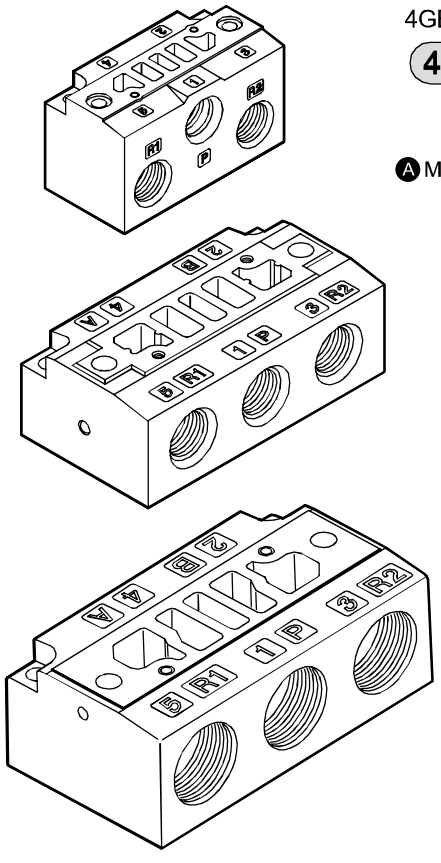
Ⓐ Model No.		3G1	3G2	3G3	4G1	4G2	4G3
Ⓑ Port size (P/R1/R2 port)							
M5	M5	●			●		
06	Rc1/8		●			●	
08	Rc1/4			●			●
06N	1/8NPT		●			●	
08N	1/4NPT			○			○
06G	G1/8		●			●	
Ⓒ Option							
P	With mounting plate (attachment)	●	●	●	●	●	●

Ⓑ Port size

Ⓒ Option

is not available.

○ indicates a custom order.



4GB single sub-plate

4G1 R - SUB - BASE - 06 - ( )

Ⓐ Model No.

Ⓐ Model No.		3G1	3G2	4G1	4G2	4G3
Ⓑ Port size (A/B/P/R1/R2 port)						
06	Rc1/8	●		●		
08	Rc1/4		●		●	●
10	Rc3/8					●
06N	1/8NPT	○		○		
08N	1/4NPT		○		○	○
10N	3/8NPT					○
06G	G1/8	○		○		
08G	G1/4		○		○	
Ⓒ Option						
K	External pilot			●	●	●
F	A/B port filter built in *1	●	●	●	●	●

Ⓑ Port size

Ⓒ Option

*1: A filter is built into the P port as standard.

is not available.

○ indicates a custom order.

Pneumatic components

Safety Precautions

Be sure to read this section before use.
Refer to Intro Page 63 for general precautions for using valves.

Product-specific cautions: 3, 5-port pilot operated valve 4G A/B /MN4G A/B Series

Design/selection

1. Surge suppressor

⚠CAUTION

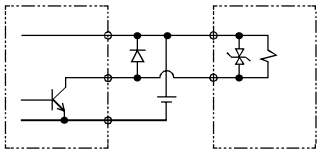
■ The surge suppressor attached to the solenoid valve is intended to protect the output contacts for the solenoid valve drive. There is no significant protection for the other peripheral devices, and devices could be damaged or could malfunction due to a surge. As well, surges generated by other devices may be absorbed and cause damage such as burning. Note the following points.

● 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. 4G series solenoid valve with surge suppressor can also suppress inverse voltage surge that occurs when the product is turned OFF to the level shown in the table below.

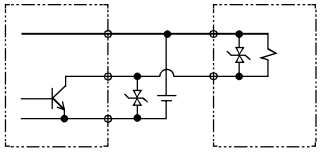
Specification voltage	Inverse voltage when OFF
3 VDC	Approx. 6.2V
5 VDC	Approx. 13V
12 VDC	Approx. 27 V
24 VDC	Approx. 47V
When option "S" and "E" are selected	Approx. 1V

● 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 install a contact protection circuit or select option "S" to avoid the risk.

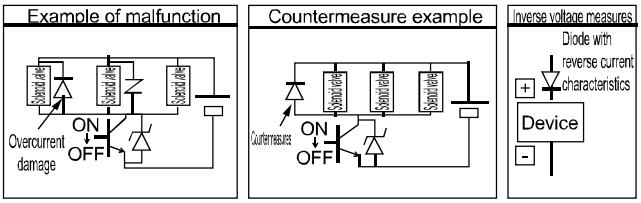
[Output transistor protection circuit: Installation example 1]



[Output transistor protection circuit: Installation example 2]



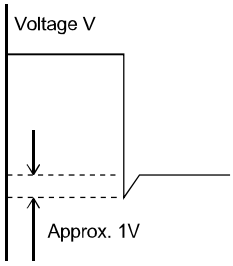
● If another device or solenoid valve is connected in parallel to the solenoid valve, the inverse voltage surge generated when the solenoid valve is OFF would apply to those devices. Even in the case of a solenoid valve with 24 VDC surge suppressor, a surge voltage may reach, negative tens of volts for 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 multiple solenoid valves in parallel.



● The surge suppressor incorporated in the solenoid valve will often be short-circuited if it is damaged by an 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.

2. Surgeless

■ Surgeless reduces the solenoid valve surge voltage up to 1 V approx. by the built-in diode. In addition, there is no polarity.

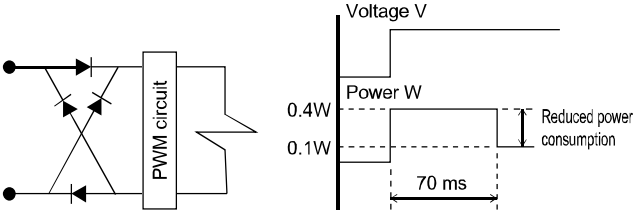


3. Low exoergic/energy saving circuit

■ The low exoergic/energy saving includes a PWM circuit in the solenoid valve, which is designed to reduce the current value when the coil is held with suction. Power consumption is reduced to 1/4 compared to standard products. In addition, there is no polarity.

[Specifications for low exoergic/energy saving type]

Descriptions		Current A	Power consumption W
When starting	12 VDC	0.033	0.4
	24 VDC	0.017	0.4
When holding	12 VDC	0.017	0.1
	24 VDC	0.008	0.1



⚠ CAUTION

■ Do not use this valve in an environment where vibration and impact exceed the specified range. This may result in valve malfunction.

■ The energized state cannot be maintained if power is cut off instantaneously for 30 ms or less on the power source driving the solenoid valve. If any disturbance has caused up to 30 ms instantaneous power cut-off of the solenoid valve after being continuously energized, cut the power OFF for 50 ms or more before switching the solenoid valve ON again.

■ Do not use this product by gradually raising the voltage. The valve will not operate.

4. AC voltage specifications

⚠ CAUTION

■ The models with AC voltage specifications have a built-in full-wave rectifier circuit.
Depending on the type of SSR used to turn ON/OFF the solenoid valve, recovery failure of the valve may result. Use caution when selecting SSRs. (Consulting the manufacturer of the relay or PLC is recommended.)

