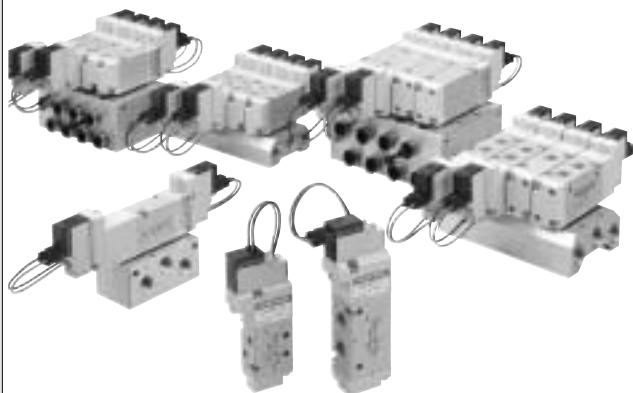




Presenting our CAD drawing  
data catalog



# KOGANEI

## VALVES GENERAL CATALOG

# SOLENOID VALVES

## G110, G180 SERIES

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Discontinued

# Best Price & Global Model

## G110, G180 SERIES SOLENOID VALVES

The high-performance 110, 180 series solenoid valve, in combination with the low power consumption G010 solenoid valves, offer the "best price & global model," achieving the basic performance required of a solenoid valve.

G010 series solenoid valves are used as the pilot valve. It achieves a low power consumption of 0.5W (DCV).

Wiring specifications:  
Grommet (standard)  
Straight connector, L connector (option)  
Lead wire length 1000mm, 3000mm (made to order)

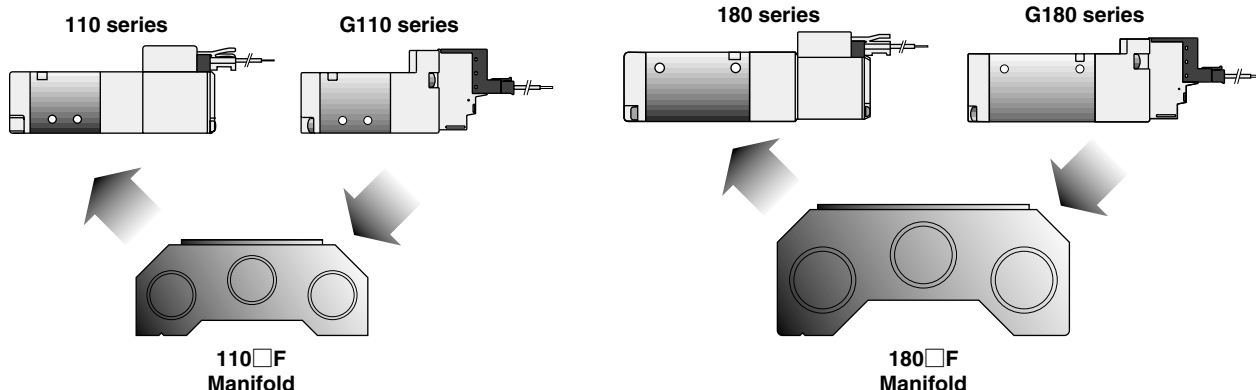
Manual override:  
Non-locking type (standard)  
Locking type (option)

**Standard type**  
Simple form emphasizes basic performance, for versatile applications at the best price.

The solenoid valves of both 100, 180 series and of 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 100, 180 series manifolds.

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

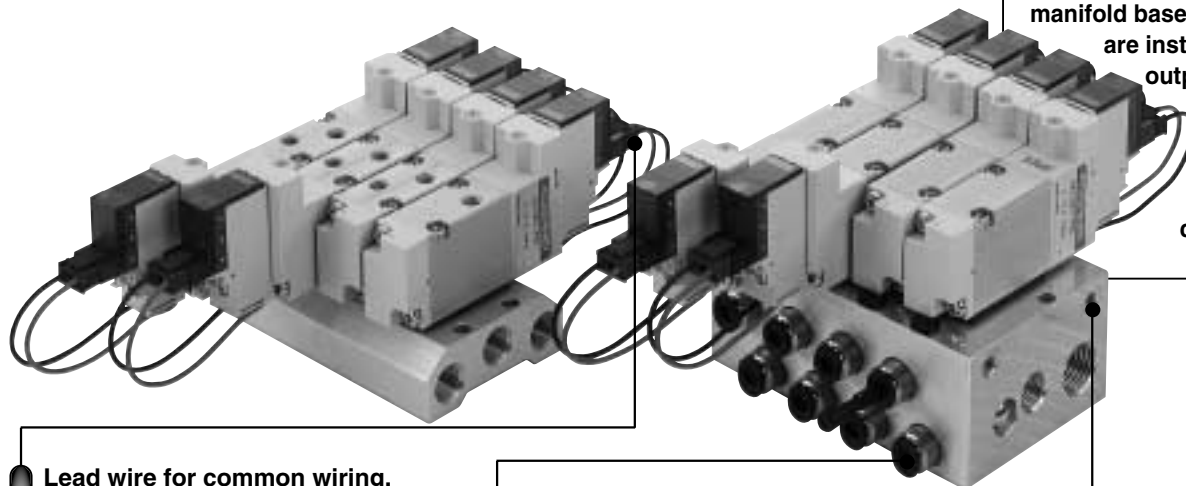


### F type manifold

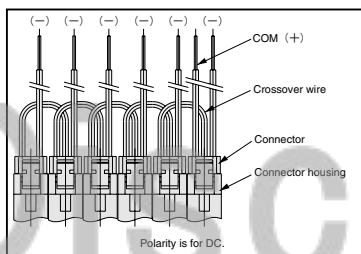
Low-priced type. Direct piping type valves can be mounted directly on this manifold. FE type (P, R, PR) manifold is also available.

### AJ type manifold

Combines all ports into a manifold base. Quick fittings are installed into the output (A, B) ports, achieving excellent assembly and maintenance in a confined space.



Lead wire for common wiring. Using the lead wire for common wiring provided as additional part saves on wiring work.

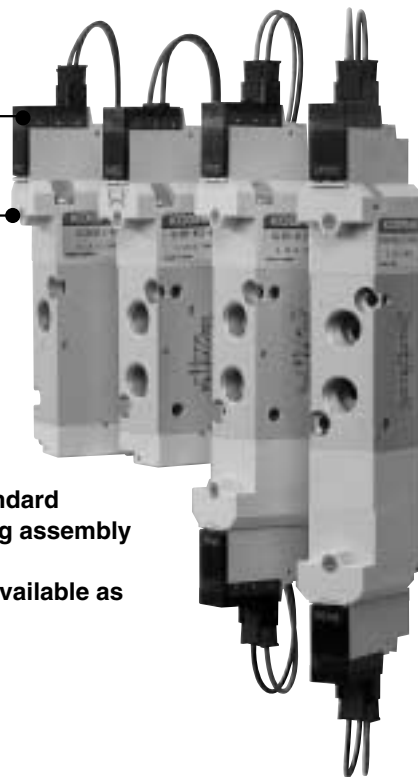


For the output port quick fittings, select from  $\phi 4$  or  $\phi 6$  tubes for each station in accordance with actuator size.

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

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

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



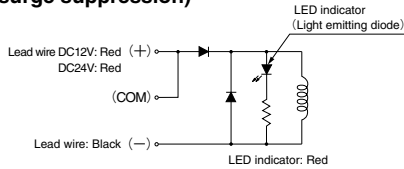


## Solenoid

### Internal circuit

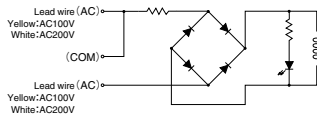
#### ● DC12V, DC24V

#### Solenoid with LED indicator (surge suppression)



#### ● AC100V, AC200V

#### Solenoid with LED indicator (surge suppression)



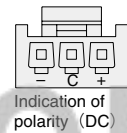
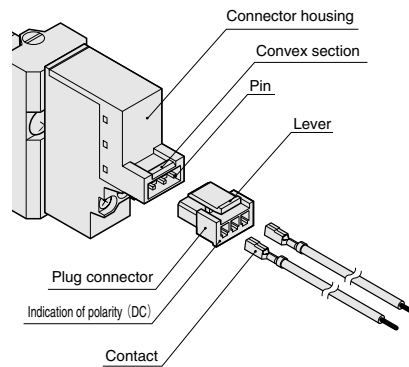
- Cautions:**
1. Do not apply megger between the lead wires.
  2. While there is no danger with a DC solenoid of a short circuit due to the wrong polarity, the valve will not operate.
  3. Leakage current inside the circuit could result in failure of the solenoid valve to return or in other erratic operation. Always use within the range of the allowable leakage current. If circuit conditions, etc., cause the leakage current to exceed the maximum allowable leakage current, consult us.
  4. For double solenoid, avoid energizing both solenoids simultaneously. The valve could fall into a neutral state.



## Plug connector

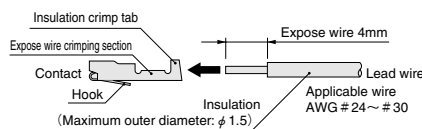
### Attaching and removing plug connector

Use fingers to insert the connector into the pin, push in until the lever claw catches on the convex section on 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 convex section on the connector housing, and pull out.



### Crimping of connecting lead wire and contact

To crimp lead wires into contacts, strip off 4mm of the insulation from the tip of the lead wire, insert into the contact, and crimp it. Be sure at this time to avoid catching the insulation on the core wire as crimping section.

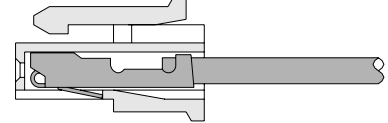


- Cautions**
1. Do not pull hard on the lead wire.
  2. Always use the dedicated tool for crimping of connecting lead wire and contact.  
Contact: Model 706312-2MK  
Manufactured by Sumiko Tech, Inc.  
Crimping tool: Model F1  
(for 706312-2MK)  
Manufactured by Sumiko Tech, Inc.

### Attaching and removing contact and connector

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

To remove, insert a tool with a fine tip (such as a jeweler's 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, shorted circuit, 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.

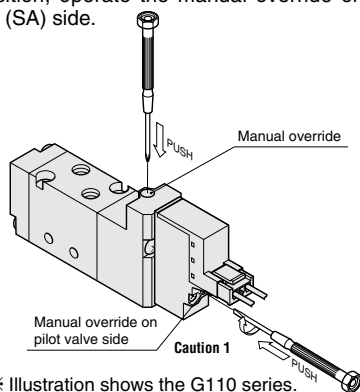


## Manual override

### Non-locking type

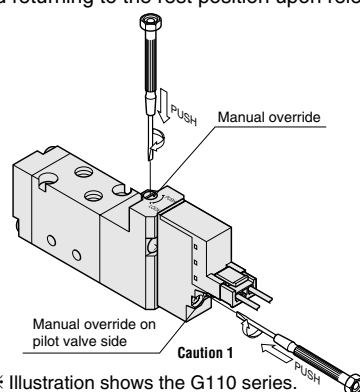
To operate, press the manual override all the way down. The valve works the same as an energized state as long as the manual override is pushed down, and returns to the rest position upon release.

In the double solenoid, pressing the manual override on the SA(SB) side switches the state of the SA(SB) to energized state, and the unit remains in that state even after the manual override is released. To return to the rest position, operate the manual override on the SB (SA) side.

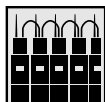


### Locking type

To lock in the lock type, use a small screwdriver to push down on the manual override all the way down and turn it clockwise 90 degrees. When locked, turning the manual override 90 degrees in a counterclockwise direction releases a spring on the manual override, returns it to the original position, and releases the lock. If the manual override is never turned, this type acts just like the non-lock type, like the valve energizing status as long as the manual override is pushed down, and returning to the rest position upon release.



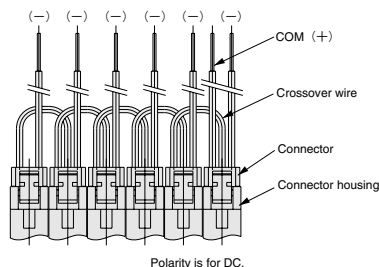
- Cautions**
1. While manual override is also possible on the pilot valve side, be sure to release the lock after completing the manual operation. Moreover, always check during valve operation to confirm that the lock on the pilot valve side has been released.
  2. Since the G110 and G180 series are internal pilot type solenoid valves, the manual override cannot switch the main valve without supplying air from the P port.
  3. Always release the lock on the lock 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 on wiring.

### Common terminal wiring example for DC plus side and AC



Note: The diagram shows a straight connector.

### Mounting a valve on the manifold

When mounting a valve on the manifold, use the following recommended tightening torque for the valve mounting screws.

