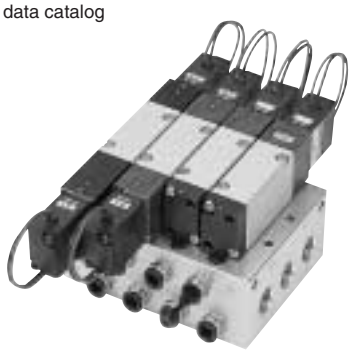
CAD drawing data catalog is available.



KOGANEI

VALVES GENERAL CATALOG

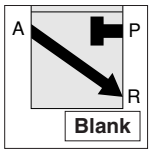
SOLENOID VALVES 180 SERIES

INDEX

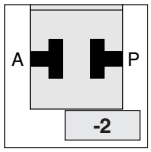
180 Series Solenoid Valve, Air-piloted Valve Order Codes

2-, 3-port valve Number of ports

3-port

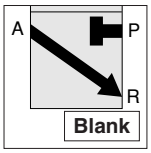


2-port

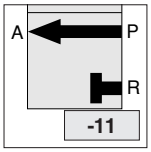


2-, 3-port valve Valve function

Normally closed (NC)

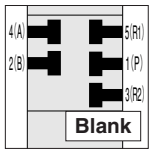


Normally open (NO)

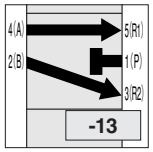


3-position valve Valve function

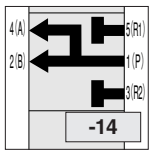
Closed center



Exhaust center



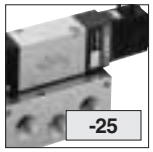
Pressure center



Sub-base

Without sub-base

With sub-base



Port fitting specifications Note 2

Female thread: **Blank**

-J41, -J42, -J43: Quick fitting for ϕ 4 tube
-J61, -J62, -J63: Quick fitting for ϕ 6 tube

●2(A) port of 181E1 (4(A) port of 180E1)

●1(P), 2(A) ports of 181E1

●4(A), 2(B) ports of 5-port

●1(P), 4(A), 2(B) ports of 5-port

Manual override

Non-locking type

Locking protruding type

Wiring type

●Lead wire length: 300mm [11.8in.] is standard.

Grommet type

Straight connector with LED indicator

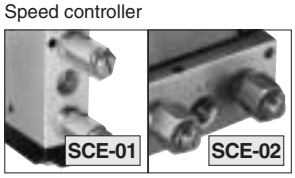
L connector with LED indicator

		Basic model							Voltage
Direct piping	2-, 3-port	181E1	-2	-11		-J41,-J42 -J61,-J62	-83	-PSL -PLL	DC12V DC24V AC100V AC200V
	5-port single solenoid	180-4E1				-J42,-J43 -J62,-J63			
	5-port double solenoid	180-4E2							
	5-port 3-position	183-4E2			-13 -14				
Sub-base piping	2-, 3-port	A181E1	-2	-11			-83	-PSL -PLL	DC12V DC24V AC100V AC200V
	5-port single solenoid	A180-4E1				-25			
	5-port double solenoid	A180-4E2							
	5-port 3-position	A183-4E2			-13 -14				
For manifold with combination mounting of 2-, 3-, 5-port valves only Note 1	2-, 3-port for 180□F, FE	180E1	-2	-11		-J41 -J61	-83	-PSL -PLL	DC12V DC24V AC100V AC200V
	5-port, 2-position twin solenoid	180-4KE2				-J42 -J62			
	5-port, 3-position twin solenoid	183-4KE2			-13 -14				
	2-, 3-port for 180□A, AJ	A180E1	-2	-11					
	5-port, 2-position twin solenoid	A180-4KE2							
	5-port, 3-position twin solenoid	A183-4KE2			-13 -14				
Direct piping air-piloted valve (made to order)	5-port single pilot	180-4A				-J42,-J43 -J62,-J63			
	5-port double pilot	180-4A2							
Sub-base piping air-piloted valve (made to order)	5-port single pilot	A180-4A				-25			
	5-port double pilot	A180-4A2							

Notes: 1. They cannot be used as single units.
2. The port fittings are for ϕ 4: TSK4-M8M, and for ϕ 6: TSK6-M8M.

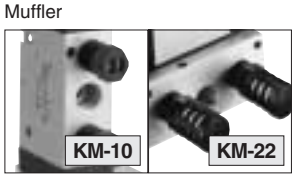
Additional Parts (To be ordered separately)

Speed controller



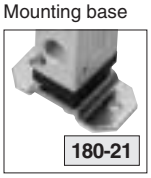
●For direct piping ●For sub-base piping

Muffler



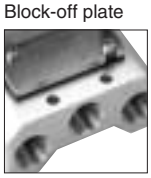
●For direct piping ●For sub-base piping

Mounting base



●For direct piping
●For 2-, 3-port and 5-port single solenoids

Block-off plate



● □ M □-BP

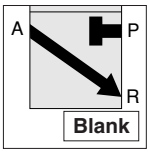
181—For 181M
180—For 180M

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

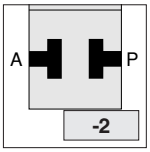
180 Series Manifold Order Codes

2-, 3-port valve Number of ports

3-port

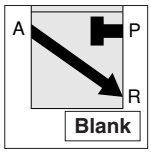


2-port

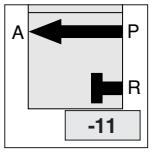


2-, 3-port valve Valve function

Normally closed (NC)

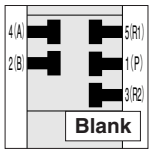


Normally open (NO)

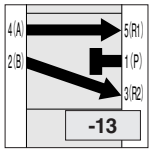


3-position valve Valve function

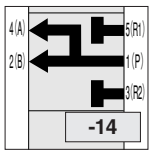
Closed center



Exhaust center



Pressure center



Port fitting specifications Note 1

Female thread: **Blank**

-J41,-J42: Quick fitting for ϕ 4 tube

-J61,-J62: Quick fitting for ϕ 6 tube

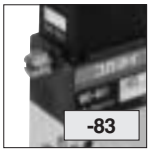
●2(A) port of **181E1** (4(A) port of **180E1**)

●4(A), 2(B) ports of 5-port

Manual override

Non-locking type

Locking protruding type



Wiring type

●Lead wire length: 300mm [11.8in.] is standard.