5. When using the product in combination with low sliding cylinders

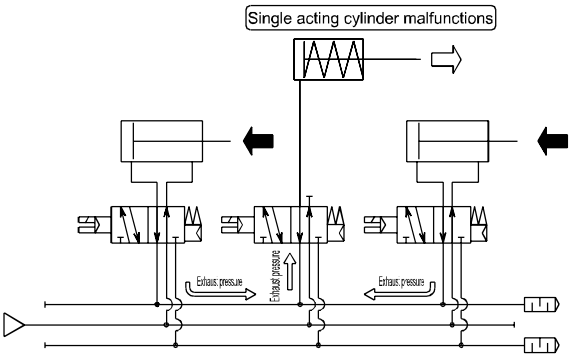
■ Malfunctions could occur because of the exhaust pressure. Contact CKD.

6. Exhaust check valve

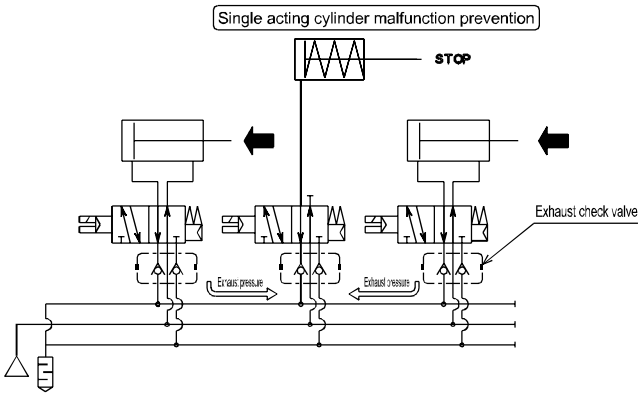
⚠ **CAUTION**: The exhaust check valve is a check valve. Note that when operating the cylinder rod directly without pressurization, the check valve opens and the cylinder rod does not move.

Generally, the double acting cylinder connected at the manifold to single acting cylinders or ABR connection valves may malfunction when adversely affected by the exhaust pressure led in by operation of other cylinders. For the manifold of 4G series, the "exhaust check valve" integrated to prevent this malfunction can be selected, except for all ports closed valves and PAB connection valves. However, with components that are affected by a small amount of leakage or pressure of low sliding cylinders, etc., the functions may not operate properly.

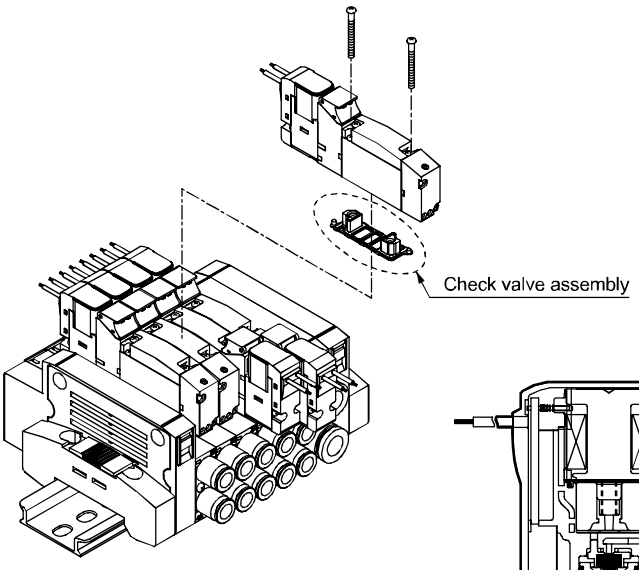
Example of pneumatic pressure system that may malfunction



4G series pneumatic pressure system



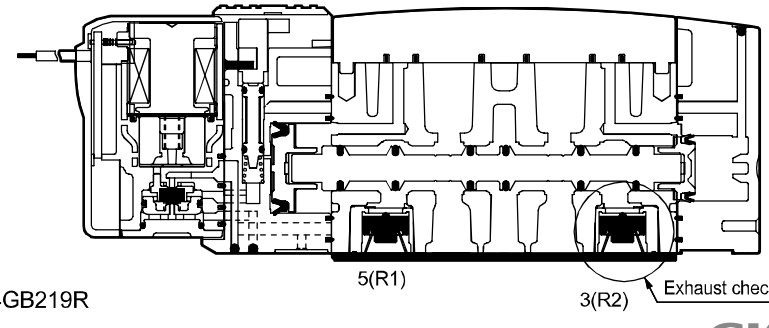
Internal structure



Standard specifications of check valve

Model No.		Flow path switching	Option (H) Selection
4G	MN4G		
3GA*19R	3GA*10R	2-position single NC	With
3GA*119R	3GA*110R	2-position single NO	With
3G $^{A}_{B}$*669R	3G $^{A}_{B}$*660R	Two 3-port valves integrated NC/NC	With
4G $^{A}_{B}$*19R	4G $^{A}_{B}$*10R	2-position single	With
4G $^{A}_{B}$*29R	4G $^{A}_{B}$*20R	2-position double	With
4G $^{A}_{B}$*39R	4G $^{A}_{B}$*30R	3-position all ports closed	None
4G $^{A}_{B}$*49R	4G $^{A}_{B}$*40R	3-position ABR connection	With
4G $^{A}_{B}$*59R	4G $^{A}_{B}$*50R	3-position PAB connection	None

Note: Because 3-position all ports closed and PAB connection are not adversely affected by the exhaust pressure led in from other cylinders at the neutral position, installation of a check valve is not required.



This figure is for 4GB219R

Mounting, installation and adjustment

1. External pilot (K) piping port

⚠CAUTION

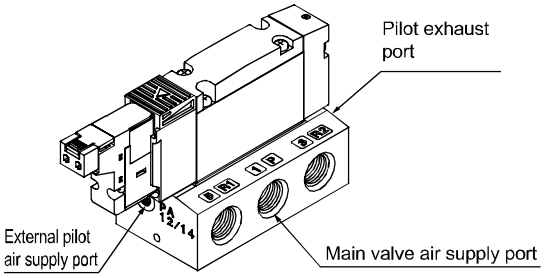
■ Metal base 4G A/B Series

● The external pilot (K) has a separate pilot air exhaust. M5 screw ports are used to supply and exhaust the pilot air, so check that the piping connection position is correct. Malfunctions could occur if the piping is incorrect.

Port indication

Applications		Indication (ISO standards)
Pilot air	Air supply port	12/14
	Exhaust port	82/84

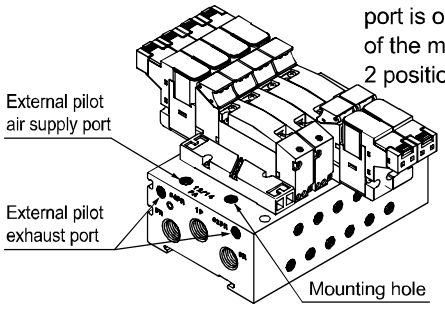
Discrete base piping



The position of external pilot air supply port is at the left side when the air supply port of the main valve is at the front.