G110 series: 39.2N·cm {4kgf·cm}

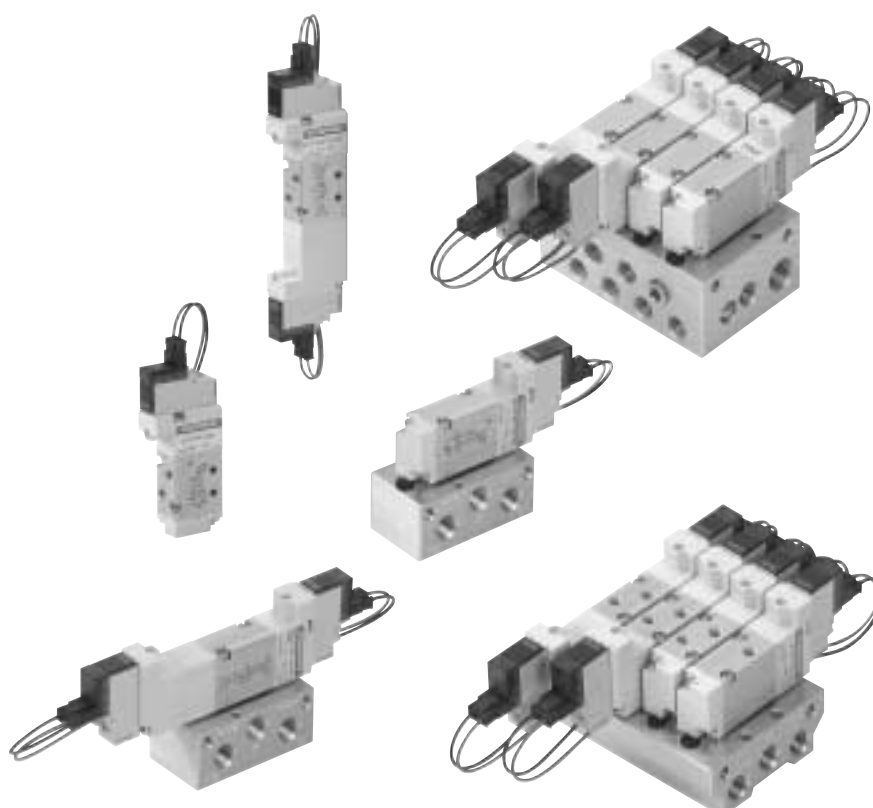
G180 series: 49N·cm {5kgf·cm}

# Discontinued







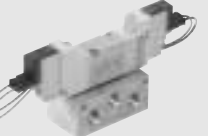


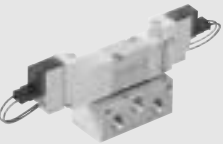
# SOLENOID VALVES G110 SERIES

## INDEX

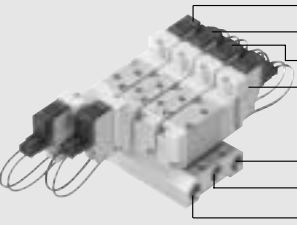
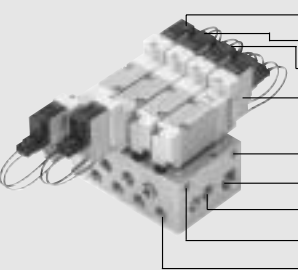
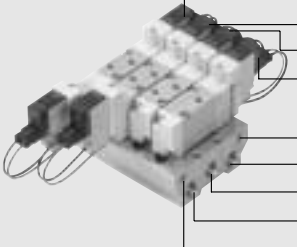
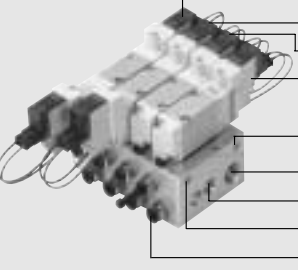
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## Basic Models and Configuration of G110 Series

Single unit					
	5-port				
	2-position		3-position		
Direct piping	Single solenoid  <b>G110-4E1</b>	Double solenoid  <b>G110-4E2</b>	All port block  <b>G113-4E2</b>	ABR connection  <b>G113-4E2-13</b>	PAB connection  <b>G113-4E2-14</b>
	Remark: Photo shows wiring specification -PSL.				
Sub-base piping	Single solenoid  <b>GA110-4E1-25</b>	Double solenoid  <b>GA110-4E2-25</b>	All port block  <b>GA113-4E2-25</b>	ABR connection  <b>GA113-4E2-13-25</b>	PAB connection  <b>GA113-4E2-14-25</b>
	Remark: Photo shows wiring specification -PSL.				

## Discontinued

Manifold	
Manifold for combined mounting of 2-, 3-, 5-port valves	
<b>G110M□F</b> —F type (P, R) manifold  <ul style="list-style-type: none"> <li>G113-4E2, G113-4E2-13, G113-4E2-14</li> <li>G110-4E2</li> <li>G110-4E1</li> <li>G110E1, G110E1-11<sup>Note</sup> (2-, 3-port valve for manifold only)</li> <li>5(R1)</li> <li>1(P)</li> <li>3(R2)</li> </ul>	<b>G110M□A</b> —A type (all port) manifold  <ul style="list-style-type: none"> <li>GA113-4E2, GA113-4E2-13, GA113-4E2-14</li> <li>GA110-4E2</li> <li>GA110-4E1</li> <li>GA110E1, GA110E1-11<sup>Note</sup> (2-, 3-port valve for manifold only)</li> <li>PR1</li> <li>3·5(R)</li> <li>1(P)</li> <li>PR2</li> <li>4(A), 2(B)</li> </ul>
<b>G110M□FE</b> —FE type (P, R, PR) manifold  <ul style="list-style-type: none"> <li>G113-4E2, G113-4E2-13, G113-4E2-14</li> <li>G110-4E2</li> <li>G110-4E1</li> <li>G110E1, G110E1-11<sup>Note</sup> (2-, 3-port valve for manifold only)</li> <li>PR1</li> <li>5(R1)</li> <li>1(P)</li> <li>3(R2)</li> <li>PR2</li> </ul>	<b>G110M□AJ</b> —AJ type (all port, with quick fitting) manifold  <ul style="list-style-type: none"> <li>GA113-4E2, GA113-4E2-13, GA113-4E2-14</li> <li>GA110-4E2</li> <li>GA110-4E1</li> <li>GA110E1, GA110E1-11<sup>Note</sup> (2-, 3-port valve for manifold only)</li> <li>PR1</li> <li>3·5(R)</li> <li>1(P)</li> <li>PR2</li> <li>4(A), 2(B) (with quick fitting)</li> </ul>

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



# SOLENOID VALVES G110 SERIES

## Specifications

### Basic Models and Functions

Item	Basic model			
	Direct piping, F, FE type manifold Sub-base piping, A, AJ type manifold	G110E1 <sup>Note</sup>	G110-4E1 G110-4E2	G113-4E2
		GA110E1 <sup>Note</sup>	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, option)	Single solenoid or Double solenoid	All port block (standard), ABR connection (option) or PAB connection (option)

Remark: For optional specifications and order code, see p. 196~197.

Note: G110E1 and GA110E1 are for manifolds for combined mounting of 2-, 3-, 5-port valves only. They cannot be used as a single unit.

### Specifications

Item	Basic model			
	Direct piping, F, FE type manifold Sub-base piping, A, AJ type manifold	G110E1	G110-4E1 G110-4E2	G113-4E2
		GA110E1	GA110-4E1 GA110-4E2	GA113-4E2
Media		Air		
Operation method		Internal pilot type		
Effective area [Cv] <sup>Note 1</sup>	mm <sup>2</sup>	4.2 [0.23]		3.8 [0.21]
Port size <sup>Note 2</sup>		M5×0.8		
Lubrication		Not required		
Operating pressure range	MPa [kgf/cm <sup>2</sup> ]	0.15~0.7 {1.5~7.1}		
Proof pressure	MPa [kgf/cm <sup>2</sup> ]	1.05 {10.7}		
Response time <sup>Note 3</sup>	ms	15/25	15/25, [20]	15/40
	ON/OFF	15/15	15/20, [15]	15/35
Maximum operating frequency	Hz	5		
Minimum time to energize for self holding	ms	—	50 (□ 110-4E2)	—
Operating temperature range (atmosphere and media)	°C	5~50		
Shock resistance	m/s <sup>2</sup> [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. 194.

2. For details, see the port size on p. 194.

3. Values when air pressure is 0.5MPa {5.1kgf/cm<sup>2</sup>}. For switching phase timing, add a maximum of 5 ms to the response time of AC specifications. Values in brackets [ ] are for G110-4E2. In addition, values for G113-4E2 are those of the all port block valve, switching from neutral state.

Remark: Conversion to psi., 1MPa=145psi., 1kgf/cm<sup>2</sup>=14.2psi., e.g. 0.7MPa=102psi.

### Solenoid Specifications

Item	Rated voltage	DC12V	DC24V	AC100V <sup>Note</sup>	AC200V <sup>Note</sup>
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
Maximum allowable leakage current	mA	1.0	1.0	1.0	1.0
Insulation resistance	MΩ	Min. 100 (value at DC500V megger)			
Wiring and lead wire length		Grommet type: 300mm, Plug connector type: 300mm			
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, consult us.

3. Provide heat radiation measures to ensure that the ambient temperature (or when using a control box, the internal temperature of the box) always remains within the temperature range specifications.

## Effective Area [Cv]

mm<sup>2</sup>

Basic model	Standard (single valve)	Built-in quick fitting	Remarks
G110E1 G110-4E1 G110-4E2	4.2 [0.23]	—	<ul style="list-style-type: none"> <li>● Attaching TS4-M5 to P, A, B ports brings the value to 1.8.</li> <li>● On the F type manifold, attaching TS4-M5 to the A, B ports brings the value to 2.1.</li> </ul>
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"> <li>● When mounting on a sub-base or manifold.</li> <li>● Attaching TS4-01 to the sub-base P, A, B ports brings the value to 3.2.</li> </ul>
GA113-4E2	3.6 [0.20]	3.6 [0.20]	

## Solenoid Valve Port Size

Basic model	Port specifications		Port size
G110E1 <sup>Note</sup>	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)		
	3·5(R)		
	PR	Female thread	M5×0.8

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

## Manifold Connection Port Size

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

## Valve Mass

g

Basic model	Mass
G110E1	53
G110-4E1	52
G110-4E2	72
G113-4E2	79
GA110E1	54 (149)
GA110-4E1	53 (148)
GA110-4E2	73 (168)
GA113-4E2	81 (176)

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

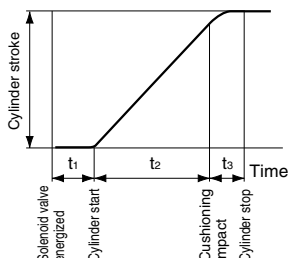
## Manifold Mass

g

Manifold model	Mass calculation of each unit (n=number of units)	Block-off plate
G110M□F	(20×n) + 30	6
G110M□FE	(40×n) + 50	11
G110M□A	(60×n) + 60	
G110M□AJ	-J4: (67×n) + 60 -J6: (64×n) + 60	

## Cylinder Operating Speed

### How to obtain cylinder speed

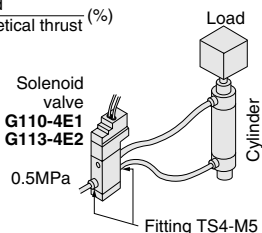


To obtain the time required for the cylinder to complete full stroke, add cylinder's delay time  $t_1$  (time between energizing of solenoid valve and actual starting of cylinder), to the cylinder's max. operating speed time  $t_2$ . When a cushion is used, add the cushioning time  $t_3$ , to the above calculation. Standard cushioning time  $t_3$  is approximately 0.2 seconds.

