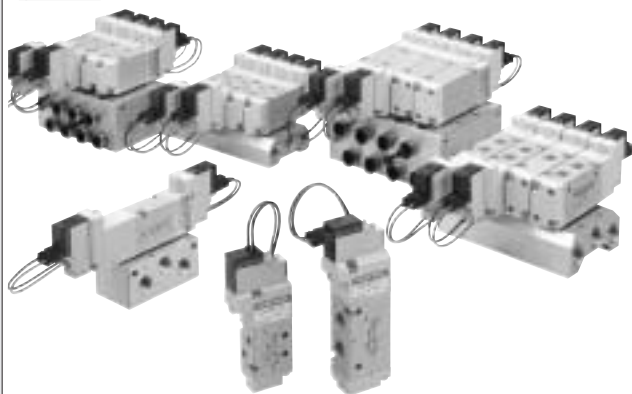




CAD drawing data catalog
is available.



KOGANEI

VALVES GENERAL CATALOG

SOLENOID VALVES G110, G180 SERIES INDEX

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SOLENOID VALVES G110, G180 SERIES

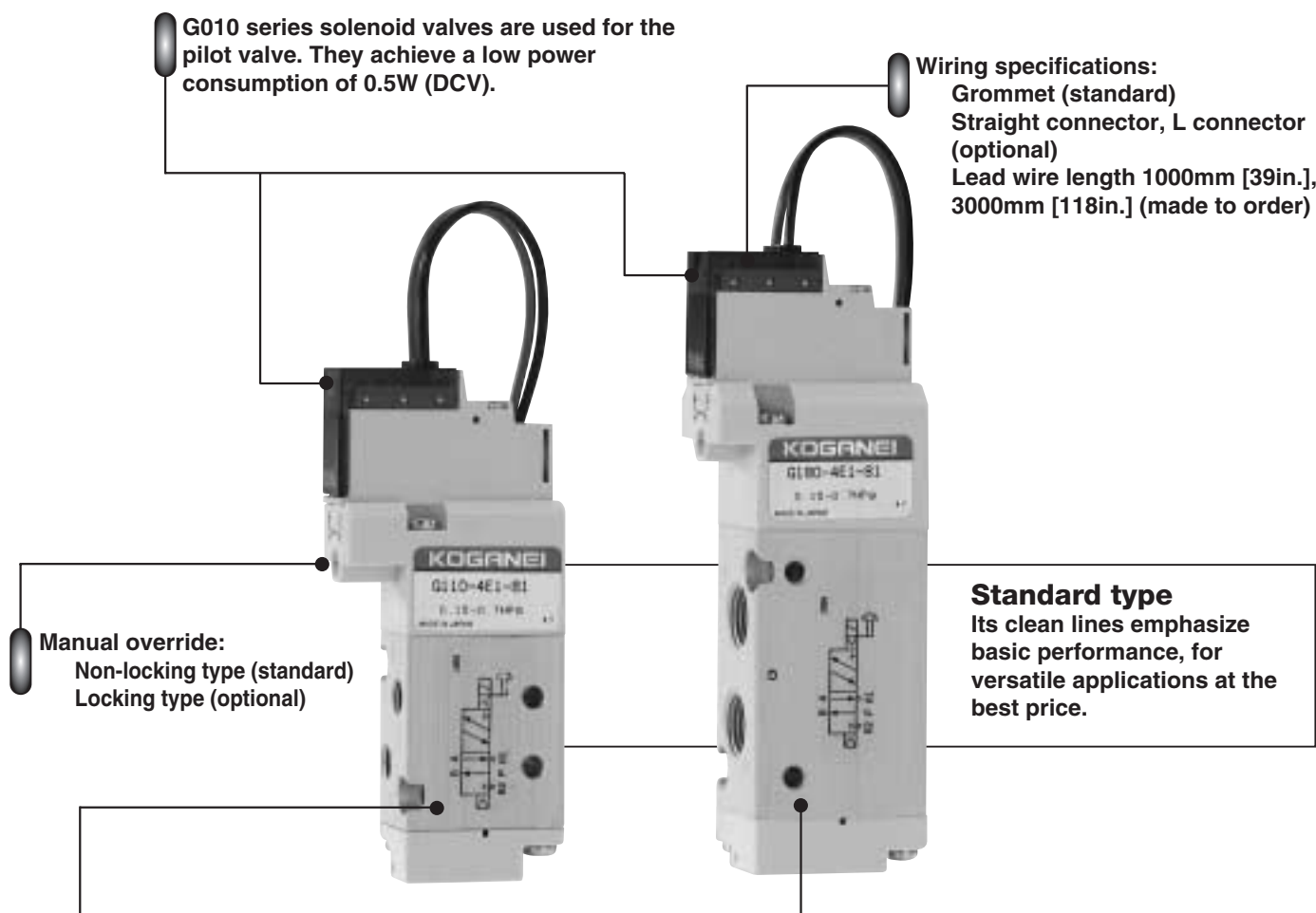


Caution

Before use, be sure to read the "Safety Precautions" on p. 31.

SOLENOID VALVES G110, G180 SERIES

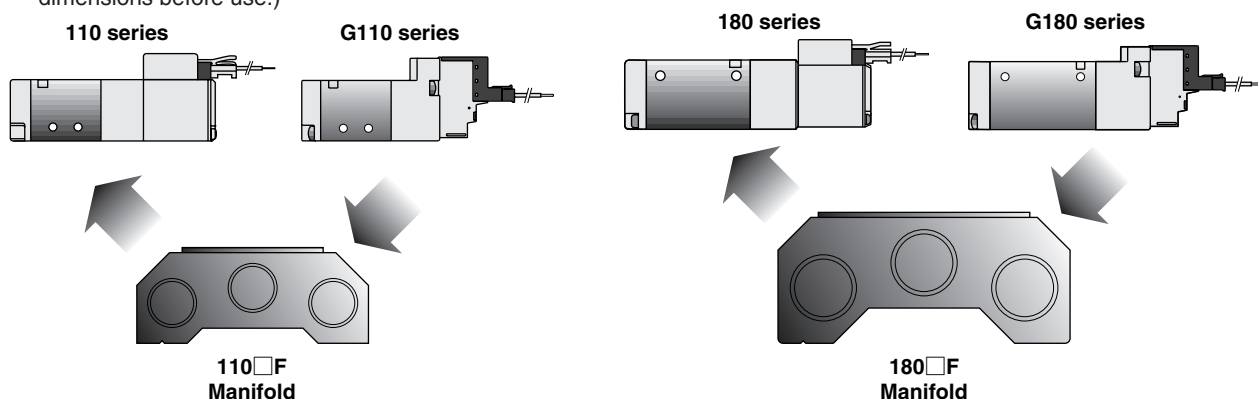
The high performance 110, 180 series solenoid valves, in combination with the low power consumption G010 solenoid valves achieve the basic performance required of a solenoid valve.



The solenoid valves of both the 100, 180 series and of the G110, G180 series can be mounted on the F, FE, A, and AJ type manifolds.

The G110, G180 series solenoid valves' mounting is compatible with the 100, 180 series manifolds.

(Note, however, that the outer shape of the G110, G180 series is different from that of the 110, 180 series. Confirm the outer dimensions before use.)

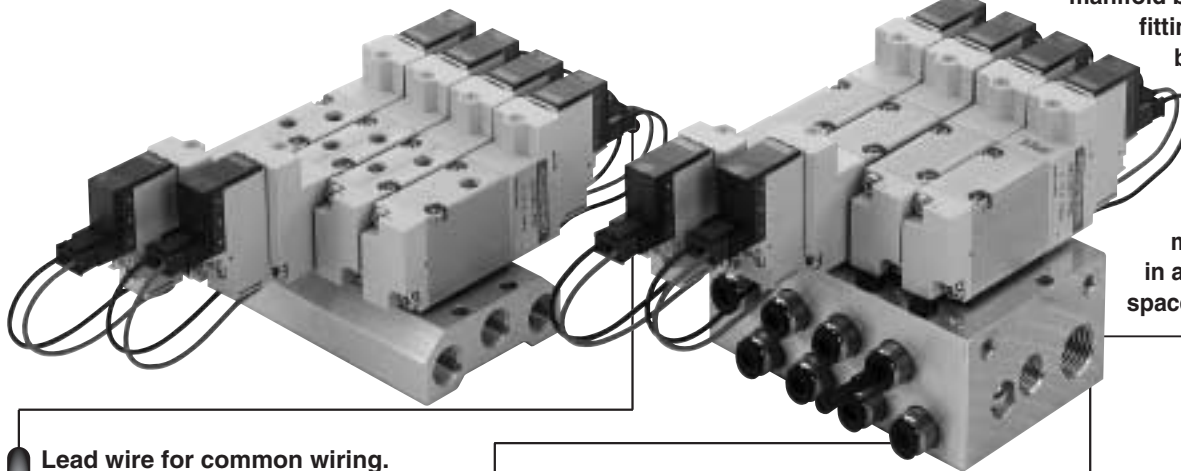


F type manifold

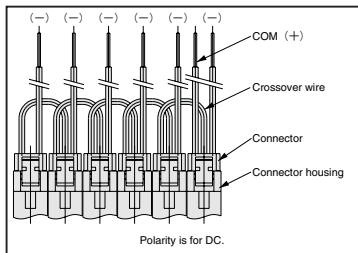
Direct piping type valves can be mounted directly on this manifold. An FE type manifold enabling collected pilot exhaust through its PR port is also available.

AJ type manifold

Combines all ports into a manifold base. Quick fittings are built into the delivery ports (4(A), 2(B)), achieving easy assembly and maintenance in a confined space.



Lead wire for common wiring. Using the lead wire for common wiring, provided as additional parts, saves wiring work.

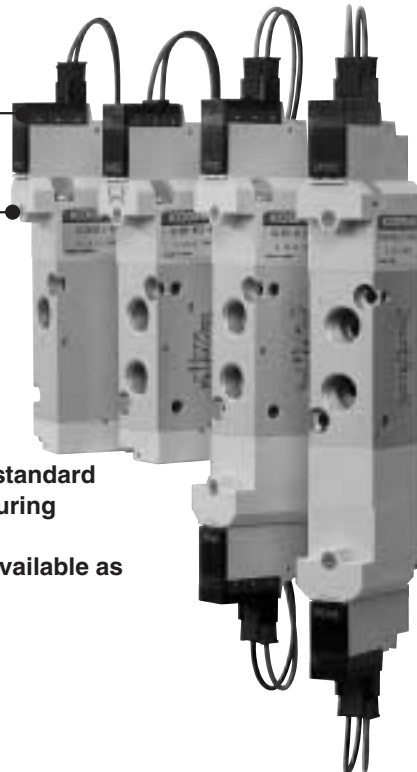


For the delivery port quick fittings, select from $\phi 4$ or $\phi 6$ fittings for each station in accordance with actuator size.

Piping to the pilot exhaust ports is also possible to keep the control box interior and working environment from becoming contaminated. The built-in check mechanism prevents exhaust interference.

The solenoid, equipped with bridge diodes for AC and a flywheel diode for DC as standard features, offers complete surge suppression.

A manual override (non-locking type) is standard equipment and offers easy adjustment during assembly and maintenance.
A locking type manual override is also available as an option.



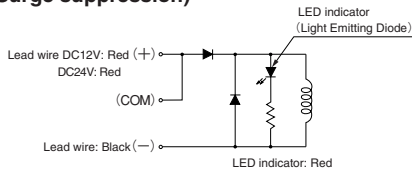


Solenoid

Internal circuit

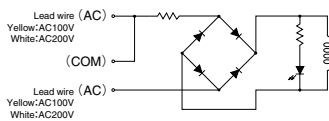
● DC12V, DC24V

Solenoid with LED indicator (Surge suppression)



● AC100V, AC200V

Solenoid with LED indicator (Surge suppression)



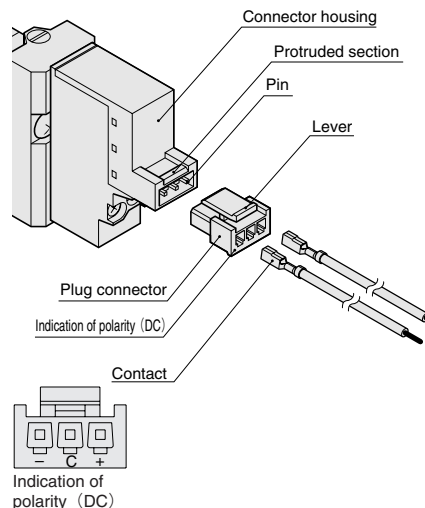
- Cautions:**
1. Do not apply megger between the lead wires.
 2. The DC solenoid will not short circuit even if the wrong polarity is applied, but the valve will not operate.
 3. Leakage current inside the circuit could result in failure of the solenoid valve to return, or in other erratic operation. Always use it within the range of the allowable leakage current. If circuit conditions, etc. cause the leakage current to exceed the allowable leakage current, consult us.
 4. For double solenoid, avoid energizing both solenoids simultaneously. The valve could fall into a neutral position.



Plug connector

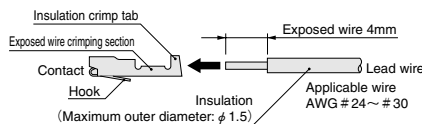
Attaching and removing plug connector

Use fingers to insert the connector into the pin, push it in until the lever claw latches onto the protruded section of the connector housing, and complete the connection.
To remove the connector, squeeze the lever along with the connector, lift the lever claw up from the protruded section of the connector housing, and pull it out.



Crimping of connecting lead wire and contact

To crimp lead wires into contacts, strip off 4mm [0.16in.] of the insulation from the end of the lead wire, insert it into the contact, and crimp it. Be sure to avoid catching the insulation on the exposed wire crimping section.

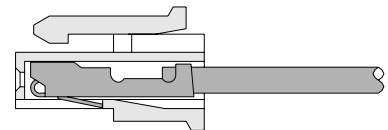


- Cautions**
1. Do not pull hard on the lead wire.
 2. Always use a dedicated tool for crimping of connecting lead wire and contact.
Contact: Model 706312-2MK
Manufactured by Sumiko Tech, Inc.
Crimping tool: Model F1
(for 706312-2MK)
Manufactured by Sumiko Tech, Inc.

