aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
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ADEX VALVE

5 PORT PILOT OPERATED SOLENOID VALVE

ADEX Valves

A00, A05, A12 Series

February 2010

Parker

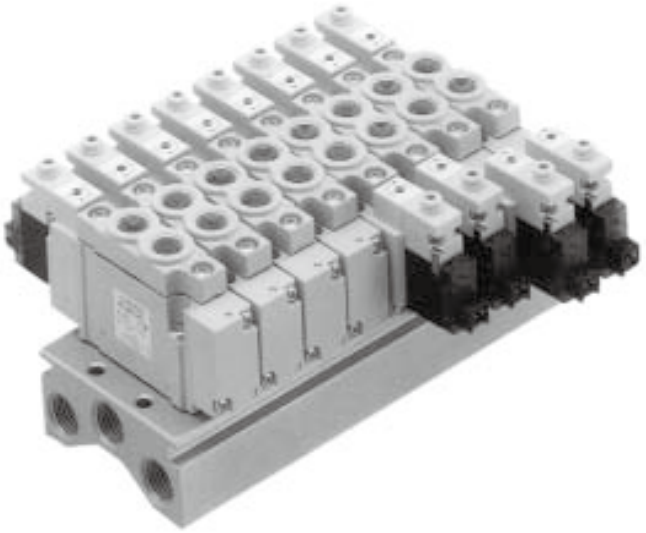
ENGINEERING YOUR SUCCESS.

CONTENTS

ADEX

A00 Series
A05 Series
A12 Series

VALVE



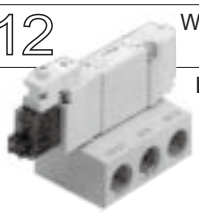
Compact body with large flow

Body width remains the same, but the flow rate 1.5 to 3 times more than conventional valves.
(In comparison with KURODA products)
It allows flexibility on your applications saving space and reducing costs.
This series is most suitable for driving cylinders of φ10 to φ100 in diameter.

A05 W : 28mm H : 80mm L : 74mm

Body width		Effective area
10 mm	⇨	5.8 mm²

A12 W : 41mm H : 61mm L : 93mm



Body width		Effective area
15 mm	⇨	11.1 mm²

Quick response time, faster than 10ms

(A05 series, Single solenoid)
Uniquely designed pilot valve cut down on response time to faster than 10ms saving power consumption.

Expected life time more than 50,000,000 operations

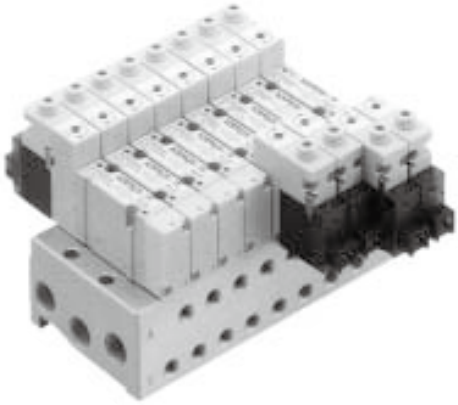
(Based on KURODA's test conditions)
A well-reputed TS (Triple Squeeze) seal is employed in the main spool. resulting in low sliding friction and long service life.

Low power consumption Only 0.6W

(With indicator light and surge suppressor)
Current required is 25mA on 24V DC.
Direct drive from PLC is possible, contributing to cost reduction as well as down-sizing of the DC power supply.

Multipin connector manifold

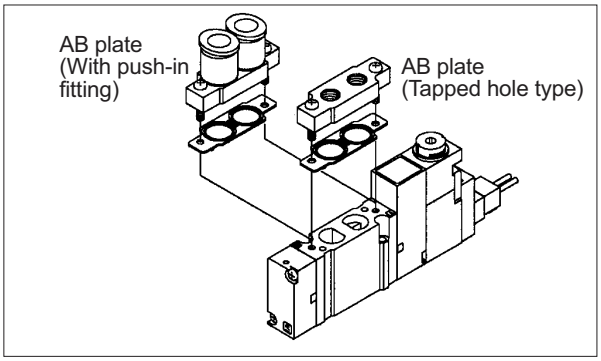
Two types of connectors, D sub-connector and a flat cable connector are provided for wiring between the manifold and control device, allowing either to be selected in relation to various control devices used.



Cylinder ports 2 and 4 selectable

(In-line mounting type)

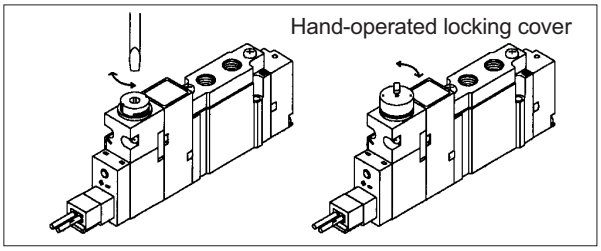
Series	Standard	Option	
	Tapped hole	Push-in fitting	
A05	M5	φ4	φ6
A12	Rc1/8	φ6	φ8



Locking button (Manual override)

Screwdriver-operated manual override is standard.

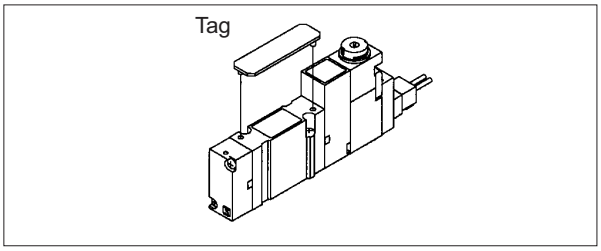
It can be used as a hand-operated locking button by fitting an optional locking cover.



Multipurpose tag available

(Sub-base mounting type)

For the convenience of installation, testing, maintenance tag can be mounted on the upside of solenoid valve body.



Captured exhaust from main valve and pilot valve

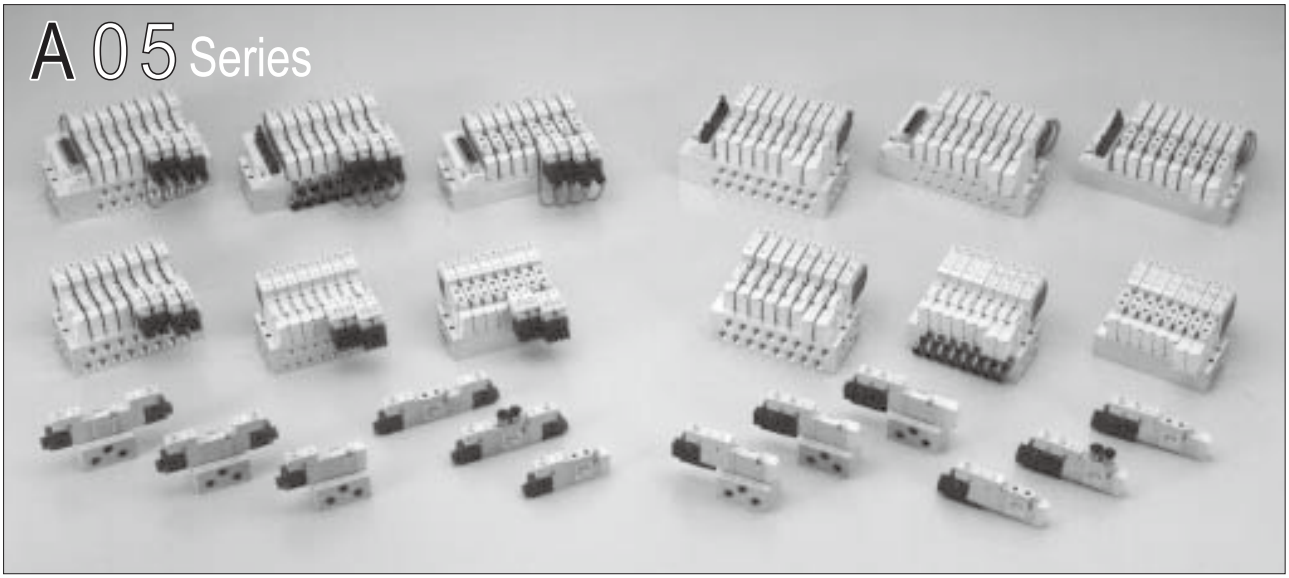
(Sub-base mounting type & manifold)

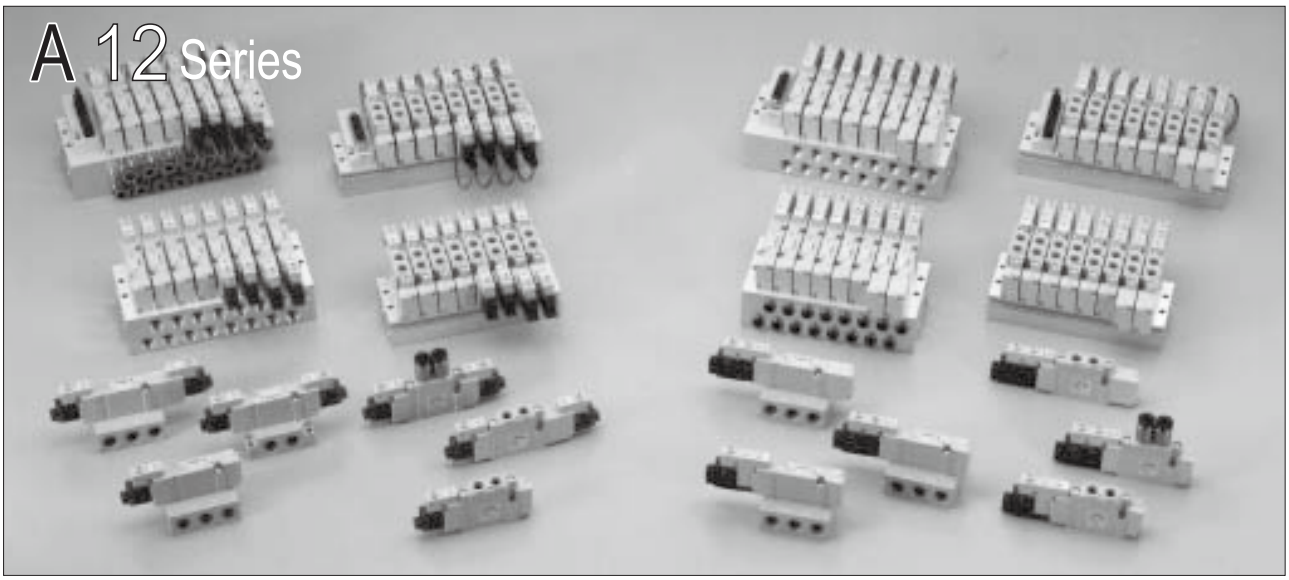
Exhaust air from pilot valve is captured together with exhaust air from main valve.

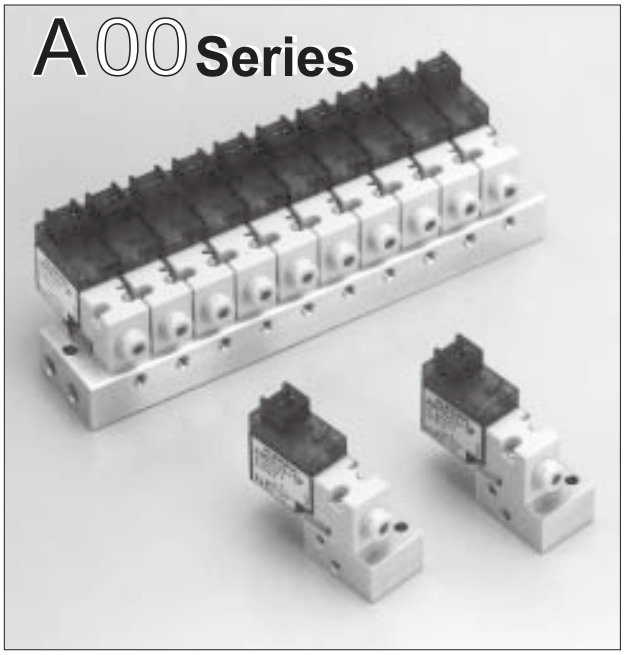
Unlike conventional exhaust systems, exhaust air from pilot valve is not directly discharged to the atmosphere.

This prevents air contamination in the atmosphere.

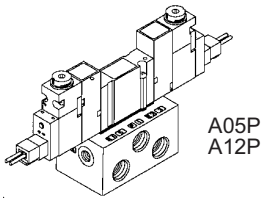
ADEX VALVE



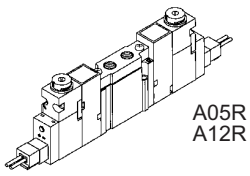




Difference between P and R type.



Sub-base mounting type



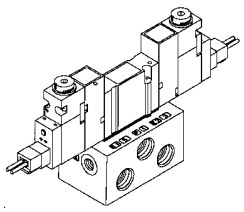
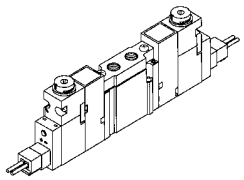
In-line mounting type

Sizing map

Series	Conditions	Cylinder Speed (mm/s)	Cylinder bore size (mm)											
			φ6	φ10	φ16	φ20	φ25	φ32	φ40	φ50	φ63	φ80	φ100	φ125
Speed Controller			SP-H-M5			SP-2H-1				SP-2H-2				
								SP-06-1	SP-06-2	SP-15-3			SP-20-4	
A05	Pressure 0.5MPa Load factor 30% Tube φ6× 1m	150												
		300												
		450												
		600												
		750												
		900												
A12	Pressure 0.5MPa Load factor 30% Tube φ8× 1m	150												
		300												
		450												
		600												
		750												
		900												

As cylinder speeds vary according to operating conditions and configurations, use the data as a guide onry for selection.

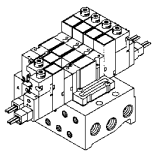
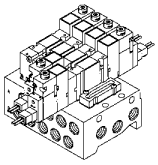
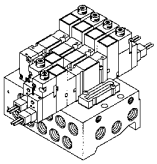
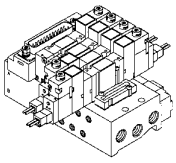
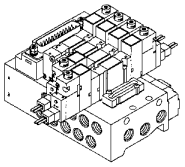
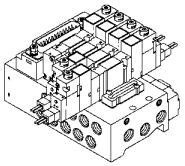
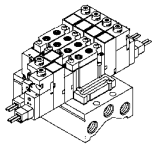
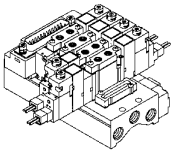
Solenoid valve variations (Lower case)

ADEX		Series	Effective area (mm^2)	Function					Voltage	Wiring	
				2-position		3-position					
				Single solenoid	Double solenoid	Closed center	Exhaust center	Pressure center	DC24V	Plug-in connector with lead wire from the side	Plug-in connector with lead wire from the bottom
PR type	Sub-base version 	A05P	5.8	○	○	○	○	○	○	○	—
		A12P	11.1								
	In-line version 	A05R	4	○	○	○	○	○	○	○	○
		A12R	8.8								

Indicator light & surge suppressor	Manual override		Bracket		Port size								Special application			
									Push-in Fitting (Only at ports 2,4)				External pilot			
	Screwdriver-operated locking button	Hand-operated locking button	Foot bracket	Side bracket	M5	Rc 1/8	Rc 1/4	Rc 3/8	φ 4	φ 6	φ 8	φ 10	Vacuum	Low pressure	Pressurizing ports 3,5	Resistant to ozone
○	○	●	—	—	—	○	—	—	—	—	—	—	△	○	△	△
					—	—	○	—	—	—	—	—				
					—	—	○	○	—	—	—	—				
○	○	●	● Single sol. only	●	○	—	—	—	○	○	—	—	△	○	△	△
					—	○	—	—	—	○	○	—				
					—	—	○	—	—	—	○	○				

○ : Standard ● : Optional △ : Made to order

Manifold variations

ADEX		Manifold	Mountable solenoid valve series
			PR type
Sub-base version	MFC Bar type Compact type Individual wiring		A05P
	MFS Bar type Individual wiring		A05P A12P
	MFX Bar type Individual wiring Common external pilot		A05P A12P
	MCC Bar type Compact type Multipin connector		A05P
	MCS Bar type Multipin connector		A05P A12P
	MCX Bar type Multipin connector Common external pilot		A05P A12P
In-line version	MFU Bar type Individual wiring		A05R A12R
	MCU Bar type Multipin connector		A05R A12R

Wiring				Port size									Special application			
Connecting method		Polarity		ports1, 3, 5		ports 2, 4							External pilot			Resistant to ozone
									Push-in fitting							
Flat cable	D sub-connector	Pluse common (NPN)	Minus common (NPN)	Rc 1/8	Rc 1/4	M5	Rc 1/8	Rc 1/4	φ4	φ6	φ8	φ10	Vacuum	Low pressure	Pressurizing port 3, 5	
—	—	—	—	○	—	○	—	—	○	○	—	—	—	—	—	△
—	—	—	—	○	—	—	○	—	—	—	—	—	—	—	—	△
				—	○	—	—	○	—	○	○	—				
—	—	—	—	○	—	—	○	—	○	○	—	—	△	○	△	△
				—	○	—	—	○	—	○	○	—				
○	○	○	△	○	—	○	—	—	○	○	—	—	—	—	—	△
○	○	○	△	○	—	—	○	—	—	—	—	—	—	—	—	△
				—	○	—	—	○	—	○	○	—				
○	○	○	△	○	—	—	○	—	○	○	—	—	△	○	△	△
				—	○	—	—	○	—	○	○	—				
—	—	—	—	○	—	○	—	—	○	○	—	—	—	—	—	△
				—	○	—	○	—	—	○	○	—				
○	○	○	△	○	—	○	—	—	○	○	—	—	—	—	—	△
				—	○	—	○	—	—	○	○	—				

○ : Standard △ : Made to order

FOR SAFETY USE

Be sure to read the following instructions before use.
For common and individual instructions, refer to the text of this catalogue.

The following safety precautions are provided to prevent damage and danger to personnel and to provide instructions on the correct usage of this product. These precautions are classified into 3 categories; **"CAUTION"**, **"WARNING"** and **"DANGER"** according to the degree of possible injury or damage and the degree of impendence of such injury or damage.
Be sure to comply with all precautions along with JIS B8370(※1) and ISO 4414(※2), as they include important content regarding safety.

⚠CAUTION	・Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in personal injury or property-damage-only accidents.
⚠WARNING	・Indicates a potentially hazardous situation which may arise due to improper handling or operation and could result in serious personal injury or death.
⚠DANGER	・Indicates an impending hazardous situation which may arise due to improper handling or operation and could result in serious personal injury or death.

(※1) JIS B8370 : General Rules for Pneumatic Systems
(※2) ISO 4414 : Pneumatic fluid power-General rules relating to systems

⚠WARNING

●The applicability of pneumatic equipment to the intended system should be judged by the pneumatic system designer or the personnel who determined specifications for such system.