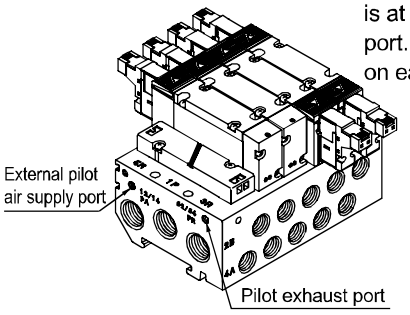
Manifold

M4G1



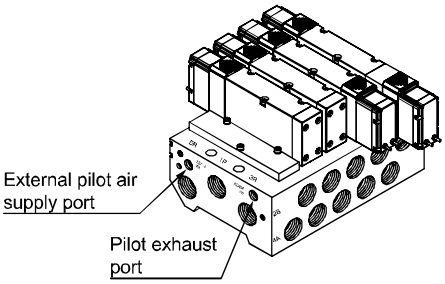
The port position of external pilot air supply port is on the top surface of the manifold. There are 2 positions on each side.

M4G2/3



The port position of external pilot air supply port is at the far side from A/B port. There are 2 positions on each end surface.

M4G4



The port position of external pilot air supply port is at the far side from A/B port. There are 2 positions on each end surface.

■ Block manifold MN4G A/B Series

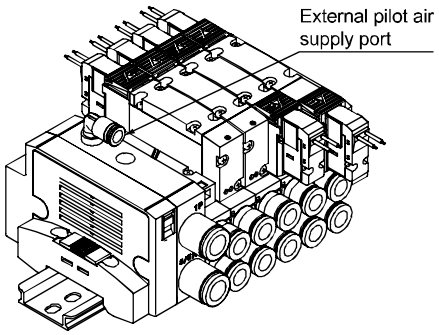
● The external pilot (K) has a separate pilot air supply. φ6 push-in fitting is used to supply the pilot air, so be careful that the piping connection position is correct. Malfunctions could occur if the piping is incorrect.

Port indication

Applications		Indication (ISO standards)
Pilot air	Air supply port	12/14

* Port A/B pressurization and port R pressurization are not possible.

MN4G2



The external pilot air supply port is the φ6 push-in fitting on the top of the supply and exhaust block.

■ Take care with supply pressure for the type with two 3-port valves integrated.

● The valving element of the type with two 3-port valves integrated is operated with the main (P port) supply pressure.

①Check that the main pressure (P port) is no higher than the pilot pressure (PA port).

②Check that the main pressure (P port) does not drop below 0.2 MPa.

Mounting, installation and adjustment

2. How to install discrete body piping (A)

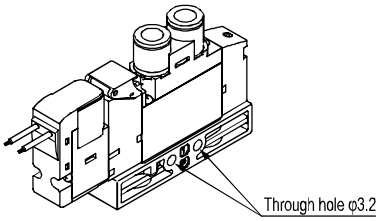
⚠ CAUTION

■ When directly installing the manifold

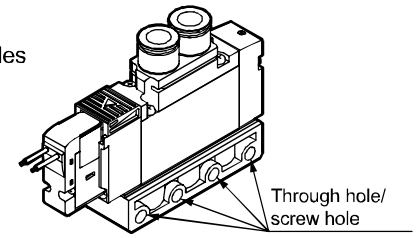
● The discrete body piping 4GA Series can be installed using the (a) through hole or (b) screw hole. When using the screw holes, be careful of the tightening torque.

Screw hole Tightening torque 0.7 to 1.2 N·m

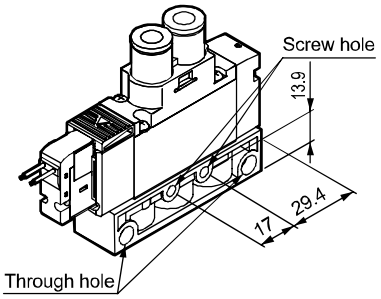
4GA1 Series
(a) 2 through holes



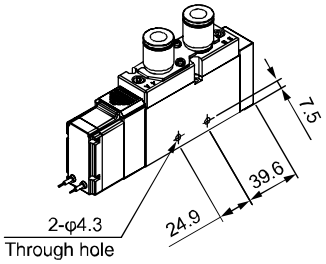
4GA2 Series
(a) Through hole
(b) 4 common screw holes



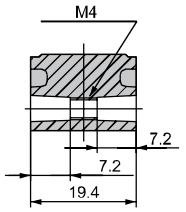
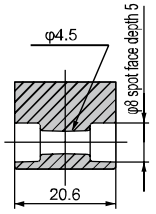
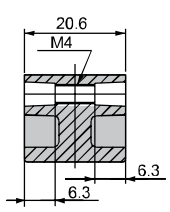
4GA3 Series
(a) Through hole
(b) 2 places each, dedicated for screws



4GA4 Series
(a) 2 through holes



Mounting hole shape

	4GA2	4GA3	
	(a) (b) Common use	(a) Through hole	(b) Screw hole
Sectional view of mounting hole			

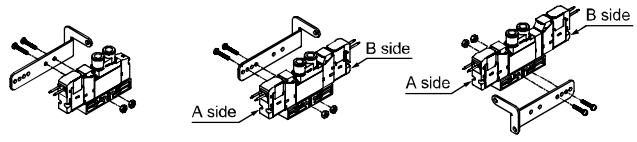
■ When installing the manifold with mounting plate (P)

● Installation method of the mounting plate (P) for discrete body piping differs among the single, double and 3-position. Be careful of the mounting direction and orientation as damage may result from incorrect mounting.

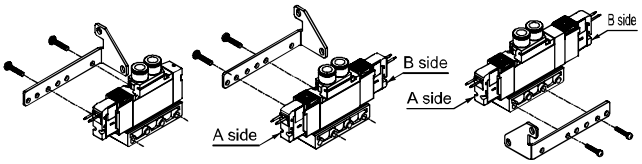
■ How to mount mounting plate (P)

● For grommet lead wire and E type connector (DC voltage)

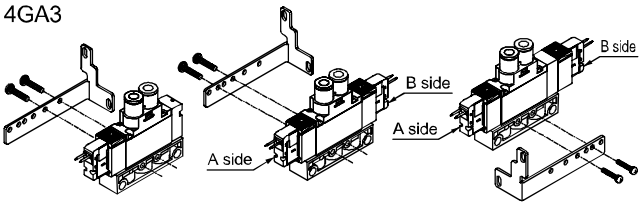
4GA1



4GA2

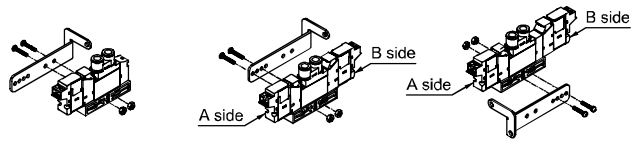


4GA3

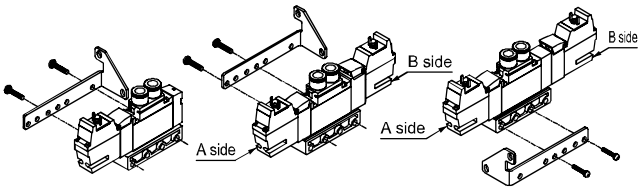


● For DIN terminal box and E type connector (AC voltage)