Attaching and removing contact and connector

Insert the contact with lead wire into a plug connector □ hole until the contact hook latches on the connector and is secured to the plug connector. Confirm that the lead wire cannot be easily pulled out.

To remove it, insert a tool with a fine tip (such as a small screwdriver) into the rectangular hole on the bottom of the plug connector to push up on the hook, and then pull out the lead wire.



- Cautions:**
1. Do not pull hard on the lead wire. It could result in defective contacts, breaking wires, etc.
 2. If the pin is bent, use a small screwdriver, etc. to gently straighten out the pin, and then complete the connection to the plug connector.
 3. For crimping of connecting lead wire and contact, always use a dedicated crimping tool. If a crimping tool is required, consult us.

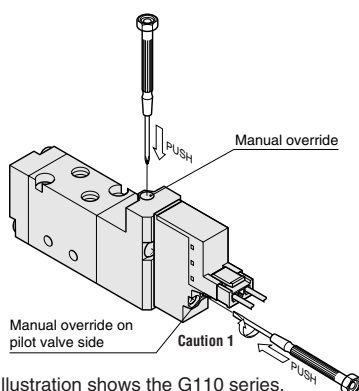


Manual override

Non-locking type

To operate the manual override, press it all the way down. The single solenoid valve works the same as when in the energized state as long as the manual override is pushed down, and returns to the normal position upon release.

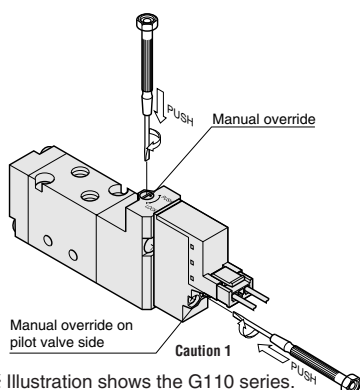
For the double solenoid valve, pressing the manual override on the 14(SA) side switches the 14(SA) to enter the energized position, and the unit remains in that state even after the manual override is released. To return it to the normal position, operate the manual override on the 12(SB) side. This is the same for the solenoid 12(SB).



※ Illustration shows the G110 series.

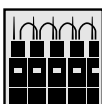
Locking type

To lock the manual override, use a small screwdriver to push down on the manual override all the way and turn it clockwise 90 degrees. When locked, turning the manual override 90 degrees in the counterclockwise direction releases a spring on the manual override, returns it to the normal position, and releases the lock. When the manual override is not turned, this type acts just like the non-locking type, the valve enters the energized position as long as the manual override is pushed down, and returns to the normal position upon release.



※ Illustration shows the G110 series.

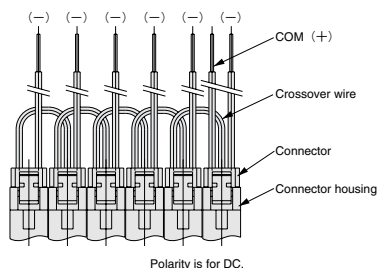
- Cautions**
1. While manual override operation is also possible on the pilot valve side, make sure to release the lock after completing the manual override operation. Moreover, always confirm that the lock on the pilot valve side has been released before operating the valve.
 2. The G110 and G180 series valves are internal pilot type solenoid valves. As a result, the manual override cannot switch the main valve without air supplied from the 1(P) port.
 3. Always release the lock of the locking type manual override before commencing normal operation.
 4. Do not attempt to operate the manual override with a pin or other object having an extremely fine tip. It could damage the manual override button.



Lead wire for common wiring

Using the lead wire for common wiring, provided as additional parts, saves wiring work.

Common terminal wiring example for DC positive side and AC



Note: The above diagram shows a straight connector.

Mounting valves on manifold

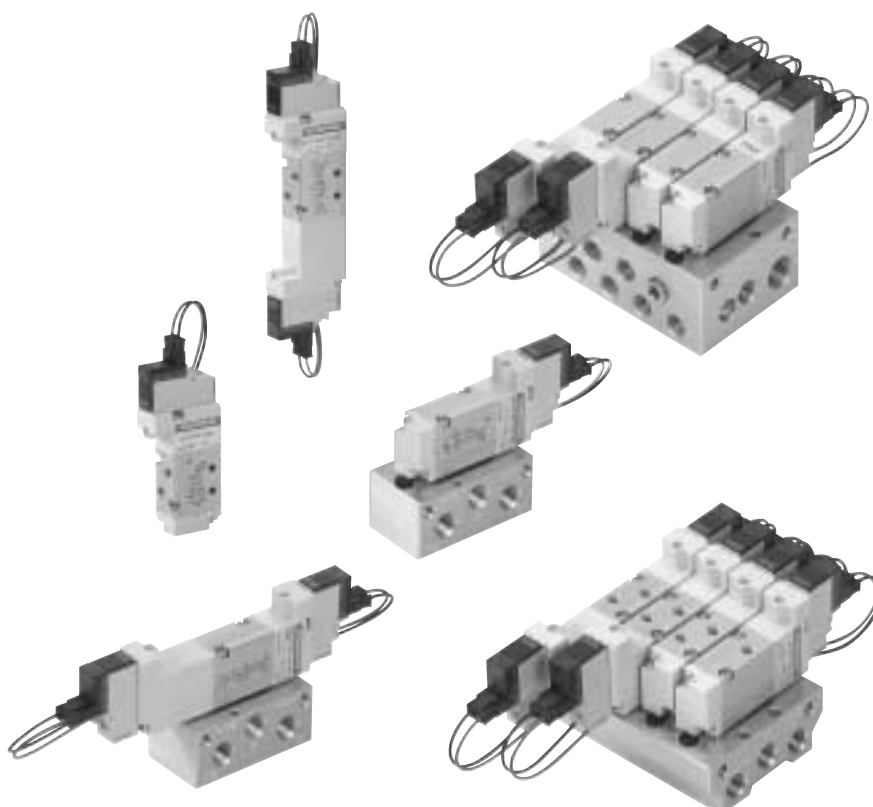
When mounting valves on manifold, apply the following recommended tightening torque for the valve mounting screws:

G110 series: 39.2N·cm {4kgf·cm} [3.5in·lbf]
G180 series: 49N·cm {5kgf·cm} [4.3in·lbf]







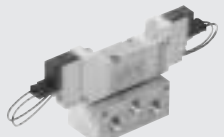

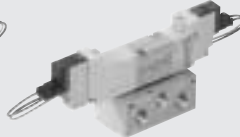
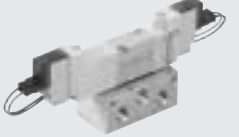
SOLENOID VALVES G110 SERIES

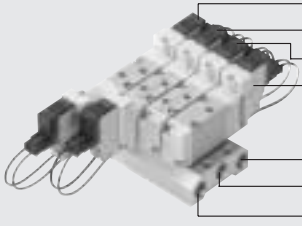
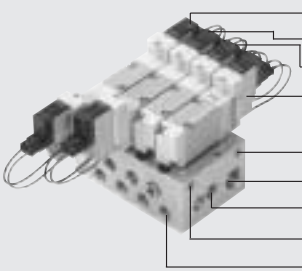
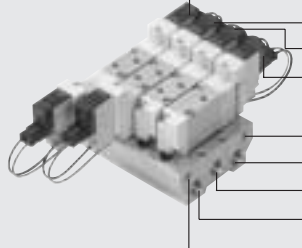
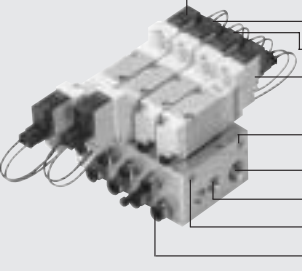
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G110 Series Basic Models and Configuration

Single unit					
	5-port				
	2-position		3-position		
Direct piping	Single solenoid  G110-4E1	Double solenoid  G110-4E2	Closed center  G113-4E2	Exhaust center  G113-4E2-13	Pressure center  G113-4E2-14
	Remark: The photos show wiring specification -PSL.				
Sub-base piping	2-position		3-position		
	Single solenoid  GA110-4E1-25	Double solenoid  GA110-4E2-25	Closed center  GA113-4E2-25	Exhaust center  GA113-4E2-13-25	Pressure center  GA113-4E2-14-25
	Remark: The photos show wiring specification -PSL.				

Manifold	
Manifold for combination mounting of 2-, 3-, 5-port valves	
G110M□F —F type (1(P), 3(R2), 5(R1)) manifold  <ul style="list-style-type: none"> G113-4E2, G113-4E2-13, G113-4E2-14 G110-4E2 G110-4E1 G110E1, G110E1-11^{Note} (2-, 3-port valve for manifold use only) 5(R1) 1(P) 3(R2) 	G110M□A —A type (all ports) manifold  <ul style="list-style-type: none"> GA113-4E2, GA113-4E2-13, GA113-4E2-14 GA110-4E2 GA110-4E1 GA110E1, GA110E1-11^{Note} (2-, 3-port valve for manifold use only) PR1 3, 5(R) 1(P) PR2 4(A), 2(B)
G110M□FE —FE type (1(P), 3(R2), 5(R1)) manifold  <ul style="list-style-type: none"> G113-4E2, G113-4E2-13, G113-4E2-14 G110-4E2 G110-4E1 G110E1, G110E1-11^{Note} (2-, 3-port valve for manifold use only) PR1 5(R1) 1(P) 3(R2) PR2 	G110M□AJ —AJ type (all ports, with quick fittings) manifold  <ul style="list-style-type: none"> GA113-4E2, GA113-4E2-13, GA113-4E2-14 GA110-4E2 GA110-4E1 GA110E1, GA110E1-11^{Note} (2-, 3-port valve for manifold use only) PR1 3, 5(R) 1(P) PR2 4(A), 2(B) (with quick fittings)

Note: G110E1 and GA110E1 are dedicated valves for manifolds with combination mounting of 2-, 3-, 5-port valves. They cannot be used as single units.

SOLENOID VALVES

G110 SERIES

Specifications

Basic Models and Functions

Item	Basic model	Direct piping, F,FE type manifolds	G110E1 ^{Note}	G110-4E1 G110-4E2	G113-4E2
		Sub-base piping, A, AJ type manifolds	GA110E1 ^{Note}	GA110-4E1 GA110-4E2	GA113-4E2
Number of positions			2 positions		3 positions
Number of ports			2, 3 ports	5 ports	
Valve function			Normally closed (NC, standard) or Normally open (NO, optional)	Single solenoid or Double solenoid	Closed center (standard), Exhaust center (optional) or Pressure center (optional)

Remark: For optional specifications and order codes, see p.273~274.

Note: G110E1 and GA110E1 are dedicated valves for manifolds with combination mounting of 2-, 3-, 5-port valves. They cannot be used as single units.

Specifications

Item	Basic model	Direct piping, F,FE type manifolds	G110E1	G110-4E1 G110-4E2	G113-4E2
		Sub-base piping, A, AJ type manifolds	GA110E1	GA110-4E1 GA110-4E2	GA113-4E2
Media			Air		
Operation type			Internal pilot type		
Effective area [Cv] ^{Note 1}	mm ²		4.2 [0.23]		3.8 [0.21]
Port size ^{Note 2}			M5×0.8		
Lubrication			Not required		
Operating pressure range	MPa {kgf/cm ² } [psi.]		0.15~0.7 {1.5~7.1} [22~102]		
Proof pressure	MPa {kgf/cm ² } [psi.]		1.05 {10.7} [152]		
Response time ^{Note 3}	ms	DC12V, DC24V	15/25	15/25, [20]	15/40
		AC100V, AC200V	15/15	15/20, [15]	15/35
ON/OFF					
Maximum operating frequency	Hz		5		
Minimum time to energize for self holding	ms		—	50 (□ 110-4E2)	—
Operating temperature range (atmosphere and media)	°C [°F]		5~50 [41~122]		
Shock resistance	m/s ² [G]		1373.0 {140.0} (Pilot valve axial direction 294.2 {30})		294.2 {30.0}
Mounting direction			Any		

Notes: 1. For details, see the effective area on p.271.

2. For details, see the port size on p.271.

3. Values when air pressure is 0.5MPa {5.1kgf/cm²} [73psi.]. Due to switching phase timing, add a maximum of 5ms to the response time for AC specifications. Values in brackets [] are for G110-4E2. In addition, values for G113-4E2 are those of the closed center valve when switching from the neutral position.

Solenoid Specifications

Item	Rated voltage	DC12V	DC24V	AC100V ^{Note}		AC200V ^{Note}	
Operating voltage range	V	10.8~13.2 (12±10%)	21.6~26.4 (24±10%)	90~110 (100±10%)		180~220 (200±10%)	
Rated frequency	Hz	—	—	50	60	50	60
Current (when rated voltage is applied)	mA (r.m.s)	42	21	11		8	
Power consumption		0.5W	0.5W	1.1VA		1.6VA	
Allowable leakage current	mA	1.0	1.0	1.0		1.0	
Insulation resistance	MΩ	Over 100 (value at DC500V megger)					
Wiring type and lead wire length		Grommet type: 300mm [11.8in.], Plug connector type: 300mm [11.8in.]					
Color of lead wire		Red (+), Black (—)		Yellow		White	
Color of LED indicator		Red					
Surge suppression (as standard)		Flywheel diode		Bridge diode			

Notes: 1. Since the AC types have built-in bridge diodes, the starting current value and energizing current value are virtually the same.

2. For long-time continuous energizing in the AC types, consult us.

3. For the AC types, provide heat radiation measures to ensure that the ambient temperature (or when used in a control box, the internal temperature of the box) always remains within the temperature range specifications.

Effective Area [Cv]

mm² [CV]

Basic model	Standard (Single valve)	Built-in quick fittings	Remarks
G110E1 G110-4E1 G110-4E2	4.2 [0.23]	—	<ul style="list-style-type: none"> ● Attaching TS4-M5 to the 1(P), 4(A), 2(B) ports gives the value 1.8. ● On the F type manifold, attaching TS4-M5 to the 4(A), 2(B) ports gives the value 2.1.
G113-4E2	3.8 [0.21]		
GA110E1 GA110-4E1 GA110-4E2	4.0 [0.22]	-J4□: 3.6 [0.20] -J6□: 4.0 [0.22]	<ul style="list-style-type: none"> ● When mounting on a sub-base or manifold. ● Attaching TS4-01 to the 1(P), 4(A), 2(B) ports on the sub-base gives the value 3.2.
GA113-4E2	3.6 [0.20]	3.6 [0.20]	

Solenoid Valve Port Size

Basic model	Port specification		Port size
G110E1 ^{Note}	Standard	Female thread	M5×0.8
G110-4E1 G110-4E2 G113-4E2	Standard	Female thread	M5×0.8
GA110-4E1-25 GA110-4E2-25 GA113-4E2-25	1(P)	Female thread	Rc1/8
	4(A), 2(B)		
	3(R2), 5(R1)		
	PR	Female thread	M5×0.8

Note: Since G110E1 is for the manifold use only, piping to the 1(P) port with a fitting is not possible.