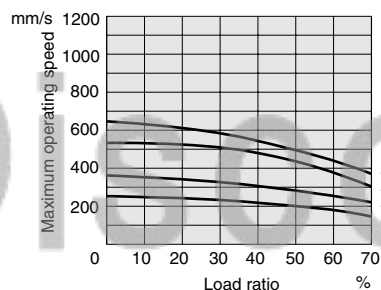
### G110-4E1 G113-4E2

#### ● Measurement conditions

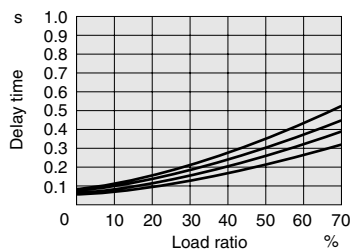
- Air pressure: 0.5MPa {5.1kgf/cm<sup>2</sup>}
- Piping inner diameter and length:  $\phi 2.5 \times 1000$ mm
- Fitting: Quick fitting TS4-M5
- Load ratio =  $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$  (%)
- Cylinder stroke: 150mm



#### Maximum operating speed



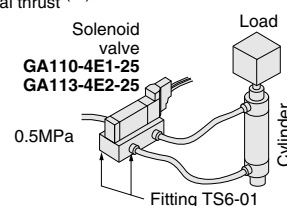
#### Delay time



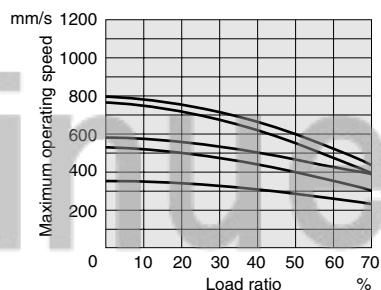
### GA110-4E1-25 GA113-4E2-25

#### ● Measurement conditions

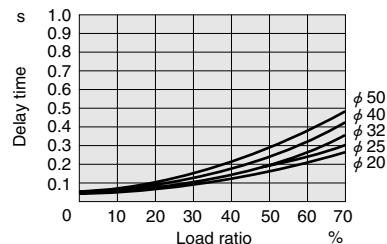
- Air pressure: 0.5MPa {5.1kgf/cm<sup>2</sup>}
- Piping inner diameter and length:  $\phi 4 \times 1000$ mm
- Fitting: Quick fitting TS6-01
- Load ratio =  $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$  (%)
- Cylinder stroke: 150mm



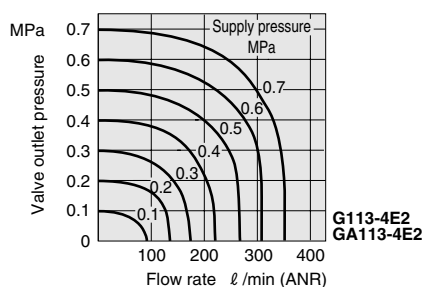
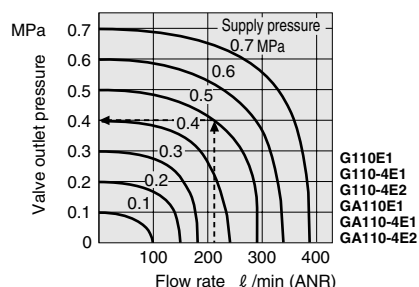
#### Maximum operating speed



#### Delay time



## Flow Rate



#### How to read the graph

If supply pressure is 0.5MPa and flow rate is 214 l/min (ANR), the valve outlet pressure becomes 0.4MPa.

G110 Series Solenoid Valve Order Code

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

# G110 Series Manifold Order Code

**2-, 3-port valve**  
Number of ports

3-port

Blank

2-port

-2

**2-, 3-port valve**  
Valve function

Normally closed (NC)

Blank

Normally open (NO)

-11

**3-position valve**  
Valve function

All port block

Blank

ABR connection

-13

PAB connection

-14

**Manual override**

Non-locking type

Blank

Locking type

-81

**Wiring**

● Lead wire length 300mm is standard.

Grommet type with LED indicator

Blank

Straight connector with LED indicator

-PSL

L connector with LED indicator

-PLL

**Manifold**  
Connection port

Quick fitting for  $\phi$  4 tube

-J4

Quick fitting for  $\phi$  6 tube

-J6

Manifold model  
Number of units

Station

Basic model

Voltage Note

Manifold for combined mounting of 2-, 3-, 5-port valves	G110M	2 ... 20	F FE	stn. <input type="checkbox"/>	-G110E1	-2	-11	-81	-PSL -PLL	DC12V DC24V AC100V AC200V
				stn. <input type="checkbox"/>	-G110-4E1					
				stn. <input type="checkbox"/>	-G110-4E2					
				stn. <input type="checkbox"/>	-G113-4E2	-13, -14				
				stn. <input type="checkbox"/>	-GA110E1	-2	-11			
				stn. <input type="checkbox"/>	-GA110-4E1					
	A AJ	stn. <input type="checkbox"/>	-GA110-4E2			-81	-PSL -PLL	-J4 -J6	DC12V DC24V AC100V AC200V	
		stn. <input type="checkbox"/>	-GA113-4E2	-13, -14						
		stn. <input type="checkbox"/>								
		stn. <input type="checkbox"/>								
		stn. <input type="checkbox"/>								
		stn. <input type="checkbox"/>								

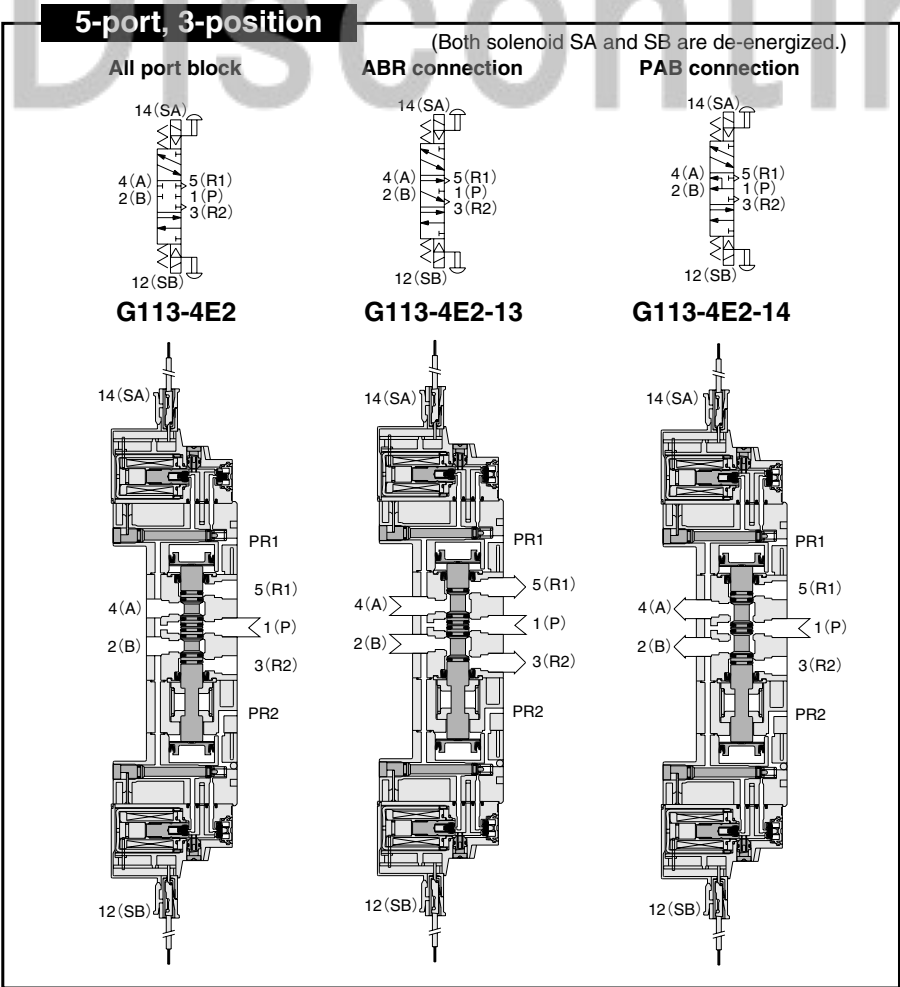
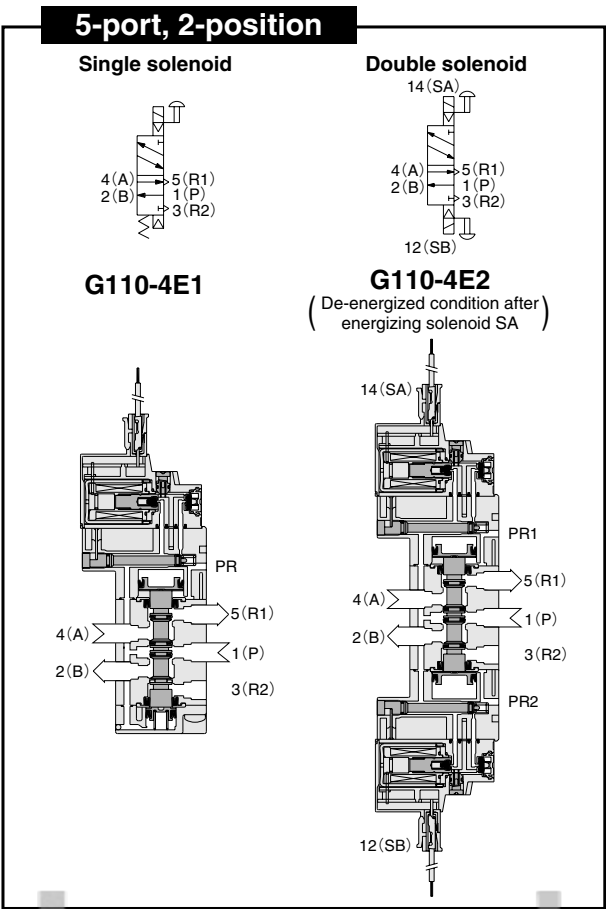
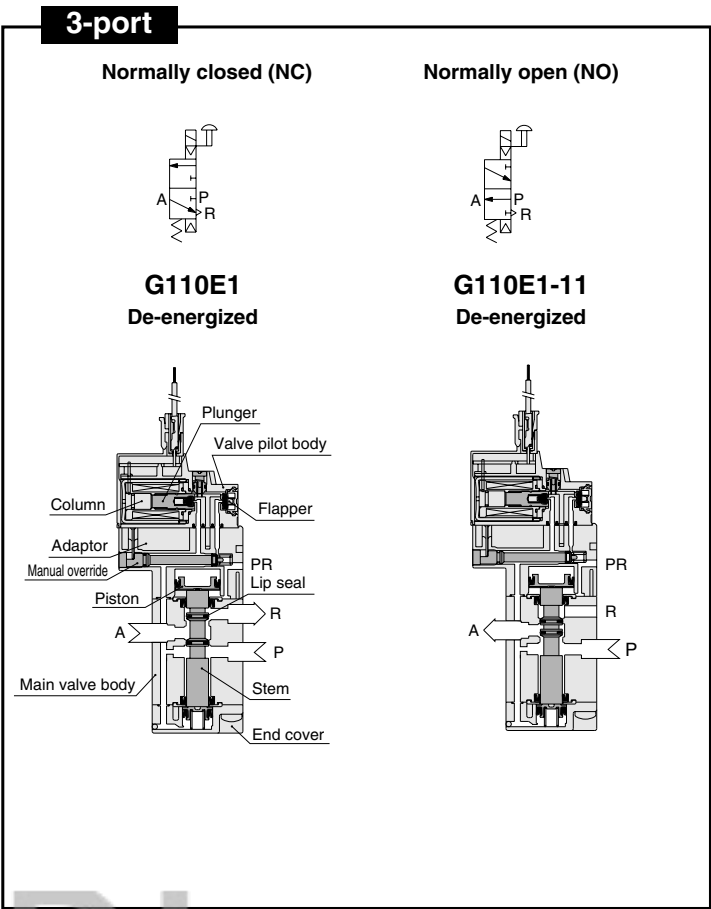
● Valve mounting location from the left-hand side when facing A, B port.

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

● Specify the valve type 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 one or the other.



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

# Dimensions of Solenoid Valve 5-port , 2-, 3-position (Scale 1/3, Unit mm)

**G110-4E1-PSL**



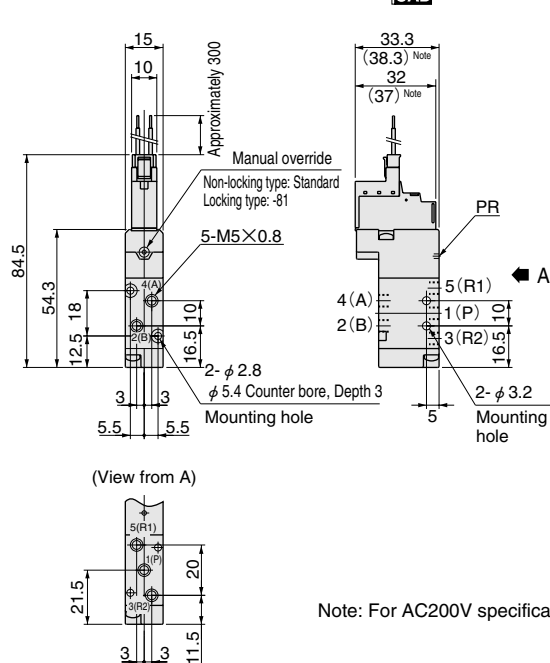
G110\_4E1

**GA110E1-25-PSL**

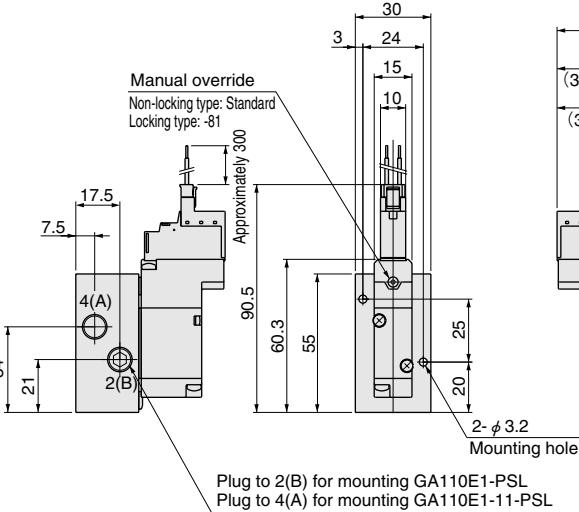
**GA110-4E1-25-PSL**



GA110E1



Note: For AC200V specification.