As operating conditions for products contained in this catalogue are diversified, the applicability of pneumatic equipment to the intended system should be determined by the pneumatic system designer or the personnel who determined specifications for such system after conducting an analysis or testing as necessary.
The system designer shall be responsible for assuring the intended system performance and safety.
Before making a system, the system designer should thoroughly examine all specifications for such a system and also take into consideration the possibility of any trouble with the equipment.

●The pneumatic equipment should be handled by persons who have sufficient knowledge and rich experience.

Inproper handling of compressed air will result in danger.
Assembling, operation and maintenance of machinery using pneumatic equipment should be performed by persons who have sufficient knowledge and rich experience.

●Never operate machinery nor remove the equipment until safety is assured.

・Before checking or servicing machinery and equipment, be sure to check that steps for prevention of dropping or runaway of the driven component have been completely taken.
・When removing the equipment, make sure that the above-mentioned safety measures have been done beforehand.
Then turn off air supply and power to the system and purge compressed air in the system.
・When restarting machinery and equipment, check that proper prevention of malfunction has been provided for and then restart carefully.

●When using the pneumatic equipment in the following conditions or environments, take the proper safety measures and consult KURODA beforehand.

・Conditions and environments other than specified and outdoor use.
・Applications to nuclear power equipment, railroads, aircraft, vehicles, medical equipment, equipment connected with food and drink, amusement facilities and safety devices such as emergency interruption devices, clutch/brake circuits for a press and the likes.
・Applications which require extreme safety and will also greatly affect men and property.

Solenoid valves/Common instructions

①

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of solenoid valves.

Design

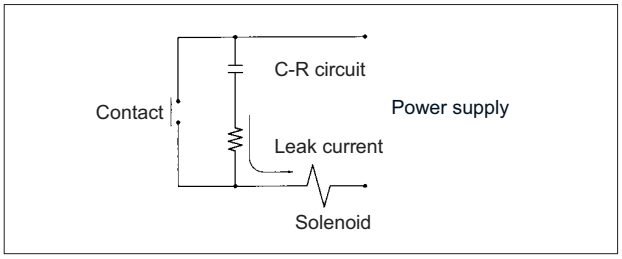
WARNING

- **Stopping actuator at intermediate position**
  When stopping the actuator at an intermediate position using a solenoid valve listed in this catalogue, it is difficult to stop it accurately because of the compressibility of air, unlike a hydraulic cylinder can dose.
  In addition, as the solenoid valve and air cylinder allow a certain degree of air leak, they cannot stop at the fixed position for a long period of time according to circumstances. When it is required to stop them at the fixed position for a long period of time, contact KURODA.
- **Keeping pressure (including vacuum)**
  As the solenoid valve is designed to allow a certain degree of air leak, it cannot be used to keep pressure (including vacuum) in a pressure vessel etc.
- **Do not use for emergency shutoff valves.**
  Solenoid valves listed in this catalogue are not designed for use in emergency shutoff valves and other safety applications.
  When using the solenoid valve for such applications, provide an independent means to assure safety.
- **Exhausting residual air**
  Provide a residual air exhausting function in due consideration of maintenance and inspection. Doing maintenance and inspection without exhausting residual air may sometimes malfunction the actuator.
  When using a 3-position closed center type solenoid valve, compressed air is shut in between solenoid valve and actuator even if residual air from the air supply side to the solenoid valve is exhausted.
  Therefore, provide a means to exhaust the residual air pressure separately.
- **Use in vacuum**
  When using a solenoid valve for diverting vacuum and other applications, check specifications for the valve and select a proper one that can be used in vacuum.
  In order to prevent sucking foreign matters from the suction pad and exhaust port, provide an inline filter between the suction pad and solenoid valve and at the exhaust port.
- **Applying current continuously for long time**
  When using a solenoid valve while applying current to it continuously for a long period of time, contact KURODA beforehand.
- **Avoid applying current simultaneously.**
  When using a double-solenoid valve while applying current to it continuously for a long period of time, do not apply current to both solenoids simultaneously ; otherwise the coil may be burnt out or the main valve may malfunction.
- **Remodeling the solenoid valve**
  Do not remodel the solenoid valve.

Design

CAUTION

- **Applying current momentarily**
  When using a double-solenoid type valve, apply current for the prescribed period of time (0.1 sec.). If current is not applied for the prescribed period of time, the solenoid valve may not perform the diverting action acording to circumstances.
- **Leak current**
  When a C-R element is used in the contact protective circuit (surge voltage protection), leak current will flow through the C-R element.
  If this leak current becomes large, a malfunction will occur. Therefore, reduce leak current to less than 1 mA.



- **Use at low temperature**
  When using a solenoid valve at 5℃ or below, provide an air dryer or other proper means to prevent moisture from solidifying or freezing.
- **Use with air blow**
  When using a solenoid valve with air blow, select a direct-operated type or external pilot type solenoid valve.
  When an internal pilot type solenoid valve is used, it may not perform the diverting action due to a pressure drop at the time of air blow.
  When an external pilot type solenoid valve is used, supply compressed air within the specified pressure range to the pilot port.
- **Mounting position and direction**
  A solenoid valve can be mounted in any position and direction as a general.
  However, a metal seal type double-solenoid valve and a 3-position solenoid valve should be mounted so that the spool may be horizontal.
- **Shock and vibration**
  Reduce shocks and vibrations applied to the solenoid valve to less than the prescribed value. (refer to specifications.)
  Applying shocks and vibrations exceeding the prescribed value may rsult in a malfunction of the solenoid valve.

Solenoid Valves/Common instructions ②

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentiond for each series of solenoid valves.

Selection

WARNING

- Refer to specifications.
  Solenoid valves listed in this catalogue are designed for compressed air. When using other fluid than compressed air, contact KURODA beforehand.
  Do not use a solenoid valve at pressure and temperature outside the range of specifications, otherwise resulting in a breakdown or malfunction.

Mounting

WARNING

- When mounting the solenoid valve, firmly fix it while using care to prevent the stationary part and joint from loosening.
  If the solenoid valve is mounted with insufficient strength, it may sometimes come off.
- Do not start the system until it is ensured that equipment works properly.
  After mounting the solenoid valve, connect power supply and then perform a functional test and a leak test. Check that it has been correctly mounted and works properly, before starting the system.
- Coating with paint
  When coating the resin portion with paint, it may be adversely affected by paint and solvent. For the propriety of painting, contact KURODA beforehand.
  Do not peel off the nameplate affixed on the solenoid valve and do not erase or smear out the letter on it.
- Provide space for maintenance and inspection.

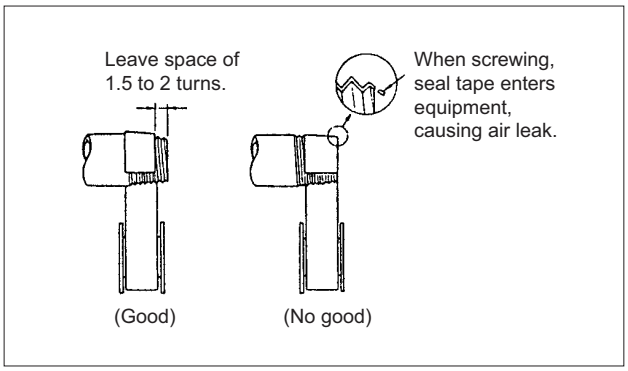
CAUTION

- Fit an air muffler to the exhaust port (ports 3 ・5) of the solenoid valve.
  Dust or foreign matter that enters it may cause a malfunction of the solenoid valve.
- Do not wipe off the model name inscribed on a nameplate etc. with organic solvent.
  The inscribed indication may be erased.

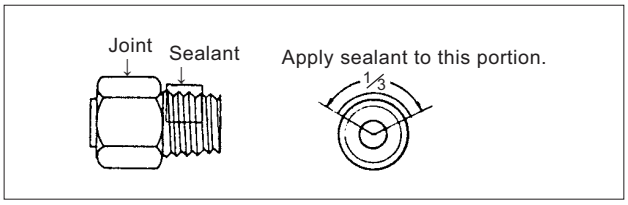
Piping

CAUTION

- Before piping
  Thoroughly flush the inside of each pipe to remove chips, coolant, dust, etc. before piping.
- How to wind a seal tape
  When winding a seal tape around the threaded portion, leave space of 1.5 to 2 thread turns.



- How to apply liquid sealant
  When applying liquid sealant to the threaded portion, apply a proper amount to about 1/3 of the periphery of the threaded portion and then screw it.



- Screw of pipe and joint
  When screwing the pipe and joint, use care to prevent chips and sealant from entering the pipe and joint.
  Tighten them within a proper range of clamping torque.

Port size	Clamping torque (N·m)
M3	0.3 ～ 0.5
M5	1.5 ～ 2.0
R, Rc1/8	7.0 ～ 9.0
R, Rc1/4	12. ～14.
R, Rc3/8	22. ～24.
R, Rc1/2	28. ～30.
R, Rc3/4	28. ～30.
R, Rc1	36. ～38.
R, Rc1 1/4	40. ～42.
R, Rc1 1/2	48. ～50.

Solenoid valves/Common instructions ③

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of solenoid valves.

Piping

CAUTION

- Avoid wrong piping.
  When connecting a pipe to a solenoid valve, be careful not to mistake the supply port by referring to the nameplate affixed to the product or the product catalogue.
- When using a 3-position closed center type solenoid valve :
  Thoroughly check the piping between solenoid valve and actuator for air leak.

Wiring

WARNING

- When doing wiring work, be sure to turn off compressed air and power supplies beforehand.
  Wiring work without turning off air and power supplies may cause an electric shock or malfunction ; this sometimes results in an injury to the human body or a damage to property.
- Avoid mis-wiring.
  Some solenoid valves have polarity : Those operating on DC with built-in indicator light and those equipped with surge protective circuit.
  When wiring to a solenoid valve, check whether or not it has polarity.
  For a solenoid valve having polarity, check the lead wire color and symbol of the polarity by the catalogue or actual article beforehand and then make correct wiring.
  Mis-wiring will result in the following problems :
  (Where no polarity protective diode is incorporated :)
  Wiring to the wrong polarity will burn out the diode in the solenoid valve, the switching element on the control unit side or the power supply unit.
  (Where a polarity protective diode is provided :)
  Wiring to the wrong polarity will not cause the solenoid valve to perform a diverting action.
- Avoid applying stress and tensile force to lead wire repeatedly.
  Wiring made in such a manner that stress and tensile force are repeatedly applied to the lead wire will result in the breaking of wire. Provide some degree of margin for wiring.
- Check that there is no insulation failure.
  If an insulation failure occurs in the lead wire connection, extension cable and terminal base, an excess flows to the switching element of the solenoid valve or control unit, sometimes resulting in a damage.
- Do not mistake applied voltage.
  Mistake in applied voltage in case of wiring to a solenoid valve will cause an operation failure or burn out the coil.
- After completion of wiring, check for wrong connection before turning on power.

Operating enviroments

DANGER

- Do not use solenoid valve in a explosive environment.

WARNING

- Do not use a solenoid valve in atmospheres containing corrosive gases, chemicals, seawater, water and vapor and in places where a solenoid valve contacts these matters.
- Do not use a solenoid valve in a place where vibrations or shocks are directly applied to it.
- When a solenoid valve is exposed to the direct sunlight, fit a protective cover to the solenoid valve.
- When a solenoid valve is located around a heat source, shut off the radiant heat.
- When installing a solenoid valve in the control panel, take proper heat-radiating measures so that the inside temperature may be kept within the specified temperature range.
- When using a solenoid valve in a place where it is exposed to welding spatters, provide a protective cover or other proper prevention.
  Welding spaters may burn out the plastic parts of the solenoid valve, sometimes resulting in a fire.

Lubrication

CAUTION

- Solenoid valves listed in this catalogue are non-lubrication.
  The non-lubricated solenoid valve can be used without lubrication, but can be used with lubrication.
  When using it with lubrication, do not discontinue supplying oil. Otherwise, the applied lubricant may run off, sometimes resulting in an operation failure.
  When using a lubricant, Class 1 turbine oil ISO VG 32 (containing additive) is recommended.

Solenoid Valves/Common instructions ④

Be sure to read them before use.
Also refer to Par. "For Safety Use" and instructions mentioned for each series of solenoid valves.

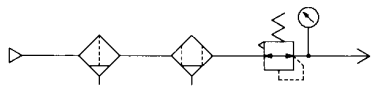
Quality of air

WARNING

- Use pure air.
  Compressed air containing corrosive gases, chemicals, salt, etc. causes a breakdown or operation failure. So do not use such air.

CAUTION

- Fit an air filter with filtration of 5 μm or fine.
- Install an air dryer.
  Compressed air containing much drainage causes the operation failure of pneumatic equipment. Install an air dryer, lower the temperature and reduce drainage.
- Take proper countermeasures against sludge.
  If sludge produced in compressor oil enters pneumatic equipment, it will cause the operation failure of pneumatic equipment. It is recommendable to use compressor oil (NISSEKI FAIRCALL A68, IDEMITSU DAPHUNY SUPER CS68) featuring minimized sludge production or use a sludge filter or mist cleaner to prevent sludge from entering the pneumatic equipment.



Maintenance and inspection

WARNING

- Inspection before maintenance
  First check that load drop prevention has been provided.
  Then shut off air and power supplies to the system and exhaust residual air in the system beforehand.
  For a 3-position closed center type solenoid valve, compressed air is sealed between solenoid valve and cylinder.
  Exhaust this residual compressed air.
- Inspection after maintenance
  When restarting the system, check that preventive measures against flying-out of the actuator have been taken. Then connect compressed air supply to the pneumatic system, and perform a proper functional test and a leak test to check that it works safely without fail, before starting the system.
- Operation at low frequency
  To prevent an operation failure, perform the switching action of the solenoid valve once per 30 days. (Be careful of air supply.)
- Manual operation
  When the solenoid valve is manually operated, the system connected to it is also operated. Make sure safety before operation.
- Disassembly of solenoid valve
  When disassembling the solenoid valve, contact KURODA beforehand.

CAUTION

- Draining
  To keep the quality of air to a certain level, drain the air filter at periodical intervals.

ADEX Valve/Individual instructions ①

Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

Flow rate

Flow rate can be calculated from the following formula :
For values in the sonic velocity zone. find out from the attached table.

①$P_H \leqq 1.89P_L$ (Subsonic velocity zone)

$$Q = 240 \times S \times \sqrt{P_L \times (P_H - P_L)} \times \sqrt{\frac{293}{T_H}}$$

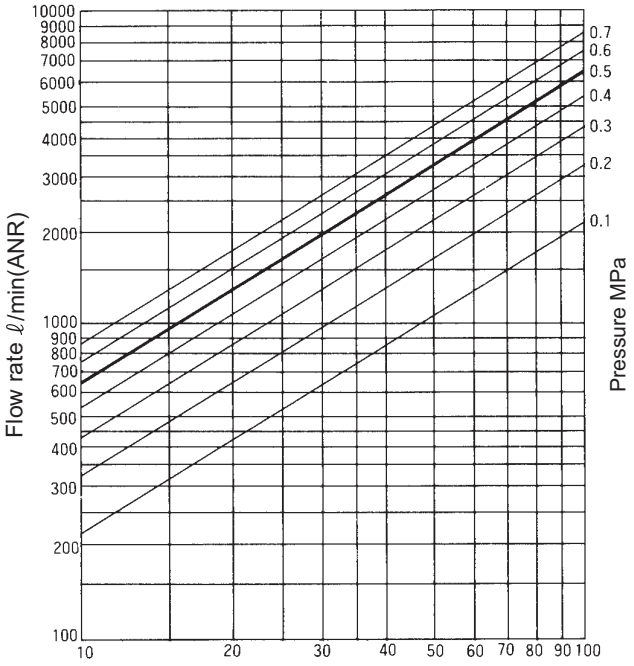
②$P_H \geqq 1.89P_L$ (Sonic velocity zone)

$$Q = 120 \times S \times P_H \times P_H \times \sqrt{\frac{273}{T_H}}$$

Q	: Flow rate	r /min(ANR)
S	: Effective area of orifice	mm^2
P_H	: Pressure on upper stream	MPa abs
P_L	: Pressure on down stream	MPa abs
T_H	: Absolute temperature on upper stream	K

(Note) Absolute pressure (MPa) = Supply pressure + 0.100 (MPa)

Sonic velocity zone (at 20℃)



(When the value of effective area is $\times 10^{-1}$ or $\times 10^{n}$, multiply the same figure by the flow rate.)

Effective area

Effective areas mentioned in this catalog are measured between ports 1→2, 4 in accordance with JIS (JAPANESE INDUSTRIAL STANDARD) B8374/8375.

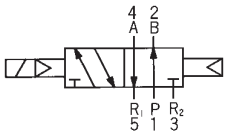
Port identification

CAUTION

Port mark

Piping port marks such as P 1 , A 4 conforming to JIS and ISO are given in the respective piping port positions.

JIS	ISO	Use
P	1	Supply port
A	4	Output port
B	2	Output port
R_1	5	Exhaust port
R_2	3	Exhaust port

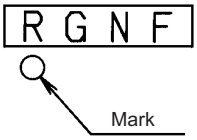


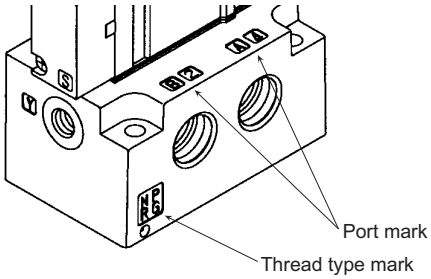
X : External pilot port
Y : Pilot valve captured exhaust port

Type of port thread

Type of port thread is marked on the sub-base by the following abbreviation.

Abbrev.	Type of thread
R	Rc
G	G
N	NPT
F	NPTF

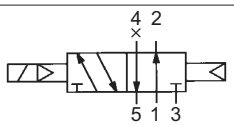
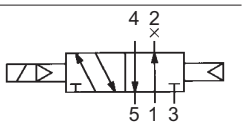
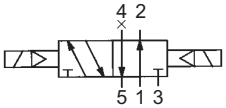
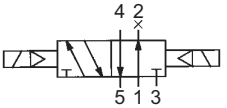




Using 5-port valve as 3-port valve

CAUTION

A05 and A12 Series are so designed that each of them can be used as a 3-port valve with normal close (NC) or normal open (NO) function. However, use it with port opened.
This function is useful when 3-port double solenoid valve is required.