Manifold Connection Port Size

Manifold model	Port	Location of piping ports	Port size
G110M□F	1(P)	Manifold	Rc1/8
	4(A), 2(B)	Valve	M5×0.8
	3(R2), 5(R1)	Manifold	Rc1/8
G110M□FE	1(P)	Manifold	Rc1/8
	4(A), 2(B)	Valve	M5×0.8
	3(R2), 5(R1)	Manifold	Rc1/8
	PR		M5×0.8
G110M□A	1(P)	Manifold	Rc1/8
	4(A), 2(B)		Rc1/4
	3, 5(R)		
	PR		M5×0.8
G110M□AJ	1(P)	Manifold	Rc1/8
	4(A), 2(B)		Quick fittings for $\phi 4$ or $\phi 6$
	3, 5(R)		Rc1/4
	PR		M5×0.8

Solenoid Valve Mass

g [oz.]

Basic model	Mass
G110E1	53 [1.87]
G110-4E1	52 [1.83]
G110-4E2	72 [2.54]
G113-4E2	79 [2.79]
GA110E1	54 [1.90] (149 [5.26])
GA110-4E1	53 [1.87] (148 [5.22])
GA110-4E2	73 [2.57] (168 [5.93])
GA113-4E2	81 [2.86] (176 [6.21])

Remark: Figures in parentheses () are the mass with sub-base: -25.

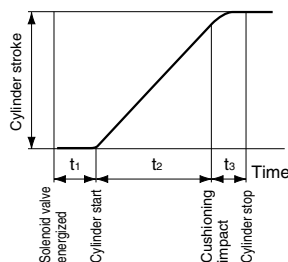
Manifold Mass

g [oz.]

Manifold model	Mass calculation of each unit (n=number of units)	Block-off plate
G110M□F	(20×n)+30 [(0.71×n)+1.06]	6 [0.21]
G110M□FE	(40×n)+50 [(1.41×n)+1.76]	11 [0.39]
G110M□A	(60×n)+60 [(2.12×n)+2.12]	
G110M□AJ	-J4: (67×n)+60 [(2.36×n)+2.12] -J6: (64×n)+60 [(2.26×n)+2.12]	

Cylinder Operating Speed

How to obtain cylinder speed



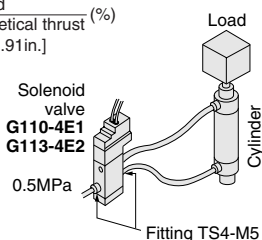
To obtain the time required for the cylinder to complete 1 stroke, add cylinder's delay time t_1 (time between energizing of the solenoid valve and actual starting of the cylinder), to the cylinder's max. speed operating time t_2 .

When a cushion is used, add the cushioning time t_3 , to the above calculation. The standard cushioning time t_3 is approximately 0.2 seconds.

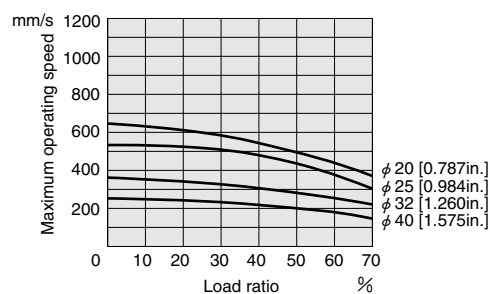
G110-4E1 G113-4E2

● Measurement conditions

- Air pressure: 0.5MPa [5.1kgf/cm²] [73psi.]
- Piping inner diameter and length: ϕ 2.5 [0.10in.]×1000mm [39in.]
- Fitting: Quick fitting TS4-M5
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- Cylinder stroke: 150mm [5.91in.]

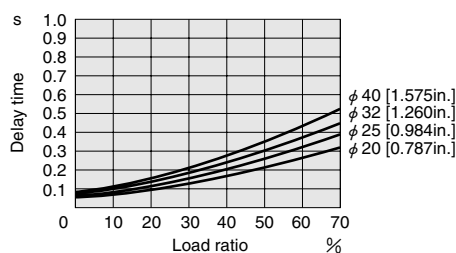


Maximum operating speed



1mm/s = 0.0394in./sec.

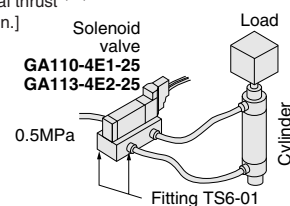
Delay time



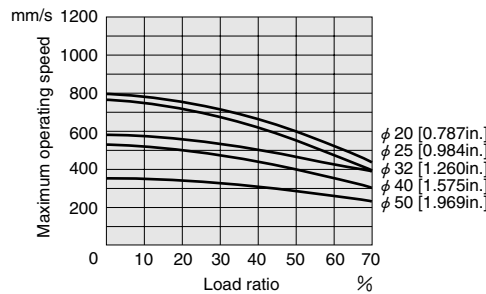
GA110-4E1-25 GA113-4E2-25

● Measurement conditions

- Air pressure: 0.5MPa [5.1kgf/cm²] [73psi.]
- Piping inner diameter and length: ϕ 4 [0.16in.]×1000mm [39in.]
- Fitting: Quick fitting TS6-01
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- Cylinder stroke: 150mm [5.91in.]

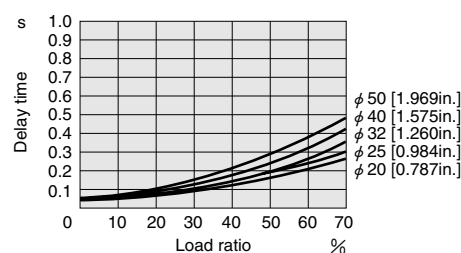


Maximum operating speed

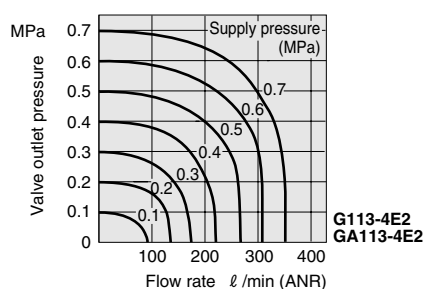
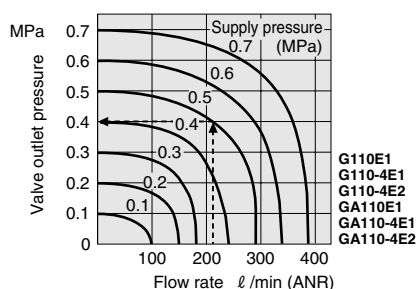


1mm/s = 0.0394in./sec.

Delay time



Flow Rate



How to read the graph

When the supply pressure is 0.5MPa [73psi.] and the flow rate is 214 l/min [7.55 ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].

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

G110 Series Solenoid Valve Order Codes

2-, 3-port valve Number of ports		2-, 3-port valve Valve function		3-position valve Valve function		Sub-base		Manual override		Wiring type	
3-port		Normally closed (NC)		Closed center		Without sub-base		Non-locking type		Grommet type with LED indicator	
2-port		Normally open (NO)		Exhaust center		With sub-base		Locking type		Straight connector with LED indicator	
				Pressure center						L connector with LED indicator	
										</	

G110 Series Manifold Order Codes

2-, 3-port valve Number of ports		2-, 3-port valve Valve function		3-position valve Valve function		Manual override		Wiring type		Manifold Connection port	
3-port Blank		Normally closed (NC) Blank		Closed center Blank		Non-locking type Blank		Grommet type with LED indicator Blank		Quick fittings for ϕ 4 tube -J4	
2-port -2		Normally open (NO) -11		Exhaust center -13		Locking type -81		Straight connector with LED indicator -PSL		L connector with LED indicator -PLL	
				Pressure center -14						Quick fittings for ϕ 6 tube -J6	

Manifold model Number of units		Station	Basic model	Voltage <small>Note</small>		
Manifold for combination mounting of 2-, 3-, 5-port valves	G110M	F FE	stn. <input type="checkbox"/> -G110E1	-2	-11	
			stn. <input type="checkbox"/> -G110-4E1	-81	-PSL	
			stn. <input type="checkbox"/> -G110-4E2	-PSL	-PLL	
			stn. <input type="checkbox"/> -G113-4E2	-13,-14		
		A AJ	stn. <input type="checkbox"/> -GA110E1	-2	-11	
			stn. <input type="checkbox"/> -GA110-4E1	-81	-PSL	
			stn. <input type="checkbox"/> -GA110-4E2	-PSL	-PLL	
			stn. <input type="checkbox"/> -GA113-4E2	-13,-14	-J4 -J6	
	2 20					

● Valve mounting location from the left-hand side when facing the 4(A), 2(B) ports.

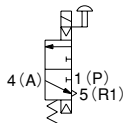
● Specify the valve model for each station.
 ● Enter **-BP** when closing a station with a block-off plate without mounting a valve.

● For the AJ type manifold only, specify either of the two.

Note: For AC 110V~120V or AC 220V~240V specifications, consult us.

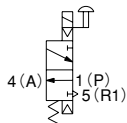
3-port

Normally closed (NC)

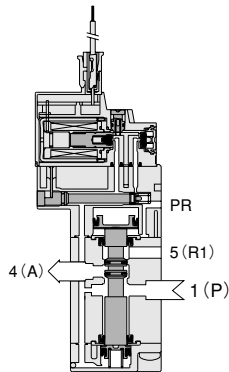
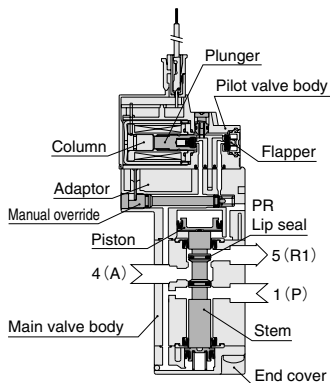


G110E1
De-energized

Normally open (NO)

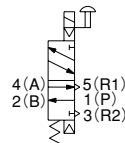


G110E1-11
De-energized

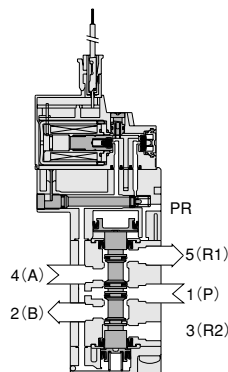


5-port, 2-position

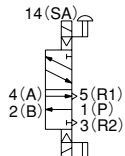
Single solenoid



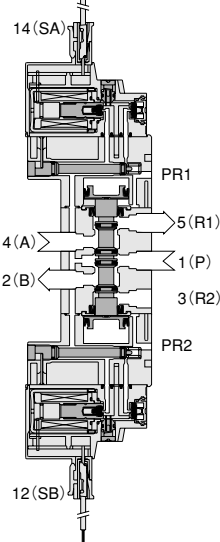
G110-4E1



Double solenoid



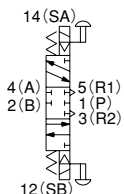
G110-4E2
(De-energized condition after energizing solenoid 14(SA))



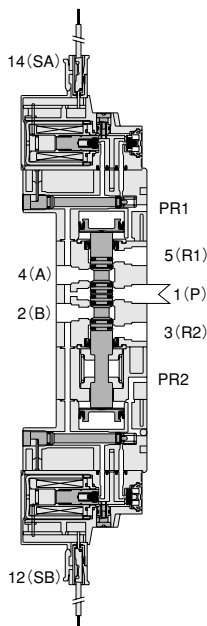
5-port, 3-position

(Both solenoids 14(SA) and 12(SB) are de-energized.)

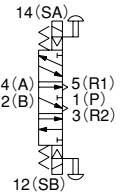
Closed center



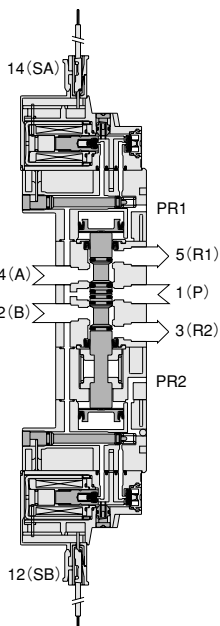
G113-4E2



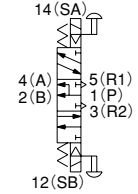
Exhaust center



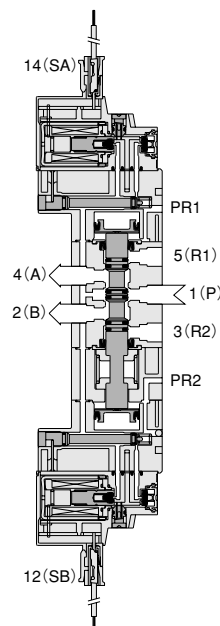
G113-4E2-13



Pressure center



G113-4E2-14



Major Parts and Materials

Parts		Materials
Valve (main valve)	Body	Aluminum alloy (anodized)
	Stem	Aluminum alloy (anodized)
	Lip seal	Synthetic rubber
	Sub-base	Aluminum alloy (anodized)
	End cover	Plastic
Valve (pilot valve)	Adaptor	Plastic
	Body	Plastic
	Plunger	Magnetic stainless steel
Manifold	Column	Synthetic rubber
	Flapper	Synthetic rubber
	Body	Aluminum alloy (anodized)
Manifold	Block-off plate	Mild steel (nickel plated)
	Seal	Synthetic rubber

Dimensions of Solenoid Valve 5-port , 2-, 3-position (mm)

G110-4E1-PSL



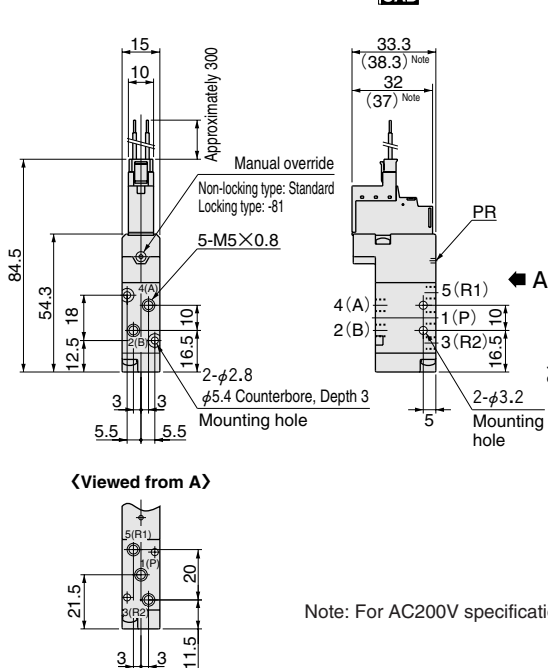
G110_4E1

GA110E1-25-PSL

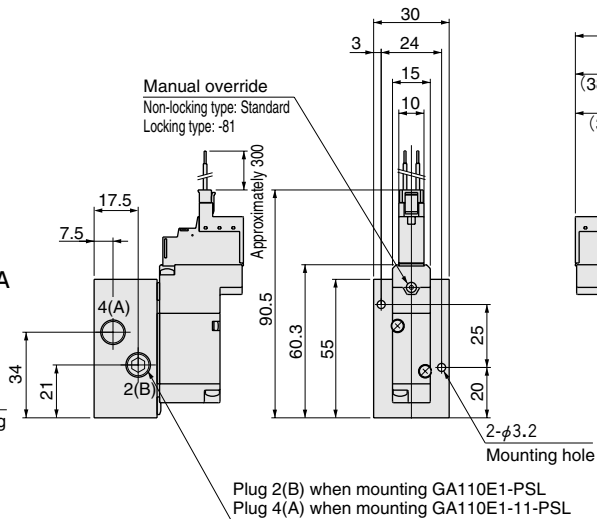
GA110-4E1-25-PSL



GA110E1



Note: For AC200V specification.