Note: For AC200V specification.

**G110-4E2-PSL**

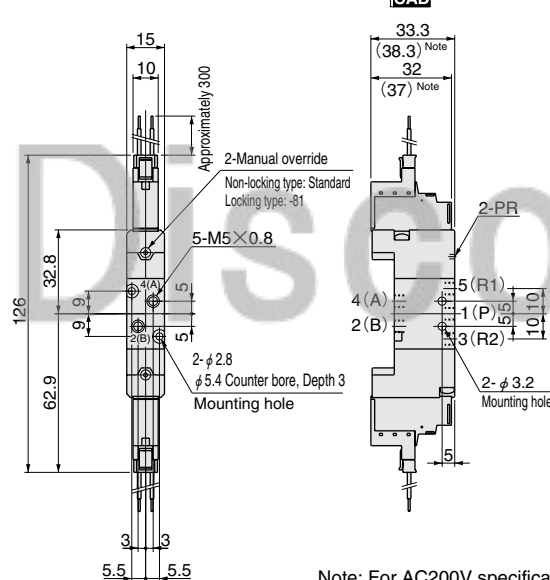


G110\_4E2

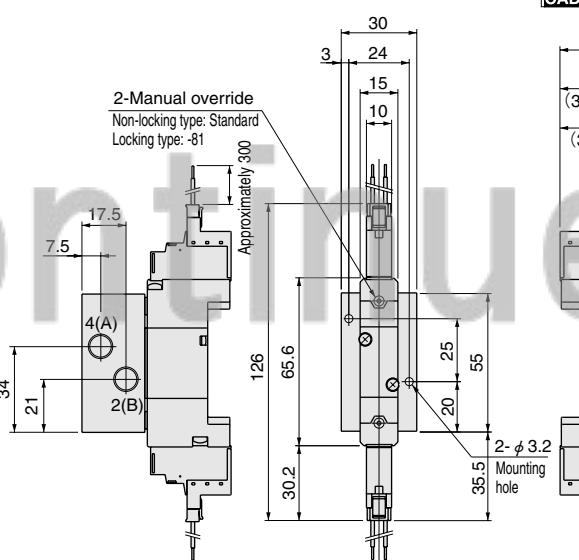
**GA110-4E2-25-PSL**



GA110\_4E



Note: For AC200V specification.



Note: For AC200V specification.

**G113-4E2-PSL**

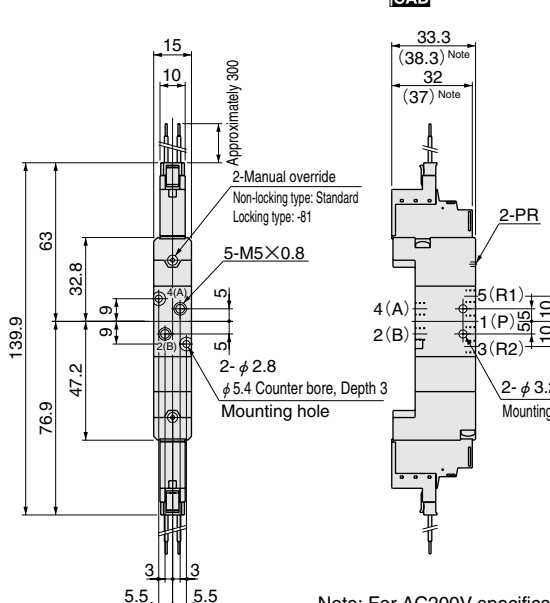


G113\_4E2

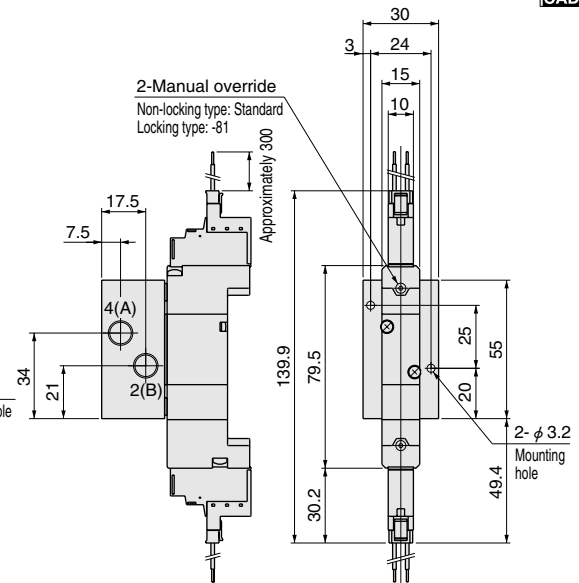
**GA113-4E2-25-PSL**



GA113\_4E



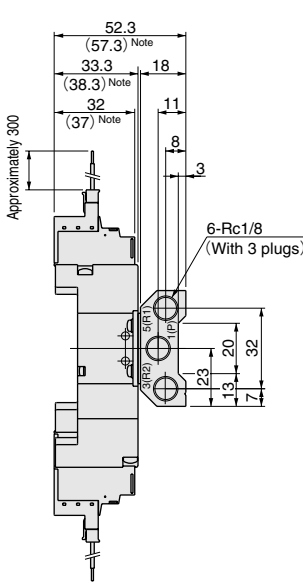
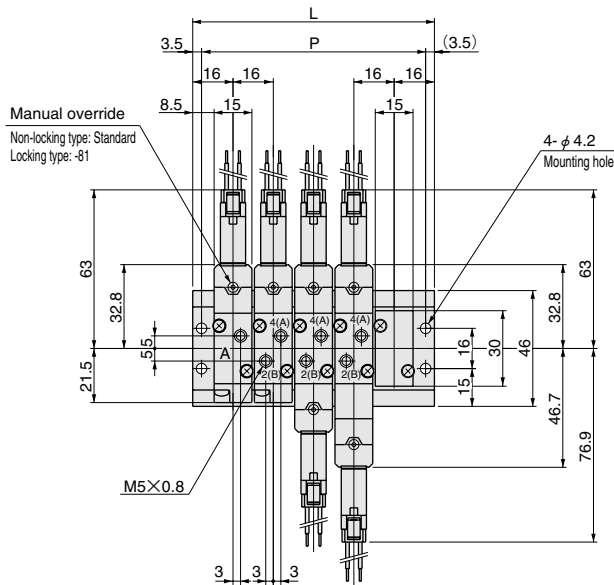
Note: For AC200V specification.



Note: For AC200V specification.

Dimensions of Manifold for Combined Mounting of 2-, 3-, 5-port Valves (Scale 1/3, Unit mm)

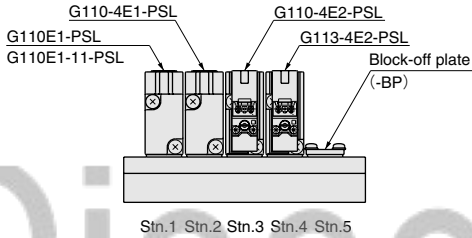
G110M□F



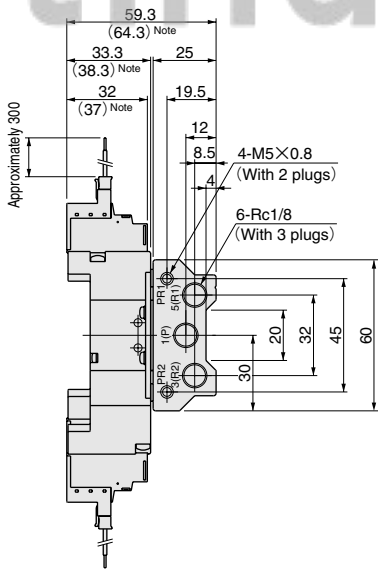
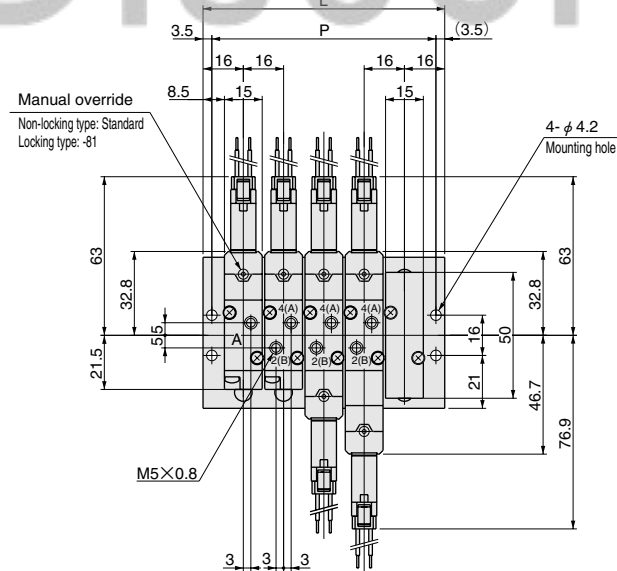
Unit dimensions

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.



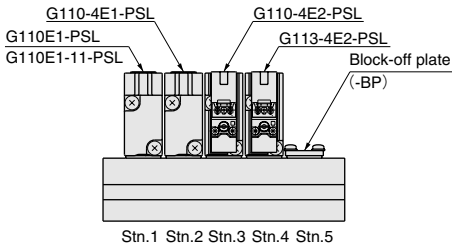
G110M□FE



Unit dimensions

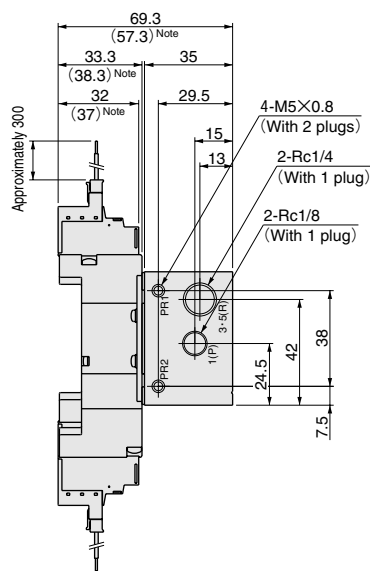
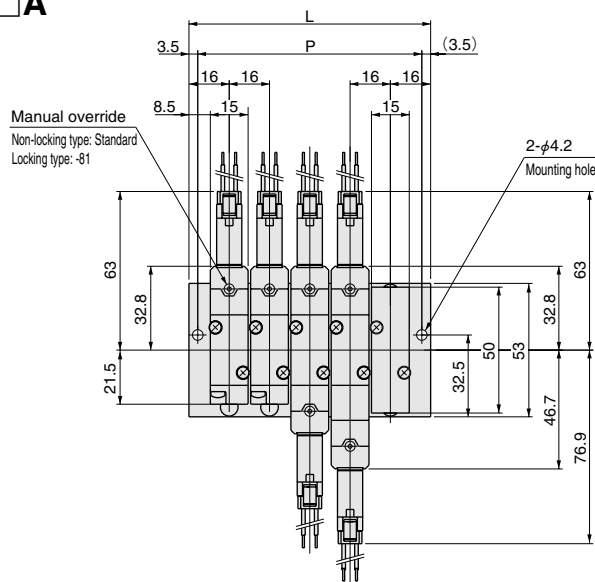
Number of units	L	P
2	48	41
3	64	57
4	80	73
5	96	89
6	112	105
7	128	121
8	144	137
9	160	153
10	176	169
11	192	185
12	208	201
13	224	217
14	240	233
15	256	249
16	272	265
17	288	281
18	304	297
19	320	313
20	336	329

Note: For AC200V specification.