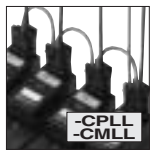
Grommet type

Straight connector with LED indicator

L connector with LED indicator

Straight connector with LED indicator

L connector with LED indicator



●**-CP□L**: DC12V and DC24V positive side, and AC100V, AC200V.

●**-CM□L**: DC12V and DC24V negative side.

Manifold Connection port

Quick fittings for ϕ 4 tube

Quick fittings for ϕ 6 tube

	Manifold model Number of units		Station	Basic model							Voltage
Manifold for 2-, 3-port valves	181M	2 ⋮ 20	F	stn.□ ⋮ stn.□	-181E1	-2	-11	-J41 -J61	-83	-PSL -PLL -CPSL -CMSL -CPLL -CMLL	-J4 -J6	DC12V DC24V AC100V AC200V
			A AJ		-A181E1	-2	-11					
Manifold for combination mounting of 2-, 3-, 5-port valves	180M	2 ⋮ 20	F FE	stn.□ ⋮ stn.□	-180E1	-2	-11	-J41 -J61	-83	-PSL -PLL -CPSL -CMSL -CPLL -CMLL		DC12V DC24V AC100V AC200V
					-180-4E1			-J42 -J62				
					-180-4E2							
					-180-4KE2							
					-183-4E2		-13 -14					
					-183-4KE2							
			A AJ	stn.□ ⋮ stn.□	-A180E1	-2	-11		-83	-PSL -PLL -CPSL -CMSL -CPLL -CMLL	-J4 -J6	DC12V DC24V AC100V AC200V
					-A180-4E1							
					-A180-4E2							
					-A180-4KE2							
					-A183-4E2		-13 -14					
					-A183-4KE2							
Manifold for mounting 5-port (made to order)	180M	2 ⋮ 20	F	stn.□ ⋮ stn.□	-180-4A			-J42 -J62				
					-180-4A2							
			A AJ	stn.□ ⋮ stn.□	-A180-4A						-J4 -J6	
					-A180-4A2							

Note: The port fittings are for ϕ 4: TSK4-M8M, and for ϕ 6: TSK6-M8M.

●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.
●Since a twin solenoid valve requires 2 stations per valve to mount, the second station (solenoid 12(S1) side) should be blank.

●For the AJ type manifold only.
●It is not required when ordering as a single valve unit.

●Pre-wired common terminal for AC100V and AC200V is either **-CPSL** or **-CPLL**.

Made to Order

The 180 series includes made to order items of various kinds for further system development.
For details, see p.353～360.

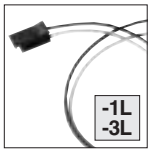
Straight connector with LED indicator

●Without lead wire
●Connector, contacts included

L connector with LED indicator

●Without lead wire
●Connector, contacts included

Lead wire length



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

DIN connector

●Cannot be used with **-L.**

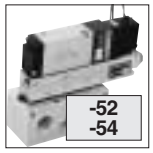
LED indicator with built-in varistor

●Cannot be used with **-39**.

Built-in interface unit

●Possible to be directly controlled by output from micro computer or other logic devices.
●With LED indicator

Sub-base regulator



●Regulate the pressure at each station on the manifold.
●**-52**: P port pressure regulating type
-54: B port pressure regulating type

Air-piloted valves 180 series

●5-port, 2-position
●Single pilot
●Double pilot

Air-piloted valves 180 series

●The optimum air valve for master valves or pilot valves for total pneumatic control.

Specifications

Item \ Basic model		For direct piping, F type manifold		For sub-base, A type, AJ type manifolds	
		Single pilot	Double pilot	Single pilot	Double pilot
		180-4A	**180-4A2**	**A180-4A**	**A180-4A2**
Media		Air			
Operation type		Air piloted type			
Number of positions and ports		2 positions, 5 ports			
Effective area〔Cv〕mm²		10.2〔0.567〕Note 1			
Port size	Main	Rc1/8Note 2		—— Note 2	
	Pilot	Rc1/8			
Lubrication		Not required			
Operating pressure range MPa {kgf/cm²} [psi.]	Main	0.15～0.7 {1.5～7.1} [22～102]	0～0.7 {0～7.1} [0～102]	0.15～0.7 {1.5～7.1} [22～102]	0～0.7 {0～7.1} [0～102]
	Pilot	See the table "Minimum Pilot Pressure"			
Proof pressure MPa {kgf/cm²} [psi.]		1.05 {10.7} [152]			
Operating temperature range (atmosphere and media) °C[°F]		5～50 [41～122]			
Shock resistance m/s² {G}		1373.0 {140.0} (Axial direction 294.2 {30.0})			
Mounting direction		Any			
Maximum operating frequency Hz		5			
Mass g [oz.]		70 [2.47]	80 [2.82]	80 [2.82] (240 [8.47])Note 3	90 [3.17] (250 [8.82])Note 3

Notes: 1. For details, see the effective area.
2. For details, see the port size.
3. Values in parentheses ( ) are the mass with sub-plate: **-25**.