Note: For AC200V specification.

G110-4E2-PSL

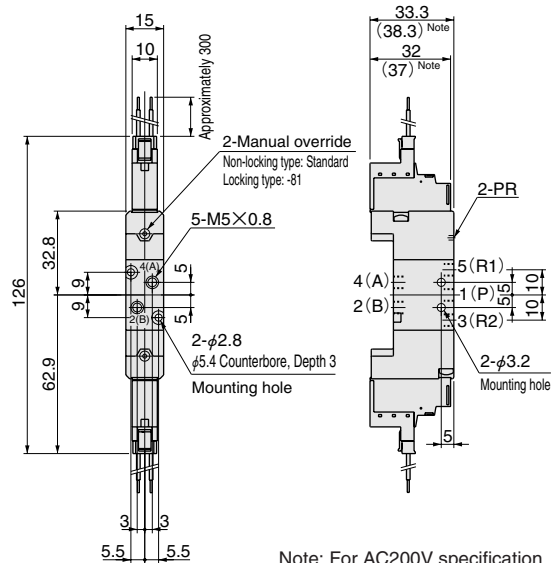


G110_4E2

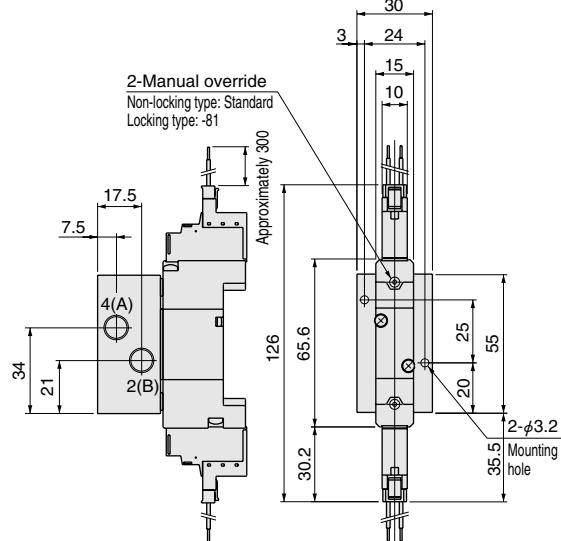
GA110-4E2-25-PSL



GA110_4E



Note: For AC200V specification.



Note: For AC200V specification.

G113-4E2-PSL

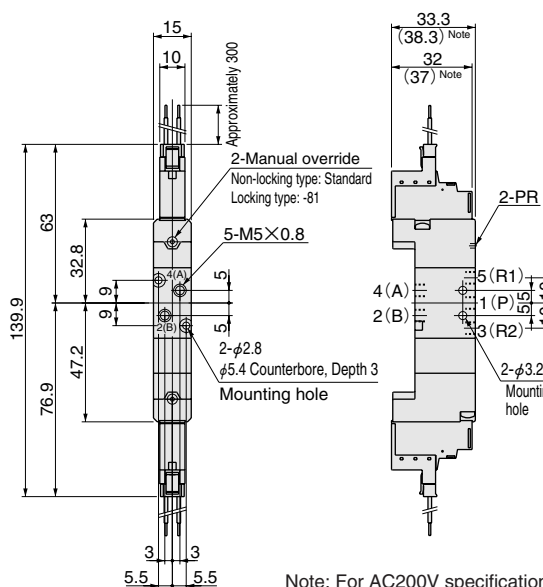


G113_4E2

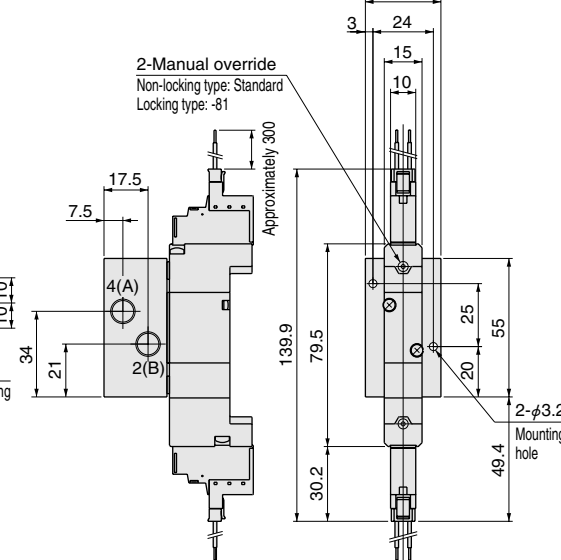
GA113-4E2-25-PSL



GA113_4E



Note: For AC200V specification.

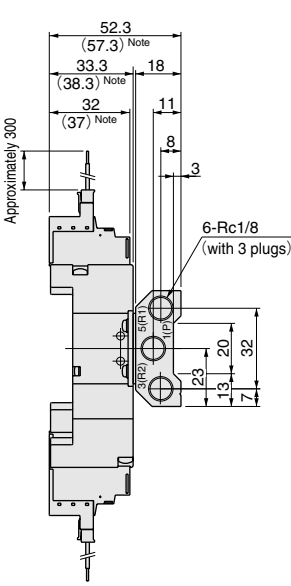
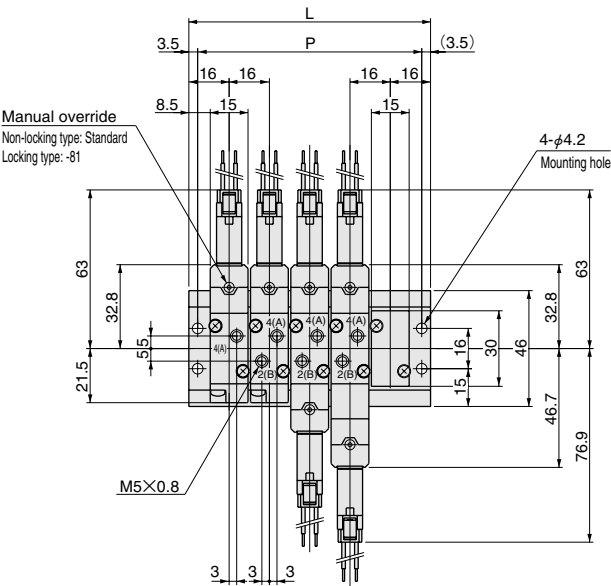


Note: For AC200V specification.

Dimensions of Manifold for Combination Mounting of 2-, 3-, 5-port Valves (mm)

G110M□F

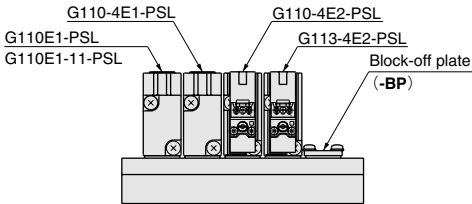
 G110MF



Unit dimensions

Number of units	L	P
2	48	41
3	64	57
4	80	73
5	96	89
6	112	105
7	128	121
8	144	137
9	160	153
10	176	169
11	192	185
12	208	201
13	224	217
14	240	233
15	256	249
16	272	265
17	288	281
18	304	297
19	320	313
20	336	329

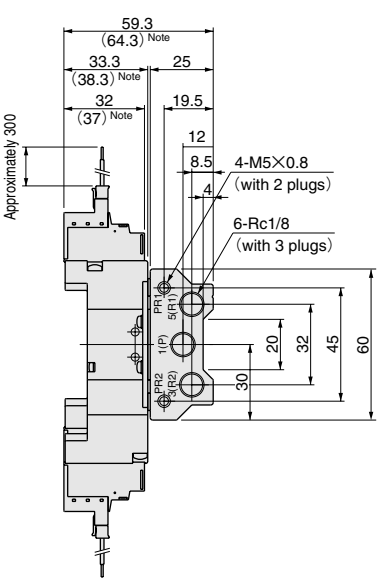
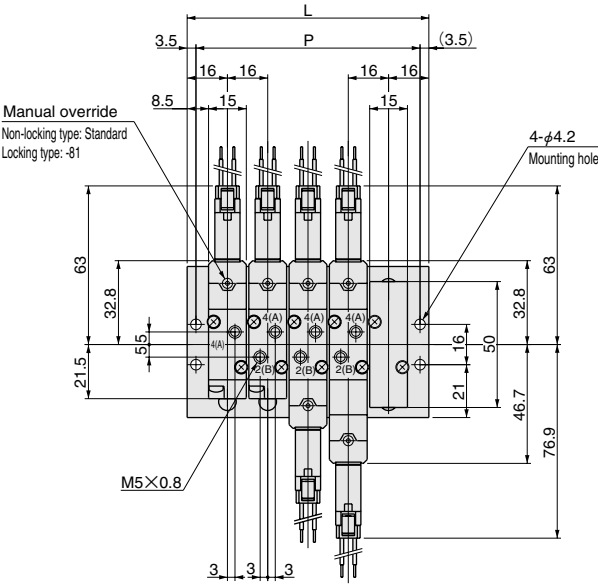
Note: For AC200V specification.



Stn.1 Stn.2 Stn.3 Stn.4 Stn.5

G110M□FE

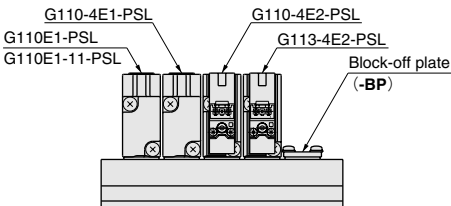
 G110MFE



Unit dimensions

Number of units	L	P
2	48	41
3	64	57
4	80	73
5	96	89
6	112	105
7	128	121
8	144	137
9	160	153
10	176	169
11	192	185
12	208	201
13	224	217
14	240	233
15	256	249
16	272	265
17	288	281
18	304	297
19	320	313
20	336	329

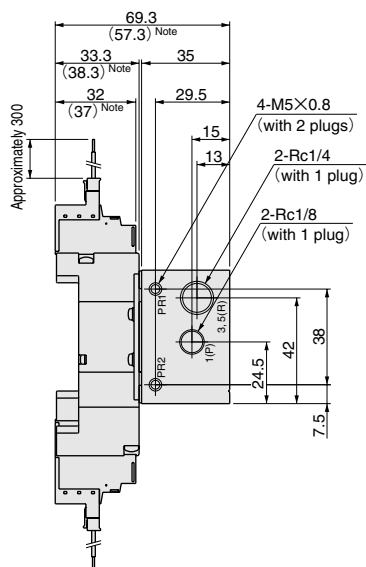
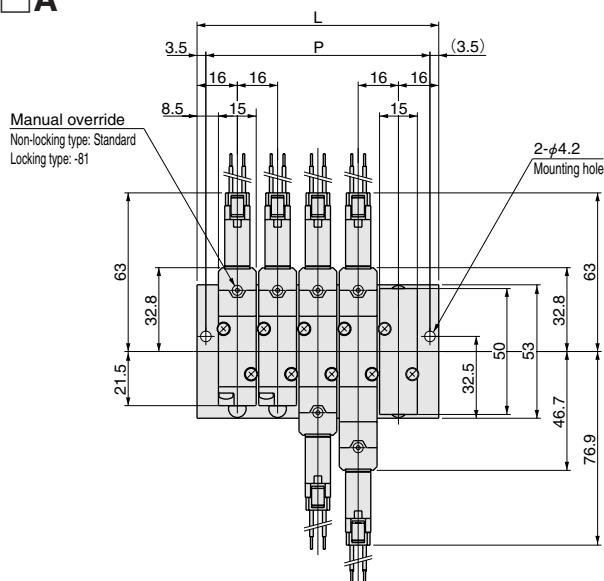
Note: For AC200V specification.



Stn.1 Stn.2 Stn.3 Stn.4 Stn.5

For wiring specifications, see p.279.