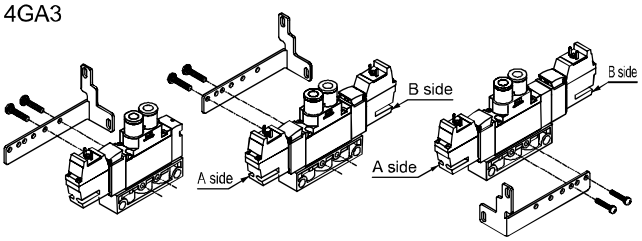
4GA1



4GA2



4GA3



Mounting (P) kit

	Kit model No.	Set parts
4GA1	4G1R-MOUNT-PLATE-KIT	Mounting plate, 2 mounting screws, 2 nuts
4GA2	4G2R-MOUNT-PLATE-KIT	Mounting plate, 2 set screws
4GA3	4G3R-MOUNT-PLATE-KIT	Mounting plate, 2 set screws

Mounting, installation and adjustment

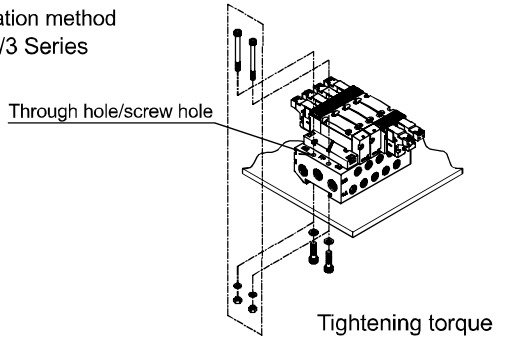
3. How to install manifold (Metal base 4G$^{A}_{B}$ Series)

⚠ CAUTION

■When directly installing the manifold

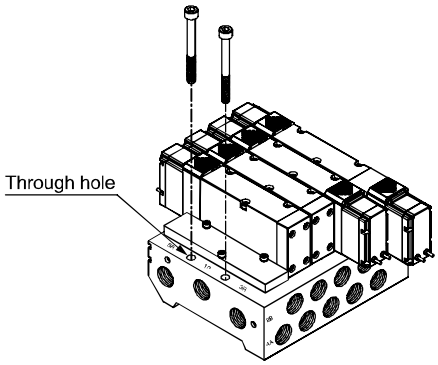
- For installation of the M4G2/3 Series, there are 2 methods of tightening the manifolds with bolts: after passing them through the upper side of the manifold base or after inserting them from the back side.
  When using a female screw as shown in the table below, check the thread depth, select a mounting bolt with 10 screw-in threads or more, and be careful with the tightening torque. The screw could be damaged if incorrectly installed.

Installation method
M4G2/3 Series

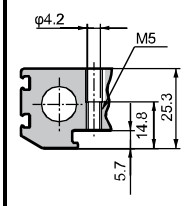
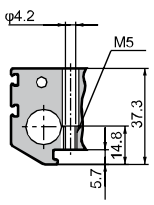
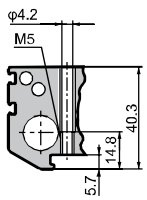
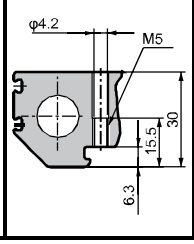
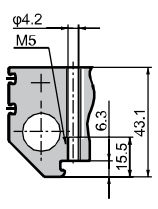
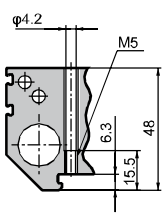


M4G4 Series

- For installation of M4G$^{A}_{B}$4 series, tighten the manifold with bolts after passing them through the upper side of the manifold base.



Mounting hole shape (sectional view)

	Standard manifold (internal pilot)		External pilot
	M4GA (direct piping)	M4GB (Base piping)	M4G-K
M4G2			
M4G3			

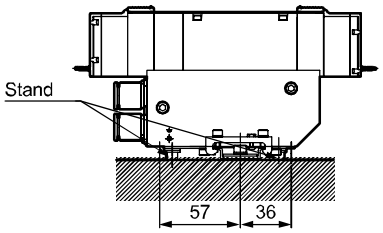
■When mounting the manifold with DIN rail

M4G1, 2, 3

- The manifold of the direct mounting specification can be changed to that of the DIN rail mounting specifications. Note that inappropriate mounting may result in falling off and damage of the manifold. If the manifold weighs more than 1 kg, or when using in an environment with vibration or impact, fix the DIN rail onto the surface at 50 to 100 mm intervals, and confirm that there is no problem with installation before starting operation. Use the individual specifications to calculate the weight.
  (CAUTION: Only the M4GB1 (page 119) is provided with a dedicated base for the direct mount or DIN rail mount. For mounting, the direct mount cannot be changed to the DIN rail mounting, but the DIN rail mounting can be direct mounted.)
  The upper limit of station No. for DIN rail mounting is 16.

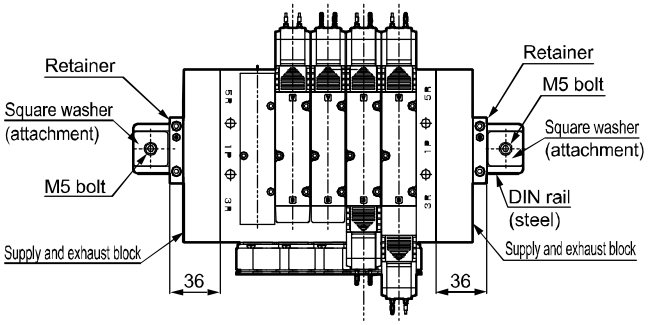
M4G4

- For DIN rail mounting, stands are attached to either end of the supply and exhaust block in order to suppress vibration or impact. Allow sufficient amount of flat surface (width 57 + 36 mm) as shown in the figure below so that the stands can be seated on the mounting surface of the DIN rail.



Fix the DIN rail onto the mounting surface at 75 to 100 mm intervals with M5 bolts using attached square washers, and confirm that there is no problem with installation before starting operation. Install the valve so that the retainer, supply and exhaust blocks will not interfere with the M5 bolts. Steel is used for the DIN rail to ensure strength. When preparing your own rail, use a DIN rail made of steel.

Retainer tightening torque: 2.5 to 3.0 N·m



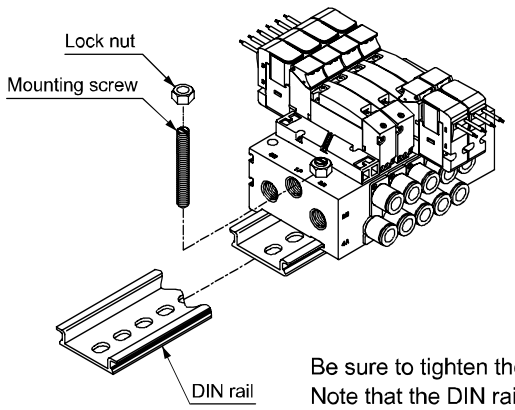
Note that inappropriate mounting may result in falling off and damage of the manifold. The upper limit of station No. for DIN rail mounting is 5.