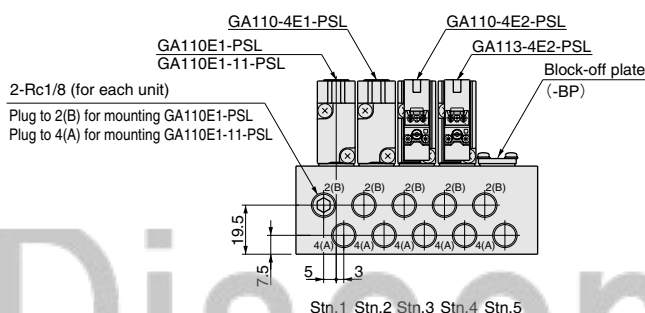
# G110M□A



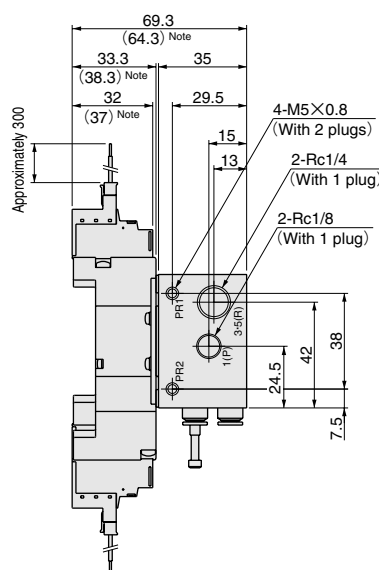
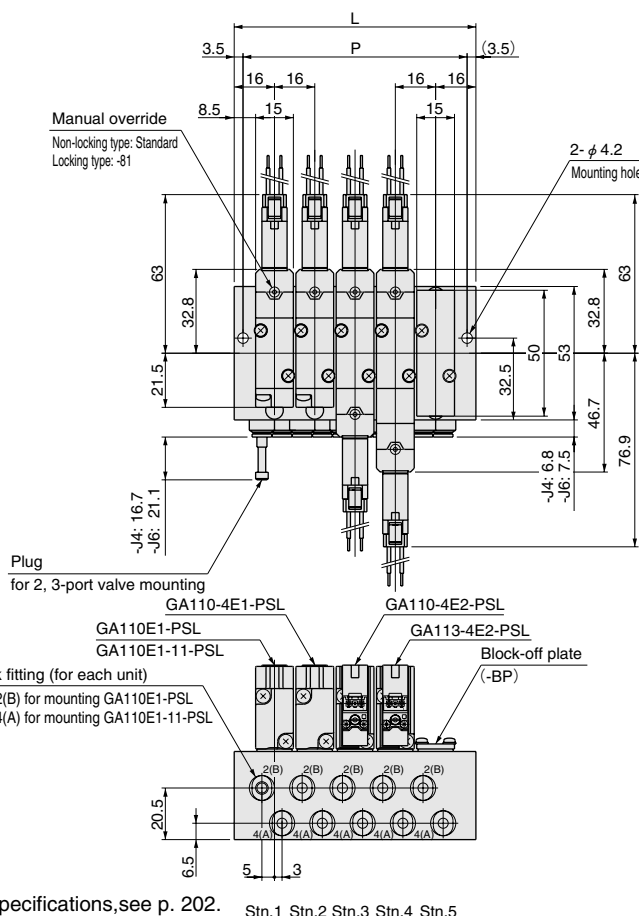
## Unit dimensions

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.



# 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.

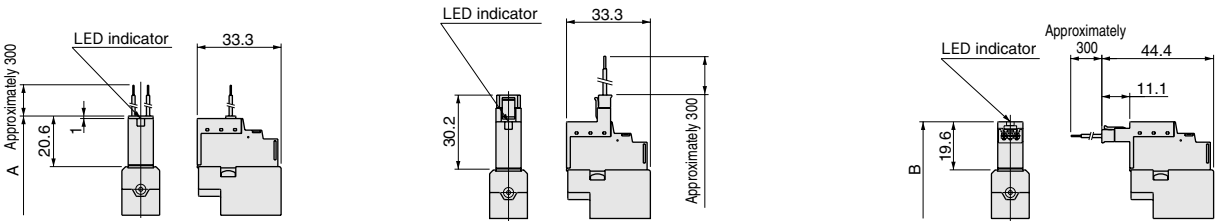
For wiring specifications, see p. 202.

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

**For DC12V, 24V, AC100V**

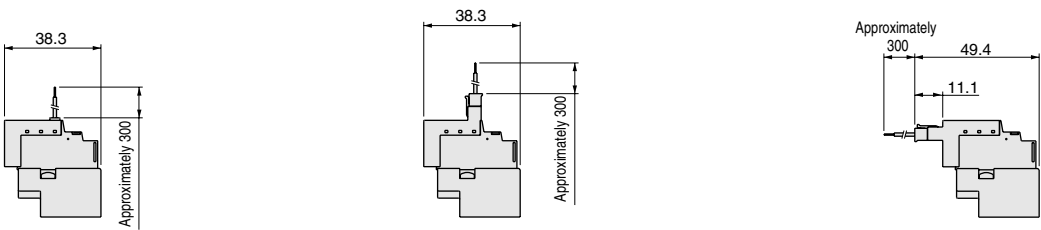


- Grommet: Blank
- Solenoid with straight connector: **-PSL**
- Solenoid with L connector: **-PLL**



**For AC200V**

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



Model	Code	A	B	Remarks
G110E1, G110-4E1		74.9	73.9	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	Total length to the end of the opposite solenoid
G113-4E2, GA113-4E2-25		120.7	118.7	

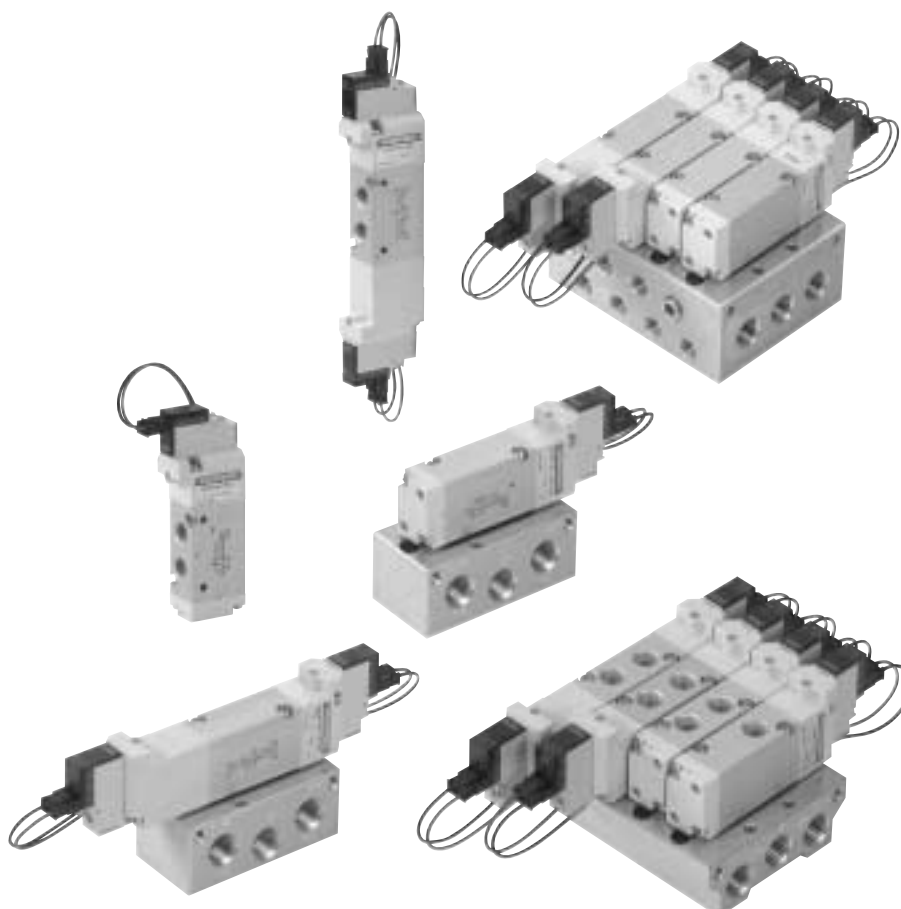
# SOLENOID VALVES G180 SERIES

## INDEX

Basic Models and Configuration	204
Specifications	205
Cylinder Operating Speed	207
Solenoid Valve Order Code	208
Manifold Order Code	209
Operating Principle and Symbol	210
Dimensions of Solenoid Valve	211
Dimensions of Manifold	212
Wiring Specifications	214







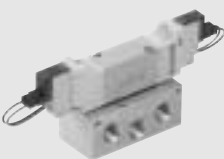
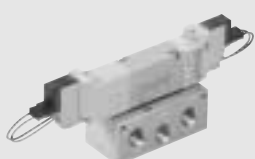
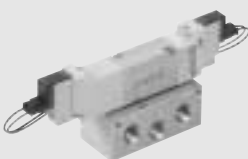
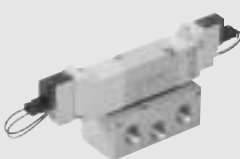


SOLENOID VALVES G110, G180 SERIES



## Basic Models and Configuration of G180 Series

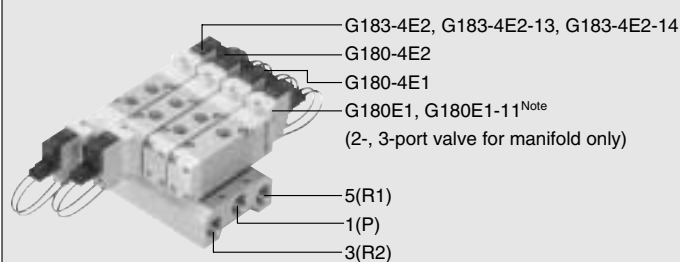
### Single unit

5-port	
Direct piping	<div>2-position</div> <div>Single solenoid</div>  <div><b>G180-4E1</b></div>
	<div>Double solenoid</div>  <div><b>G180-4E2</b></div>
	<div>All port block</div>  <div><b>G183-4E2</b></div>
	<div>3-position</div> <div>ABR connection</div>  <div><b>G183-4E2-13</b></div>
	<div>PAB connection</div>  <div><b>G183-4E2-14</b></div>
Remark: Photo shows wiring specification -PSL.	
Sub-base piping	<div>2-position</div> <div>Single solenoid</div>  <div><b>GA180-4E1-25</b></div>
	<div>Double solenoid</div>  <div><b>GA180-4E2-25</b></div>
	<div>All port block</div>  <div><b>GA183-4E2-25</b></div>
	<div>3-position</div> <div>ABR connection</div>  <div><b>GA183-4E2-13-25</b></div>
	<div>PAB connection</div>  <div><b>GA183-4E2-14-25</b></div>
Remark: Photo shows wiring specification -PSL.	

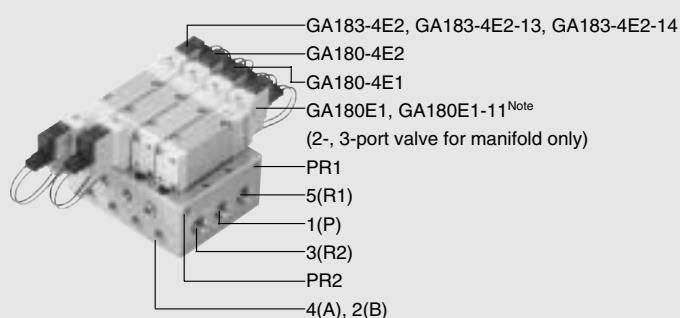
### Manifold

#### Manifold for combined mounting of 2-, 3-, 5-port valves

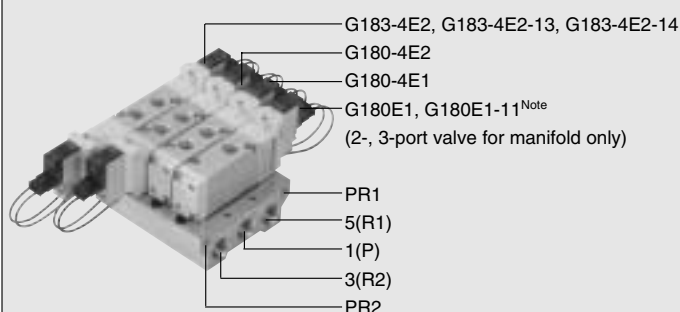
##### G180M□F—F type (P,R) manifold



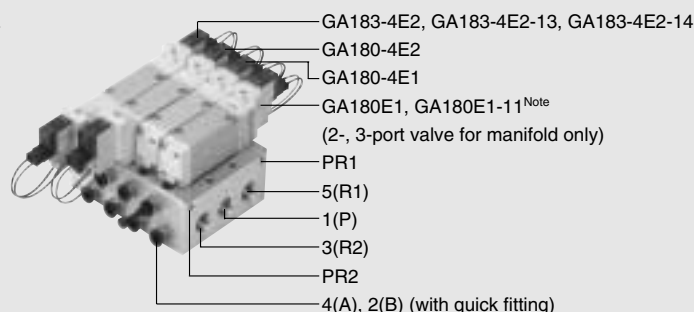
##### G180M□A—A type (all port) manifold



##### G180M□FE—FE type (P, R, PR) manifold



##### G180M□AJ—AJ type (all port, with quick fitting) manifold



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

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

# SOLENOID VALVES G180 SERIES

## Specifications

### Basic Models and Functions

Basic model Item	Direct piping, F, FE type manifold	<b>G180E1</b> <sup>Note</sup>	<b>G180-4E1</b> <b>G180-4E2</b>	<b>G183-4E2</b>
	Sub-base piping, A, AJ type manifold	<b>GA180E1</b> <sup>Note</sup>	<b>GA180-4E1</b> <b>GA180-4E2</b>	<b>GA183-4E2</b>
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, option)	Single solenoid or Double solenoid	All port block (standard), ABR connection or PAB connection (option)

Remark: For optional specifications and order code, see p. 208~209.