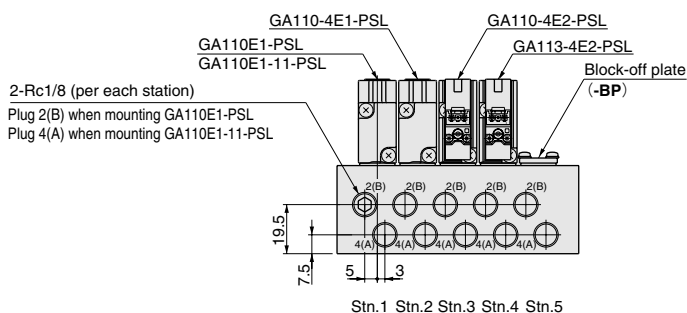
G110M□A



Unit dimensions

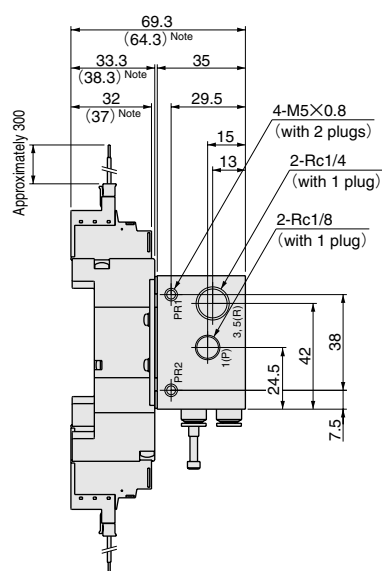
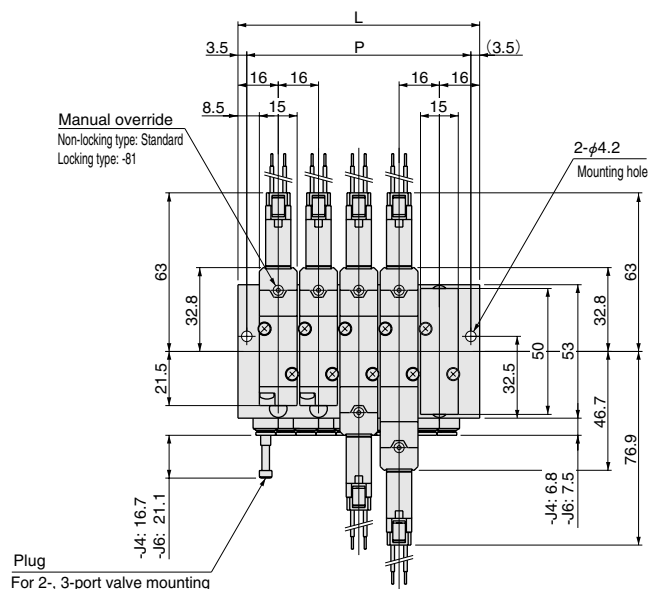
Number of units	L	P
2	48	41
3	64	57
4	80	73
5	96	89
6	112	105
7	128	121
8	144	137
9	160	153
10	176	169
11	192	185
12	208	201
13	224	217
14	240	233
15	256	249
16	272	265
17	288	281
18	304	297
19	320	313
20	336	329

Note: For AC200V specification.



Stn.1 Stn.2 Stn.3 Stn.4 Stn.5

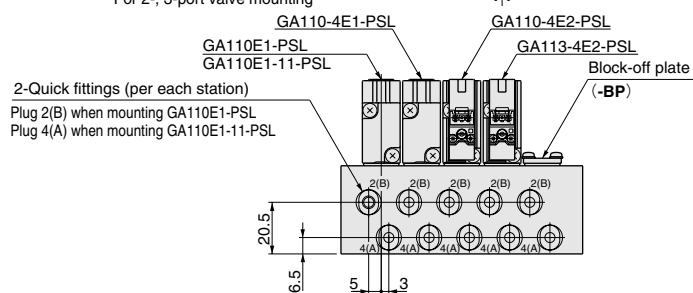
G110M□AJ



Unit dimensions

Number of units	L	P
2	48	41
3	64	57
4	80	73
5	96	89
6	112	105
7	128	121
8	144	137
9	160	153
10	176	169
11	192	185
12	208	201
13	224	217
14	240	233
15	256	249
16	272	265
17	288	281
18	304	297
19	320	313
20	336	329

Note: For AC200V specification.



Stn.1 Stn.2 Stn.3 Stn.4 Stn.5

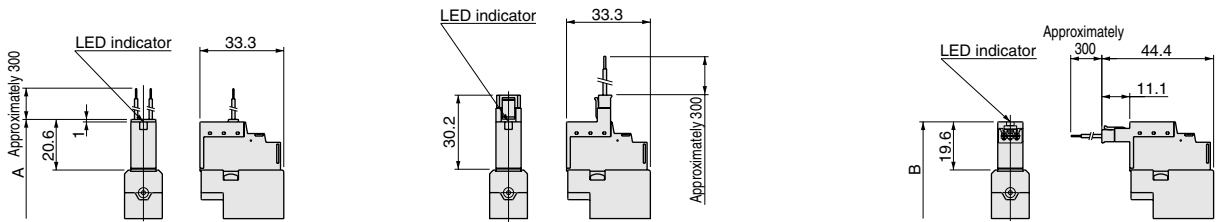
For wiring specifications, see p.279.

Wiring Specifications (mm)

■ For DC12V, 24V, AC100V

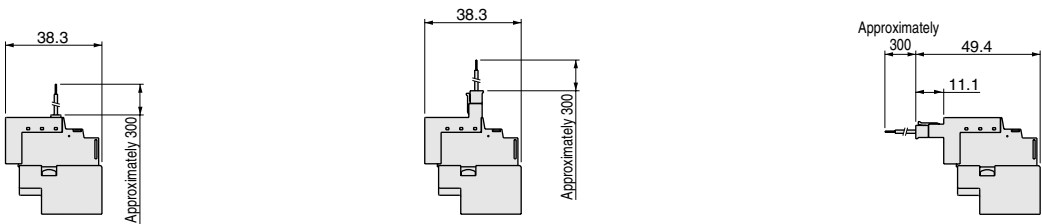


- Grommet: Blank
- Solenoid with straight connector: -PSL
- Solenoid with L connector: -PLL



■ For AC200V

- Grommet: Blank
- Solenoid with straight connector: -PSL
- Solenoid with L connector: -PLL

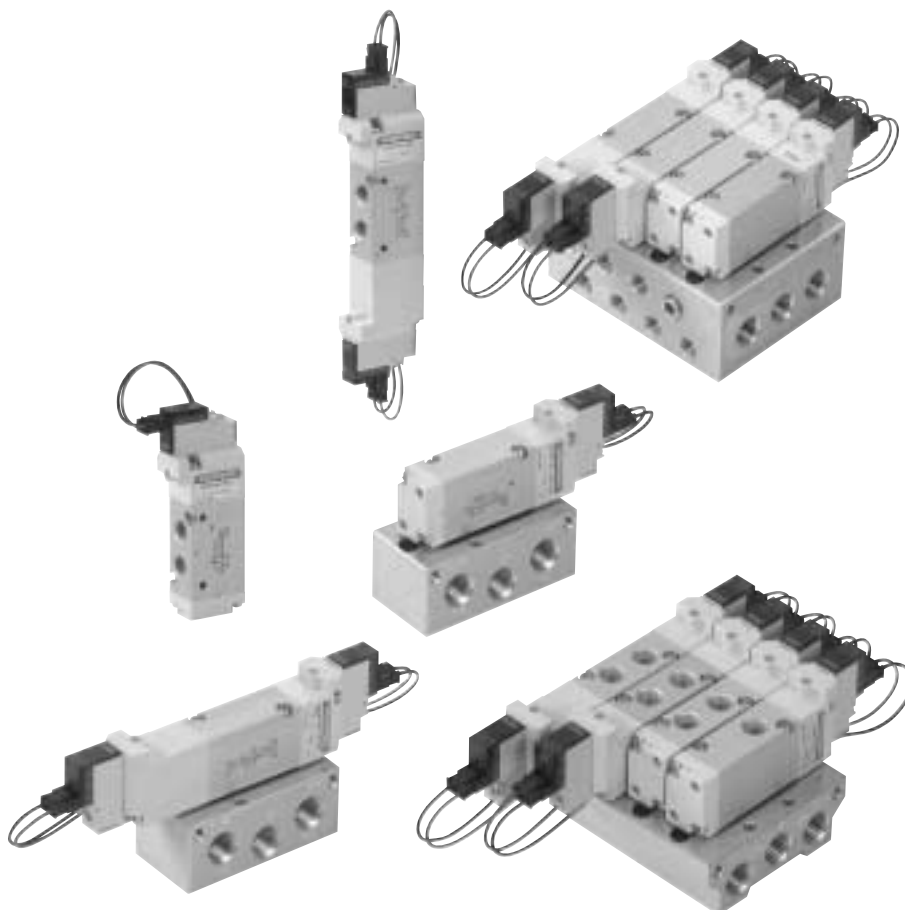


				mm
Model	Code	A	B	Remarks
G110E1, G110-4E1		74.9	73.9	Overall length to the end of the valve or sub-base
GA110E1-25, GA110-4E1-25		80.9	79.9	
G110-4E2, GA110-4E2-25		106.8	104.8	Overall length to the end of the opposite solenoid
G113-4E2, GA113-4E2-25		120.7	118.7	

SOLENOID VALVES G180^{SERIES}







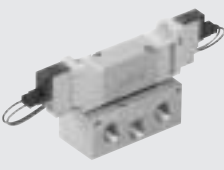
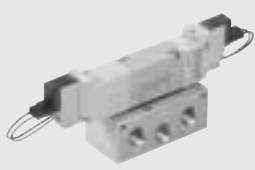
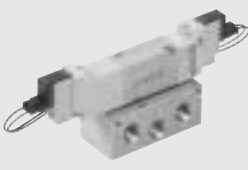
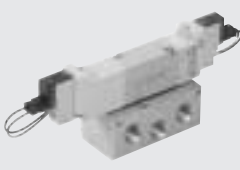
INDEX

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Dimensions of Solenoid Valve 5-port, 2-, 3-position	288
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Wiring Specifications	291



G180 Series Basic Models and Configuration

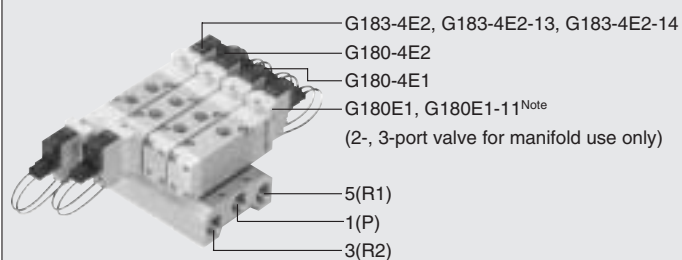
Single unit

5-port	
Direct piping	<div>2-position</div> <div>Single solenoid</div>  <div>G180-4E1</div>
	<div>Double solenoid</div>  <div>G180-4E2</div>
	<div>Closed center</div>  <div>G183-4E2</div>
	<div>3-position</div> <div>Exhaust center</div>  <div>G183-4E2-13</div>
	<div>Pressure center</div>  <div>G183-4E2-14</div>
Remark: The photos show wiring specification -PSL.	
Sub-base piping	<div>2-position</div> <div>Single solenoid</div>  <div>GA180-4E1-25</div>
	<div>Double solenoid</div>  <div>GA180-4E2-25</div>
	<div>Closed center</div>  <div>GA183-4E2-25</div>
	<div>3-position</div> <div>Exhaust center</div>  <div>GA183-4E2-13-25</div>
	<div>Pressure center</div>  <div>GA183-4E2-14-25</div>
Remark: The photos show wiring specification -PSL.	

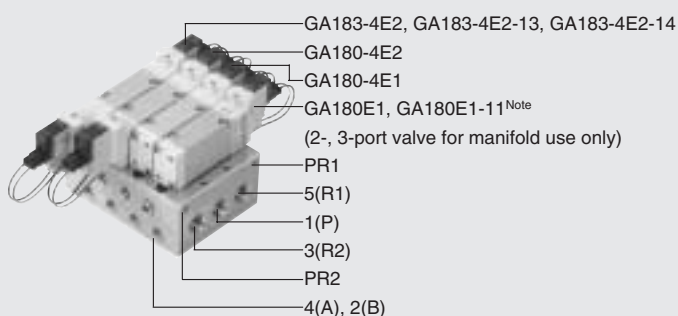
Manifold

Manifold for combination mounting of 2-, 3-, 5-port valves

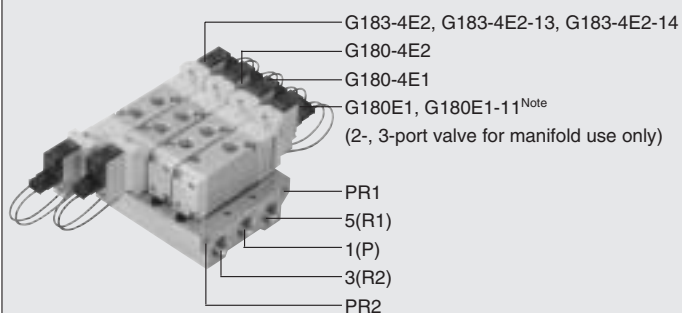
G180M□F—F type (1(P), 3(R2), 5(R1)) manifold



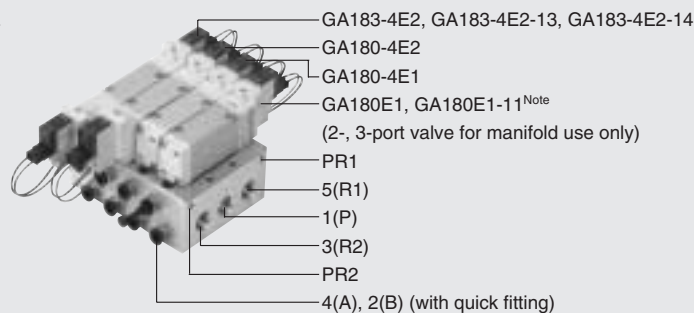
G180M□A—A type (all ports) manifold



G180M□FE—FE type (1(P), 3(R2), 5(R1)) manifold



G180M□AJ—AJ type (all ports, with quick fittings) manifold



Remark: The wiring specifications of solenoid valves in photos are -PSL.

Note: G180E1 and GA180E1 are dedicated valves for manifolds with combination mounting of 2-, 3-, 5-port valves. They cannot be used as single units.

SOLENOID VALVES

G180 SERIES

Specifications

Basic Models and Functions

Item	Basic model	Direct piping, F, FE type manifolds	G180E1 ^{Note}	G180-4E1 G180-4E2	G183-4E2
		Sub-base piping, A, AJ type manifolds	GA180E1 ^{Note}	GA180-4E1 GA180-4E2	GA183-4E2
Number of positions		2 positions			3 positions
Number of ports		2, 3 ports		5 ports	
Valve function		Normally closed (NC, standard) or Normally open (NO, optional)		Single solenoid or Double solenoid	Closed center (standard), Exhaust center or Pressure center (optional)

Remark: For optional specifications and order codes, see p.285~286.