※For optional specifications and order codes, see p.339～340.

Effective Area

mm²〔Cv〕

Specifications \ Basic model		For direct piping, F type manifold	For sub-base, A type, AJ type manifolds
		180-4A, 180-4A2	**A180-4A, A180-4A2**
Single valve		10.2〔0.57〕	8.2〔0.46〕
Built-in quick fitting for φ4 tube	-J42 4(A), 2(B) ports with fittings	4.4〔0.24〕	4.4〔0.24〕 When mounted on the AJ type manifold with -J4 specification
	-J43 1(P), 4(A), 2(B) ports with fittings		——
Built-in quick fitting for φ6 tube	-J62 4(A), 2(B) ports with fittings	9.6〔0.53〕	7.9〔0.44〕 When mounted on the AJ type manifold with -J6 specification
	-J63 1(P), 4(A), 2(B) ports with fittings		——
Remarks		●Attaching TS6-01 to the 1(P), 4(A), 2(B) ports gives the value 9.2〔0.51〕. ●On the F type manifold, attaching TS4-01 to the 4(A), 2(B) ports gives the value 4.1 [0.23], and attaching TS6-01 gives the value 9.2〔0.51〕.	●Attaching TS6-02 to the 1(P), 4(A), 2(B) ports on the sub-base (-25) gives the value 7.5〔0.42〕.

Manifold Specifications and Port Size

Manifold model	Specifications	Port		Port size
F type	1(P), 3(R2), 5(R1) manifold piping 4(A), 2(B) valve piping	1(P)		Rc1/4
		4(A), 2(B)		Rc1/8 or quick fitting (valve order code for φ4: -J 42, for φ6: -J62)
		3(R2), 5(R1)		Rc1/4
A type	All ports manifold piping	1(P)		Rc1/4
		4(A), 2(B)		Rc1/8
		3(R2), 5(R1)		Rc1/4
AJ type	4(A), 2(B) ports built-in quick fitting All ports manifold piping	1(P)		Rc1/4
		4(A),	-J4	Quick fitting for φ4 tube
		2(B)	-J6	Quick fitting for φ6 tube
		3(R2), 5(R1)		Rc1/4

※For optional specifications and order codes, see p.340.

Manifold Mass

g [oz.]

Manifold model		Mass calculation of each unit (n=number of units)	Mounting valve			
			180-4A	**180-4A2**	**A180-4A**	**A180-4A2**
F type		(42×n)+40 [(1.48×n)+1.41]	70 [2.47]	80 [2.82]	—	—
A type		(120×n)+120 [(4.23×n)+4.23]	—	—	120 [4.23]	170 [6.00]
AJ type	-J4	(135×n)+120 [(4.76×n)+4.23]				
	-J6	(138×n)+120 [(4.87×n)+4.23]				

Calculation example: The mass of 180M 10F stn.1～5 180-4A, stn.6～10
180-4A2 becomes (42×10)+40+(110×5)+(90×5)=1310 g [46.21oz.]

Minimum Pilot Pressure

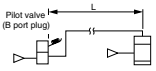
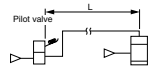
MPa {kgf/cm²} [psi.]

Model \ Main pressure	0.15 {1.5} [22]	0.3 {3.0} [44]	0.5 {5.1} [73]	0.7 {7.1} [102]
180-4A	0.15 {1.5} [22]	0.25 {2.5} [36]	0.34 {3.5} [49]	0.45 {4.5} [65]
180-4A2	0.08 {0.8} [12]	0.10 {1.0} [15]	0.12 {1.2} [17]	0.14 {1.4} [20]

Time Required for Switching

s

Model	Operation	Pilot line length L m [ft.]					
		2 [6.6]	6 [19.7]	10 [32.8]	20 [65.6]	50 [163.9]	100 [327.9]
180-4A	ON	0.07	0.18	0.32	0.65	2.10	5.80
	OFF	0.15	0.42	0.72	1.50	4.32	12.20
180-4A2	ON	0.09	0.23	0.40	0.83	2.73	7.00
	OFF						

Model	Measurement circuit	Measurement conditions
180-4A		● Pilot valve=050-4E1 (effective area1.2mm²〔Cv: 0.067〕) ● Tube inner diameter=4mm [0.16in.] ● Air pressure (both main and pilot) =0.5MPa [73psi.]
180-4A2		

Port Size

Specifications \ Basic model		Port	For direct piping, F type manifold: 180-4A, 180-4A2	For sub-base, A type, AJ type manifolds: A180-4A, A180-4A2	Remarks
Female thread		1(P)	Rc1/8	—	Standard
		4(A), 2(B)			
		3(R2), 5(R1)			
Built-in quick fitting	-J42	1(P)	Rc1/8	—	●Straight type ●For φ4 tube ●For both nylon tubes and urethane tubes
		4(A), 2(B)	Built-in quick fitting		
		3(R2), 5(R1)	Rc1/8		
	-J43	1(P)	Built-in quick fitting		
		4(A), 2(B)			
		3(R2), 5(R1)	Rc1/8		
	-J62	1(P)	Rc1/8	—	●Straight type ●For φ6 tube ●For both nylon tubes and urethane tubes
		4(A), 2(B)	Built-in quick fitting		
		3(R2), 5(R1)	Rc1/8		
	-J63	1(P)	Built-in quick fitting		
		4(A), 2(B)			
		3(R2), 5(R1)	Rc1/8		