Plug position		Port 4	Port 2
Function		NO	NC
Number of solenoid	Single solenoid		
	Duble solenoid		

ADEX Valve/Individual instructions ②

Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

Continuous energizing

CAUTION

- When ADEX VALVE is continuously energized with power turned on for a long period of time, the solenoid may heat up, resulting in a damage to the packing and gasket according to circumstances. However, ADEX VALVE can be used under the following conditions :
  ①Operating ambient temperature : Below 40 ℃
  ②Rated operating voltage (Only DC) : +0 −10%
  ③The following models can be used under good heat-adiating conditions :
  - Single item of A00
  - Single item of A05P and A05R, and bar type manifolds (MFS, MCS, MCC and MCU), except when MFC, MFU, MFX or single item is mounted on a plane.
  - Single item of A12P, A12R, A20P and A20R, and bar type manifolds (MFS, MFX, MFU, MCS, MCX and MCU).
- When operating ADEX VALVE with power continuously turned on in other conditions than above-mentioned, be sure to consult KURODA beforehand.

Selection of proper configuration fitting

CAUTION

There is the possibility that some fitting cannot be fitted to ports 2 and 4 (manifold, sub-base, and AB plate) of this solenoid valve because there are various fitting makers supplying different types of fittings.
Check the size of the intended fitting by referring to the catalogue supplied by the fitting maker.
Note that the pitch between ports 2 and 4 (AB plate) of the in-line mounting type valve is designed to be a minimum.

TAG

CAUTION

Do not reuse a tag that was once attached to same place.
Otherwise, it may be too loose.

Air exhaust

CAUTION

- As this solenoid valve is so constructed that exhaust air from pilot valve and exhaust air from main valve are collected at ports 3, 5 use care that exhaust air is not extremely choked. Otherwise, it may cause a malfunction.
- When operating 5 or more solenoid valves simultaneously on a manifold of 10 or more stations, open both sides of ports 3, 5. (For common external pilot type, also open port Y.)
  (The bar type manifold is open on both sides. For a separate type manifold, place PR blocks on both sides.)

Pressure supply (For external pilot type)

CAUTION

- Supply pressure to external pilot valve from port X. (Port Y is pilot valve exhaust port.)
- When supplying air pressure, first supply external pilot pressure and then supply main valve pressure.
- To cut the pressure supply and exhaust air, do so for the main valve first and then for the external pilot valve.

Tightening torque for mounting screw

CAUTION

Recommended tightening torque range is shown as below.

Name	Screw size	Torque (N·m)
A05 solenoid valve mounting screw blank plate mounting screw	M2	0.2 ～0.22
A12 solenoid valve mounting screw blank plate mounting screw	M3	0.5 ～0.55
A05 AB plate mounting screw	M2	0.18～0.2
A12 AB plate mounting screw	M3	0.8 ～1.0
A00 solenoid valve mounting screw blank plate mounting screw	M1.6	0.08～0.1

ADEX Valve/Individual instructions ③

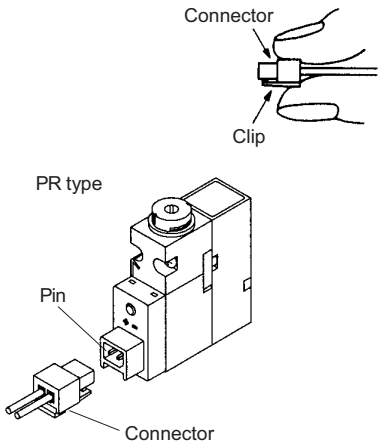
Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

How to use connectors

CAUTION

When doing wiring work, be sure to turn off power beforehand.

- How to attach and detach a connector
  When attaching a connector, pinch the clip with your finger and insert the connector into the pin straight to the end. When detaching a connector, pinch the clip with your finger and pull out the connector straight.

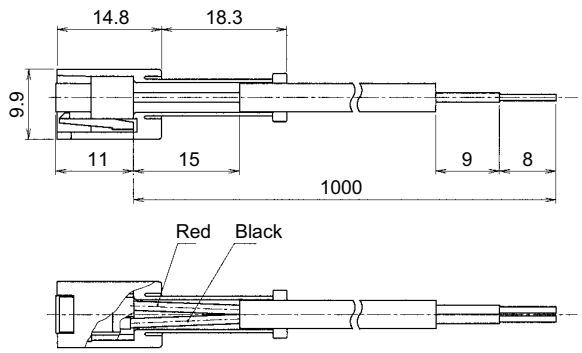


Connector ass'y with protective cover

CAUTION

- Prevents short-circuiting caused by the entry of foreign matters into the connector.
- The cover is made of chloroprene rubber for electrical use, assuring excellent weather and insulation resistance. However, be careful not to place it under splash of cutting oil etc.
- Neat appearance owing to use of round cord.
  Connector Ass'y with protective cover is optionally available. Specify the following model No. when ordering.

- A05P-DC-CB10



ADEX Valve/Individual instructions

④

Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

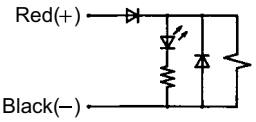
Internal circuit of solenoid with indicator light and surge suppresor

CAUTION

- For DC24V :

〔Plus common (NPN)〕 〔Minus common (PNP)〕

PR type



NPN only

Make connection in accordance with polarity marks (+) (–).

ADEX Valve/Individual instructions ⑤

Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

Manual override

WARNING

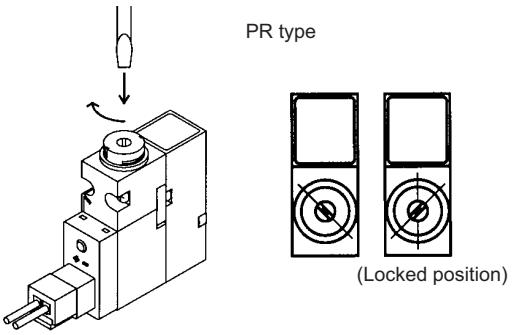
● Screwdriver-operated locking manual override (Standard)

No-locking operation

Push the locking button with a screwdriver, and the valve shifts to energized position. When the screwdriver is released from the locking button, the valve is reset to non-energized position.

Locking operation

Push the locking button with a slotted screwdriver and rotate the button clockwise by 90˚.
The valve is locked to keep energized position.
When the button is rotated counterclockwise by 90˚ and the screwdriver is released from the button, the valve is reset to non-energized position.
Use a screwdriver with blade width of 2.3 to 2.4 mm.

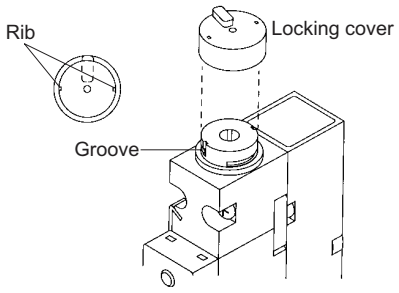


● Hand-operated locking manual override (Option)

The screwdriver-operated locking button can be used as a hand-operated locking button by fitting an optional locking cover.

How to fit a locking cover

Adjust the rib provided inside the locking cover to 2 respective groove on the circumference of the screwdriver-operated locking button and insert the cover.
Then rotate it clockwise by 30˚. Thus, the locking cover has been completely fitted. (To remove the locking cover, reverse the above-mentioned procedure.)

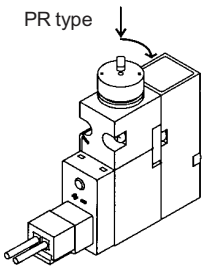


No-locking operation

Push the locking button with your finger, and the valve shifts to energized position. When the finger is released from the locking button, the valve is reset to non-energized position.

Locking operation

Push the locking button with your finger and rotate the button clockwise by 90˚.
The valve is locked to keep energized position.
When the button is rotated counterclockwise by 90˚ and your finger is released from the button, the valve is reset to non-energized position.



ADEX Valve/Individual instructions ⑥

Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

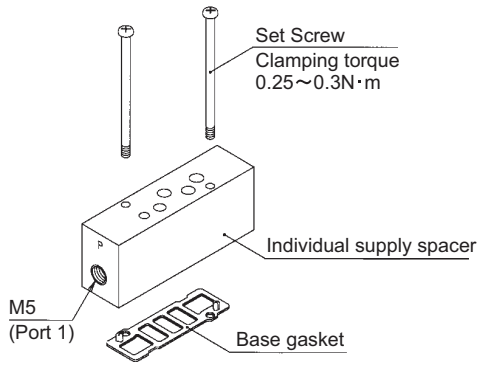
Individual supply spacer

CAUTION

Mounting an individual supply spacer between solenoid valve and manifold makes it possible to provide each solenoid valve with an individual supply port. However, the types of manifolds to which these spacers can be mounted are specified as follows : As individual supply spacers are optionally available, please order by the model number shown below.

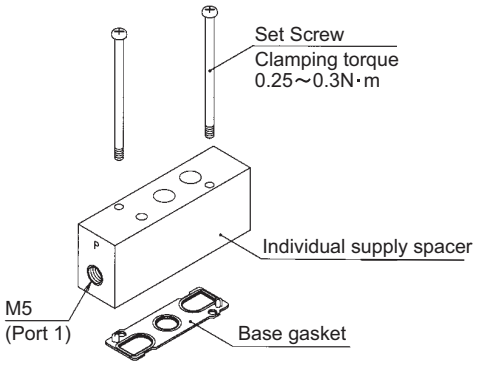
Model No.	Applicable manifold	
A05PA-IS-M5	Individual wiring type	MFS□-A05P-01
	Multipin connector type	MCC□-A05P-M5(C4, C6)
		MCS□-A05P-01
A05RA-IS-M5	Multipin connector type	MCU□-A05R-M5(C4, C6)
A12PA-IS-01	Individual wiring type	MFS□-A12P-02
	Multipin connector type	MCS□-A12P-02(C6, C8)

● A05PA-IS-M5, A12PA-IS-01



(Note)● Mounting height of individual supply spacer
A05 : 18.5 mm, A12 : 20 mm
● When mounting a supply spacer, turn port 1 toward the end cover side in case of single solenoid valve.

● A05RA-IS-M5



(Note) Mounting height of individual supply spacer : 18.5 mm

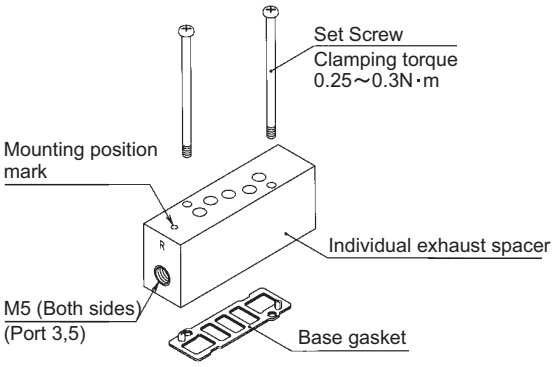
Individual exhaust spacer

CAUTION

Mounting an individual exhaust spacer between solenoid valve and manifold makes it possible to provide each solenoid valve with an individual exhaust port. However, the types of manifolds to which these spacers can be mounted are specified as follows : As individual exhaust spacers are optionally avalable, please order by the model number shown below.

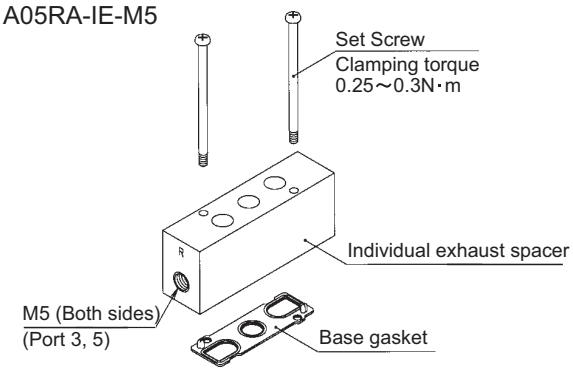
Model No.	Applicable manifold	
A05PA-IE-M5	Individual wiring type	MFS□ -A05P-01
	Multipin connector type	MCC□ -A05P-M5(C4, C6)
		MCS□ -A05P-01
A05RA-IE-M5	Multipin connector type	MCU□ -A05R-M5(C4, C6)
A12PA-IE-01	Individual wiring type	MFS□ -A12P-02
	Multipin connector type	MCS□ -A12P-02(C6, C8)

● A05PA-IE-M5, A12PA-IE-01



(Note)● Mounting height of individual exhaust spacer
A05 : 18.5 mm, A12 : 20 mm
● When mounting an exhaust spacer, turn the mounting position mark (shown in the above figure) toward the end cover side in case of single solenoid valve.
● Be sure to connect a pipe to the exhaust port on the pilot valve side and protect the wiring from drain.

● A05RA-IE-M5



(Note)● Mounting height of individual exhaust spacer : 18.5 mm
● Be sure to connect a pipe to the exhaust port on the pilot valve side and protect the wiring from drain.

ADEX Valve/Individual instructions ⑦

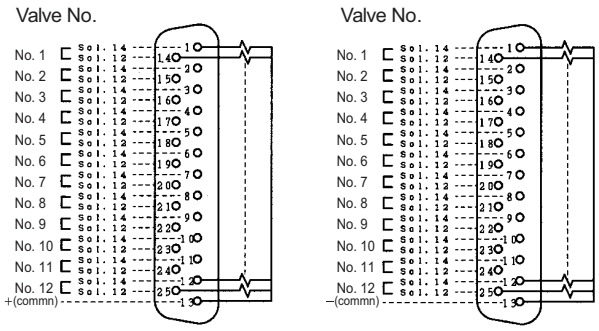
Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

Specifications for multipin connector type manifolds

CAUTION

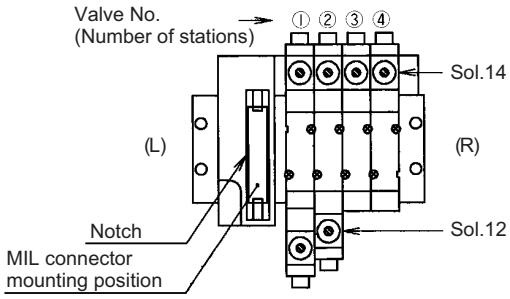
This manifold allows wiring to each solenoid valve to be made on a printed circuit board and allows wiring from the outside to be collectively made using a D sub-connector or flat cable connector, thereby reducing the number of connections and providing a neat appearance. Use of connectors based on MIL specification broadens the compatibility of this manifold.

● Wiring specifications for D sub-connector (25-pole)



Plus common (NPN) Minus common (PNP)

Valve numbering order



(Note) ● Internal wiring of manifold is connected to Sol.14, Sol.12 and D sub-connector terminal on common specifications.

● Count the number of stations based on the L side of D sub-connector mounting position.

Example : 1-station, 2-station, · · · · n-station

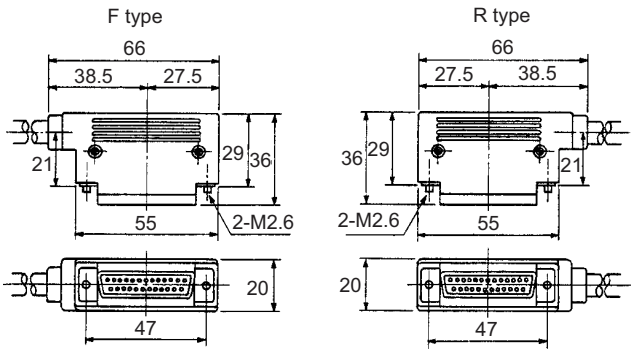
● Maximum number of stations is 12 for manifold and 24 for solenoid.

For your specific requirement for more than the maximum number of stations, contact KURODA.

● When wiring with flat cable be careful of external surge voltage.

● D sub-connector Ass'y
Ordering Instructions
DSS-R25FB-1K

- Cable length 1K : 1m
  2K : 2m
- Color B : Black
- Connector position F : Ftype
  R : Rtype
- Number of pin 25 : 25pins

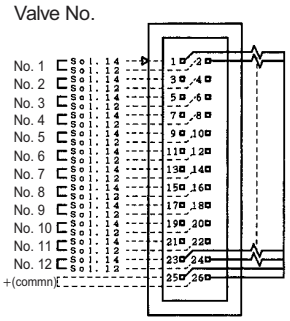


ADEX Valve/individual instructions ⑧

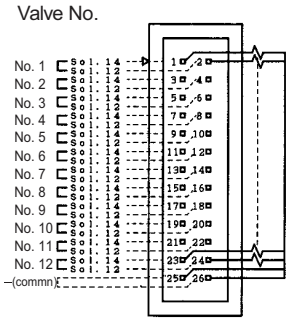
Be sure to read them before use.
Also refer to Par. "For Safety Use" and common instructions.

Specifications for multipin connector type manifolds

● Wiring specifications for flat cable connector (26-pole)

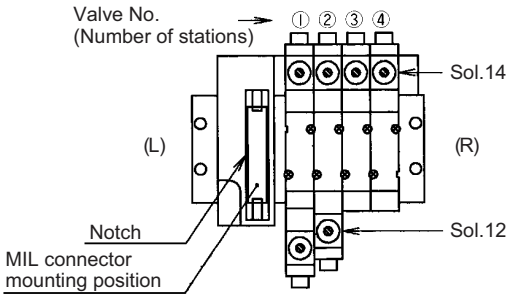


Plus common (NPN)



Minus common (PNP)

VALVE NUMBERING ORDER



(Note) ● Internal wiring of manifold is connected to Sol.14, Sol.12 and flat cable connector terminal on common specifications.

● Count the number of stations from the L side of flat cable connector mounting position.

Example :1-station, 2-station,・・・・ n-station

● Maximum number of stations is 12 for manifold and 24 for solenoid.

● For your specific requirement for more than the maximum number of stations, contact KURODA Pneumatics Ltd..

● When wiring with flat cable, be careful of external surge voltage.

● Flat cable connector

Use a product conforming to MIL-C 83503/7A.

ADEX

VALVE

PR TYPE

5 port pilot operated solenoid valve

A05P Series

Rubber Seal/Sub-base Mounting type

A05PS25	2-position Single solenoid
A05PD25	2-position Double solenoid
A05PD35	3-position Closed center
A05PE35	3-position Exhaust center
A05PO35	3-position Pressure center

Specifications

Model No.			Unit	A05PS25	A05PD25	A05PD35	A05PE35	A05PO35
Fluid				Non-lubricated/lubricated air				
Port size				Rc 1/8				
Effective area			mm²	5.8		4.5		6.7
Cv value				0.32		0.25		0.37
Operating ambient temperature			℃	−5～50				
Pressure range			MPa	0.15～0.7	0.1～0.7	0.2～0.7		
				−0.1～0.7 For external pilot operation				
Maximum frequency			cycle/min	600		500		
Response time	DC	ON	s	0.010	0.010	0.010		
		OFF	s	0.010 (0.016)	—	0.015 (0.021)		
Pilot air exhaust				Captured exhaust				
Manual override				Screwdriver-operated locking button				
Mounting position				Free				
Shock resistance, vibration resistance			m/s²	150/30				
Mass	Without sub-base		g	52	67	69		
	With sub-base		g	108	126	128		

(Note) · Service kit not available
· When temperature of valve site goes down below 5 ℃, complete dry air should be supplied to prevent from freezing.
· Pressure range of external pilot supply : 0.25～0.7MPa
· Response time in bracket ( ) shows with surge suppressor.
· Response time shown above is in accordance with JIS B 8375.
· Effective area shown above is a value between ports 1 and 2, 4.