Mounting, installation and adjustment

■How to mount DIN rail

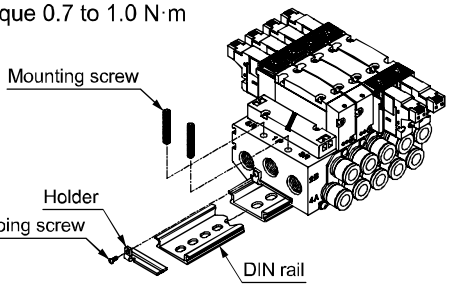
● Only the M4GB1 Series is provided with a dedicated base for the direct mount or DIN rail mount. For mounting, the direct mount cannot be changed to the DIN rail mounting, but the DIN rail mounting can be direct mounted.

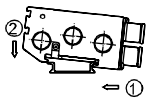
Tightening torque 0.3 to 0.5 N·m

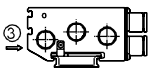


Be sure to tighten the lock nut. Note that the DIN rail may deform if excessive tightening torque is applied.

M4G2 Series
M4G3 Series
Tightening torque 0.7 to 1.0 N·m







1. Attach the holder (secure with bolts to prevent falling off)
2. Temporarily set the mounting screw
3. Engage the jaws with the DIN rail in ② order from ①.
4. Push in the direction of ③.
5. Tighten the mounting screws.

DIN rail kit

	Model No.	Content
M4G1	4GA1R-BAA length - option D	DIN rail, 2 mounting screws, 2 lock nuts
	4GB1R-BAA length - option D	
M4G2	4GA2R-BAA length - option D	DIN rail/ 2 holders, 2 bolts, 4 mounting screws
	4GB2R-BAA length - option D	
M4G3	4GA3R-BAA length - option D	
	4GB3R-BAA length - option D	

Specify the length "0" when the DIN rail is not required.
Specify the option "K" when using with the manifold base for external pilot.

Set the DIN rail length, referring to the working manifold dimensions and DIN rail length quick reference list (page 303).

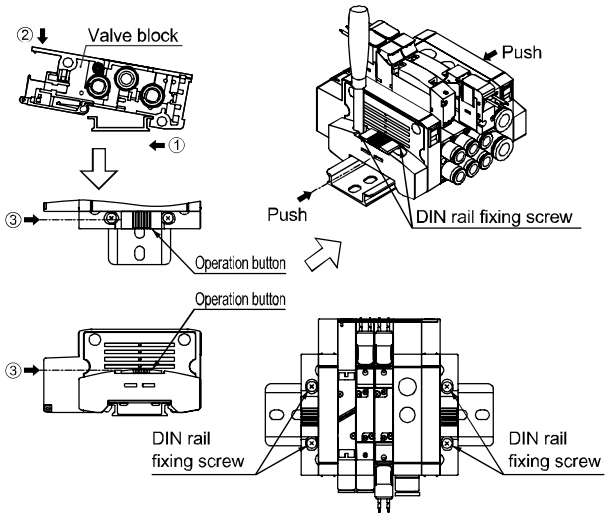
4. How to install manifold (Block manifold)

⚠CAUTION

■Mounting orientation

● The block manifold is mounted on a DIN rail. If the manifold's total weight exceeds 1kg, or when using in an environment with vibration or impact, fix the DIN rails on the mounting surface with a pitch of 50 to 100 mm. Check that there are no problems with installation.
Although there is no restriction in mounting direction and orientation, attention should be paid to mounting screw loosening caused by resonance due to vibration that may cause the manifold to fall out during operation.

● How to mount and remove manifold
Removal
Loosen the four DIN rail fixing screws (two each on the left and right).
Installation
1. Engage the jaws with the DIN rail in order from ① to ②.
2. Press the operation button in the direction of ③.
3. While holding down so that there is no gap between blocks, tighten DIN rail fixing screws. (recommended tightening torque 1.2 to 1.6 N·m).



5. Lead wire connection

⚠CAUTION

■ Lead wire standards differ depending on the type of electrical connections. Connect wires according to each lead wire to be used.

4G1 to 3

Electrical connection code	Content	Conductor size	Conductor sectional area	Outer φ of insulator	Outer φ of covering
Blank	Grommet lead wire	AWG#26	0.13 or equiv.	1.3	-
E□	E type connector (with lead wire)	AWG#26	0.13 or equiv.	1.3	-
E□J	EJ type connector	AWG#24	0.16 or equiv.	1.14	3.7

4G4

Electrical connection code	Content	Conductor size	Conductor sectional area	Outer φ of insulator	Outer φ of covering
Blank	Grommet lead wire	AWG#20	0.52 or equiv.	1.8	-
E□	E type connector (with lead wire)	AWG#26	0.13 or equiv.	1.3	-
E□J	EJ type connector	AWG#24	0.2 or equiv.	1.14	3.7

When installing the manifold and making electrical connections, check that tension by lead wires is not applied to the solenoid valve coil.

Mounting, installation and adjustment

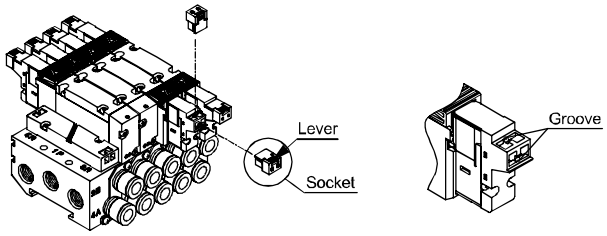
6. How to use E type connector

⚠CAUTION

■The E type connector has top and side connectors to which sockets can be connected. The socket assembly is connected from the side direction at shipment. Select the connection direction based on the installation environment.

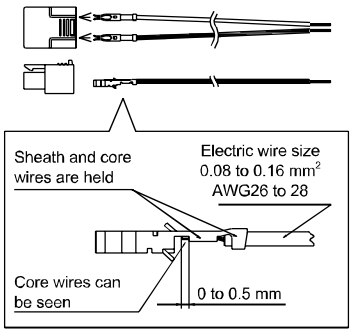
■How to mount and remove socket

- When mounting the socket, hold the lever and socket with fingers and insert straight into the square window on the connector body. Align the lever jaw with the groove on the connector body and lock it. When mounting from the top, position the socket so that the lever faces the front. When mounting from the side, position the socket so that the lever is in an upward direction.
- When pulling out the socket, press down the lever to release its jaw from the groove, then pull straight out.



■How to connect lead wire

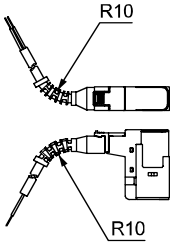
- Strip the end of the lead wire by about 3mm. Align the end of core wires, insert them into the contact terminal, and crimp with a crimp tool. When crimping, check that both the sheath and core wires are held, and 0 to 0.5 mm of the core wire end is visible.
- After crimping, position the contact terminal as shown below, and insert into the square window on the socket. The terminal locks when it is inserted to the end. After inserting, pull the terminal lightly to check that it is locked.