Note: G180E1 and GA180E1 are for manifolds for combined mounting of 2-, 3-, 5-port valves only. They cannot be used as a single unit.

### Specifications

Basic model Item	Direct piping, F, FE type manifold	<b>G180E1</b>	<b>G180-4E1</b> <b>G180-4E2</b>	<b>G183-4E2</b>
	Sub-base piping, A, AJ type manifold	<b>GA180E1</b>	<b>GA180-4E1</b> <b>GA180-4E2</b>	<b>GA183-4E2</b>
Media		Air		
Operation method		Internal pilot type		
Effective area [Cv] <sup>Note 1</sup> mm <sup>2</sup>		10.2 [0.57]		9.0 [0.50]
Port size <sup>Note 2</sup>		Rc1/8		
Lubrication		Not required		
Operating pressure range MPa {kgf/cm <sup>2</sup> }		0.15~0.7 {1.5~7.1}		
Proof pressure MPa {kgf/cm <sup>2</sup> }		1.05 {10.7}		
Response time <sup>Note 3</sup> ms ON/OFF	DC12V, DC24V	20/30	20/30, [20]	20/65
	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		5~50		
Shock resistance m/s <sup>2</sup> {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. 206.

2. For details, see the port size on p. 206.

3. Values when air pressure is 0.5MPa {5.1kgf/cm<sup>2</sup>}. For switching phase timing, add a maximum of 5 ms to the response time of AC specifications.

Values in brackets [ ] are for G180-4E2. In addition, values for G183-4E2 are those of the all port block valve switching from neutral state.

Remark: Conversion to psi., 1MPa=145psi., 1kgf/cm<sup>2</sup>=14.2psi., e.g. 0.7MPa=102psi.

### Solenoid specifications

Item	Rated voltage	DC12V	DC24V	AC100V <sup>Note</sup>	AC200V <sup>Note</sup>
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
Maximum allowable leakage current	mA	1.0	1.0	1.0	1.0
Insulation resistance	MΩ	Min. 100 (value at DC500V megger)			
Wiring and lead wire length		Grommet type: 300mm, Plug connector type: 300mm			
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, consult us.

3. Provide heat radiation measures to ensure that the ambient temperature (or when using a control box, the internal temperature of the box) always remains within the temperature range specifications.

## Effective Area [Cv]

mm<sup>2</sup>

Basic model	Standard (single valve)	Built-in quick fitting	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"> <li>● When mounting on a sub-base or manifold.</li> <li>● Attaching TS6-02 to the sub-base P, A, B ports brings the value to 7.5.</li> </ul>

## Solenoid Valve Port Size

Basic model	Port specification		Port size
G180E1 <sup>Note</sup>	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)		
	3·5(R)		
	PR	Female thread	M5×0.8

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

## Manifold Connection Port Size

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

## Valve Mass

g

Basic model	Mass
G180E1	85
G180-4E1	80
G180-4E2	101
G183-4E2	111
GA180E1	86 (246)
GA180-4E1	85 (245)
GA180-4E2	106 (266)
GA183-4E2	115 (275)

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

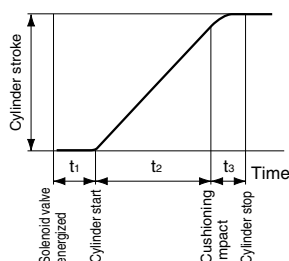
## Manifold Mass

g

Manifold model	Mass calculation of each unit (n=number of units)	Block-off plate
G180M□F	$(42 \times n) + 40$	19
G180M□FE	$(60 \times n) + 70$	30
G180M□A	$(120 \times n) + 120$	
G180M□AJ	~J4: $(135 \times n) + 120$ ~J6: $(138 \times n) + 120$	

## Cylinder Operating Speed

How to obtain cylinder speed

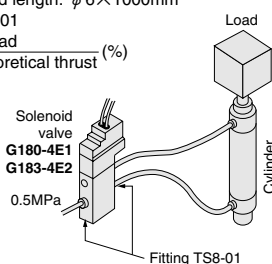


To obtain the time required for the cylinder to complete full stroke, add cylinder's delay time  $t_1$  (time between energizing of solenoid valve and actual starting of cylinder), to the cylinder's max. operating time  $t_2$ . When a cushion is used, add the cushioning time  $t_3$  to the above calculation. Standard cushioning time  $t_3$  is approximately 0.2 seconds.

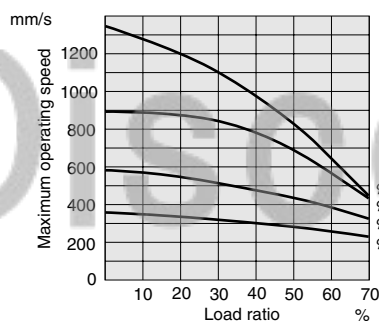
### G180-4E1 G183-4E2

#### ● Measurement conditions

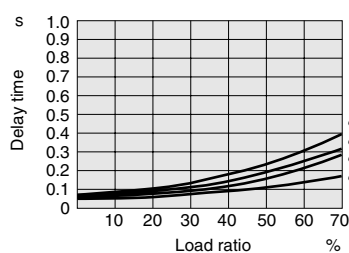
- Air pressure: 0.5MPa {5.1kgf/cm<sup>2</sup>}
- Piping inner diameter and length:  $\phi 6 \times 1000$ mm
- Fitting: Quick fitting TS8-01
- Load ratio =  $\frac{\text{Load}}{\text{Cylinder theoretical thrust}} (\%)$
- Cylinder stroke: 150mm



#### Maximum operating speed



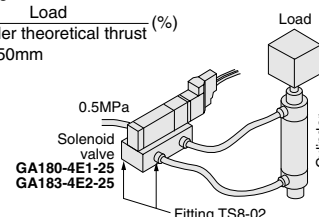
#### Delay time



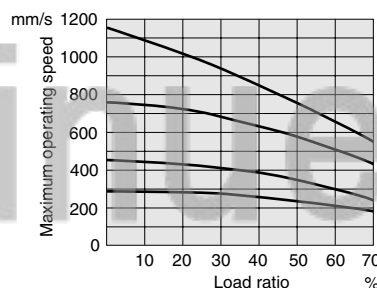
### GA180-4E1-25 GA183-4E2-25

#### ● Measurement conditions

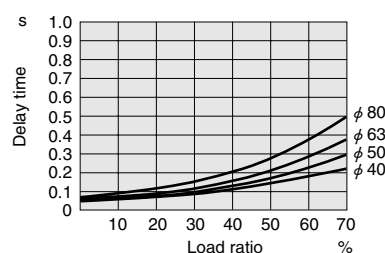
- Air pressure: 0.5MPa {5.1kgf/cm<sup>2</sup>}
- Piping inner diameter and length:  $\phi 6 \times 1000$ mm
- Fitting: Quick fitting TS8-02
- Load ratio =  $\frac{\text{Load}}{\text{Cylinder theoretical thrust}} (\%)$
- Cylinder stroke: 150mm



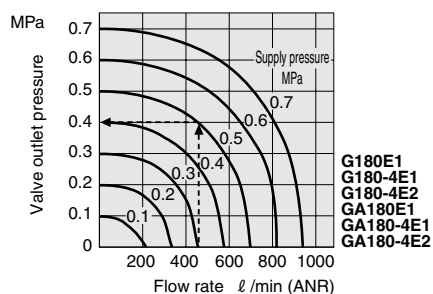
#### Maximum operating speed



#### Delay time

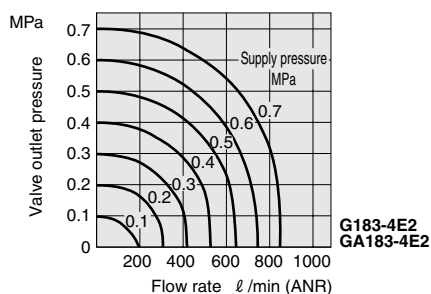


## Flow Rate



#### How to read the graph

If supply pressure is 0.5MPa and flow rate is 460 l/min (ANR), the valve outlet pressure becomes 0.4MPa.

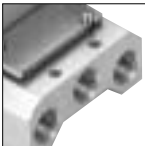


G180 Series Solenoid Valve Order Code

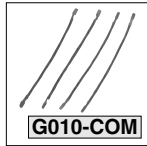
2-, 3-port valve		2-, 3-port valve		3-position valve		Sub-base		Manual override		Wiring	
Number of ports		Valve function		Valve function							
3-port		Normally closed (NC)		All port block		Without sub-base		Non-locking type		Lead wire length 300mm is standard.	
Blank		Blank		Blank		Blank		Blank		Blank	
2-port		Normally open (NO)		ABR connection		With sub-base		Locking type		Straight connector with LED indicator	
-2		-11		-13		-25		-81		-PSL	
				PAB connection						L connector with LED indicator	
				-14						-PLL	
		</									

Additional Parts (Sold Separately)

Block-off plate



Lead wire for common wiring



● G180M□F-BP

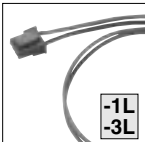
180—For G180M

F —For F type manifold  
FE—For FE type manifold  
A —For A type, AJ type manifold

● For -PSL, -PLL  
(10-piece set)

Made to Order (After the wiring order code, enter the codes below.)

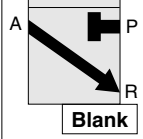
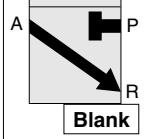
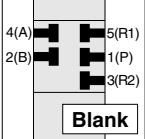

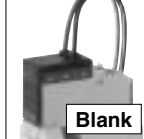

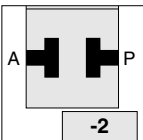
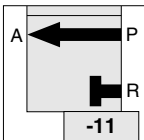
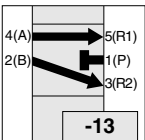
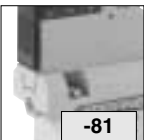
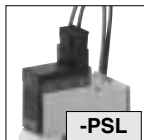

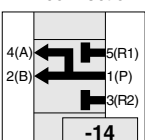
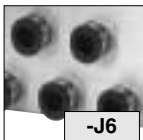
Lead wire length



● For plug connector  
● Length -1L: 1000 (mm)  
-3L: 3000



## G180 Series Manifold Order Code

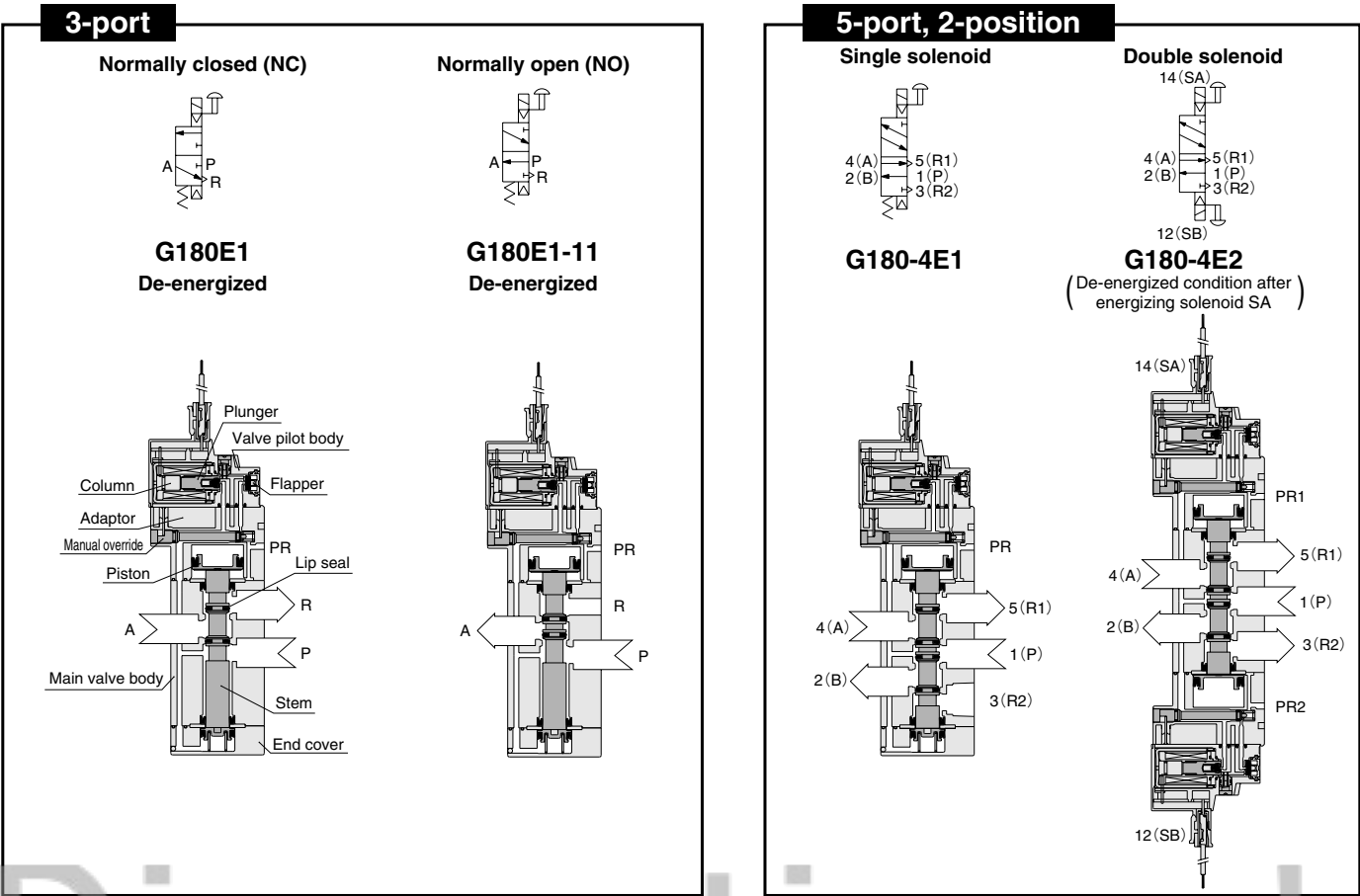
2-, 3-port valve Number of ports		2-, 3-port valve Valve function		3-position valve Valve function		Manual override		Wiring		Manifold Connection port	
3-port  Blank		Normally closed (NC)  Blank		All port block  Blank		Non-locking type  Blank		Grommet type with LED indicator  Blank		Quick fitting for $\phi$ 4 tube  -J4	
2-port  -2		Normally open (NO)  -11		ABR connection  -13		Locking type  -81		Straight connector with LED indicator  -PSL		L connector with LED indicator  -PLL	
				PAB connection  -14						Quick fitting for $\phi$ 6 tube  -J6	