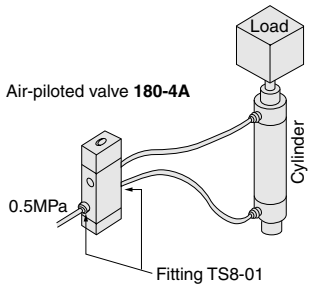
Specifications \ Basic model	Port	For direct piping, F type manifold: 180-4A, 180-4A2	For sub-base, A type, AJ type manifolds: A180-4A, A180-4A2	Remarks
Sub-base -25	1(P)	—	Rc1/4	● All ports sub-base piping
	4(A), 2(B)			
	3(R2), 5(R1)			
F type manifold	1(P)	Rc1/4	—	● 1(P), 3(R2), 5(R1) manifold, 4(A), 2(B) valve piping
	4(A), 2(B)	Rc1/8 or quick fitting		
	3(R2), 5(R1)	Rc1/4		
A type manifold	1(P)	—	Rc1/4	● All ports manifold piping
	4(A), 2(B)		Rc1/8	
	3(R2), 5(R1)		Rc1/4	
AJ type manifold	1(P)	—	Rc1/4	● All ports manifold piping ● 4(A), 2(B) ports -J4: For φ4 tube -J6: For φ6 tube
	4(A), -J4		Built-in quick fitting	
	2(B) -J6		Built-in quick fitting	
	3(R2), 5(R1)		Rc1/4	

Cylinder Operating Speed and Flow Rate

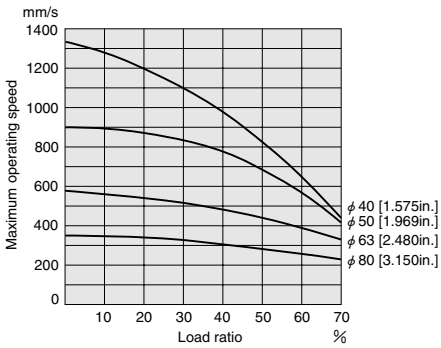
180-4A

●Measurement conditions

- ●Air pressure: 0.5MPa {5.1kgf/cm²} [73psi.]
- ●Piping inner diameter and length: φ6 [0.24in.]×1000mm [39in.]
- ●Fitting: Quick fitting TS8-01
- ●Load ratio= $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- ●Cylinder stroke: 150mm [5.91in.]



Maximum operating speed

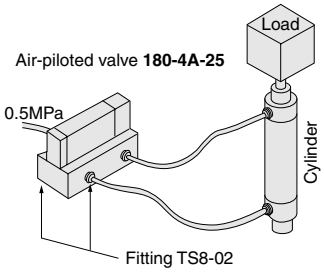


1mm/s = 0.0394in./sec.

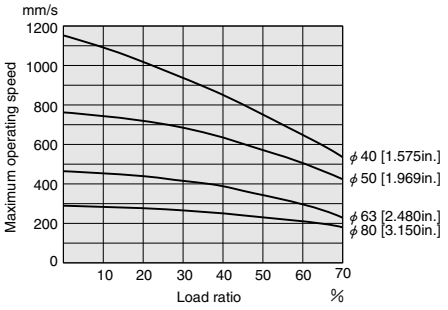
A180-4A-25

●Measurement conditions

- ●Air pressure: 0.5MPa {5.1kgf/cm²} [73psi.]
- ●Piping inner diameter and length: φ6 [0.24in.]×1000mm [39in.]
- ●Fitting: Quick fitting TS8-02
- ●Load ratio= $\frac{\text{Load}}{\text{Cylinder theoretical thrust}}$ (%)
- ●Cylinder stroke: 150mm [5.91in.]

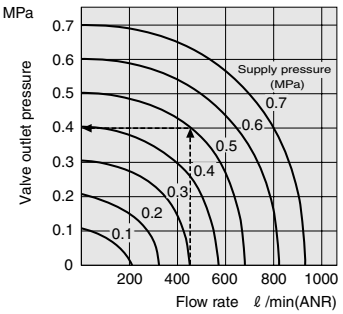


Maximum operating speed



1mm/s = 0.0394in./sec.

Flow rate 180 series



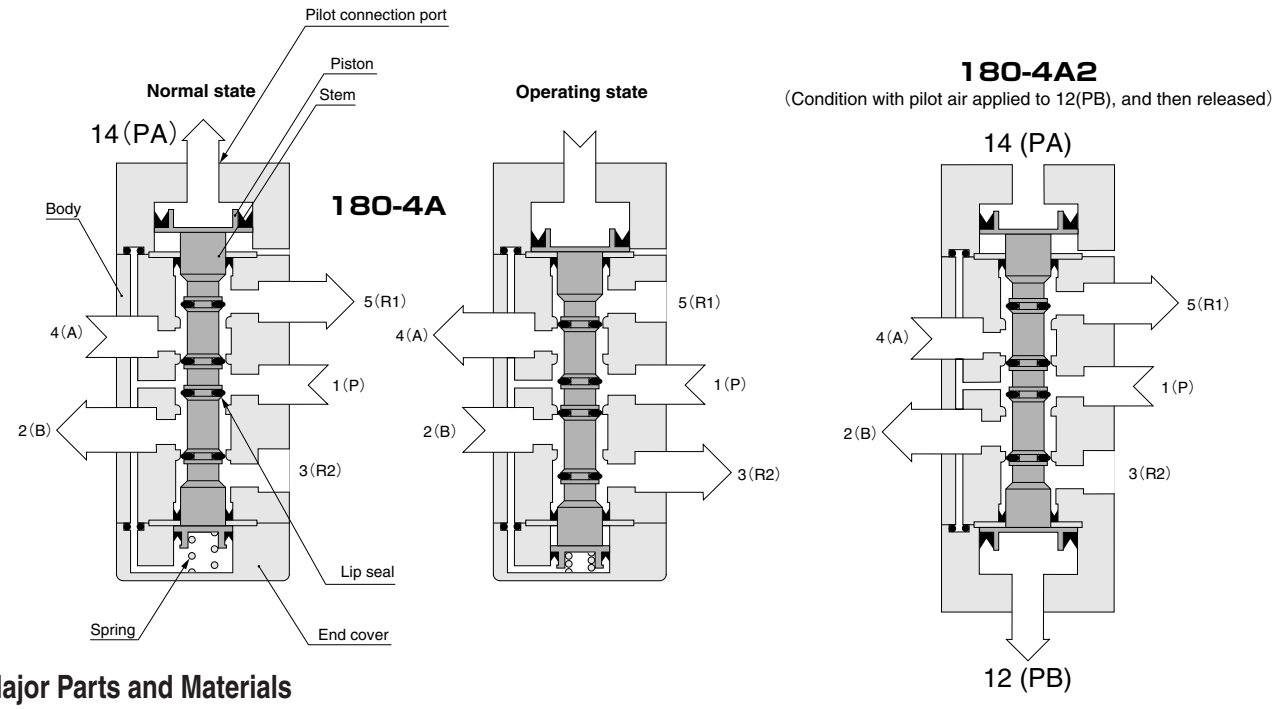
1MPa = 145psi., 1 ℓ /min = 0.0353ft³/min.