7. How to use E □ J type connector

⚠CAUTION

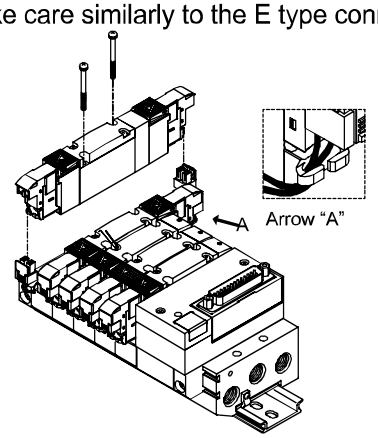
■Use the lead wire with limited bending as shown in the figure below.



8. How to use A type connector

⚠CAUTION

■The A type connector is dedicated for reduced wiring manifold mounting, which can be connected from the bottom direction. When mounting or removing the socket, take care similarly to the E type connector.



9. DIN terminal box

⚠WARNING

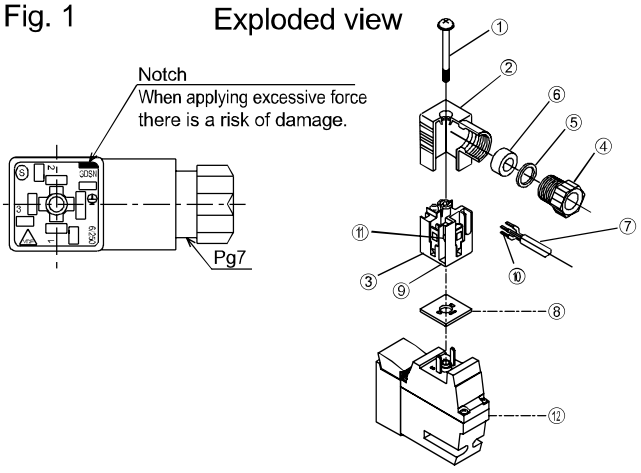
■As there is a risk of electric shock when assembling or disassembling the terminal box, perform the assembly and/or disassembly after turning OFF the power supply.

⚠CAUTION

■Disassembly

- Loosen screw ① and pull cover ② in the direction of screw ① to remove the connector from coil assembly ⑫.
- Remove screw ① from cover ②.
- Notch ⑨ (next to the GDSN mark) can be found at the bottom of terminal block ③. Insert a compact flathead screwdriver in the gap between housing ② and terminal block ③ and pry to remove terminal block ③ from cover ② (Refer to Fig. 1). Remove the terminal block without applying excessive force. There is a risk of damage.
- Remove cable gland ④ and take out washer ⑤ and rubber packing ⑥.

Fig. 1 Exploded view



Mounting, installation and adjustment

■Wiring

● Wiring preparation
- The applicable dimensions for cable ⑦ are the VCTF2(3) core (φ3.5 to 7) defined in JIS C3306.
- The length of the lead wire stripping of the cable is 10 mm.
- Both stranded wires and solid wires can be used for wiring.
- When using a stranded wire, avoid connecting a pre-soldered wire.
- When using a crimp sleeve ⑩ at the end of the twisted wire, select H0.5/6 (0.3 to 0.5 mm^2) or H0.75/6 (0.75 mm^2) made by Weidmüller Japan, or an equivalent product. Crimp sleeves are not included.

● Wiring
- Pass cable ⑦ through cable gland ④, washer ⑤, and rubber packing ⑥ in this order, and insert it into cover ②.
- Connect it to terminals 1 and 2. There is no polarity.
- The recommended tightening torque is 0.2 to 0.25 N·m.
- Be sure to lay ground wiring for AC. However, DC type does not require ground wiring.

■Assembly

● Set the wired terminal block ③ on cover ②. (Push in until it clicks.)

* The terminal block can be set in any of the four different directions (Fig.2).

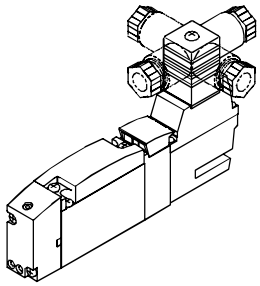
● Insert rubber packing ⑥, and washer ⑤, in this order into the cable through hole in cover ②, and securely tighten cable gland ④.

Remarks: The recommended tightening torque for the cable gland is 1.0 to 1.5 N·m.
Pull the cable to check that it does not become loose.

● Place gasket ⑧ between the bottom part of terminal block ③ and the plug of the coil assembly ⑫, insert the connector, insert screw ② from over the cover ① and tighten it.

Remarks: The recommended tightening torque for screws is 0.4 to 0.45 N·m.

Fig. 2

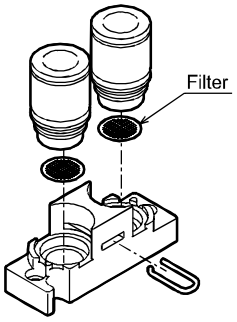


10. Port filter

⚠CAUTION

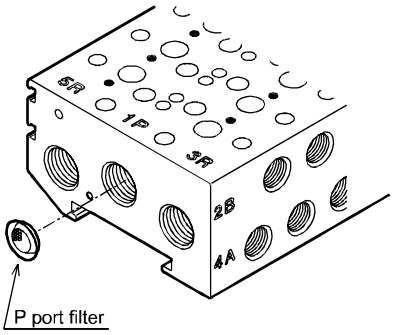
■The port filter prevents the entry of foreign matter, and prevents problems from occurring in the valve. As this does not improve the quality of the compressed air, read Warnings and Precautions on Intro Pages 61 to 68, then mount, install, and adjust the filter accordingly.
Do not detach or press down the port filter forcibly.

The filter could deform, causing problems. If contaminants and foreign matters are found on the filter surface, blow them lightly, or remove them by tweezers, etc.



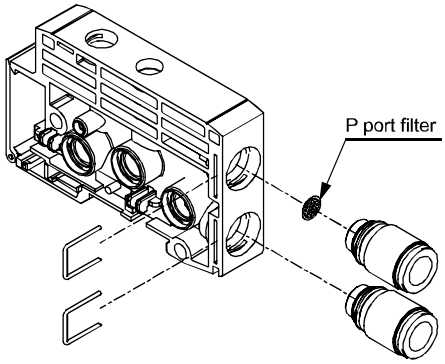
Example of A/B port filter option combination

M4G Series



P port filter (standard) example of embedding

MN4G Series



P port filter (standard) example of embedding

Use/maintenance

1. Continuous energizing

⚠CAUTION

■When using in a continuously energized state for long periods, use the low exoergic/energy saving type.

■If a valve other than the low exoergic/energy saving type is used in a continuously energized state for long periods, the valve performance may deteriorate more quickly.

Furthermore, use caution under the following working conditions likewise.