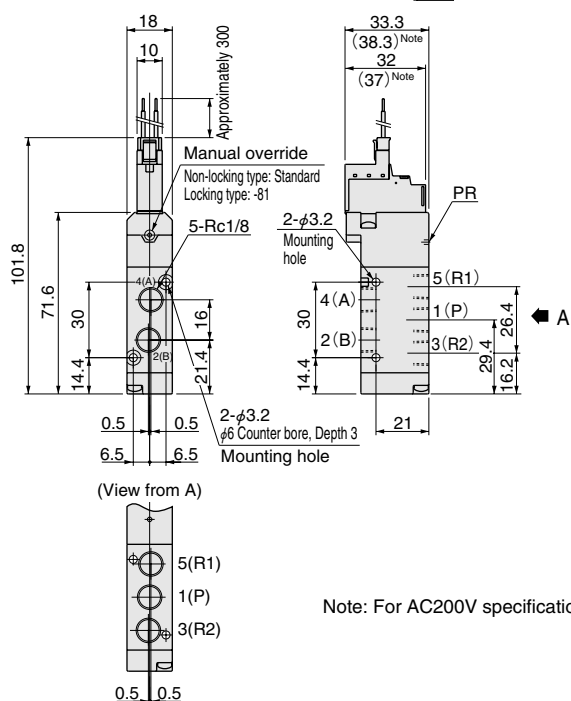
Manifold model Number of units	Station	Basic model	Valve mounting location	Manual override	Wiring	Manifold Connection port	Voltage <sup>Note</sup>
G180M	F FE	stn. <input type="checkbox"/> -G180E1	-2	-11	-81	-PSL -PLL	DC12V DC24V AC100V AC200V
		stn. <input type="checkbox"/> -G180-4E1					
		stn. <input type="checkbox"/> -G180-4E2					
		stn. <input type="checkbox"/> -G183-4E2	-13, -14				
		stn. <input type="checkbox"/> -GA180E1	-2	-11			
		stn. <input type="checkbox"/> -GA180-4E1					
	A AJ	stn. <input type="checkbox"/> -GA180-4E2			-81	-PSL -PLL	DC12V DC24V AC100V AC200V
		stn. <input type="checkbox"/> -GA183-4E2	-13 -14				
		stn. <input type="checkbox"/> -GA180E1	-2	-11			
		stn. <input type="checkbox"/> -GA180-4E1					
		stn. <input type="checkbox"/> -GA180-4E2					
		stn. <input type="checkbox"/> -GA183-4E2	-13 -14				

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

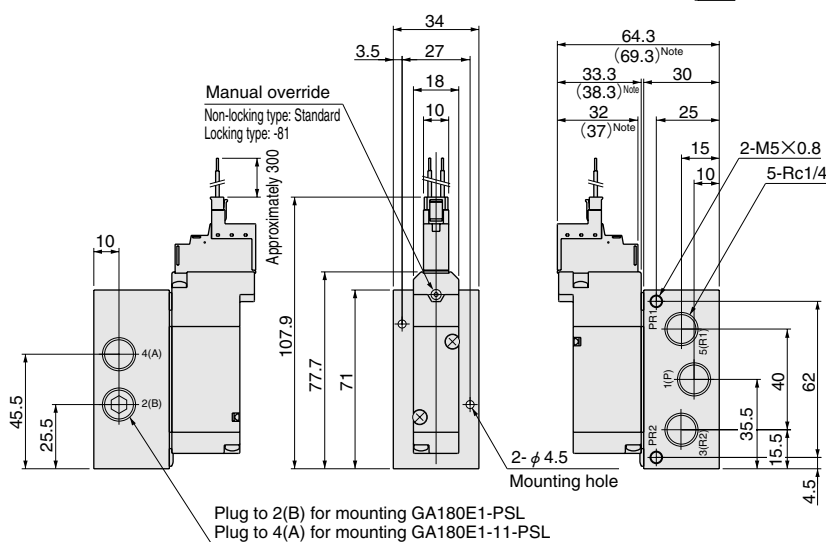
- Specify the valve type for each station.
- Enter -BP when closing a station with a block-off plate without mounting a valve.
- Valve mounting location from the left-hand side when facing A, B port.
- For the AJ type manifold only.



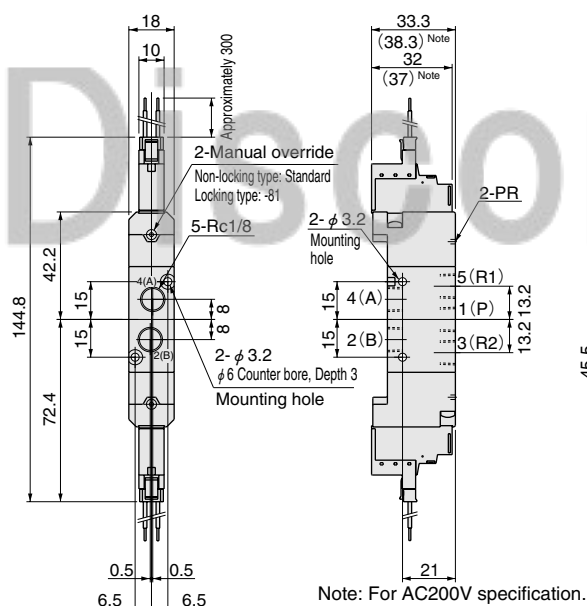
**G180-4E1-PSL**  G180\_4E1



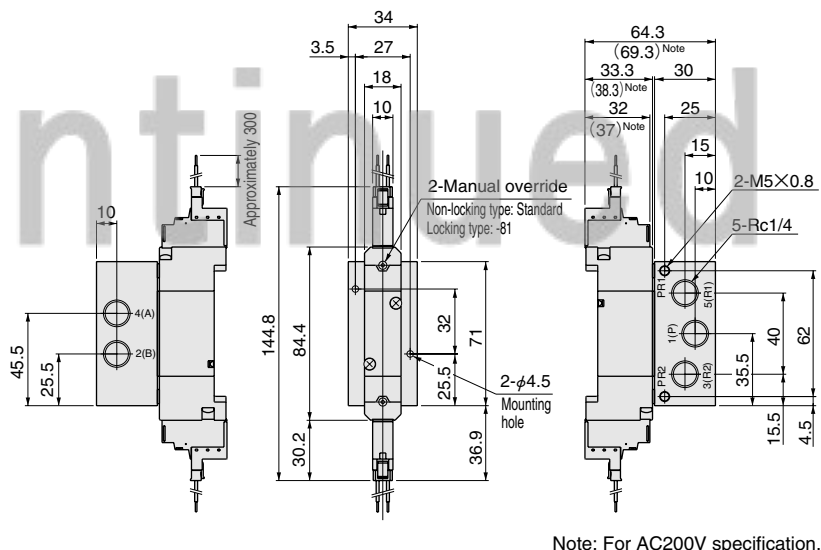
**GA180E1-25-PSL** **GA180-4E1-25-PSL**  GA180E1



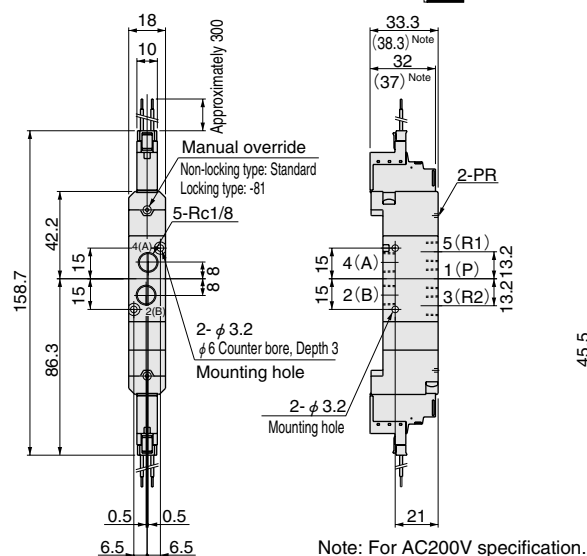
**G180-4E2-PSL**  G180\_4E2




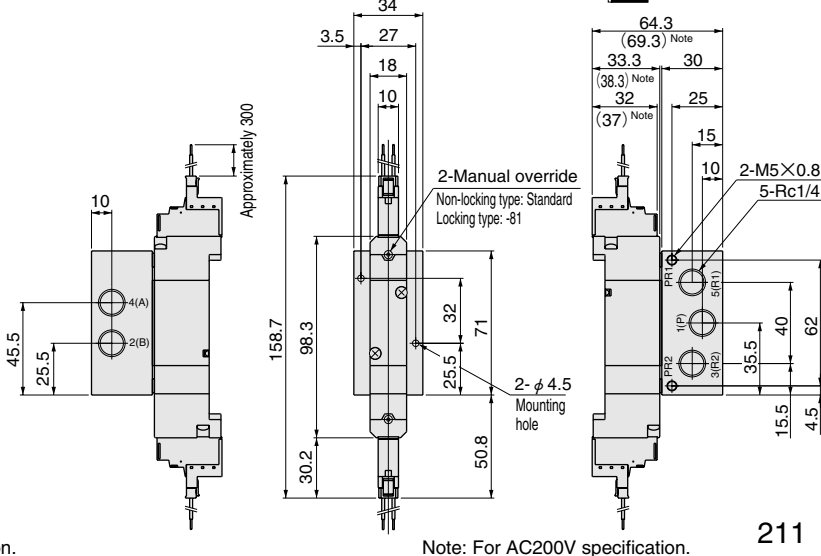
**GA180-4E2-25-PSL**  GA180\_4E



**G183-4E2-PSL**  G183\_4E2



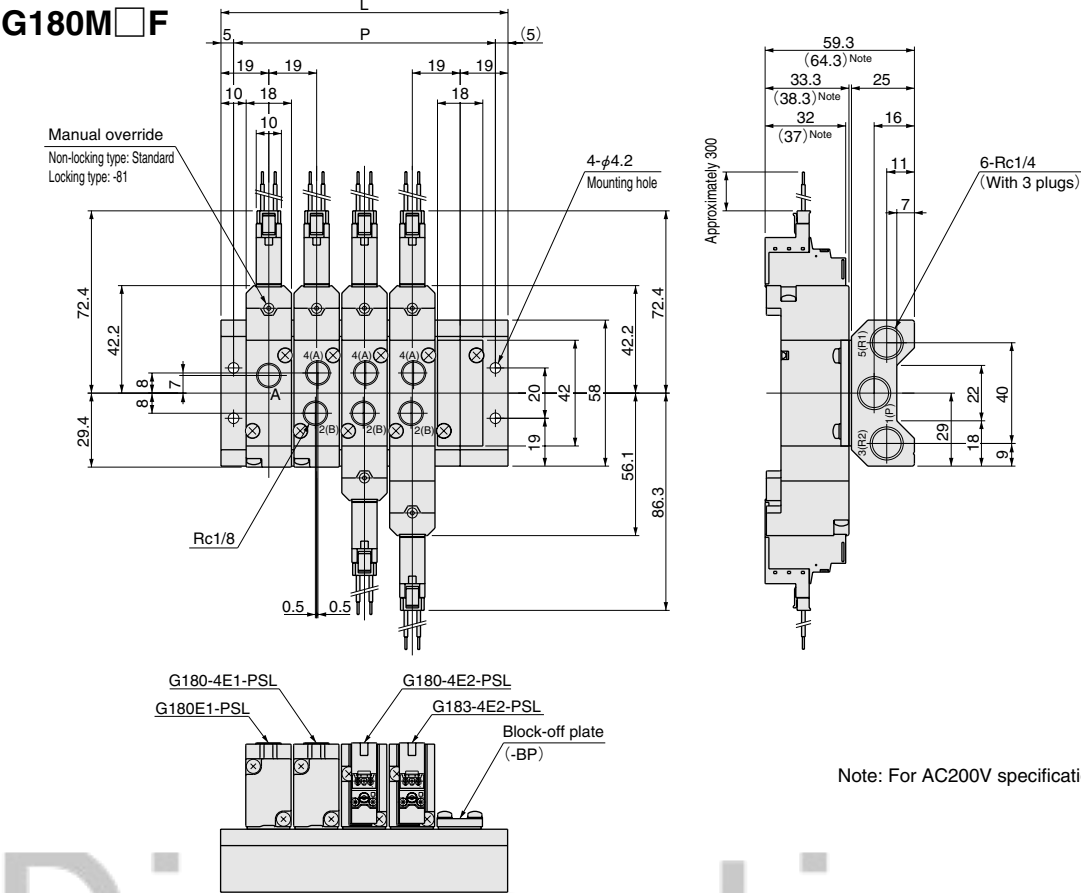
**GA183-4E2-25-PSL**  GA183\_4E



Dimensions of Manifold for Combined Mounting of 2-, 3-, 5-port Valves (Scale 1/3, Unit mm)