Note: G180E1 and GA180E1 are dedicated valves for manifolds with combination mounting of 2-, 3-, 5-port valves. They cannot be used as single units.

Specifications

Item	Basic model	Direct piping, F, FE type manifolds	G180E1	G180-4E1 G180-4E2	G183-4E2
		Sub-base piping, A, AJ type manifolds	GA180E1	GA180-4E1 GA180-4E2	GA183-4E2
Media			Air		
Operation type			Internal pilot type		
Effective area [Cv] <small>Note 1</small> mm ²			10.2 [0.57]		9.0 [0.50]
Port size <small>Note 2</small>			Rc1/8		
Lubrication			Not required		
Operating pressure range MPa {kgf/cm ² } [psi.]			0.15~0.7 {1.5~7.1} [22~102]		
Proof pressure MPa {kgf/cm ² } [psi.]			1.05 {10.7} [152]		
Response time <small>Note 3</small> ms	DC12V, DC24V	20/30	20/30, {20}		20/65
	ON/OFF AC100V, AC200V	20/25	20/25, {20}		20/55
Maximum operating frequency Hz			5		
Minimum time to energize for self holding ms			—	50 (□ 180-4E2)	—
Operating temperature range (atmosphere and media) °C [°F]			5~50 [41~122]		
Shock resistance m/s ² {G}			1373.0 {140.0} (Pilot valve axial direction 294.2 {30.0})		294.2 {30.0}
Mounting direction			Any		

Notes: 1. For details, see the effective area on p.283.

2. For details, see the port size on p.283.

3. Values when air pressure is 0.5MPa {5.1kgf/cm²} [73psi.]. Due to switching phase timing, add a maximum of 5ms to the response time for AC specifications.

Values in brackets [] are for G180-4E2. In addition, values for G183-4E2 are those of the closed center valve when switching from the neutral position.

Solenoid specifications

Item	Rated voltage	DC12V	DC24V	AC100V ^{Note}		AC200V ^{Note}	
Operating voltage range	V	10.8~13.2 (12±10%)	21.6~26.4 (24±10%)	90~110 (100±10%)		180~220 (200±10%)	
Rated frequency	Hz	—	—	50	60	50	60
Current (when rated voltage is applied)	mA (r.m.s)	42	21	11		8	
Power consumption		0.5W	0.5W	1.1VA		1.6VA	
Allowable leakage current	mA	1.0	1.0	1.0		1.0	
Insulation resistance	MΩ	Over 100 (value at DC500V megger)					
Wiring type and lead wire length		Grommet type: 300mm [11.8in.], Plug connector type: 300mm [11.8in.]					
Color of lead wire		Red (+), Black (—)		Yellow		White	
Color of LED indicator		Red					
Surge suppression (as standard)		Flywheel diode			Bridge diode		

Notes: 1. Since the AC types have built-in bridge diodes, the starting current value and energizing current value are virtually the same.

2. For long-time continuous energizing in the AC types, consult us.

3. For the AC types, provide heat radiation measures to ensure that the ambient temperature (or when used in a control box, the internal temperature of the box) always remains within the temperature range specifications.

Effective Area [Cv]

mm² [CV]

Basic model	Standard (Single valve)	Built-in quick fittings	Remarks
G180E1 G180-4E1 G180-4E2	10.2 [0.57]	—	—
G183-4E2	9.0 [0.50]		
GA180E1 GA180-4E1 GA180-4E2 GA183-4E2	8.2 [0.46]	~J4: 4.4 [0.24] ~J6: 7.9 [0.44]	<ul style="list-style-type: none"> ● When mounting on a sub-base or manifold. ● Attaching TS6-02 to the 1(P), 4(A), 2(B) ports on the sub-base gives the value 7.5.

Solenoid Valve Port Size

Basic model	Port specification		Port size
G180E1 ^{Note}	Standard	Female thread	Rc1/8
G180-4E1 G180-4E2 G183-4E2	Standard	Female thread	Rc1/8
GA180-4E1-25 GA180-4E2-25 GA183-4E2-25	1(P)	Female thread	Rc1/4
	4(A), 2(B)		
	3(R2), 5(R1)		
	PR	Female thread	M5×0.8

Note: Since G180E1 is for the manifold use only, piping to the 1(P) port with a fitting is not possible.

Manifold Connection Port Size

Manifold model	Port	Location of piping ports	Port size
G180M□F	1(P)	Manifold	Rc1/4
	4(A), 2(B)	Valve	Rc1/8
	3(R2), 5(R1)	Manifold	Rc1/4
G180M□FE	1(P)	Manifold	Rc1/4
	4(A), 2(B)	Valve	Rc1/8
	3(R2), 5(R1)	Manifold	Rc1/4
	PR		M5×0.8
G180M□A	1(P)	Manifold	Rc1/4
	4(A), 2(B)		Rc1/8
	3(R2), 5(R1)		Rc1/4
	PR		M5×0.8
G180M□AJ	1(P)	Manifold	Rc1/4
	4(A), 2(B)		Quick fittings for $\phi 4$ or $\phi 6$
	3(R2), 5(R1)		
	PR		M5×0.8

Solenoid Valve Mass

g [oz.]

Basic model	Mass
G180E1	85 [3.00]
G180-4E1	80 [2.82]
G180-4E2	101 [3.56]
G183-4E2	111 [3.92]
GA180E1	86 [3.03] (246 [8.68])
GA180-4E1	85 [3.00] (245 [8.64])
GA180-4E2	106 [3.74] (266 [9.38])
GA183-4E2	115 [4.06] (275 [9.70])

Remark: Figures in parentheses () are the mass with sub-base: -25.

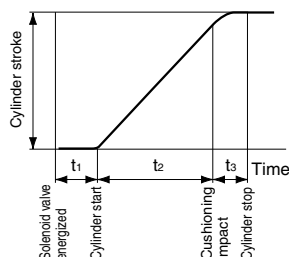
Manifold Mass

g [oz.]

Manifold model	Mass calculation of each unit (n=number of units)	Block-off plate
G180M□F	$(42 \times n) + 40$ [(1.48×n)+1.41]	19 [0.67]
G180M□FE	$(60 \times n) + 70$ [(2.12×n)+2.47]	30 [1.06]
G180M□A	$(120 \times n) + 120$ [(4.23×n)+4.23]	
G180M□AJ	~J4: $(135 \times n) + 120$ [(4.76×n)+4.23]	
	~J6: $(138 \times n) + 120$ [(4.87×n)+4.23]	

Cylinder Operating Speed

How to obtain cylinder speed



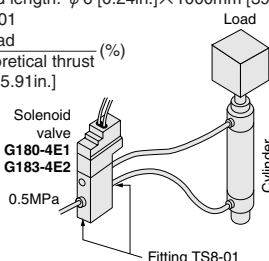
To obtain the time required for the cylinder to complete 1 stroke, add cylinder's delay time t_1 (time between energizing of the solenoid valve and actual starting of the cylinder), to the cylinder's max. speed operating time t_2 .

When a cushion is used, add the cushioning time t_3 , to the above calculation. The standard cushioning time t_3 is approximately 0.2 seconds.

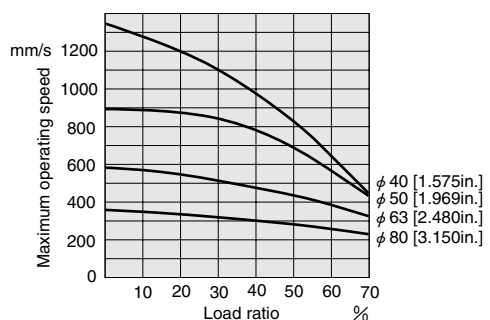
G180-4E1 G183-4E2

● Measurement conditions

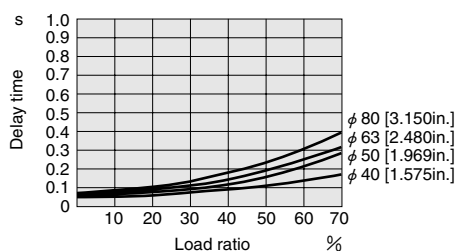
- Air pressure: 0.5MPa [5.1kgf/cm²] [73psi.]
- Piping inner diameter and length: $\phi 6$ [0.24in.] \times 1000mm [39in.]
- Fitting: Quick fitting TS8-01
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}} (\%)$
- Cylinder stroke: 150mm [5.91in.]



Maximum operating speed



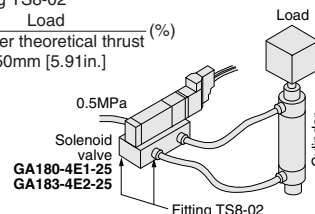
Delay time



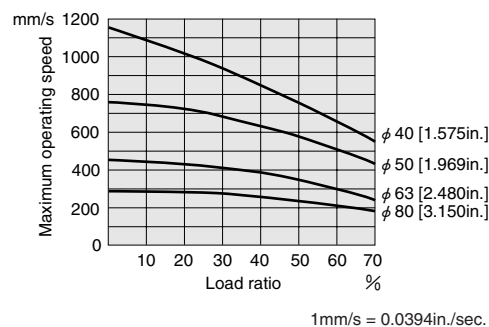
GA180-4E1-25 GA183-4E2-25

● Measurement conditions

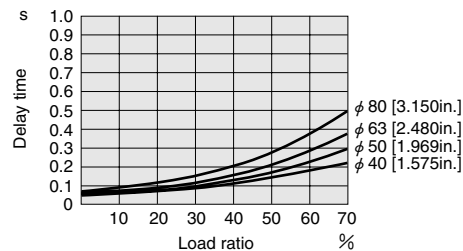
- Air pressure: 0.5MPa [5.1kgf/cm²] [73psi.]
- Piping inner diameter and length: $\phi 6$ [0.24in.] \times 1000mm [39in.]
- Fitting: Quick fitting TS8-02
- Load ratio = $\frac{\text{Load}}{\text{Cylinder theoretical thrust}} (\%)$
- Cylinder stroke: 150mm [5.91in.]



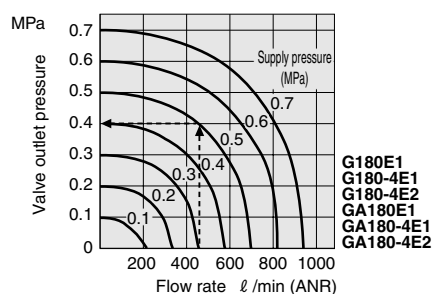
Maximum operating speed



Delay time

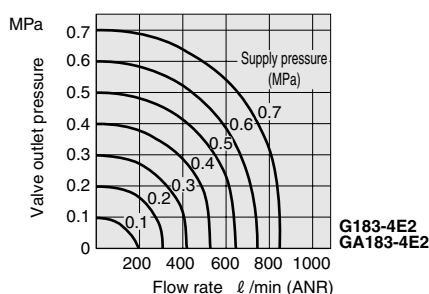


Flow Rate

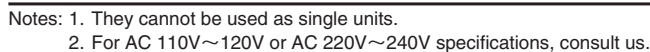


How to read the graph

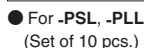
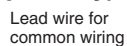
When the supply pressure is 0.5MPa [73psi.] and the flow rate is 460 l/min [16.2ft³/min.] (ANR), the valve outlet pressure becomes 0.4MPa [58psi.].



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



Lead wire for



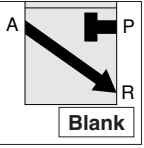
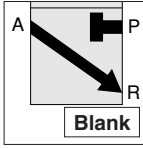
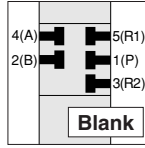
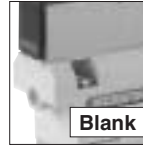
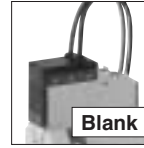
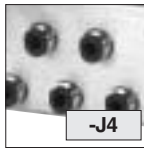
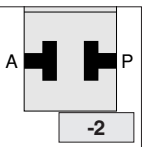
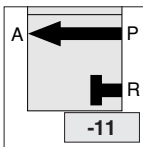
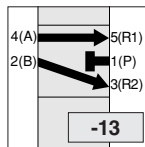


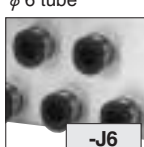
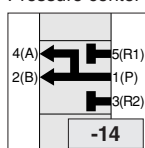
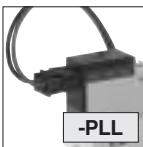
180—For G180M

- **F** —For F type manifold
FE—For FE type manifold
A —For A type, AJ type manifolds

-1L
-3L

- For plug connector
- Length -1L: 1000 [39in.]
(mm) -3L: 3000 [118in.]

G180 Series Manifold Order Codes

2-, 3-port valve Number of ports		2-, 3-port valve Valve function		3-position valve Valve function		Manual override		Wiring type		Manifold Connection port	
3-port  Blank		Normally closed (NC)  Blank		Closed center  Blank		Non-locking type  Blank		Grommet type with LED indicator  Blank		Quick fittings for ϕ 4 tube  -J4	
2-port  -2		Normally open (NO)  -11		Exhaust center  -13		Locking type  -81		Straight connector with LED indicator  -PSL		Quick fittings for ϕ 6 tube  -J6	
				Pressure center  -14				L connector with LED indicator  -PLL			

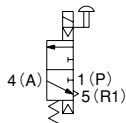
Manifold model Number of units		Station	Basic model	Voltage Note					
G180M	2 ... 20	F FE	stn. <input type="checkbox"/> -G180E1	-2	-11	-81	-PSL -PLL	DC12V DC24V AC100V AC200V	
			stn. <input type="checkbox"/> -G180-4E1						
			stn. <input type="checkbox"/> -G180-4E2						
			stn. <input type="checkbox"/> -G183-4E2	-13, -14					
		A AJ	stn. <input type="checkbox"/> -GA180E1	-2	-11	-81	-PSL -PLL	-J4 -J6	DC12V DC24V AC100V AC200V
			stn. <input type="checkbox"/> -GA180-4E1						
			stn. <input type="checkbox"/> -GA180-4E2	-13					
			stn. <input type="checkbox"/> -GA183-4E2	-14					

Note: For AC 110V~120V or AC 220V~240V specifications, consult us.