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.].

Operating Principles, and Major Parts and Materials

5-port, 2-position

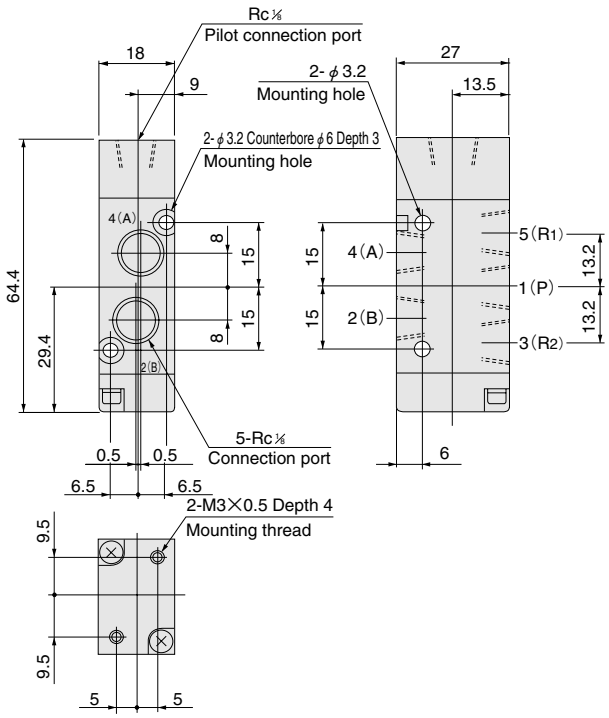


Major Parts and Materials

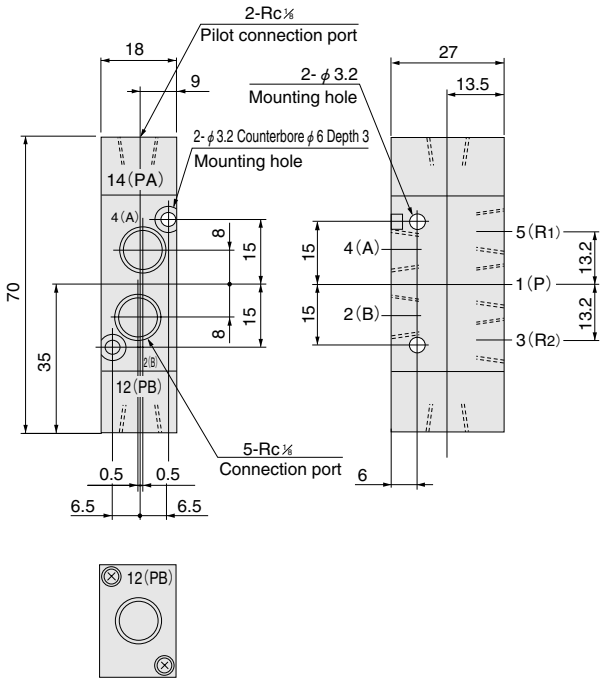
Parts	Materials
Body	Aluminum alloy (anodized)
Stem	
Lip seal	Synthetic rubber
Mounting base	Mild steel (zinc plated)
Sub-base	Aluminum alloy (anodized)

Dimensions of Air-piloted 5-port, 2-position Valve (mm)