Electrical Specifications

Rated voltage	DC	V	24
Permissible voltage fluctuation		%	+10, −10
Power consumption	DC	W	0.6 (with indicator light and surge suppressor), 0.55 (without indicator light and surge suppressor)
Grade of Insulation			JIS grade E
Wiring			Plug-in connector
Surge suppressor			Diode
Indicator light			LED

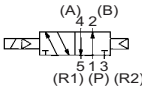
A05P Series

Ordering Instructions

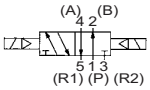
A05P S25 □ – 1 P – 01 – E

Function

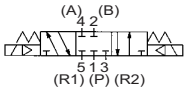
S25 : 2-position, single solenoid



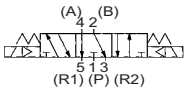
D25 : 2-position, double solenoid



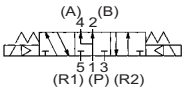
D35 : 3-position, closed center



E35 : 3-position, exhaust center



O35 : 3-position, pressure center



Wiring

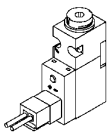
No mark : Without connector
E : Connector with lead wire (Length : 500mm)

Port size

No mark : Without sub-base
01 : Rc1/8
G1 : * G1/8
N1 : * NPT1/8
F1 : * NPTF 1/8
(Note) Valve without sub-base comes with a base gasket & two mounting screws.

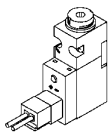
Connector position

P :



(With indicator light and surge suppressor)

S :



(Without indicator light and surge suppressor)

Voltage

1 : DC24V

Special specification

No mark : standard (Internal pilot)
X : * External pilot (Pilot air is exhaused through exclusive port Y.)

* : Made to order

A05P Series

Optional Accessories and Spare parts

● Connector with lead wire

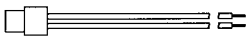
A 0 5 P — D C — C L 5

● Lead wire length
5 : 500mm
10 : *1000mm

● Voltage
DC : For DC

● Type
P : For PR type

For PR type



DC
(−) Black
(+) Black

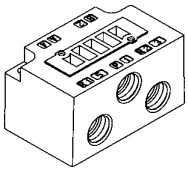
(Note) For common use with PR type of A05 and A12

● Sub-base

A 0 5 P — B — 0 1 X

● Special specifications
No mark: Standard
X : For external pilot (With port X)

● Port size
01 : Rc 1/8
G1 : * G 1/8
N1 : * NPT 1/8
F1 : * NPTF 1/8



● Locking cover

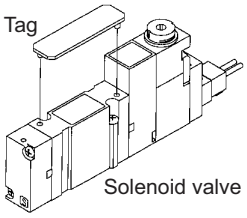
A 0 5 P — L A

● Color
A : Orange

(Note) For common use with all A05 and A12

● Tag for solenoid valve

A 0 5 P — N (Pack of 10)



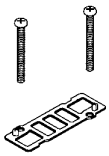
(Note) For common use with sub-base mounted type of A05 and A12

● Base gasket

A 0 5 P X — G

● Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)

● Special specifications
No mark: Standard
X : * For external pilot (With port X)



Mounting screw

Base gasket

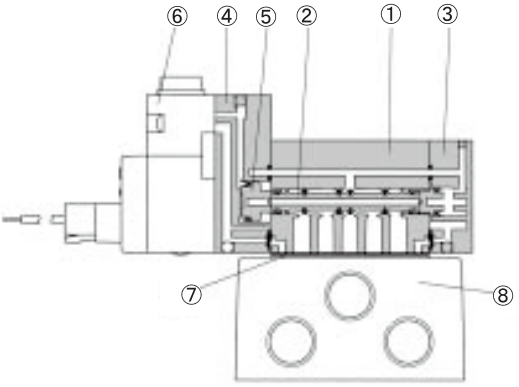
(Note) For common use with A05P

➲ *: Made to order

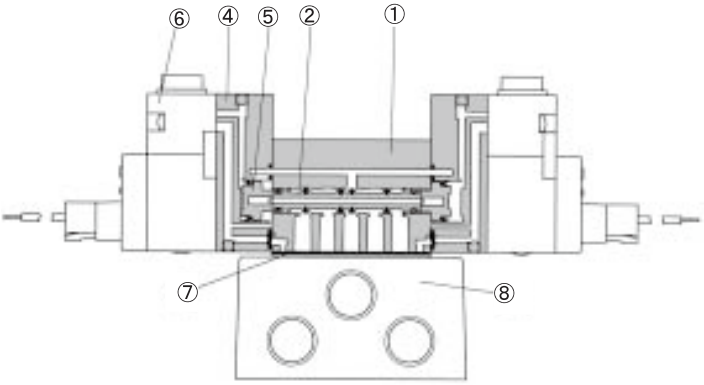
A05P Series

Material Specification

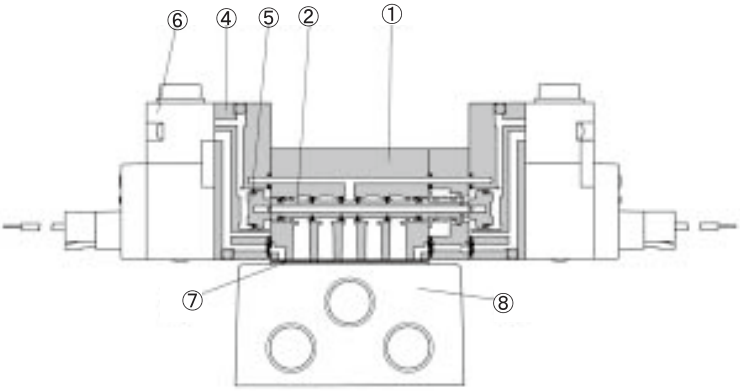
2-position
Single solenoid



2-position
Double solenoid



3-position
Closed center
3-position
Exhaust center
3-position
Pressure center



Main Components

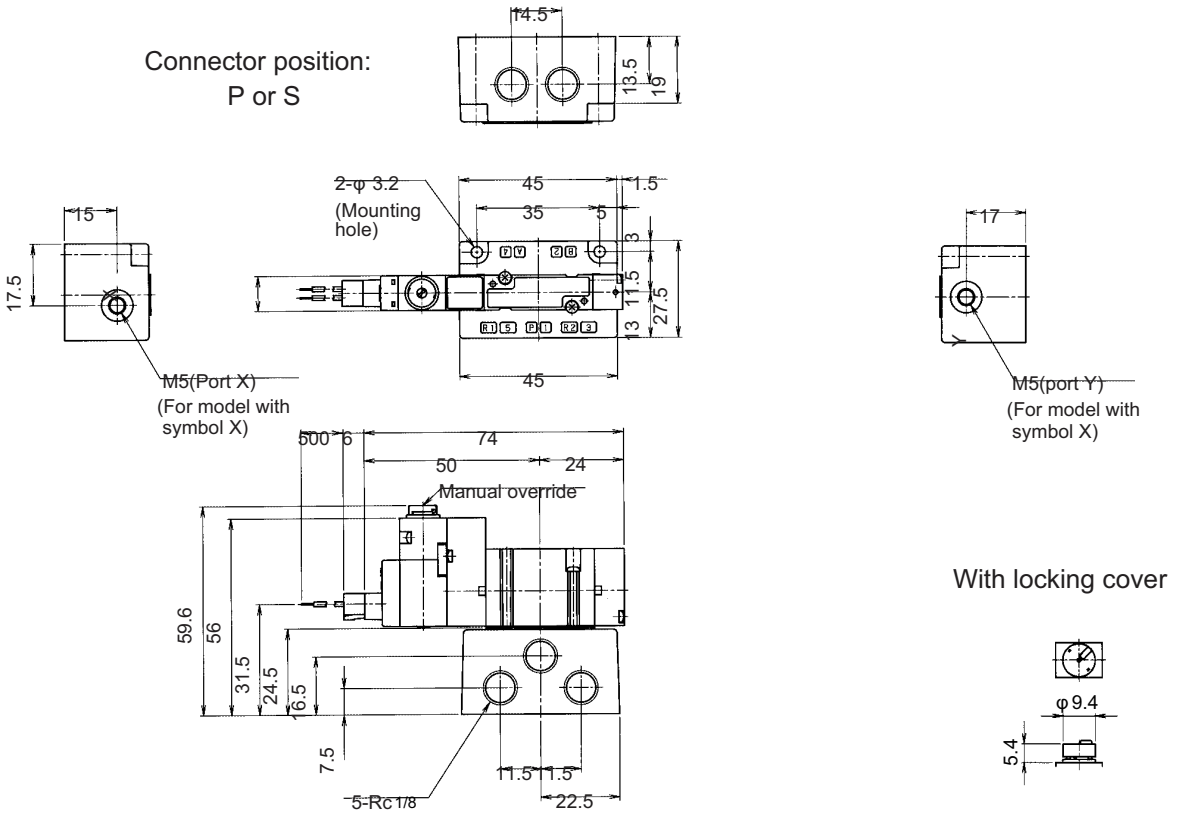
No.	Description	Material
①	Body	Zinc die-casting
②	Spool ass'y	Aluminium/NBR
③	End cover	Resin
④	Piston housing	Resin
⑤	Piston	Resin
⑥	Pilot valve	Refer to A00 Series
⑦	Base gasket	NBR
⑧	Sub-base	Aluminium die-casting

A05P Series

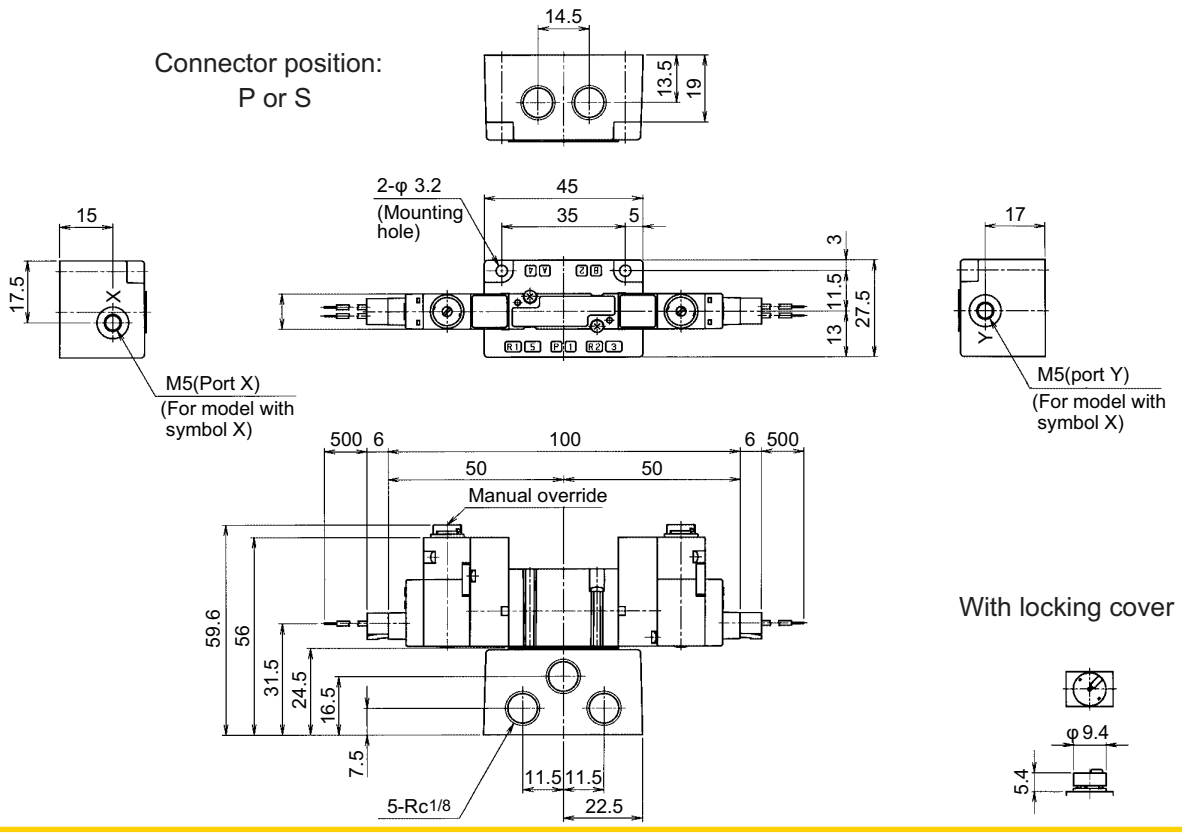
Dimensions

●A05PS25

(Unit : mm)



●A05PD25

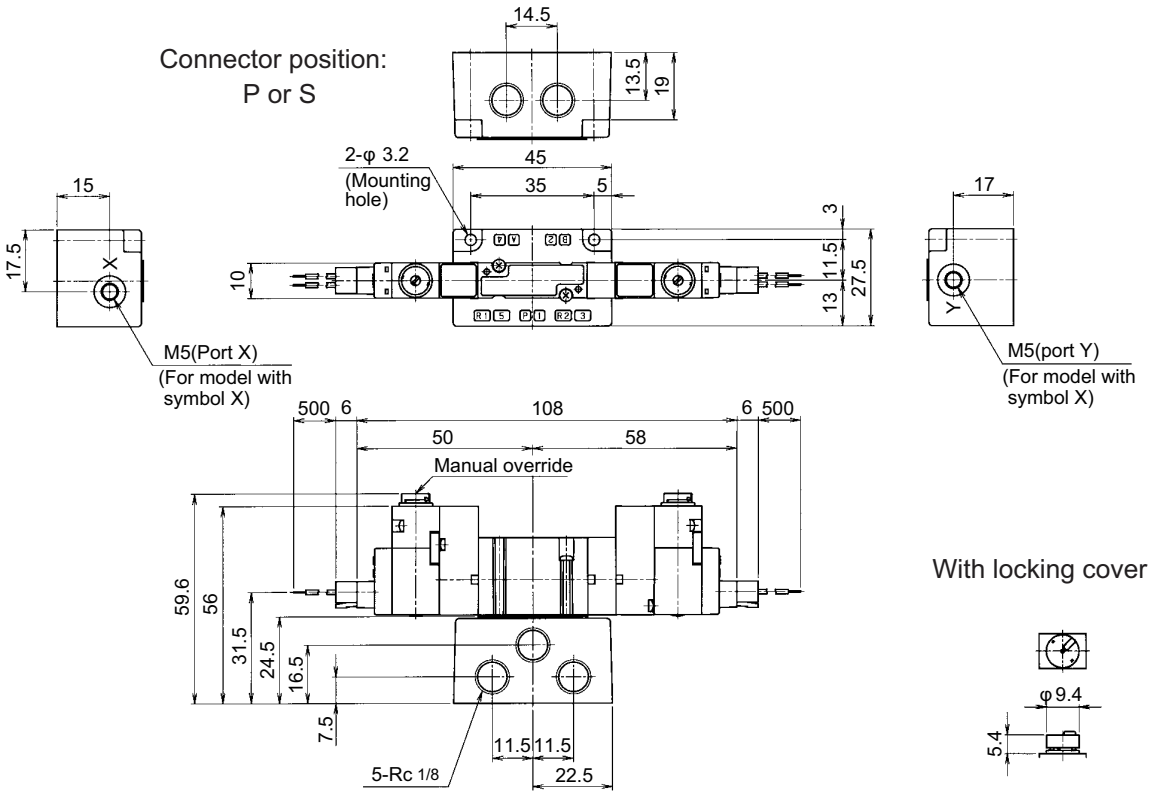


A05P Series

Dimensions

●A05PD35, A05PE35, A05PO35

(Unit : mm)



5 Port pilot operated solenoid valve

A05R Series

Rubber Seal/In-line Mounting type

A05RS25	2-position Single solenoid
A05RD25	2-position Double solenoid
A05RD35	3-position Closed center
A05RE35	3-position Exhaust center
A05RO35	3-position Pressure center

Spscifications

Model No.			Unit	A05RS25	A05RD25	A05RD35	A05RE35	A05RO35
Fluid				Non-lubricated / lubricated air				
Port size				Port 2, 4 : M5, C4, C6 Port 1, 3, 5 : M5				
Effective area			mm^2	4		3.7		4.5
Cv value				0.22		0.20		0.25
Operating ambient temperature			℃	−5~50				
Pressure range			MPa	0.15～0.7	0.1～0.7	0.2~0.7		
				−0.1~0.7 For external pilot operation				
Maximum frequency			cycle/min	600		500		
Response time	DC	ON	s	0.010	0.010	0.010		
		OFF	s	0.010 (0.016)	−	0.015 (0.021)		
Pilot air exhaust				Individual exhaust				
Manual override				Screwdriver-operated locking button				
Mounting position				Free				
Shock resistance, vibration resistance			m/s^2	150/30				
Mass			g	59	76	78		

(Note) · Service kit not available
· When temperature of valve site goes down below 5℃, complete dry air should be supplied to prevent from freezing.
· Pressure range of external pilot supply : 0.25～ 0.7MPa
· Response time in bracket ( ) shows with surge suppressor.
· Response time shown above is in accordance with JIS B 8375.
· Effective area shown above is a value between ports 1 and 2, 4.

Electrical Specifications

Rated voltage	DC	V	24
Permissible voltage fluctuation		%	+10, −10
Power consumption	DC	W	0.6 (with indicator light and surge suppressor), 0.55 (without indicator light and surge suppressor)
Grade of Insulation			JIS grade E
Wiring			Plug-in connector
Surge suppressor			Diode
Indicator light			LED

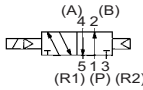
A05R Series

Ordering Instructions

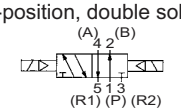
A05R S25 [ ] – 1 P – M5 – E

Function

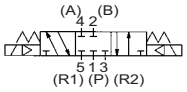
S25 : 2-position, single solenoid



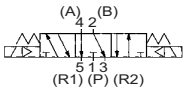
D25 : 2-position, double solenoid



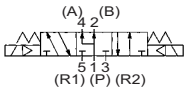
D35 : 3-position, closed center



E35 : 3-position, exhaust center



O35 : 3-position, pressure center



Wiring

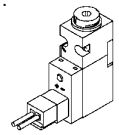
No mark : Without connector
E : Connector with lead wire (Length : 500mm)

Size of ports 2 and 4

M5 : M5
C4 : * With push-in fitting forφ 4
C6 : * With push-in fitting forφ 6

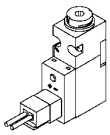
Connector position

P :



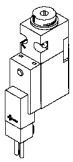
(With indicator light and surge suppressor)

S :



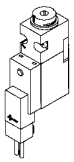
(Without indicator light and surge suppressor)

Q :



(With indicator light and surge suppressor)

B :



(Without indicator light and surge suppressor)

Voltage

1 : DC24V

Special specification

No mark : standard (Internal pilot)
X : * External pilot (Pilot air is exhaust through exclusive port Y.)