G180M□F

CAD G180MF



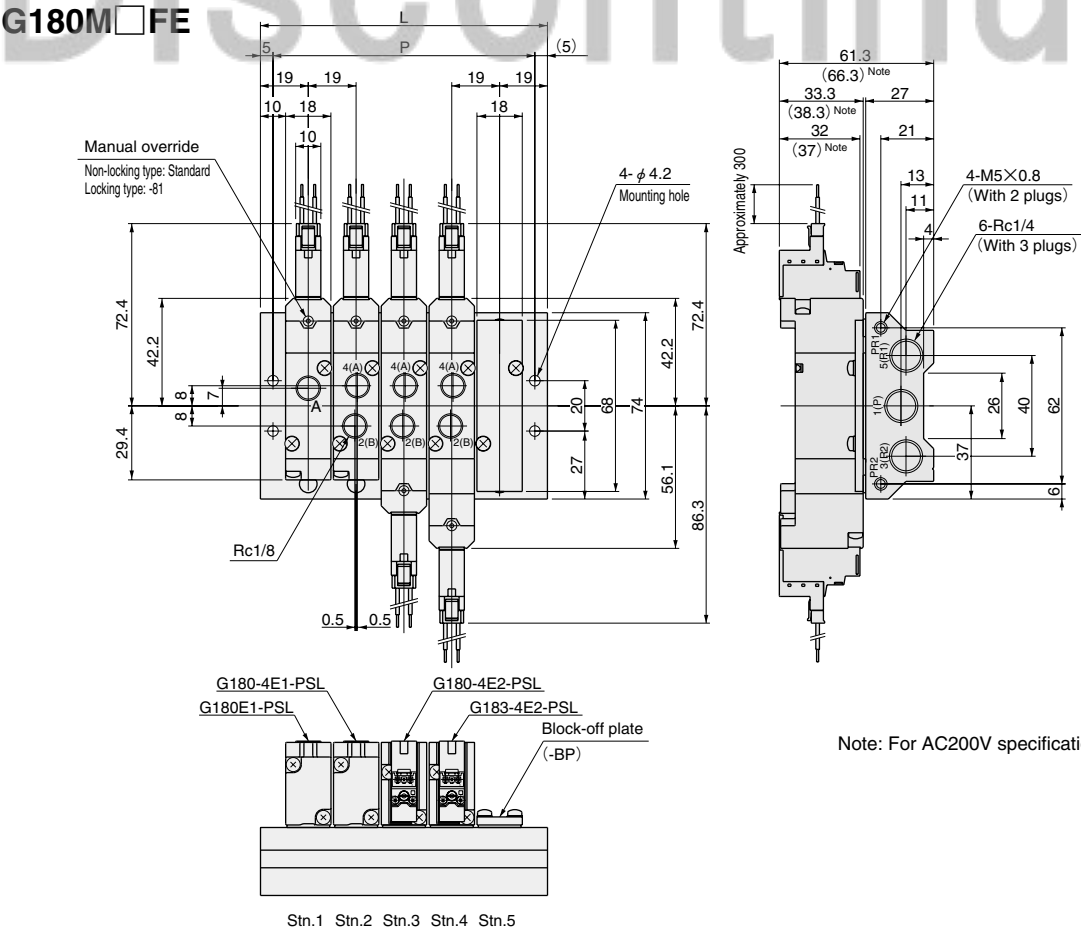
Unit dimensions

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

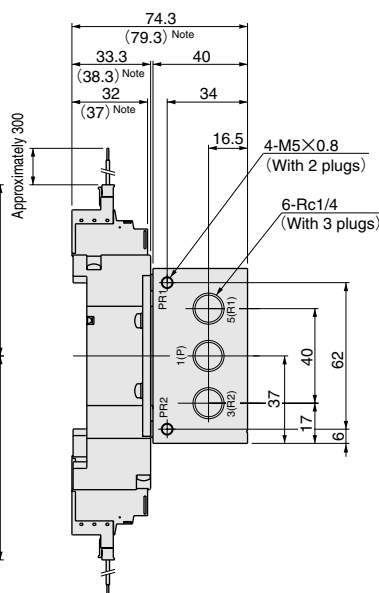
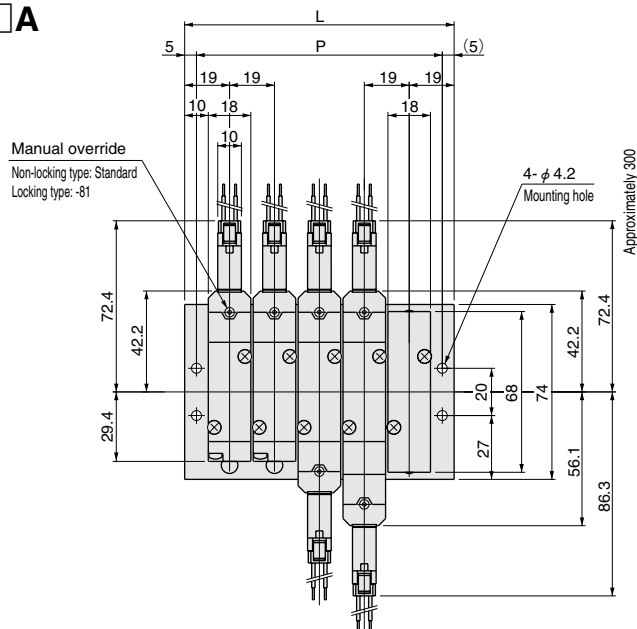
Number of units	L	P
2	57	47
3	76	66
4	95	85
5	114	104
6	133	123
7	152	142
8	171	161
9	190	180
10	209	199
11	228	218
12	247	237
13	266	256
14	285	275
15	304	294
16	323	313
17	342	332
18	361	351
19	380	370
20	399	389

Note: For AC200V specification.

For wiring specifications, see p. 214.

# G180M□A

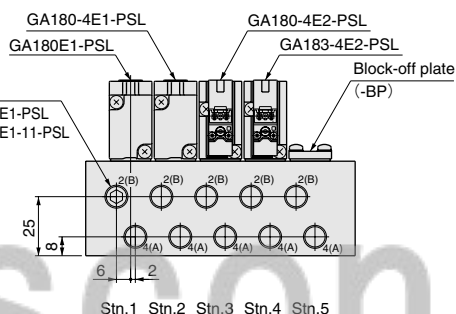
CAD G180MA



## Unit dimensions

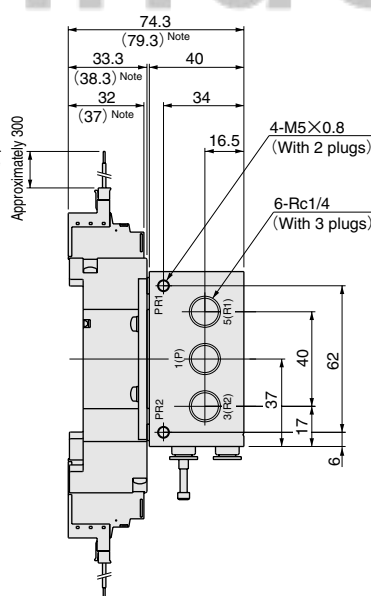
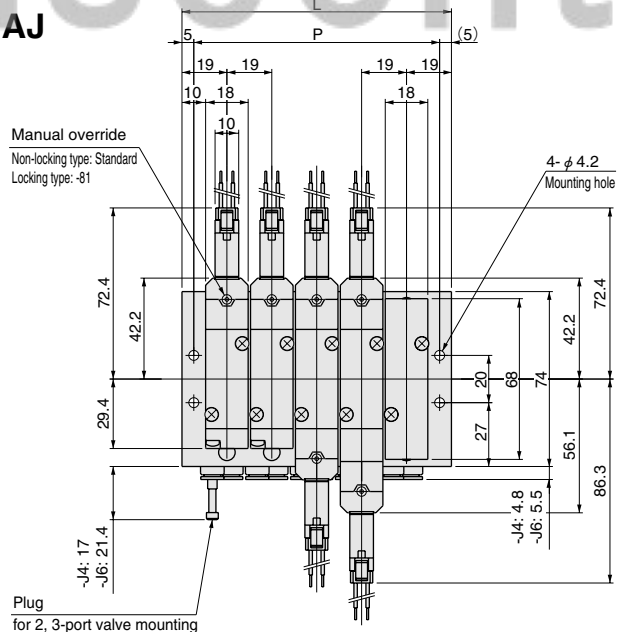
Number of units	L	P
2	57	47
3	76	66
4	95	85
5	114	104
6	133	123
7	152	142
8	171	161
9	190	180
10	209	199
11	228	218
12	247	237
13	266	256
14	285	275
15	304	294
16	323	313
17	342	332
18	361	351
19	380	370
20	399	389

Note: For AC200V specification.



# G180M□AJ

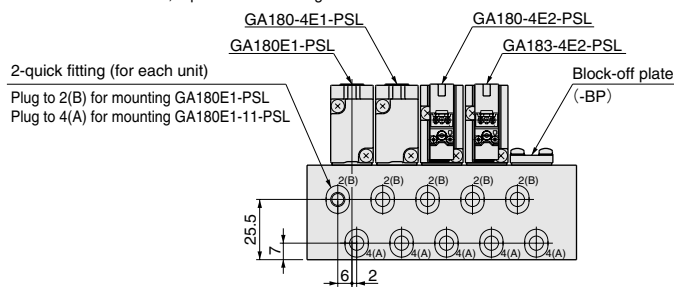
CAD G180MAJ



## 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.

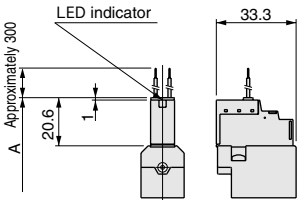


For wiring specifications, see p. 214.

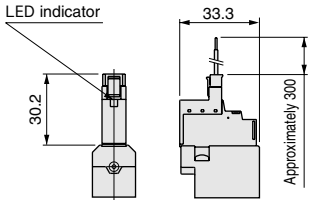
For DC12V, 24V, AC100V



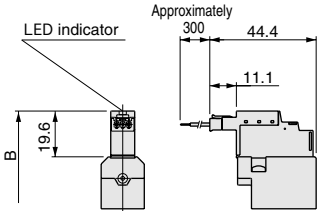
Grommet: Blank



Solenoid with straight connector: -PSL

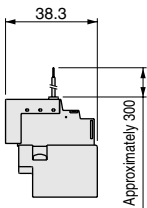


Solenoid with L connector: -PLL

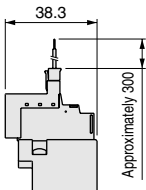


For AC200V

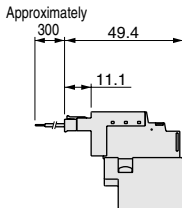
Grommet: Blank



Solenoid with straight connector: -PSL



Solenoid with L connector: -PLL



Model	Code	A	B	Remarks
G180E1, G180-4E1		92.2	91.2	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	Total length to the end of the opposite solenoid
G183-4E2, GA183-4E2-25		139.5	137.5	

mm