180-4A

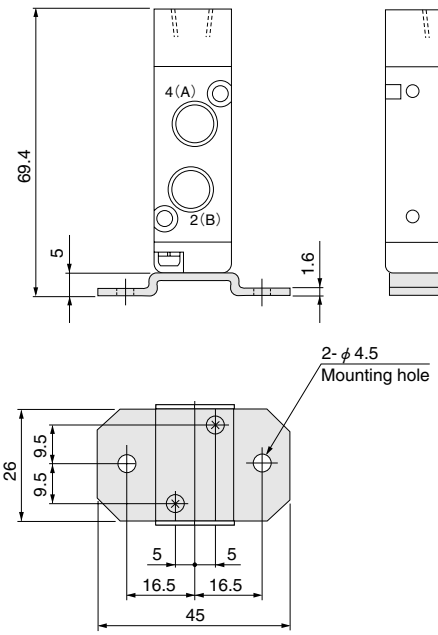


180-4A2

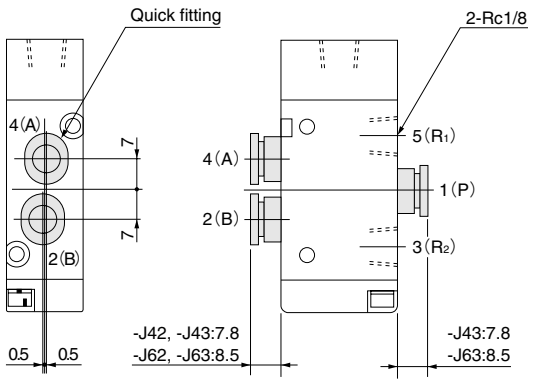


Options

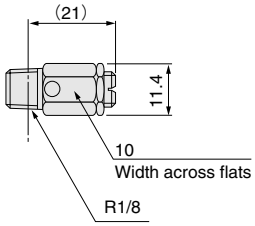
●Mounting base: **-21**



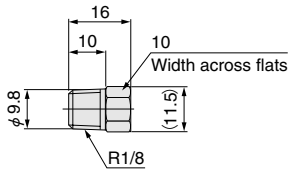
●With quick fittings: **-J42** (For φ4 tube, 4(A), 2(B) ports with fittings)
-J43 (For φ4 tube, 1(P), 4(A), 2(B) ports with fittings)
-J62 (For φ6 tube, 4(A), 2(B) ports with fittings)
-J63 (For φ6 tube, 1(P), 4(A), 2(B) ports with fittings)



●Speed controller: **-70**

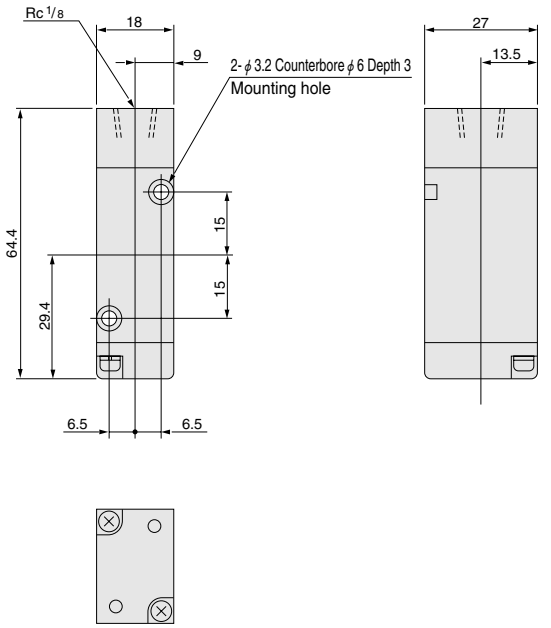


●Muffler: **-75**

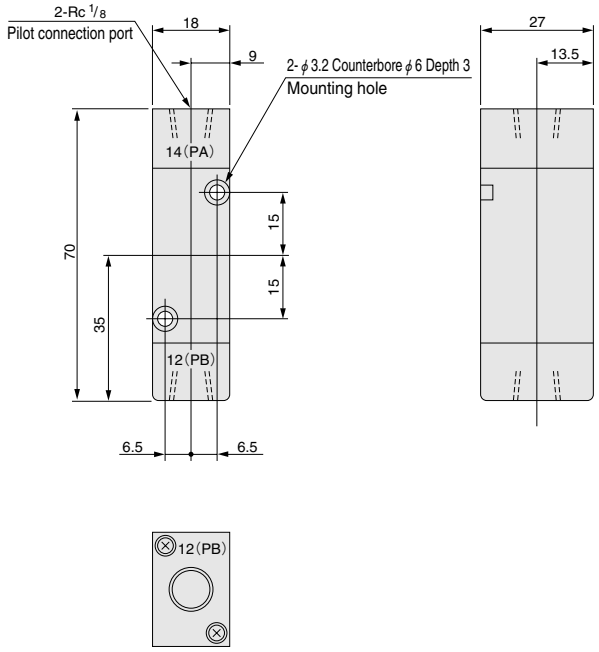


Dimensions of Air-piloted 5-port, 2-position Valve (mm)