* : Made to order

A05R Series

Optional Accessories and Spare parts

●Connector with lead wire

A 0 5 P — D C — C L 5

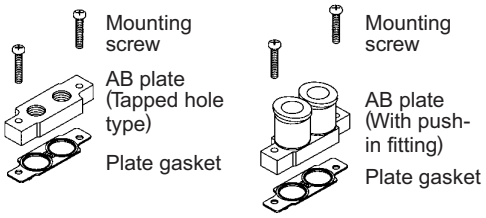
- ●Lead wire length
  - 5 : 500mm
  - 10 : * 1000mm
- ●Voltage
  - DC : For DC
- ●Type
  - P : For PR type

(Note) For common use with PR type of A05 and A12

●AB plate

A 0 5 R — A B — M 5 X

- ●Special specifications
  - No mark : Standard
  - X : * For external pilot (With port X)
- ●Port size
  - M5 : M5
  - C4 : * With push-in fitting forφ 4
  - C6 : * With push-in fitting forφ 6



(Note) Gasket & mounting screws are supplied
For common use with A05R

●Locking cover

A 0 5 P — L A

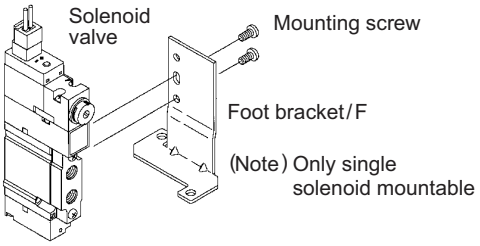
- ●Color
  - A : Orange

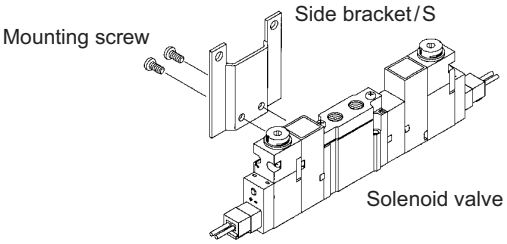
(Note) For common use with all A05 and A12

●Bracket

A 0 5 R — B F

- ●Mounting
  - F : Foot bracket
  - S : Side bracket



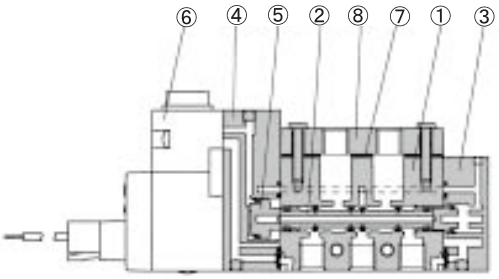


* : Made to order

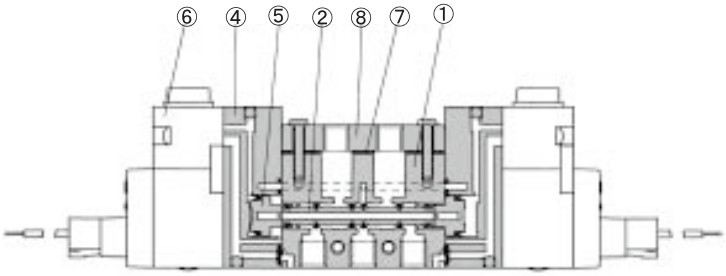
A05R Series

Material Specification

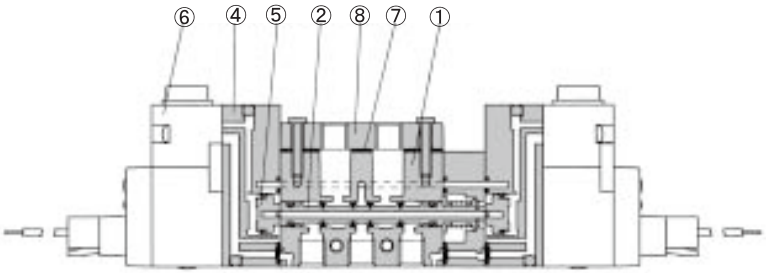
2-position
Single solenoid



2-position
Double solenoid



3-position
Closed center
3-position
Exhaust center
3-position
Pressure center



Main Components

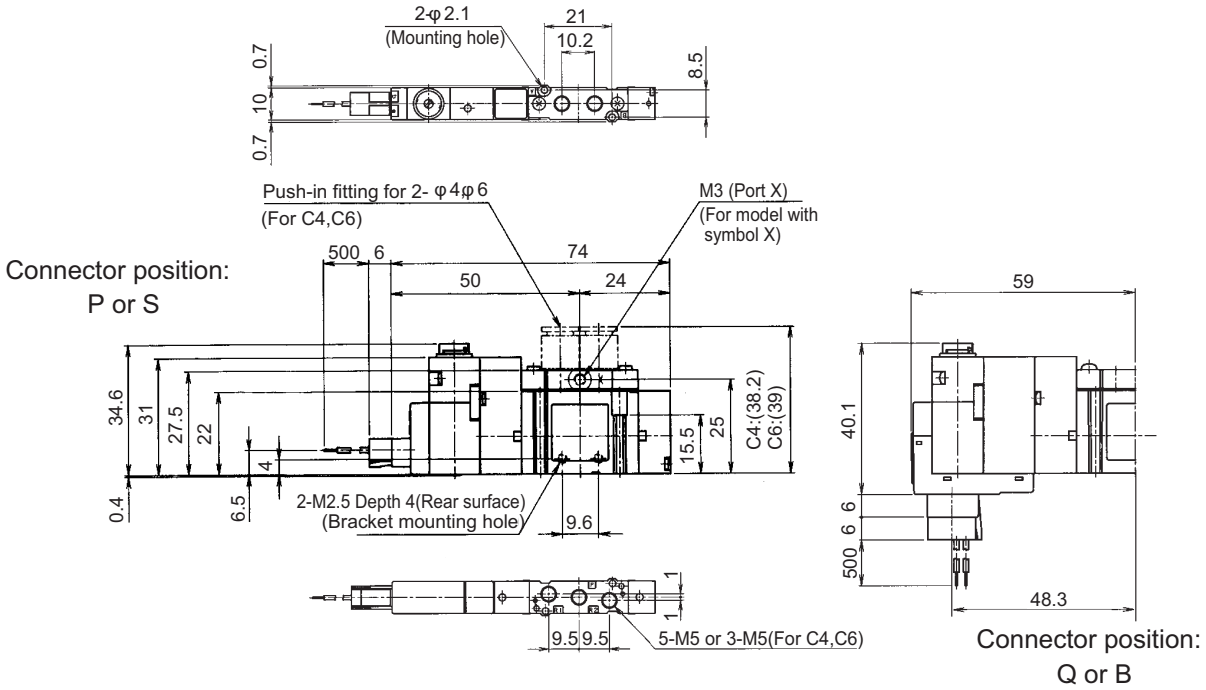
No.	Description	Material
①	Body	Zinc die-casting
②	Spool ass'y	Aluminium/NBR
③	End cover	Resin
④	Piston housing	Resin
⑤	Piston	Resin
⑥	Pilot valve	Refer to A00 Series
⑦	Plate gasket	NBR
⑧	AB plate	Aluminium die-casting

A05R Series

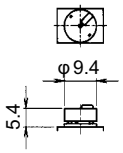
Dimensions

●A05RS25

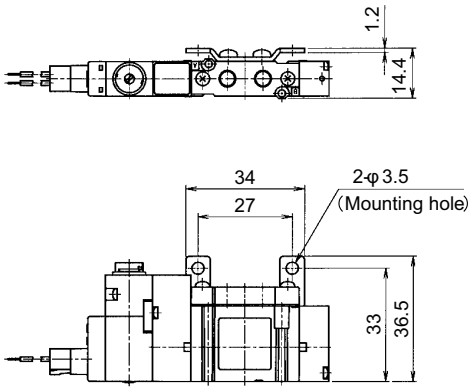
(Unit : mm)



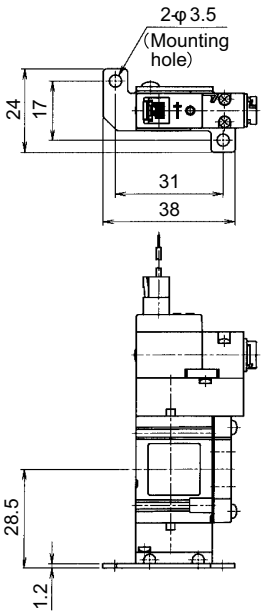
With locking cover



With side bracket



With foot bracket

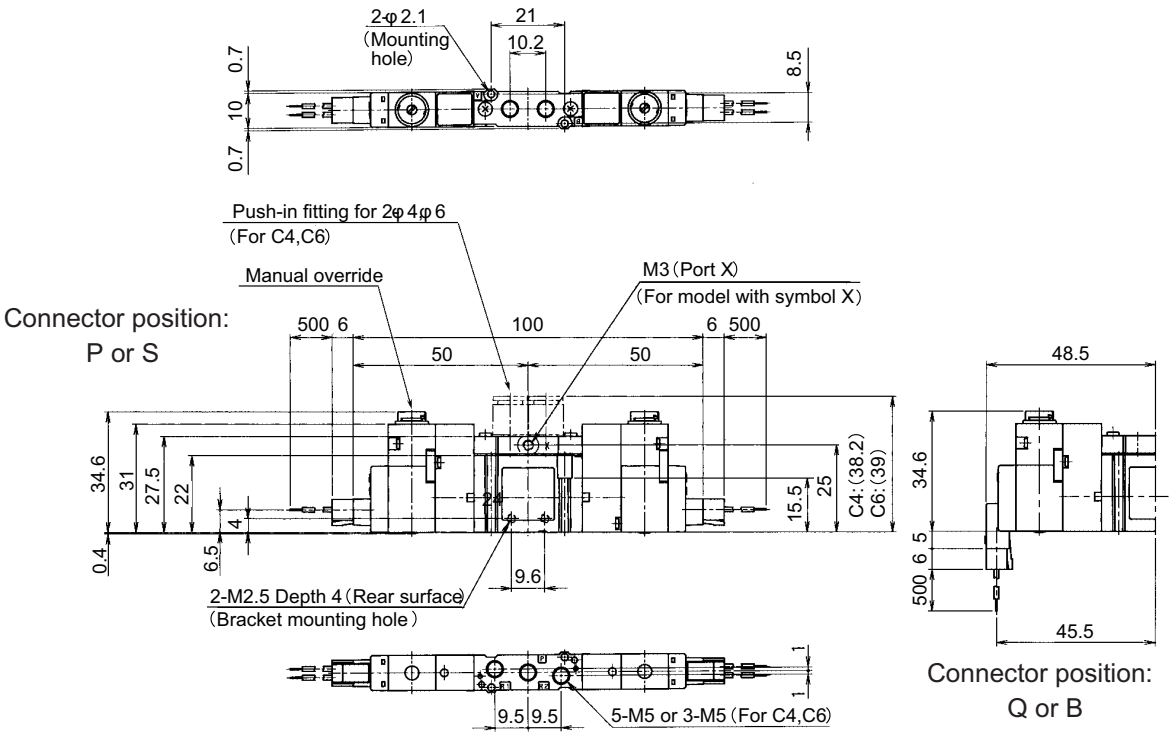


A05R Series

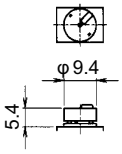
Dimensions

●A05RD25

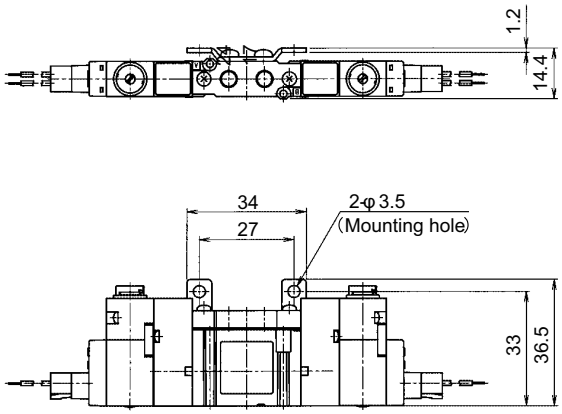
(Unit : mm)



With locking cover



With side bracket

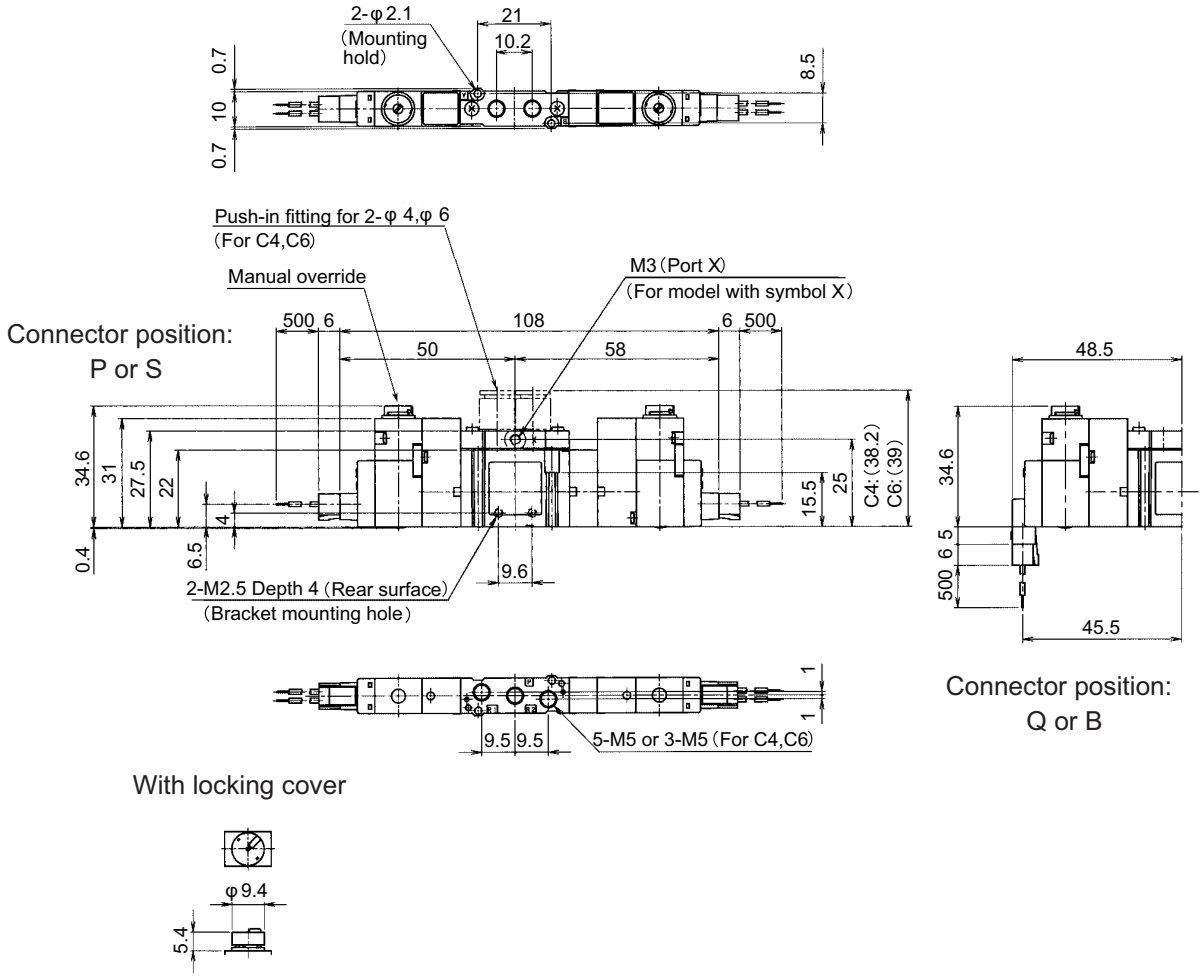


A05R Series

Dimensions

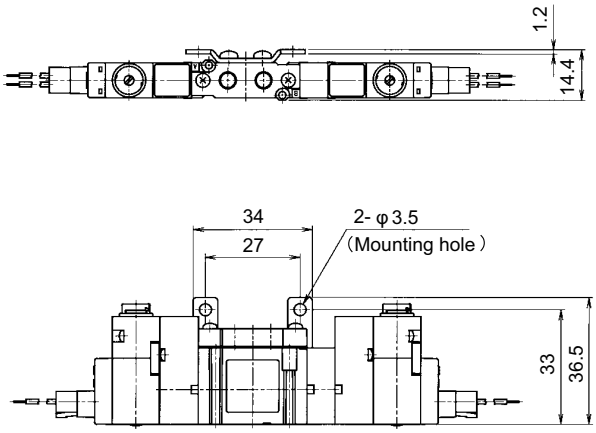
●A05RD35, A05RE35, A05RO35

(Unit : mm)



With locking cover

With side bracket

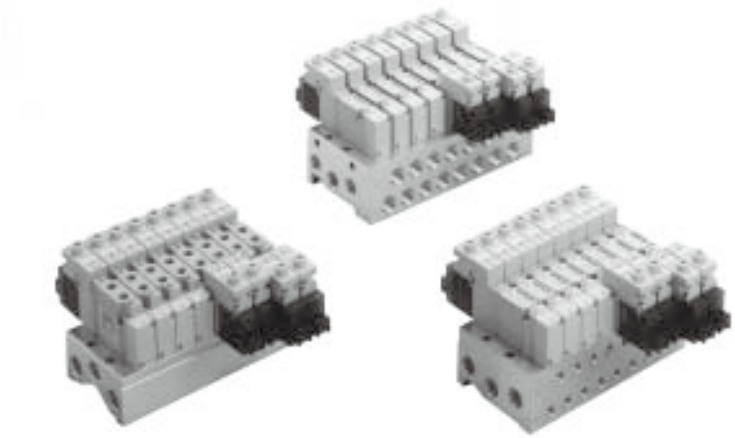


Individual wiring type manifold

MF○-A05 P/R

Bar type

MFC□-A05P	Common SUP, Common EXH Ports 2 & 4 on side Compact type
MFS□-A05P	Common SUP, Common EXH Ports 2 & 4 on side
MFX□-A05P	Common SUP, Common EXH Common external pilot Ports 2 & 4 on side
MFU□-A05R	Common SUP, Common EXH Ports 2 & 4 on valve body



Manifold Specifications

		For A05P Series			For A05R Series
		MFC□-A05P	MCS□-A05P	MCX□-A05P	MCU□-A05R
Type of manifold		Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on side Compact type	Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Common external pilot Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on valve body
Port size	Ports 1, 3, 5	Rc1/8	Rc1/8	Rc1/8	Rc1/8
	Ports 2, 4	M5, C4, C6	Rc1/8	Rc1/8 , C4, C6	M5, C4, C6
	Port Y	–	–	M5	–
	Port X	–	–	M5	–
Number of stations		2～20			
Mounting		Direct mount			
Mountable solenoid valve		A05PS25 A05PD25 A05PD35 A05PE35 A05PO35	A05PS25 A05PD25 A05PD35 A05PE35 A05PO35	A05PS25X A05PD25X A05PD35X A05PE35X A05PO35X	A05RS25 A05RD25 A05RD35 A05RE35 A05RO35
Blank plate		A05P-BP			A05R-BP

A05P, A05R Series

Ordeing Instruction

Manifold for A05P Series

MFC 7 – A05P – M5 – ☐

Type of manifold
MFC : Common SUP, Common EXH
Ports 2 & 4 on side
Compact type
MFS : Common SUP, Common EXH
Ports 2 & 4 on side
MFX : Common SUP, Common EXH
Common external pilot
Ports 2 & 4 on side

Number of stations
2 : 2 station
⋮ ⋮
20 : 20station

Mountable solenoid valve series
A05P

Size of Ports 2 and 4
M5 : M5
01 : Rc1/8
C4 : *With push-in fitting forφ 4
C6 : *With push-in fitting forφ 6

Type	M5	01	C4	C6
MFC	○	—	○	○
MFS	—	○	—	—
MFX	—	○	○	○

(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

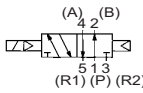
Option 1
B : With bracket
No mark : Without bracket
(Note) Bracket can be mounted only when single solenoid is mounted on MFC, MFS type.