- Specify the valve model for each station.
- Enter -BP when closing a station with a block-off plate without mounting a valve.
- Valve mounting location from the left-hand side when facing the 4(A), 2(B) ports.
- For the AJ type manifold only.

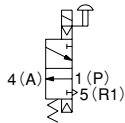
3-port

Normally closed (NC)

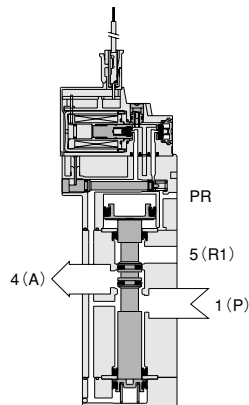
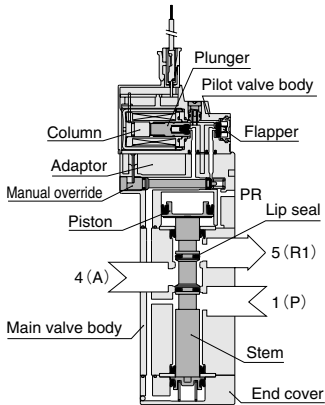


G180E1
De-energized

Normally open (NO)

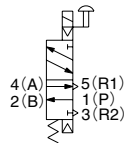


G180E1-11
De-energized



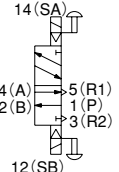
5-port, 2-position

Single solenoid

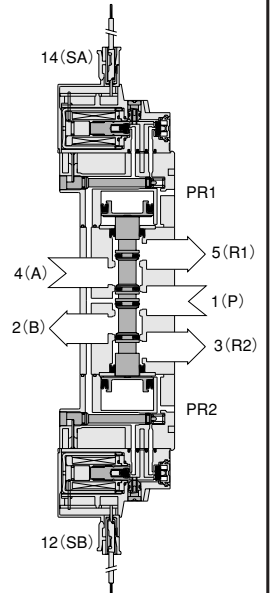
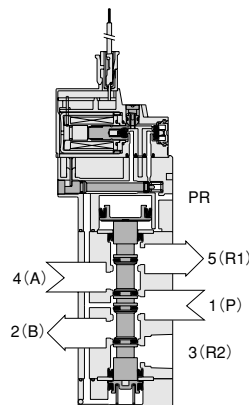


G180-4E1

Double solenoid

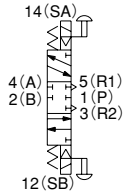


G180-4E2
(De-energized condition after energizing solenoid 14(SA))

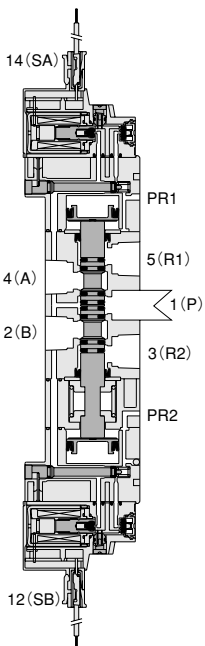


5-port, 3-position

Closed center

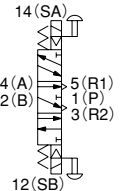


G183-4E2

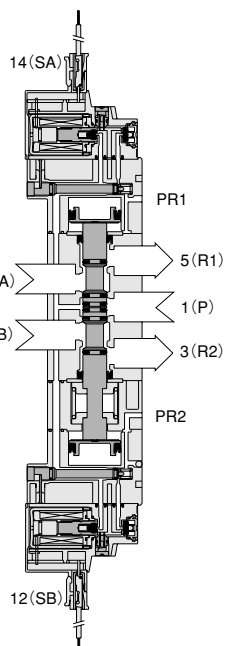


(Both solenoids 14(SA) and 12(SB) are de-energized.)

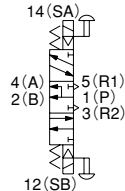
Exhaust center



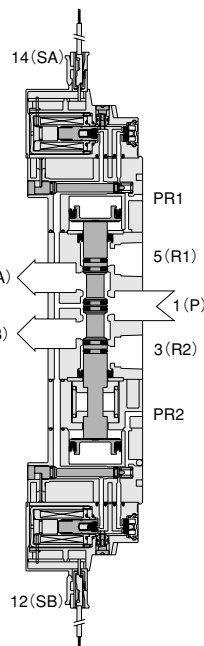
G183-4E2-13



Pressure center



G183-4E2-14

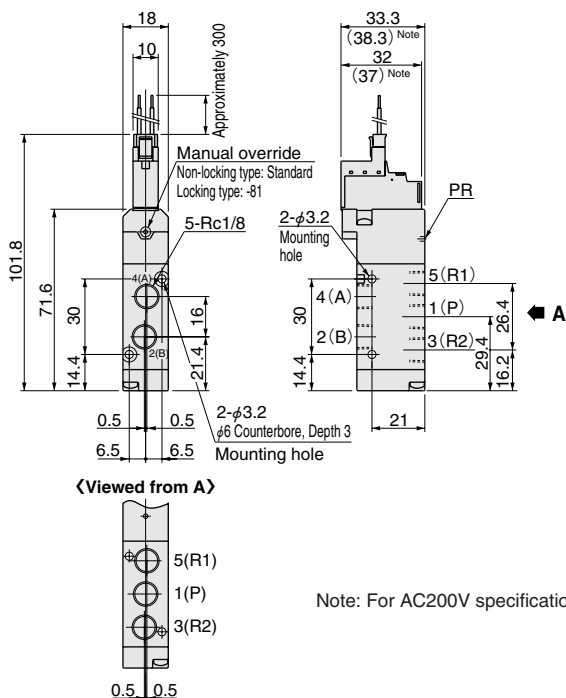


Major Parts and Materials

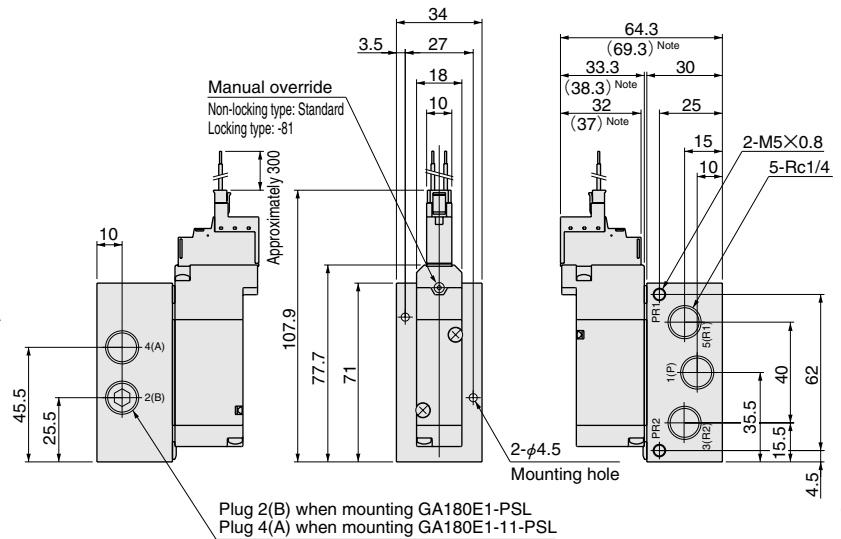
Parts		Materials
Valve (main valve)	Body	Aluminum alloy (anodized)
	Stem	(anodized)
	Lip seal	Synthetic rubber
	Sub-base	Aluminum alloy (anodized)
	End cover	Plastic
Valve (pilot valve)	Adapter	
	Body	Plastic
	Plunger	Magnetic stainless steel
	Column	
Manifold	Flapper	Synthetic rubber
	Body	Aluminum alloy (anodized)
	Block-off plate	Mild steel (nickel plated)
	Seal	Synthetic rubber

Dimensions of Solenoid Valve 5-port , 2-, 3-position (mm)

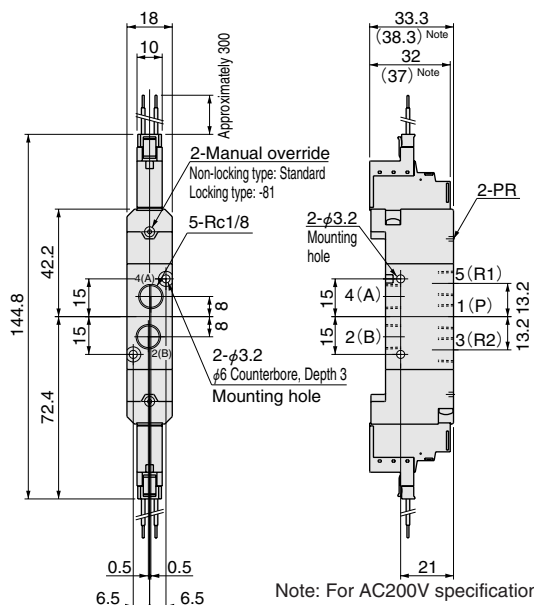
G180-4E1-PSL  G180_4E1



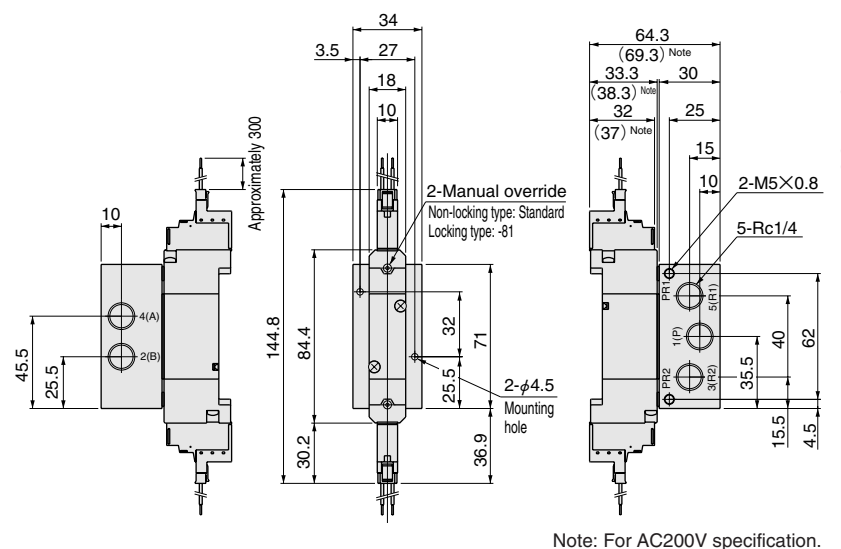
GA180E1-25-PSL **GA180-4E1-25-PSL**  GA180E1



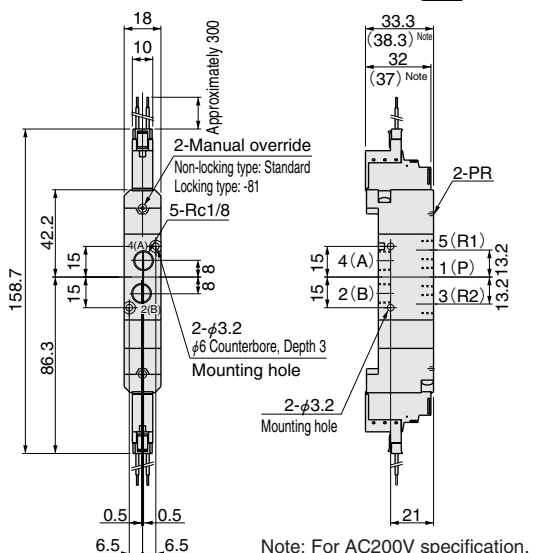
G180-4E2-PSL  G180_4E2



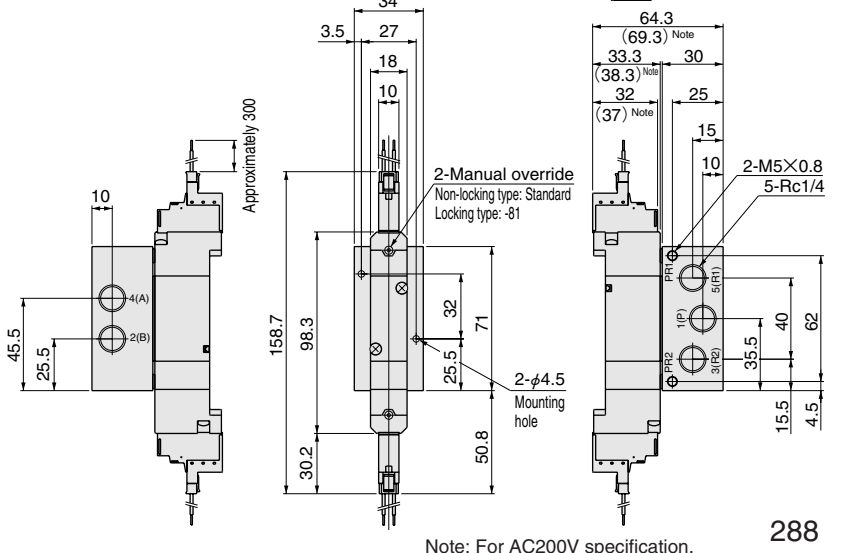
GA180-4E2-25-PSL  GA180_4E



G183-4E2-PSL  G183_4E2



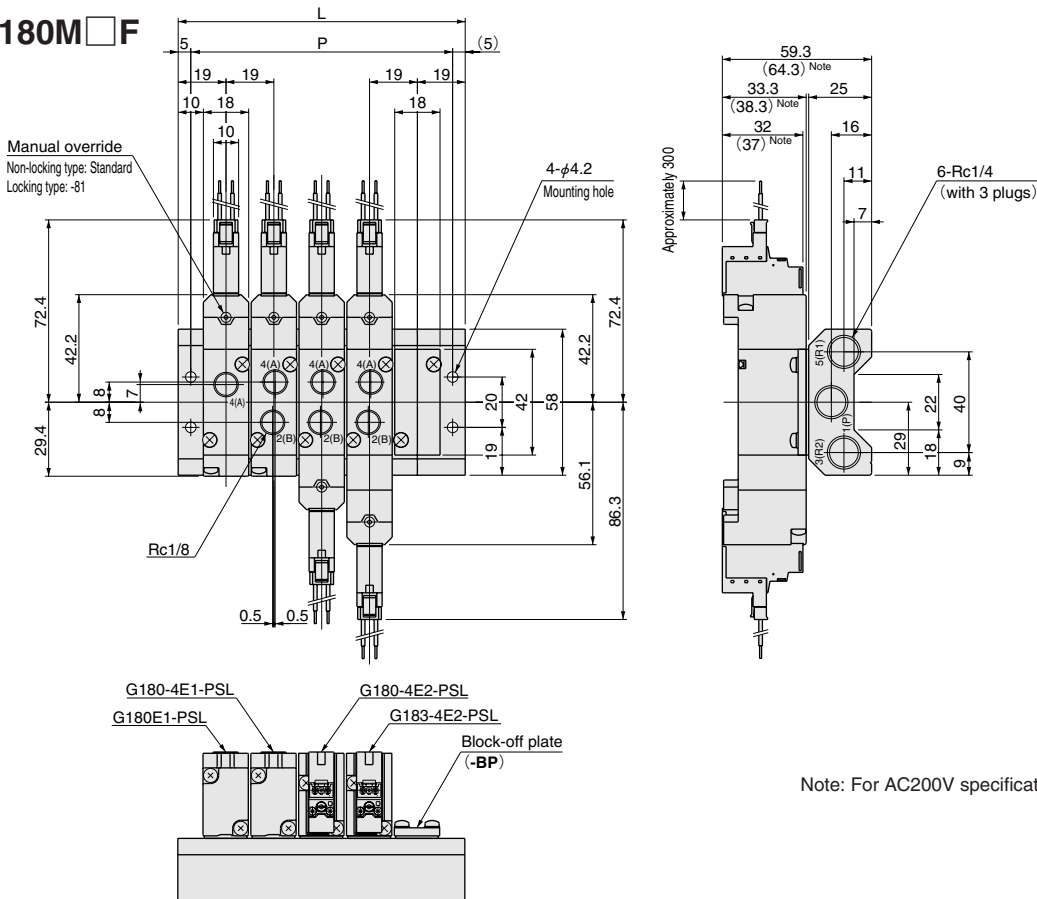
GA183-4E2-25-PSL  GA183_4E



Dimensions of Manifold for Combination Mounting of 2-, 3-, 5-port Valves (mm)