- When the energized time exceeds non-energized time in intermittent operation
- When one energizing session exceeds 30 minutes in intermittent operation

Give sufficient consideration to heat dissipation when installing the product.

■When using the AC voltage in a continuously energized state, the temperature of the coil's outer surface will be high. It may cause burns. Do not touch it when it is energized.

2. Manual ocerride

⚠WARNING

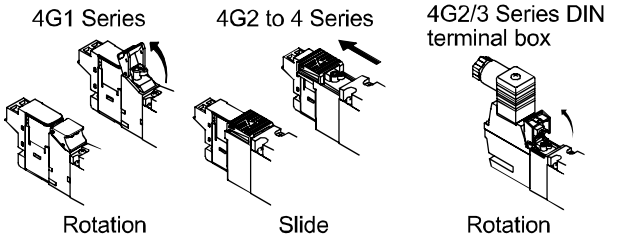
■The 4G Series is a pilot operated solenoid valve. If air is not supplied to the P port, the main valve will not be switched even if the manual override is operated.

■Manual override protective cover is provided as standard. The protective cover is closed when shipped. Therefore, the manual override device cannot be seen when delivered. Open the protective cover to operate the manual override. Note that the protective cover will not close unless the locking manual override is released.

■Manual override is used for both non-locking and locking. Holding down and turning the button locks the valve. For locking, be sure to press down and turn. If manual override is turned without being pressed down, it could be damaged or air could leak.

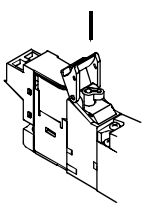
■Opening and closing the manual protective cover

Do not excessively force the manual protective cover when opening and closing it. Excessive external force could cause failures. (Below 5 N)

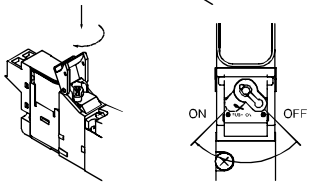


■How to operate manual override

- Push non-locking operation
  Push straight in the direction of the arrow until it stops
  Release to cancel.



- Push & locking operation
  Push manual override and turn 90° in the direction of the arrow.
  The function is not canceled even when the button is released.



■When conducting manual operations, make sure that there are no people near the operating cylinder.

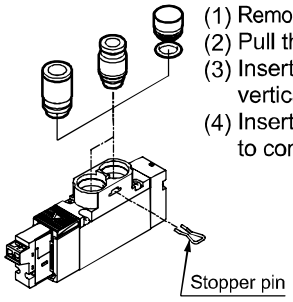
3. How to replace cartridge fitting

⚠CAUTION

■Check procedures before changing the push-in fitting size. If installed incorrectly, or if the tightening of the mounting screw is insufficient, air leakage could occur.

■Body piping (A)

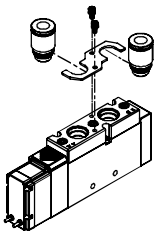
4 G 1, 2, 3



(1) Remove the stopper pin with a screwdriver.
(2) Pull the joint out.
(3) Insert the joint for replacement vertically until it reaches the back.
(4) Insert the stopper pin. Pull on the fitting to confirm that it is properly installed.

	Size	Tightening Torque (N·m)
4G1	M1.7	0.18 to 0.22
4G2	M2.5	0.25 to 0.30
4G3	M3	0.6 to 0.7

4 G 4

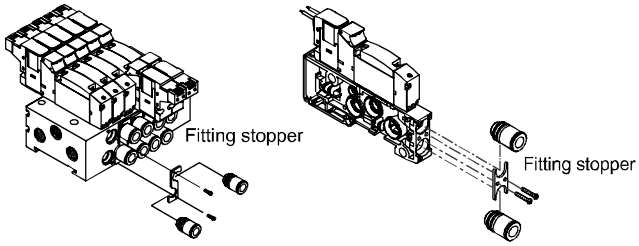


(1) Remove the mounting screw.
(2) Pull out the stopper plate and fitting together.
(3) Align the groove of the replacement fitting with the stopper plate and assemble them temporarily.
(4) Assemble the stopper plate with the fitting, and tighten the mounting screw.

Pull on the fitting to confirm that it is properly installed.

	Size	Tightening Torque (N·m)
4G4	M3	0.7

■Base piping (B)



(1) Remove the mounting screw.
(2) Pull out the stopper plate and fitting together.
(3) Align the groove of the replacement fitting with the stopper plate and assemble them temporarily.
(4) Assemble the stopper plate with the fitting, and tighten the mounting screw. Pull on the fitting to confirm that it is properly installed.

Use/maintenance

Model No. of cartridge push-in fitting

Model	Part name	Model No.
4G1	φ1.8 barbed	4G1R-JOINT-CF
	φ1.8 straight	4G1R-JOINT-C18
	φ4 straight	4G1R-JOINT-C4
	φ6 straight	4G1R-JOINT-C6
	φ8 straight	4G1R-JOINT-C8
	φ1.8 elbow	4G1R-JOINT-CL18,CLL18
	φ4 elbow	4G1R-JOINT-CL4,CLL4
	φ6 elbow	4G1R-JOINT-CL6,CLL6
	φ1/8" straight	4G1R-JOINT-C3N
	φ5/32" straight	4G1R-JOINT-C4N
	φ1/8" elbow *1	4G1R-JOINT-CL3N,CLL3N
	φ5/32" elbow *1	4G1R-JOINT-CL4N,CLL4N
	Plug cartridge	4G1R-JOINT-CPG
4G2	φ4 straight	4G2R-JOINT-C4
	φ6 straight	4G2R-JOINT-C6
	φ8 straight	4G2R-JOINT-C8
	φ10 straight *2	4G2R-JOINT-C10
	φ6 elbow	4G2R-JOINT-CL6,CLL6
	φ8 elbow	4G2R-JOINT-CL8,CLL8
	φ1/4" straight	4G2R-JOINT-C6N
	φ5/16" straight	4G2R-JOINT-C8N
	φ1/4" elbow *1	4G2R-JOINT-CL6N,CLL6N
	φ5/16" elbow *1	4G2R-JOINT-CL8N,CLL8N
	Plug cartridge	4G2R-JOINT-CPG
4G3	φ6 straight	4G3R-JOINT-C6
	φ8 straight	4G3R-JOINT-C8
	φ10 straight	4G3R-JOINT-C10
	φ8 elbow	4G3R-JOINT-CL8,CLL8
	φ10 elbow	4G3R-JOINT-CL10,CLL10
	φ5/16" straight	4G3R-JOINT-C8N
	φ3/8" straight	4G3R-JOINT-C10N
4G4	φ8 straight	4G4-JOINT-C8
	φ10 straight	4G4-JOINT-C10
	φ12 straight	4G4-JOINT-C12

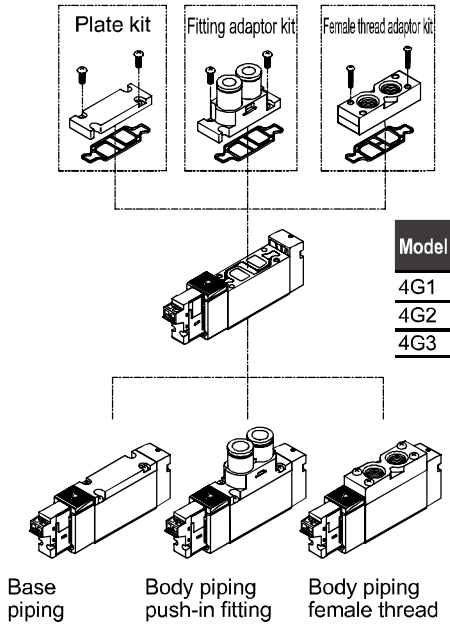
*1: Custom order. *2: Common product with the 4G3 φ10 straight.