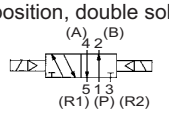
Mountable solenoid valve

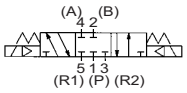
(For details refer to Pages 26～28.)

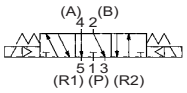
A05P S25 ☐ – 1 P – ☐ – E

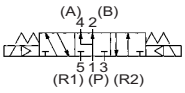
Function

S25 : 2-position, single solenoid


D25 : 2-position, double solenoid


D35 : 3-position, closed center


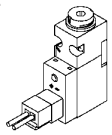
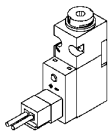
E35 : 3-position, exhaust center


O35 : 3-position, pressure center


Special specifications
No mark : Standard (Internal pilot)
X : *External pilot
(Note) External pilot valve is available only when it is mounted on MFX.

Voltage
1 : DC24V

Connector position

P :	S :
	
(With indicator light and surge suppressor)	(Without indicator light and surge suppressor)

Size of port 2 and 4
No mark : Without sub-base
(Note) A gasket & two mounting screws come with valve.

Wiring
No mark : Without connector
E : Connector with lead wire (Length : 500mm)

➲ *: Made to order

A05P, A05R Series

Ordering Instruction

Manifold for A05R Series

MFU 7 – A05R – M5

Type of manifold
MCU : Common SUP, Common EXH
Ports 2 & 4 on valve body

Number of stations
2 : 2 station
⋮ ⋮
20 : 20 station

Mountable solenoid valve series
A05R

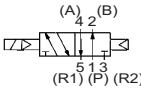
Size of A and B ports
M5 : M5
C4 : * With push-in fitting for φ 4
C6 : * With push-in fitting for φ 6

Mountable solenoid valve (For details refer to Pages 32～34.)

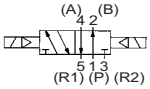
A05R S25 – 1 P – M5 – E – ☐

Function

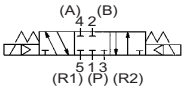
S25 : 2-position, single solenoid



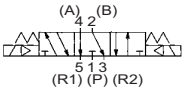
D25 : 2-position, double solenoid



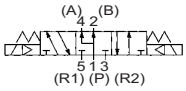
D35 : 3-position, closed center



E35 : 3-position, exhaust center

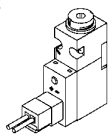
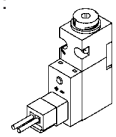


O35 : 3-position, pressure center



Voltage
1 : DC24V

Connector position

P :	S :
	
(With indicator light and surge suppressor)	(Without indicator light and surge suppressor)

Size of ports 2 and 4
M5 : M5
C4 : * With push-in fitting for φ 4
C6 : * With push-in fitting for φ 6

Wiring
No mark : Without connector
E : Connector with lead wire (Length : 500mm)

For mounting on manifold
MF : For mounting on manifold
(Note) A gasket & two mounting screws come with valve.

➲ * : Made to order

A05P, A05R Series

Optional Accessories and Spare parts

●Connector with lead wire

A 0 5 P − D C − C L 5

- ●Lead wire length
  - 5 : 500mm
  - 10 : *1000mm
- ●Voltage
  - DC : For DC
- ●Type
  - P : For PR type

For PR type

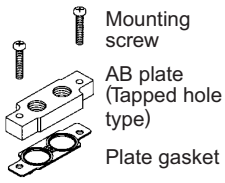
	DC
(−)	Black
(+)	Red

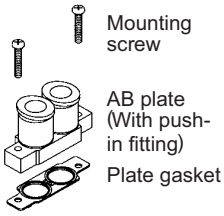
(Note) For common use with PR type of A05 and A12

●AB plate

A 0 5 R − A B − M 5

- ●Port size
  - M5 : M5
  - C4 : *With push-in fitting for φ 4
  - C6 : *With push-in fitting for φ 6





(Note) Gasket & mounting screws are supplied
For common use with A05R

●Locking cover

A 0 5 P − L A

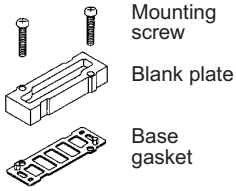
- ●Color
  - A : Orange

(Note) For common use with all A05 and A12

●Blank plate

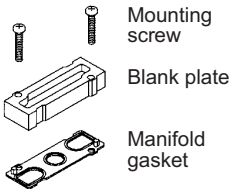
For A05P

A 0 5 P − B P



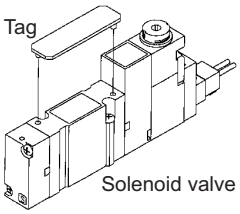
For A05R

A 0 5 R − B P



●Tag for solenoid valve

A 0 5 P − N (Pack of 10)

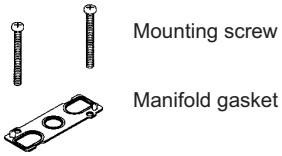


(Note) For common use with sub-base mountig type of A05 and A12

●Manifold gasket

A 0 5 R − G

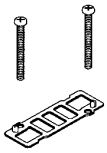
- ●Content of kit
  - SG : Gasket & mounting screws
  - G : Gasket only (Pack of 10)
  - S : Mounting screw only (Pack of 20)



●Base gasket

A 0 5 P X − G

- ●Content of kit
  - SG : Gasket & mounting screws
  - G : Gasket only (Pack of 10)
  - S : Mounting screw only (Pack of 20)
- ●Special specifications
  - No mark : Standard
  - X : * For external pilot (With port X)



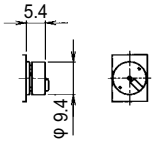
➲ * : Made to order

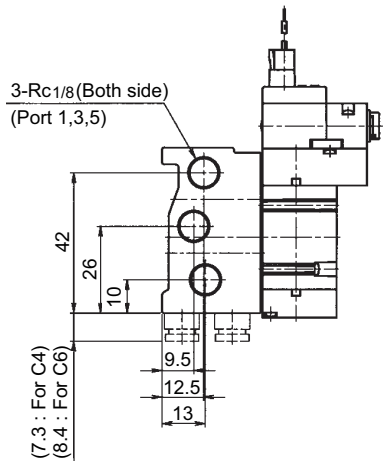
A05P, A05R Series

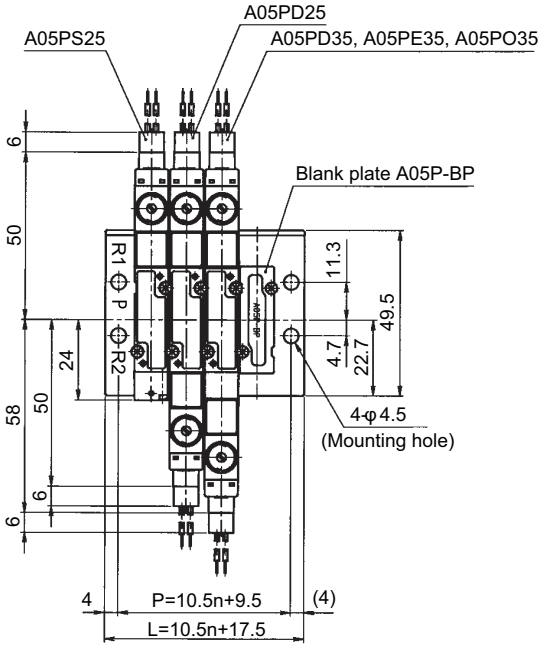
Dimensions

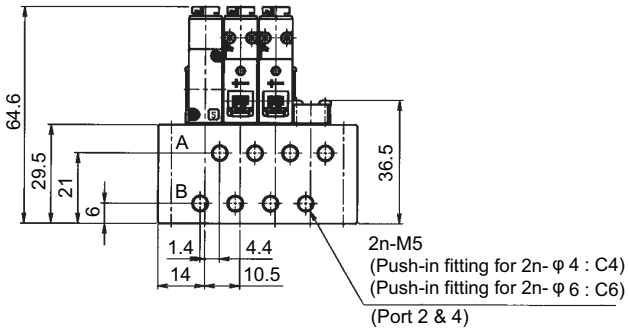
●MFC□-A05P-M5（C4, C6）

(Unit : mm)







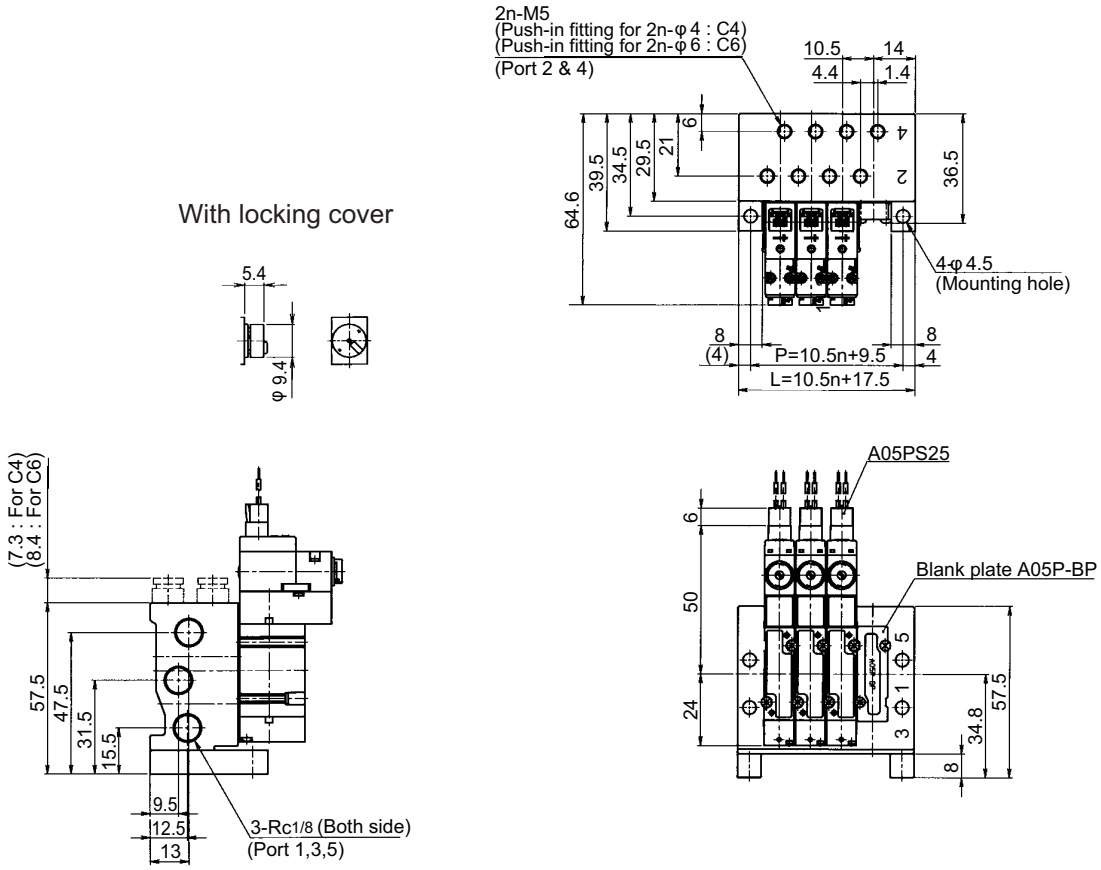


A05P, A05R Series

Dimensions

●MFC□-A05P-M5（C4, C6）-B

(Unit : mm)



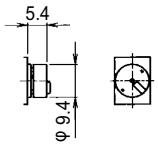
A05P, A05R Series

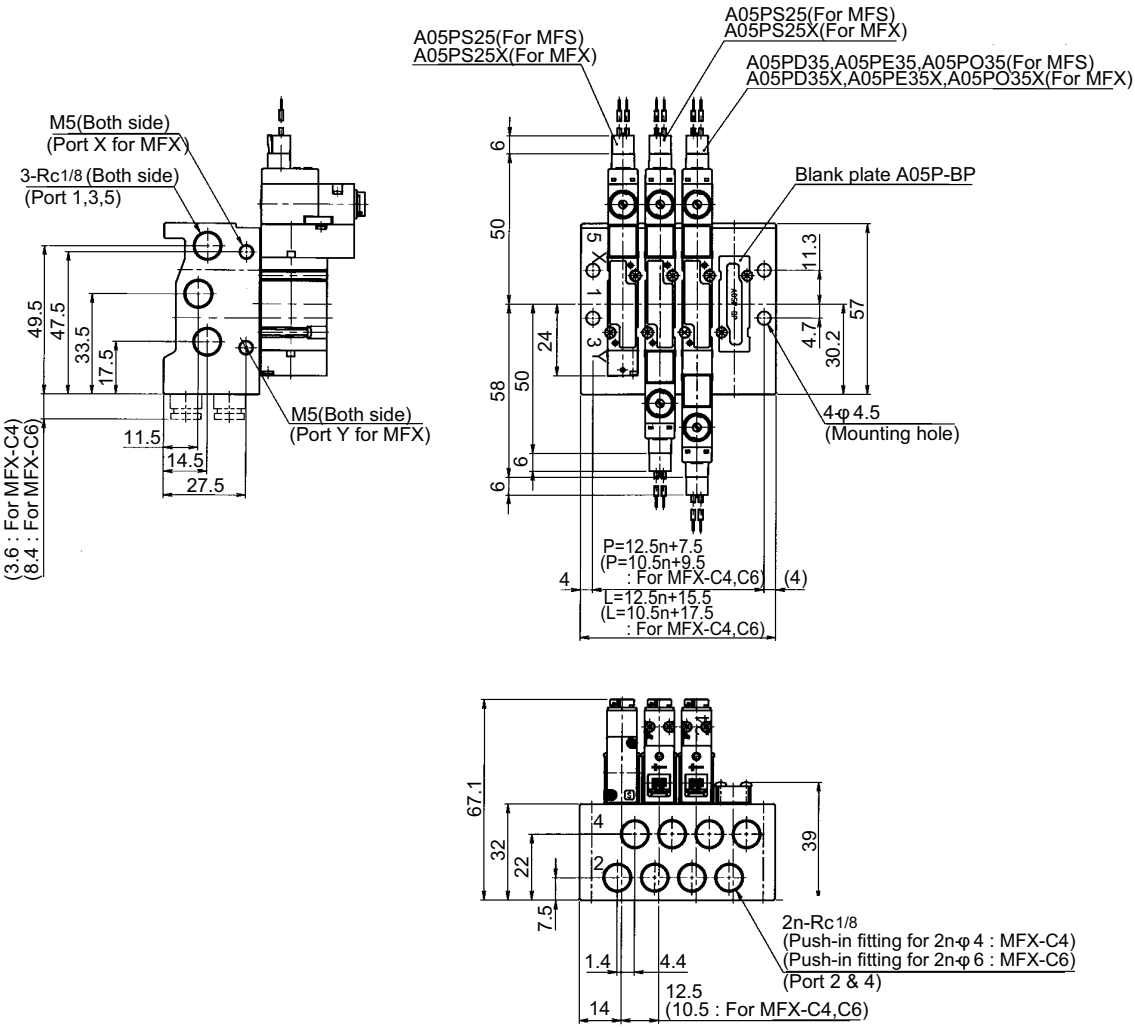
Dimensions

●MFS□-A05P-01, MFX□-A05P-01（C4, C6）

(Unit : mm)

With locking cover



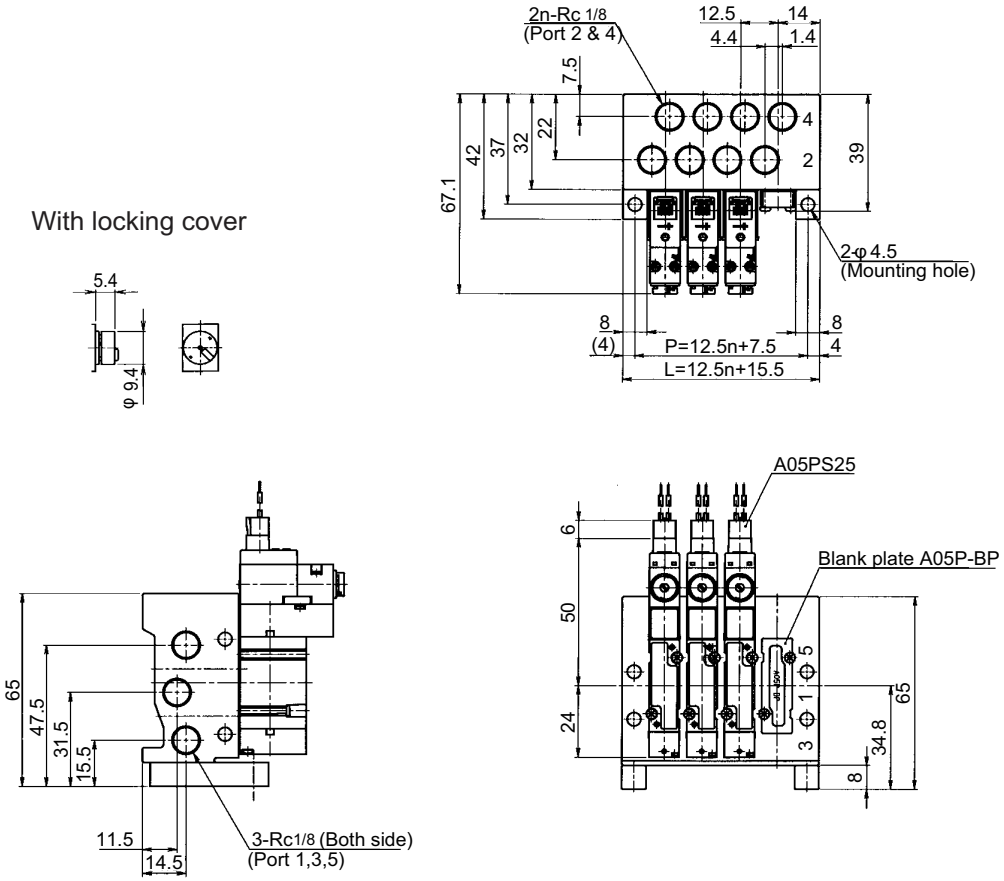


A05P, A05R Series

Dimensions

●MFS□-A05P-01-B

(Unit : mm)