A180-4A

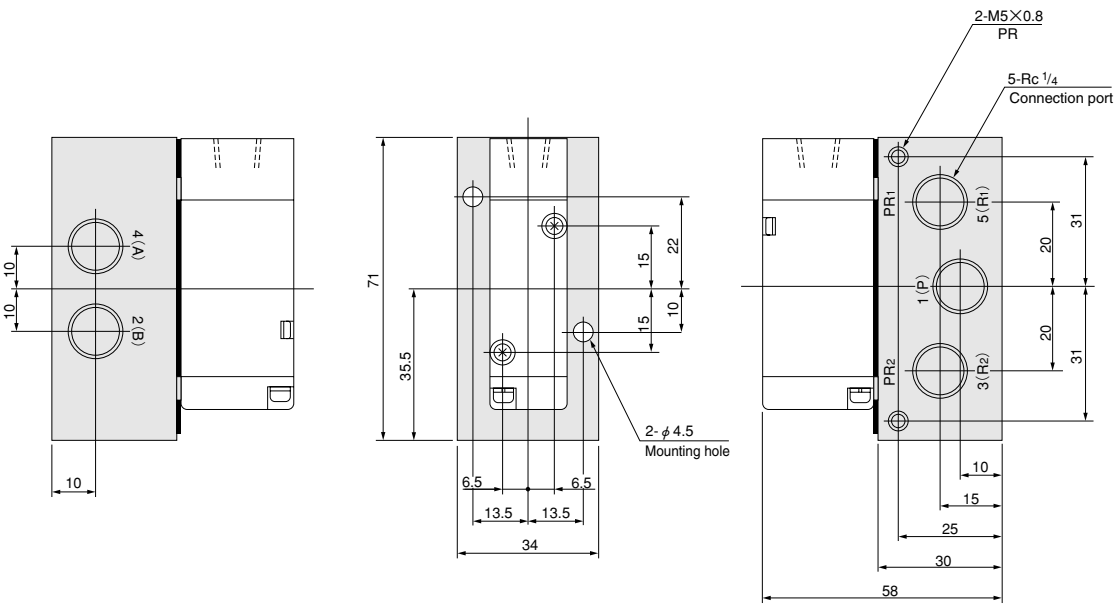


A180-4A2

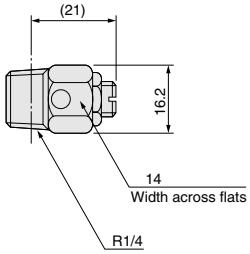


Options

●Sub-base: **-25**



●Speed controller: **-70**
(for sub-base only)

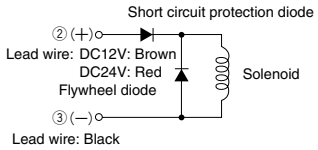


Solenoid

Internal circuit

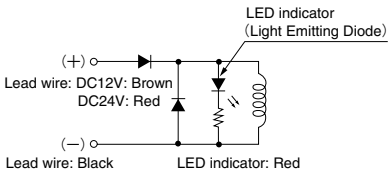
●DC12V, DC24V

Standard solenoid (Surge suppression)



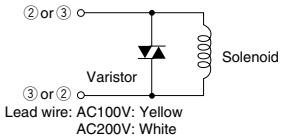
② and ③ are for with DIN connector (Order code: -39).

Solenoid with LED indicator (Surge suppression)
Order code: -PSL, -PLL



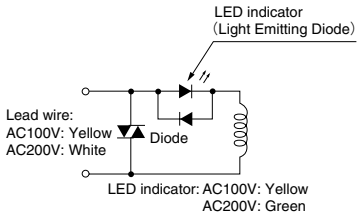
●AC100V, AC200V

Standard solenoid (Surge suppression)



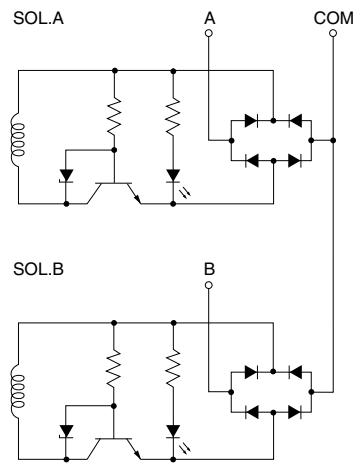
② and ③ are for with DIN connector (Order code: -39).

Solenoid with LED indicator (Surge suppression)
Order code: -PSL, -PLL



●DC24V

Tandem solenoid

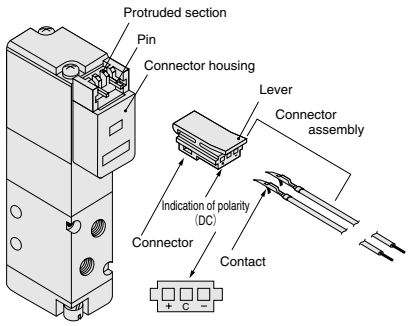


Cautions: 1. Do not apply megger between the lead wires.
2. The DC solenoid will not short circuit even if the wrong polarity is applied, but the valve will not operate.
3. Leakage current inside the circuit could result in failure of the solenoid valve to return, or in other erratic operation. Always 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 and twin solenoid, avoid energizing both solenoids simultaneously. The valve could fall into the neutral position.

Plug connector

Attaching and removing plug connector

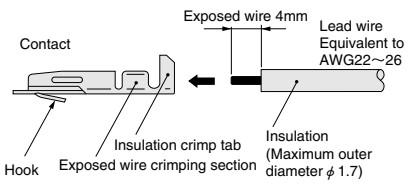
Use fingers to insert the connector into the pin, push it in until the lever claw latches onto the protruded section of the connector housing, and complete the connection.
To remove the connector, squeeze the lever along with the connector, lift the lever claw up from the protruded section of the connector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



※Illustration shows the 110 series.

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.



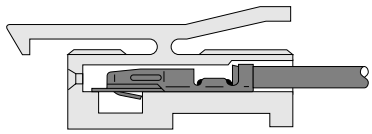
Cautions: 1. Do not pull hard on the lead wire.
2. Always use a dedicated tool for crimping of connecting lead wire and contact.

Contact: Model 702062-2M
Manufactured by Sumiko Tech, Inc.

Crimping tool: Model F1-702062
Manufactured by Sumiko Tech, Inc.

Attaching and removing contact and connector

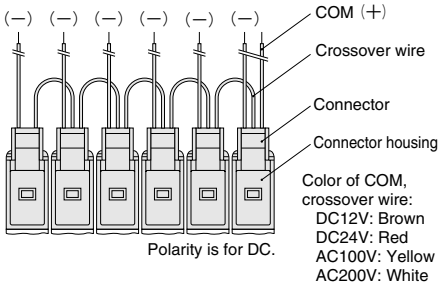
Insert the contact with lead wire into a plug connector □ hole until the contact hook latches on the connector and is secured to the plug connector. Confirm that the lead wire cannot be easily pulled out.
To remove it, insert a tool with a fine tip (such as a small screwdriver) into the rectangular hole on the side of the plug connector to push up on the hook, and then pull out the lead wire.