4. How to change piping connection specification

⚠ CAUTION

4 G 1, 2, 3

■When replacing the plate or fitting adaptor on the body, changing the body piping and base piping, or changing the push-in fitting and female thread of body piping, be sure to use appropriate tightening torque since air may leak if the mounting screws are loose.



Model	Size	Tightening Torque (N·m)
4G1	M1.7	0.18 to 0.22
4G2	M2.5	0.25 to 0.30
4G3	M3	0.6 to 0.7

Plate kit

Model	Kit model No.	Set parts
4GB1	4G1R-PLATE-KIT	Plate, gasket, 2 mounting screws
4GB2	4G2R-PLATE-KIT	Plate, gasket, 2 mounting screws
4GB3	4G3R-PLATE-KIT	Plate, gasket, 2 mounting screws

Use/maintenance

Fitting adaptor kit

4GA1 R-JNT-ADAPTOR-KIT- C4 NC - F

Ⓐ Model No.
Ⓑ Port size
Ⓒ NC/NO
Ⓓ Option

Code	Content	Ⓐ Model No. 3G1	3G2	3G3	4G1	4G2	4G3
Ⓑ Port size							
CF	φ1.8 barbed	●			●		
C18	φ1.8 straight	●			●		
C4	φ4 straight	●	●			●	
C6	φ6 straight	●	●	●		●	●
C8	φ8 straight		●	●		●	●
C10	φ10 straight			●			●
C3N	φ1/8" straight	●			●		
C4N	φ5/32" straight	●			●		
C6N	φ1/4" straight		●			●	
C8N	φ5/16" straight		●	●		●	●
C10N	φ3/8" straight			●			●
Ⓒ NC/NO							
NC	For 3GA □ 10	●	●	●			
NO	For 3GA□110	●	●	●			
Blank	Other than 3GA□10 or 3GA□110	●	●		●	●	●
Ⓓ Option							
Blank		●	●	●	●	●	●
F	A/B port filter built in	●	●	●	●	●	●

Note: Fitting adapter (with fittings), gasket and 2 mounting screws are in a set.

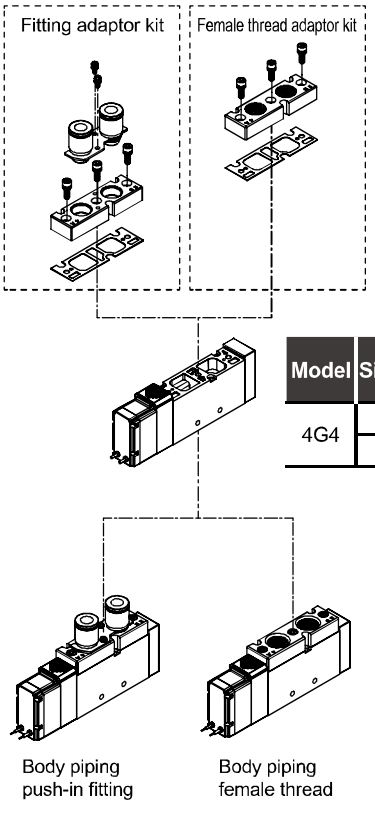
Female thread adaptor kit

Model	Kit model No.	Set parts
4GA1	4G1R - FML - ADAPTOR - KIT - bore size - option	Female screw adaptor, gasket, 2 mounting screws
4GA2	4G2R - FML - ADAPTOR - KIT - bore size - option	Female screw adaptor, gasket, 2 mounting screws
4GA3	4G3R - FML - ADAPTOR - KIT - bore size - option	Female screw adaptor, gasket, 2 mounting screws, 2 body mounting screws

Specify the option "F" when using the A/B port filter integrated.

4 G 4

■ When replacing the fitting adaptor on the body piping or changing the push-in fitting and female thread of body piping, be sure to use appropriate tightening torque since air may leak if the mounting screws are loose.



Model	Size	Tightening Torque (N·m)
4G4	M3	0.7
	M4	2.6

Fitting adaptor kit

Model	Part name	Kit model No.	Set parts
4GA4	φ8 fitting adaptor kit	4GA4 - JNT - ADAPTOR - KIT - C8 - option	Fitting adaptor, Push-in fitting 2, Fitting stopper plate, Gasket, Mounting screw 2, Adaptor mounting screw 3
	φ10 fitting adaptor kit	4GA4 - JNT - ADAPTOR - KIT - C10 - option	
	φ12 fitting adaptor kit	4GA4 - JNT - ADAPTOR - KIT - C12 - option	

Specify the option "F" when using the A/B port filter integrated.

Female thread adaptor kit

Model	Kit model No.	Set parts
4G4	4GA4 - FML - ADAPTOR - KIT - port size - option	Female thread adaptor, gasket, Adaptor mounting screw 3

Specify the option "F" when using the A/B port filter integrated.

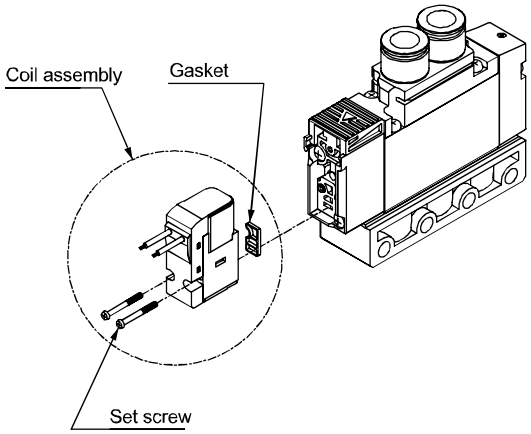
Use/maintenance

5. How to replace coil

⚠WARNING

■Grommet lead wire, E type and EJ type connector coil assemblies

Replace the coil by removing the set screws shown below. Loosening other screws could cause operation failures. When installing, check that the gasket is installed on the coil side and tightening torque is proper. Improper installation could result in air leakage or operation failures.



■DIN terminal box coil assembly

Replace the coil assembly by removing the set screws shown below. Loosening other screws could cause operation failures. When installing, check that the gasket is installed on the coil assembly side and tightening torque is proper. Improper installation could result in air leakage or operation failures.

The coil assembly of grommet lead wire, E-connector specification and DIN terminal box specification cannot be replaced.

Recommended tightening torque 0.15 to 0.19 N·m