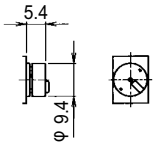


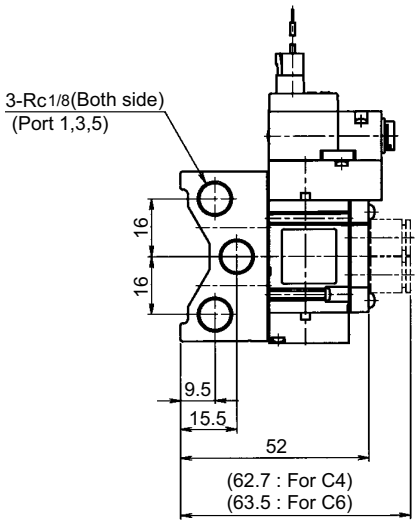
A05P, A05R Series

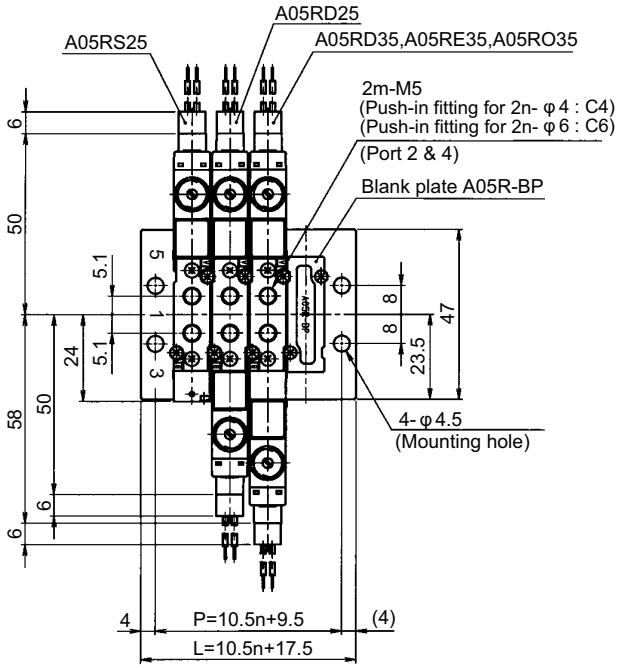
Dimensions

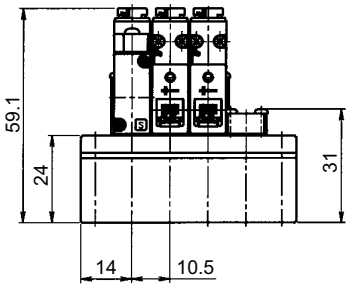
●MFU□-A05R-M5（C4, C6）

(Unit : mm)









Multipin connector type manifold

MC○-A05P/R

Bar type

MCC□-A05P	Common SUP, Common EXH Ports 2 & 4 on side Compact type
MCS□-A05P	Common SUP, Common EXH Ports 2 & 4 on side
MCX□-A05P	Common SUP, Common EXH Common external pilot Ports 2 & 4 on side
MCU□-A05R	Common SUP, Common EXH Ports 2 & 4 on valve body

Manifold Specifications

		For A05P Series			For A05R Series
		MCC□-A05P	MCS□-A05P	MCX□-A05P	MCU□-A05R
Type of manifold		Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on side Compact type	Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Common external pilot Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on valve body
Port size	Ports 1, 3, 5	Rc1/8	Rc 1/8	Rc1/8	Rc1/8
	Ports 2, 4	M5, C4, C6	Rc 1/8	Rc1/8, C4, C6	M5, C4, C6
	Port Y	—	—	M5	—
	Port X	—	—	M5	—
Number of stations		2～12			
Mounting		Direct mount			
Mountable solenoid valve		A05PS25 A05PD25 A05PD35 A05PE35 A05PO35	A05PS25 A05PD25 A05PD35 A05PE35 A05PO35	A05PS25X A05PD25X A05PD35X A05PE35X A05PO35X	A05RS25 A05RD25 A05RD35 A05RE35 A05RO35
Blank plate		A05PG-BP			A05RG-BP

Wiring

When doing wiring work, be sure to turn off power beforehand.
For wiring instructions, refer to Pages 23 and 24.

A05P, A05R Series

Ordering Instructions

Manifold for A05P Series

MCC 7 – A05P – 01 – ML P – [ ]

Type of manifold

MCC : Common SUP, Common EXH
Ports 2 & 4 on side
Compact type

MCS : Common SUP, Common EXH
Ports 2 & 4 on side

MCX : Common SUP, Common EXH
Common external pilot
Ports 2 & 4 on side

Number of stations

2 : 2 station
⋮ ⋮
12 : 12 station

Mountable solenoid valve series

A05P

Size of Ports 2 and 4

M5 : M5
01 : Rc1/8
C4 : * With push-in fitting for φ 4
C6 : * With push-in fitting for φ 6

Type	M5	01	C4	C6
MCC	○	—	○	○
MCS	—	○	—	—
MCX	—	○	○	○

(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Connector specification

ML : Flat cable connector
DL : D sub-connector

Polarity

P : NPN type
M : * PNP type

Ootion 2

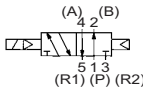
DMF : With Manifold drive unit
No mark : Without Manifold drive unit
(Note) Manifold drive unit can be mounted for ML type only.

Mountable solenoid valve (For details refer to Pages 26～28.)

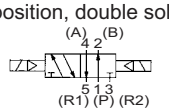
A05P S25 [ ] – 1 P – [ ] – PS

Function

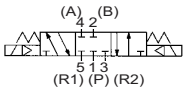
S25 : 2-position, single solenoid



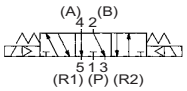
D25 : 2-position, double solenoid



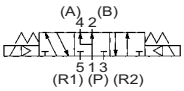
D35 : 3-position, closed center



E35 : 3-position, exhaust center



O35 : 3-position, pressure center



Special specifications

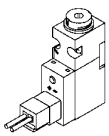
No mark : Standard (Internal pilot)
X : * External pilot
(Note) External pilot valve is available only when it is mounted on MCX.

Voltage

1 : DC24V

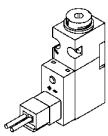
Connector position

P :



(With indicator light and surge suppressor)

S :



(Without indicator light and surge suppressor)

Port size

No mark : Without sub-base
(Note) A gasket & two mounting screws come with valve.

Wiring

No mark : Without connector
PS : With connector for collective wiring (For single solenoid)
PD : With connector for collective wiring (For double solenoid)
(Note) For minus common (PNP), order a connector in addition

* : Made to order

A05P, A05R Series

Ordering Instructions

Manifold for A05R Series

MCU 7 – A05R – 01 – ML P – [ ]

Type of manifold
MCU : Common SUP, Common EXH
Ports 2 & 4 on valve body

Number of stations
2 : 2 station
⋮ ⋮
12 : 12 station

Mountable solenoid valve series
A05R

Size of ports 2 and 4
M5 : M5
C4 : * With push-in fitting for φ 4
C6 : * With push-in fitting for φ 6

Connector specification
ML : Flat cable connector
DL : D sub-connector

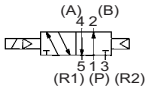
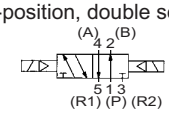
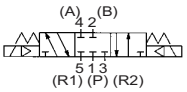
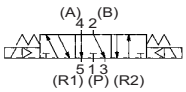
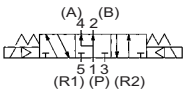
Polarity
P : NPN type
M : * PNP type

Option 2
DMF : With Manifold drive unit
No mark : Without Manifold drive unit
(Note) Manifold drive unit can be mounted for ML type only.

Mountable solenoid valve (For details refer to Pages 32～34.)

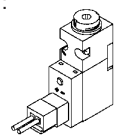
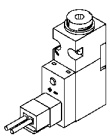
A05R S25 – 1 P – [ ] – PS – [ ]

Function

S25 : 2-position, single solenoid	
D25 : 2-position, double solenoid	
D35 : 3-position, closed center	
E35 : 3-position, exhaust center	
O35 : 3-position, pressure center	

Voltage
1 : DC24V

Connector position

P :	S :
 (With indicator light and surge suppressor)	 (Without indicator light and surge suppressor)

Size of ports 2 and 4
M5 : M5
C4 : * With push-in fitting for φ 4
C6 : * With push-in fitting for φ 6

Wiring
No mark : Without connector
PS : With connector for collective wiring (For single solenoid)
PD : With connector for collective wiring (For double solenoid)
(Note) For minus common (PNP), order a connector in addition

For mounting on manifold
MF : For mounting on manifold
(Note) A gasket & two mounting screws come with valve.

* : Made to order

A05P, A05R Series

Optional Accessories and Spare parts

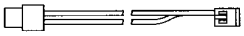
●Collective wiring connector

A 0 5 P S — C C — □

●Polarity
No mark : NPN type
M : * PNP type

●Type
PS : For PR type single solenoid
PD : For PR type double solenoid

For PR type single solenoid



For PR type double solenoid

●Locking cover

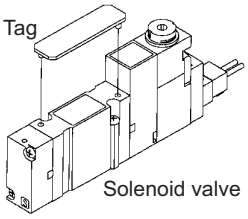
A 0 5 P — L A

●Color
A : Orange

(Note) For common use with all A05 and A12

●Tag for solenoid valve

A 0 5 P — N (Pack of 10)



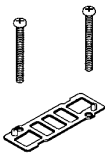
(Note) For common use with sub-base mountig type of A05 and A12

●Base gasket

A 0 5 P X — G

●Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)

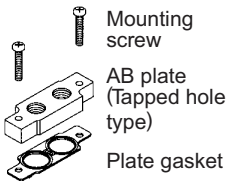
●Special specifications
No mark : Standard
X : * For external pilot (With port X)

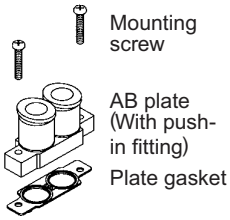


●AB plate

A 0 5 R — A B — M 5

●Port size
M5 : M5
C4 : * With push-in fitting for φ 4
C6 : * With push-in fitting for φ 6

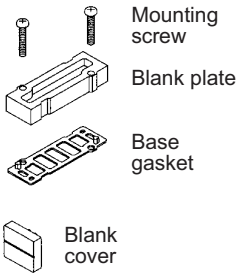




●Blank plate

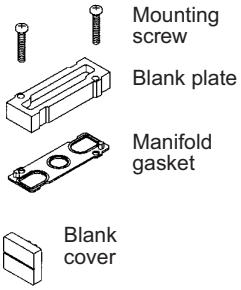
For A05P

A 0 5 P G — B P



For A05R

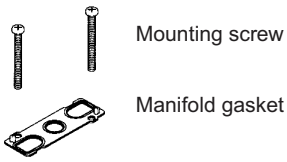
A 0 5 R G — B P



●Manifold gasket

A 0 5 R — G

●Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)



➲ * : Made to order

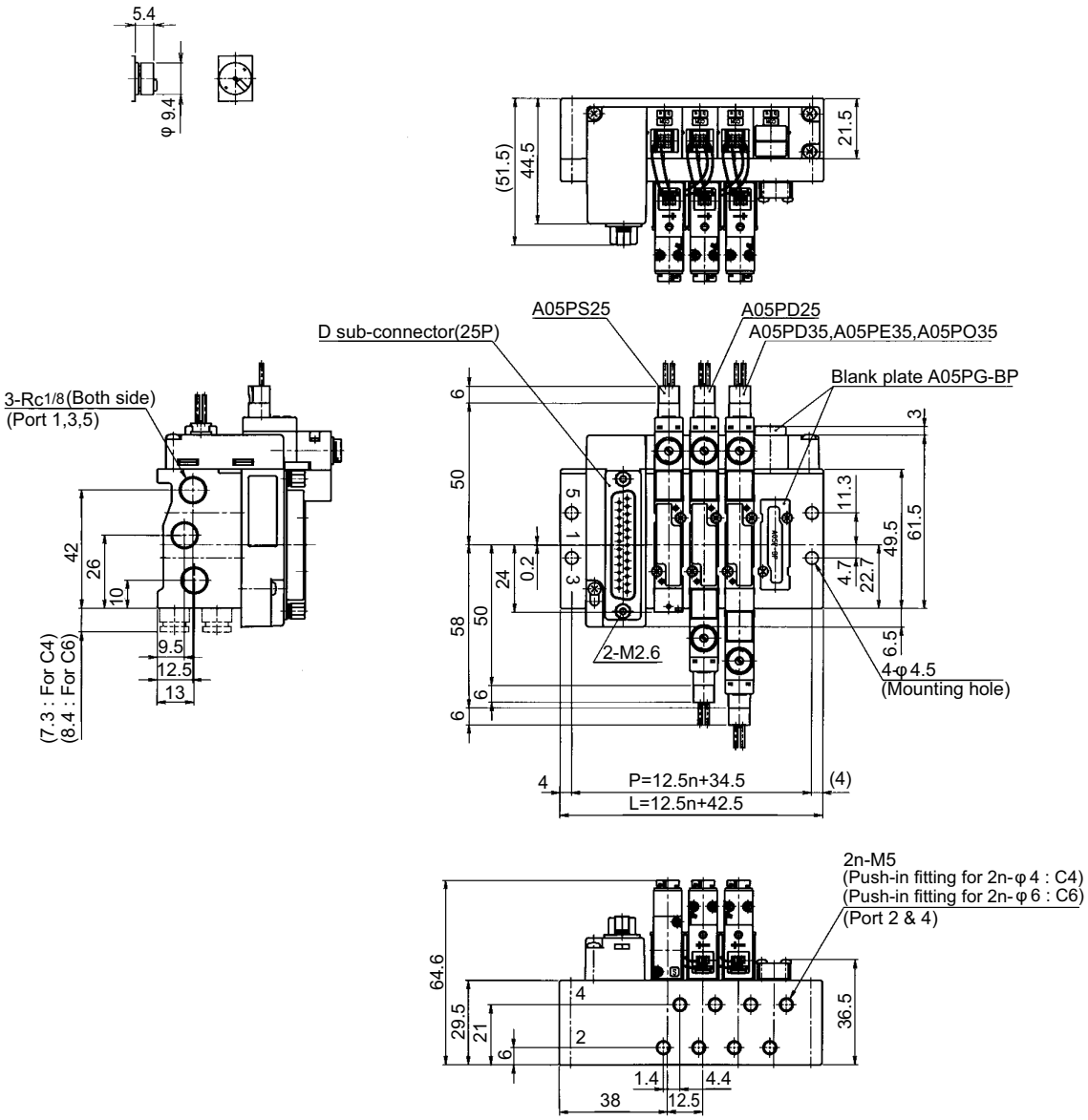
A05P, A05R Series

Dimensions

● MCC□-A05-M5 (C4, C6)-DL

(Unit : mm)

With locking cover



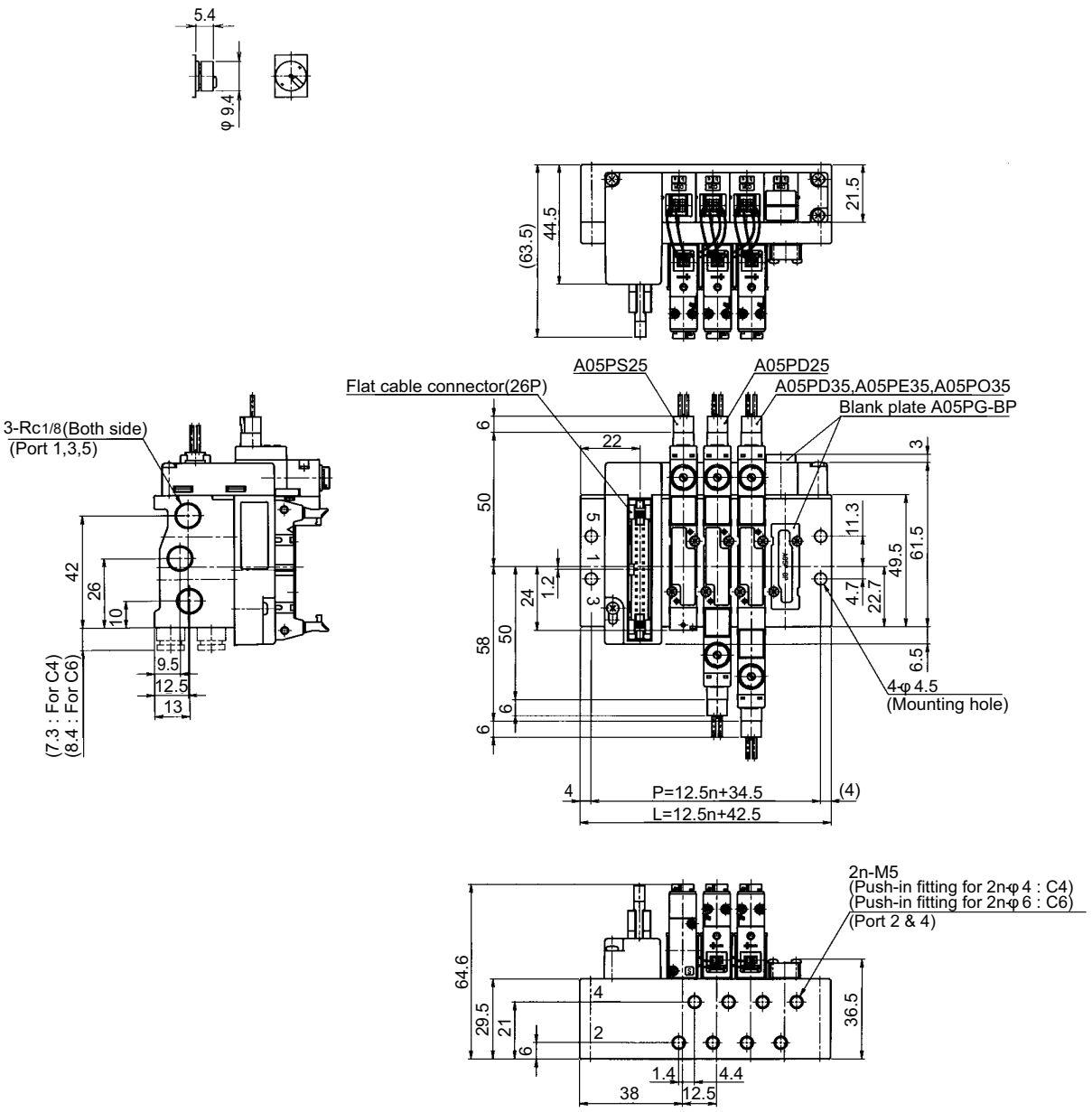
A05P, A05R Series

Dimensions

●MCC□-A05P-M5（C4, C6）-ML

(Unit : mm)