G180M□F

CAD G180MF



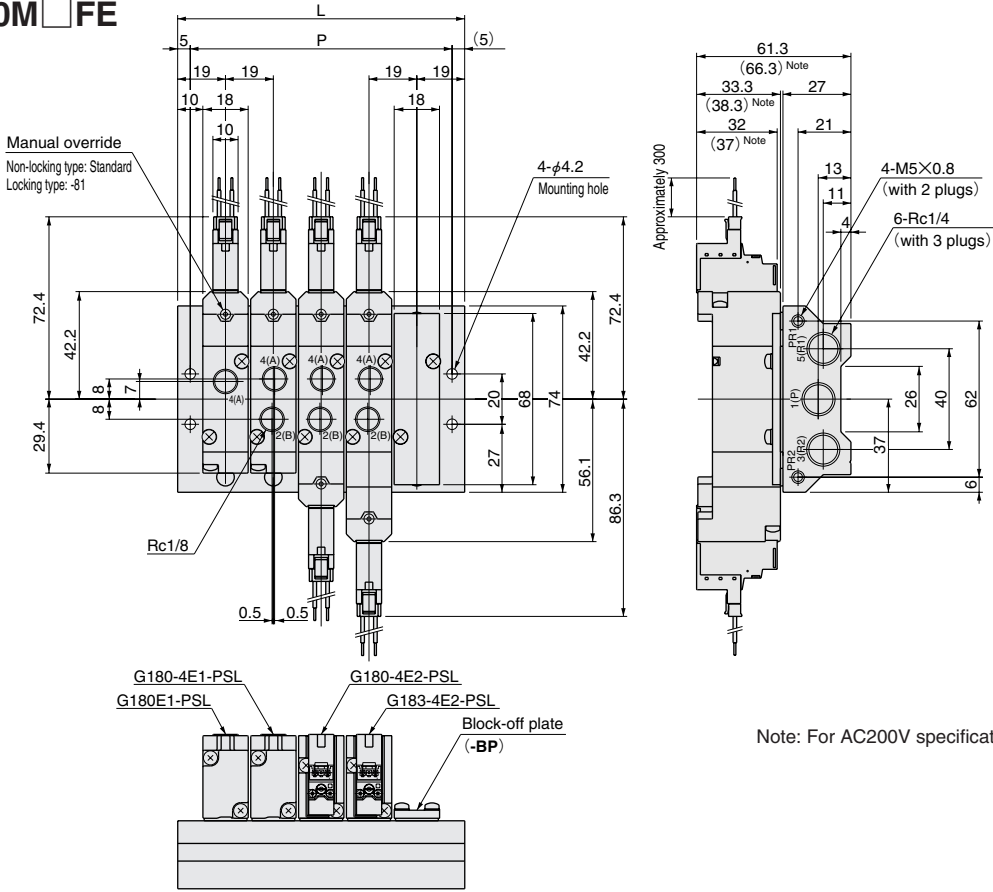
Unit dimensions

Number of units	L	P
2	57	47
3	76	66
4	95	85
5	114	104
6	133	123
7	152	142
8	171	161
9	190	180
10	209	199
11	228	218
12	247	237
13	266	256
14	285	275
15	304	294
16	323	313
17	342	332
18	361	351
19	380	370
20	399	389

Note: For AC200V specification.

G180M□FE

CAD G180MFE



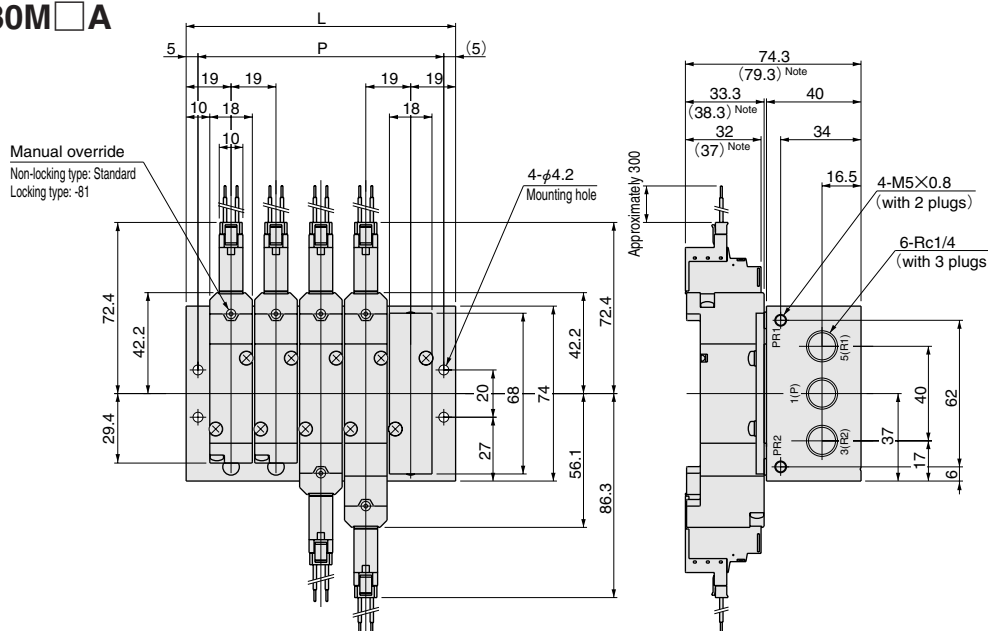
Unit dimensions

Number of units	L	P
2	57	47
3	76	66
4	95	85
5	114	104
6	133	123
7	152	142
8	171	161
9	190	180
10	209	199
11	228	218
12	247	237
13	266	256
14	285	275
15	304	294
16	323	313
17	342	332
18	361	351
19	380	370
20	399	389

Note: For AC200V specification.

G180M□A

CAD G180MA



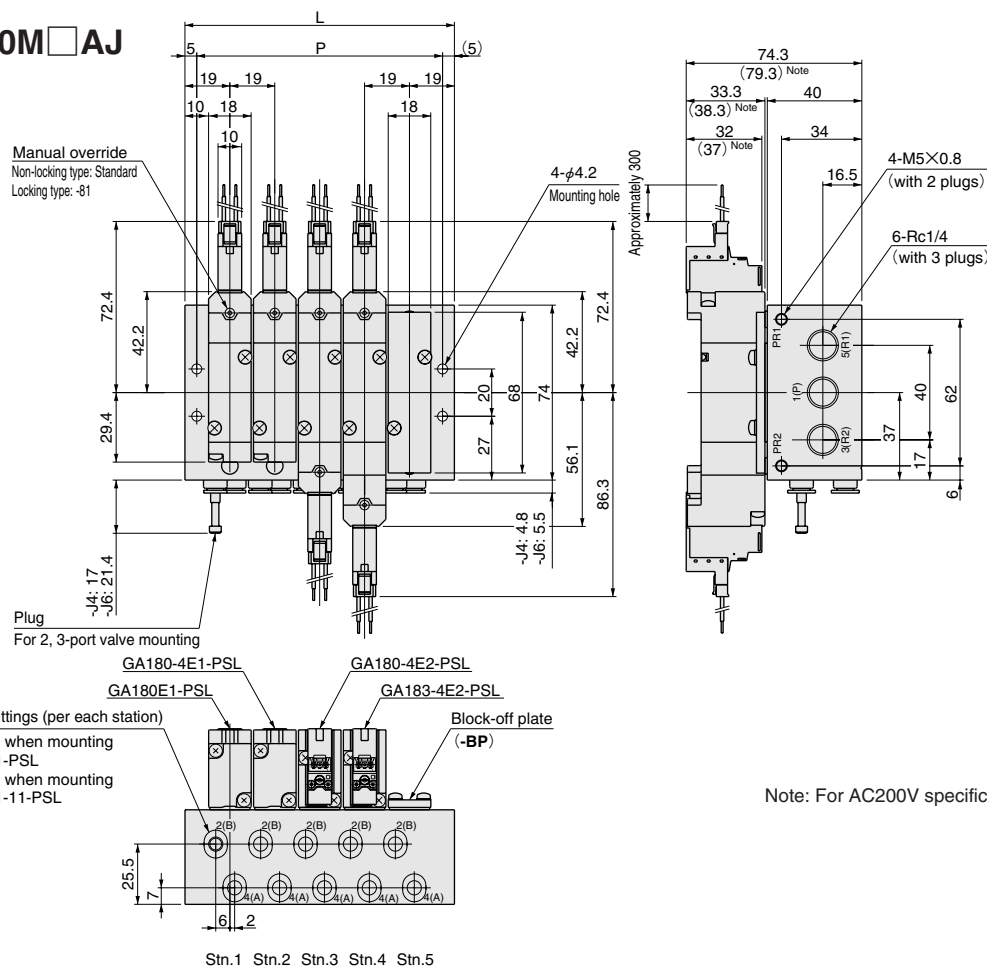
Unit dimensions

Number of units	L	P
2	57	47
3	76	66
4	95	85
5	114	104
6	133	123
7	152	142
8	171	161
9	190	180
10	209	199
11	228	218
12	247	237
13	266	256
14	285	275
15	304	294
16	323	313
17	342	332
18	361	351
19	380	370
20	399	389

Note: For AC200V specification.

G180M□AJ

CAD G180MAJ



Unit dimensions

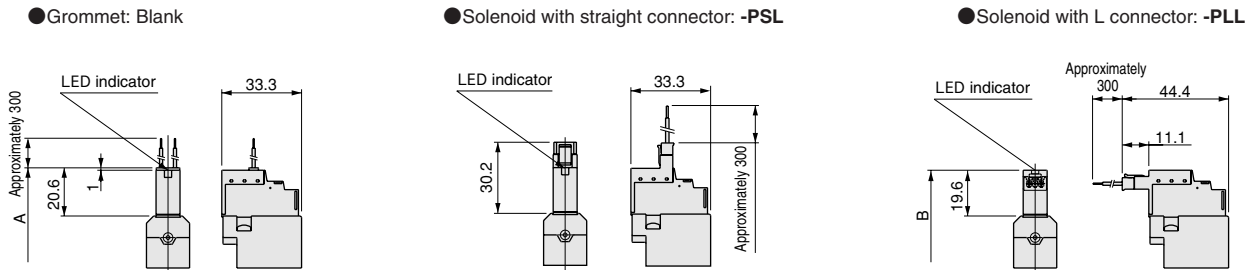
Number of units	L	P
2	57	47
3	76	66
4	95	85
5	114	104
6	133	123
7	152	142
8	171	161
9	190	180
10	209	199
11	228	218
12	247	237
13	266	256
14	285	275
15	304	294
16	323	313
17	342	332
18	361	351
19	380	370
20	399	389

Note: For AC200V specification.

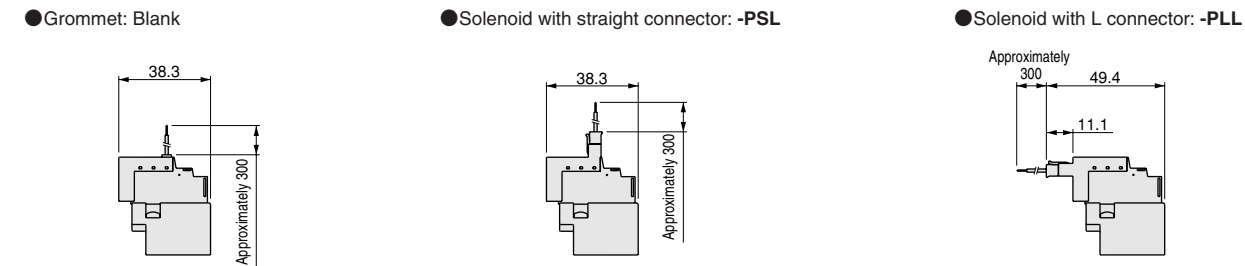
For wiring specifications, see p.291.

Wiring Specifications (mm)

■For DC12V, 24V, AC100V



■For AC200V



				mm
Model	Code	A	B	Remarks
G180E1, G180-4E1		92.2	91.2	Overall length to the end of the valve or sub-base
GA180E1-25, GA180-4E1-25		98.3	97.3	
G180-4E2, GA180-4E2-25		125.6	123.6	Overall length to the end of the opposite solenoid
G183-4E2, GA183-4E2-25		139.5	137.5	