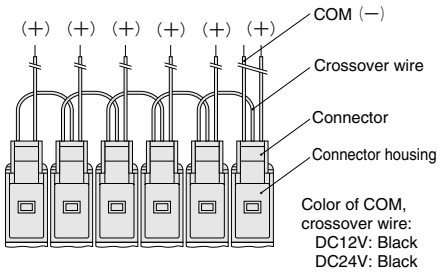
Cautions: 1. Do not pull hard on the lead wire. It could result in defective contacts, breaking wires, etc.
2. If the pin is bent, use a small screwdriver, etc. to gently straighten out the pin, and then complete the connection to the plug connector.

Common terminal pre-wired plug connector

1. Pre-wired common terminal at DC positive side or AC
Order code With straight connector: -CPSL
With L connector: -CPLL



2. Pre-wired common terminal at DC negative side
Order code With straight connector: -CMSL
With L connector: -CMLL

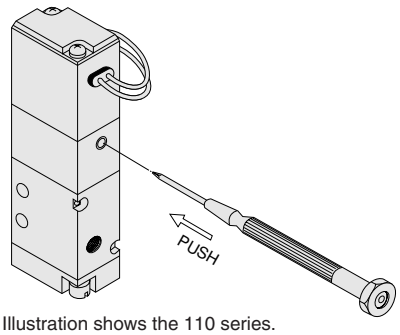


Cautions: 1. The diagrams show the straight connector configuration.
While the connector's orientation is different in the case of the L connector, in every case the first COM lead wire comes from the last station's mounted valve.
2. Since the COM terminal is connected to a crossover terminal inside the connector housing, the connector cannot be switched between a positive common and a negative common by changing the connectors.

Manual override

Non-locking type

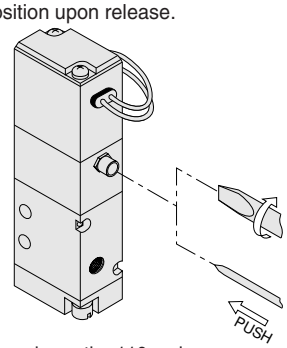
To operate the manual override, press it all the way down. The single solenoid valve works the same as when in the energized state as long as the manual override is pushed down, and returns to the normal position upon release.
For the double solenoid and twin solenoid valves, pressing the manual override on the 12(S1) side switches the 12(S1) 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 14(S2) side. This is the same for the solenoid 14(S2).



※Illustration shows the 110 series.

Locking protruding type

Use a small screwdriver to turn the adjusting knob several times in the clockwise direction, and lock the manual override in place. When locked, turning the adjusting knob several times in the counterclockwise direction releases a spring on the manual override, returns it to the normal position, and releases the lock.
For the locking protruding type, when the adjusting knob 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 it returns to the normal position upon release.



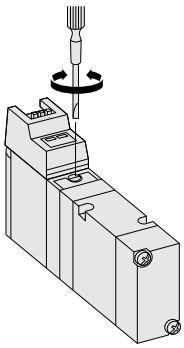
※Illustration shows the 110 series.

Cautions:
1. The 180 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.
2. Always release the lock of the locking type and locking protruding type manual override before commencing normal operation.
3. 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.
4. Do not turn the adjusting knob more than needed. It could result in defective operation.

Manual override (Tandem solenoid)

Locking type

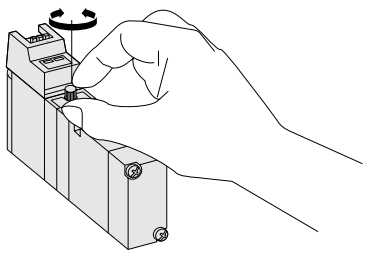
To lock the locking type manual override, use a small screwdriver to push down the manual override all the way, then set the 0 position as the reference point and turn it in the clockwise direction as far as position A. This achieves the same conditions as when the 14(SA) side is energized, and the manual override is locked in place. For the 12(SB) side, turn it in the counterclockwise direction as far as position B. To release the lock, return the manual override to the 0 position. A spring mechanism returns the manual override to its normal position, and the lock is released. Care should be taken to avoid excessive turning of the manual override, which could damage it.



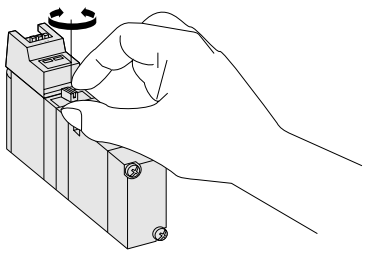
Locking protruding type, locking manual lever type

To lock the locking protruding type manual override or locking manual lever type, use either a small screwdriver or your fingertips to push the manual override button (manual lever) all the way down, then set the 0 position as the reference point and turn it in the clockwise direction as far as position A. This achieves the same conditions as when the 14(SA) side is energized, and the manual override button (manual lever) is locked in place. For the 12(SB) side, turn it in the counterclockwise direction as far as position B. To release the lock, return the manual override button (manual lever) to the 0 position. A spring mechanism returns the manual override button (manual lever) to its normal position, and the lock is released. Care should be taken to avoid excessive turning of the manual override button (manual lever), which could damage it.

Locking protruding type manual override



Locking manual lever type



Cautions:
1. The 180 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.
2. Always release the lock of the locking protruding type manual override before commencing normal operation.
3. 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.

Mounting base 180-21

When installing a mounting base to the valve, always use the provided screws. The recommended tightening torque for the screws is 49N·cm {5kgf·cm} [4.3in·lbf]. If you must use screws other than the provided ones, use screws with a screw length of 6mm [0.24in.] or less. Avoid applying excessive force or shocks.

Mounting valves on manifold

When mounting valves on manifold, apply the recommended tightening torque of 49N·cm {5kgf·cm} [4.3in·lbf] for the valve mounting screws.