With locking cover



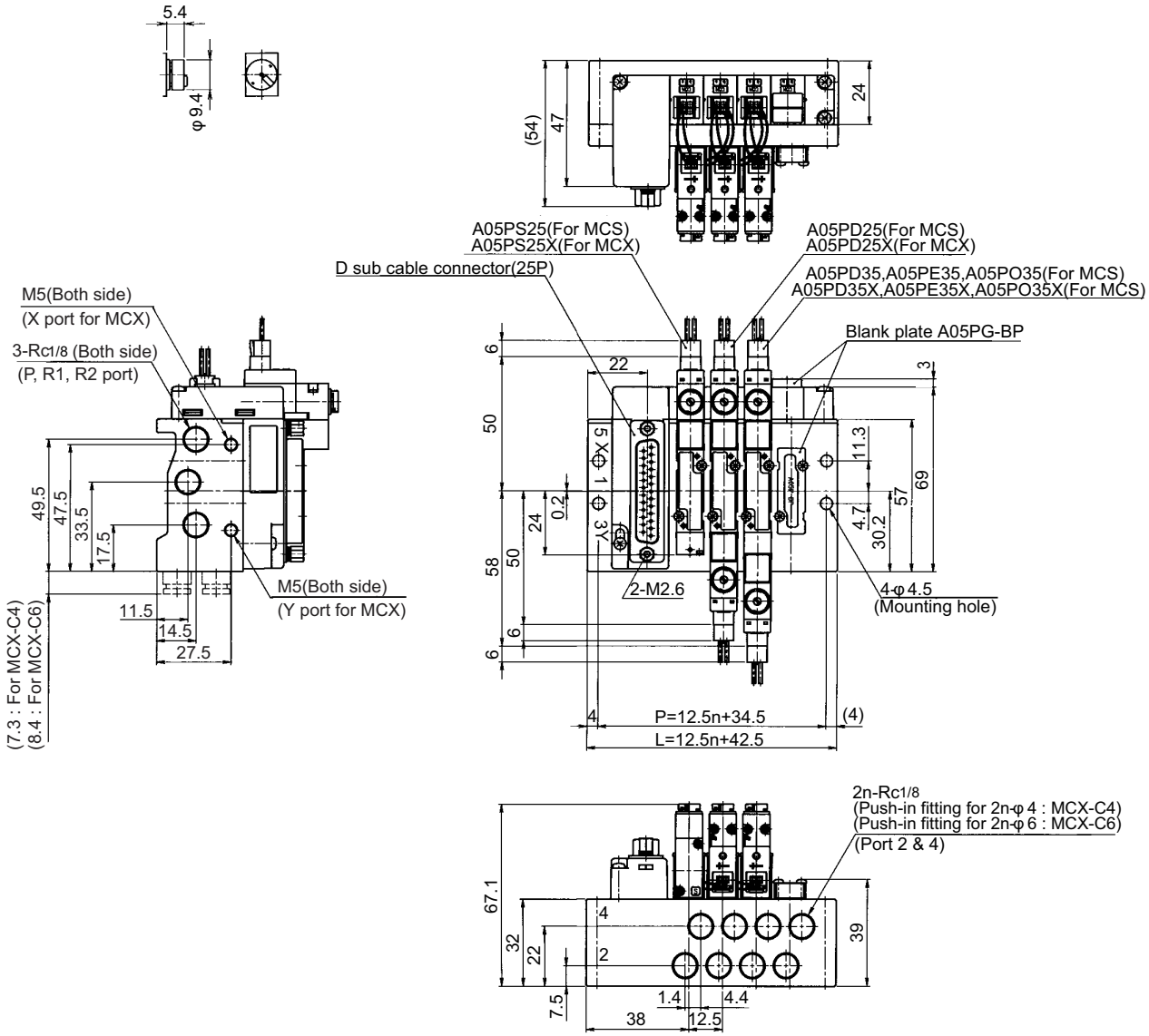
A05P, A05R Series

Dimensions

●MCS□-A05P-01-DL, MCX□-A05P-01（C4, C6）-DL

(Unit : mm)

With locking cover



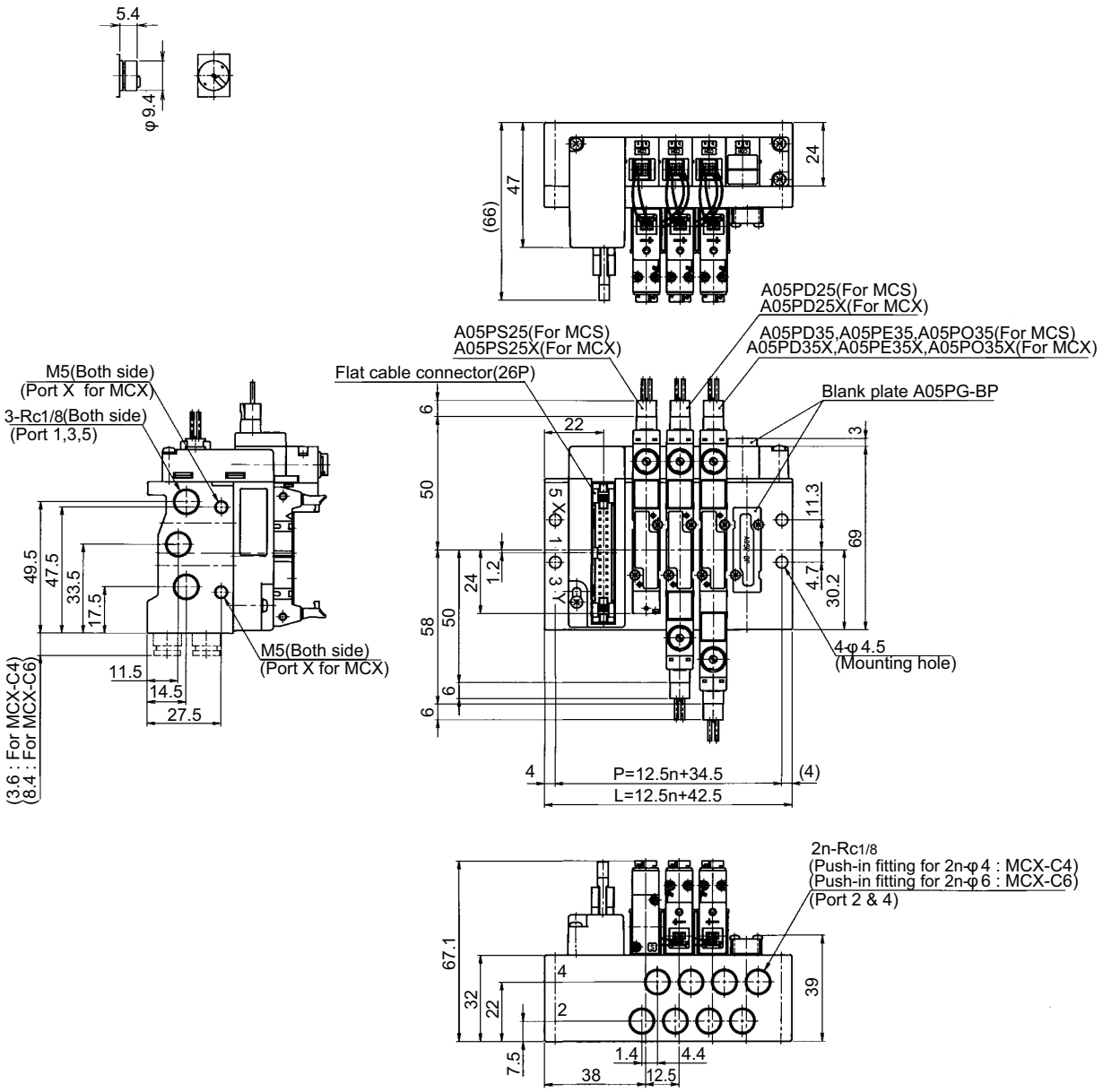
A05P, A05R Series

Dimensions

●MCS□-A05P-01-ML, MCX□-A05P-01（C4, C6）-ML

(Unit : mm)

With locking cover



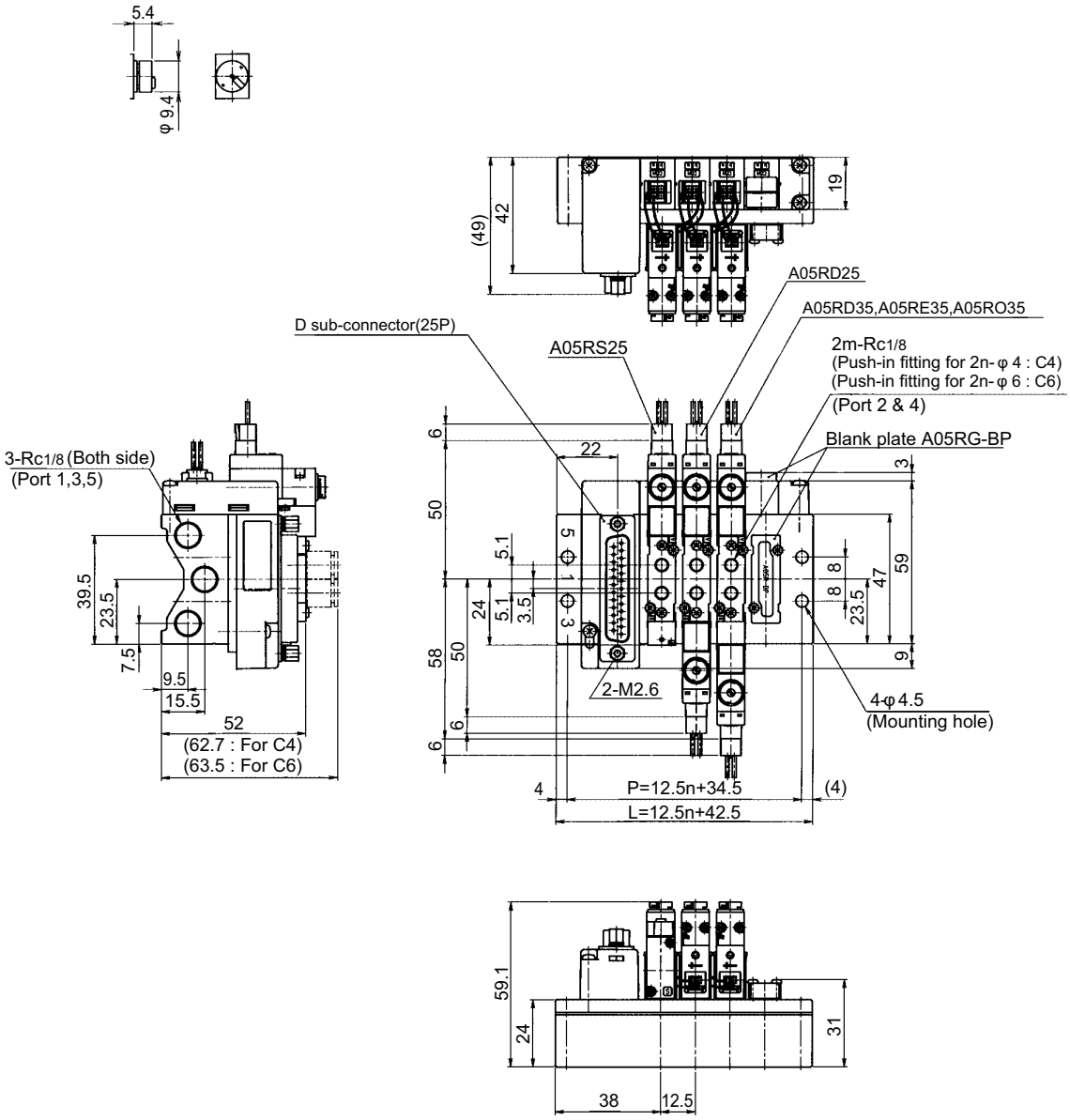
A05P, A05R Series

Dimensions

●MCU□-A05R-M5（C4, C6）-DL

(Unit : mm)

With locking cover



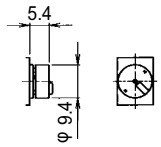
A05P, A05R Series

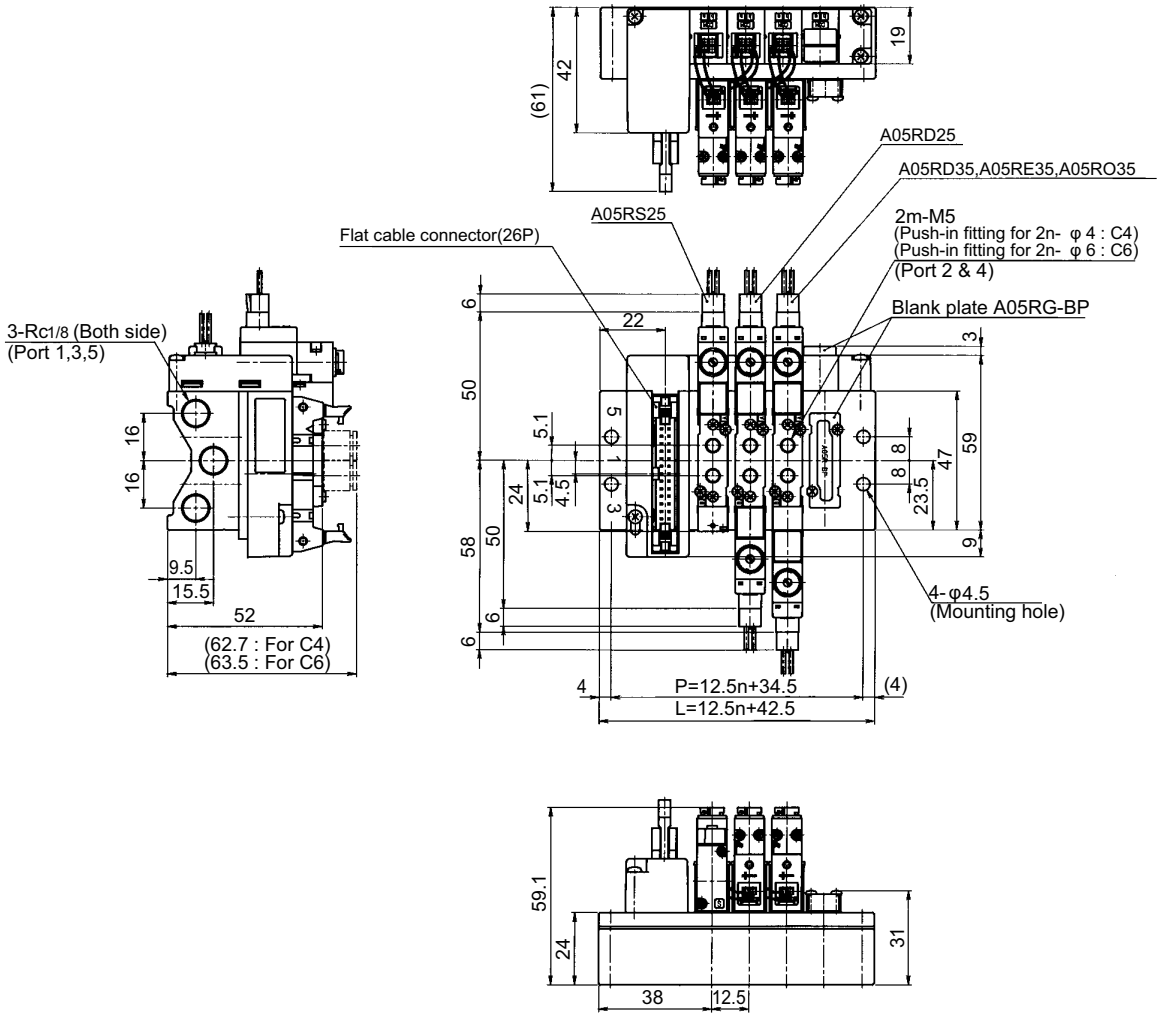
Dimensions

●MCU□-A05R-M5（C4, C6）-ML

(Unit : mm)

With locking cover



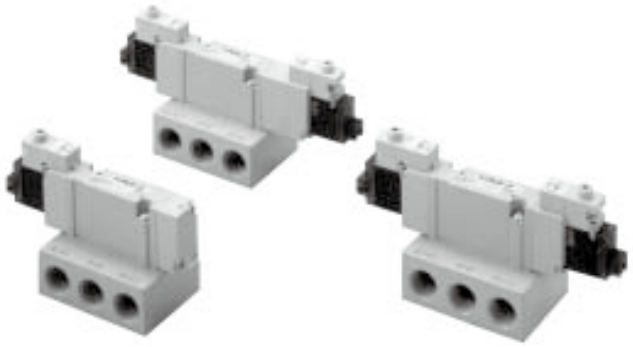


5 Port pilot operated solenoid valve

A12P Series

Rubber Seal/Sub-base Mounting type

A12PS25	2-position Single solenoid
A12PD25	2-position Double solenoid
A12PD35	3-position Closed center
A12PE35	3-position Exhaust center
A12PO35	3-position Pressure center



Specifications

Model No.			Unit	A12PS25	A12PD25	A12PD35	A12PE35	A12PO35
Fluid				Non-lubricated / lubricated air				
Port size				Rc1/8				
Effective area			mm^2	11.1		7.6		14.1
Cv value				0.61		0.42		0.78
Operating ambient temperature			℃	−5~50				
Pressure range			MPa	0.15~0.7	0.1~0.7	0.2~0.7		
				−0.1~0.7 For external pilot operation				
Maximum frequency			cycle/min	600		500		
Response time	DC	ON	s	0.015	0.010	0.012		
		OFF	s	0.018 (0.024)	—	0.036 (0.042)		
Pilot air exhaust				Captured exhaust				
Manual override				Screwdriver-operated locking button				
Mounting position				Free				
Shock resistance, vibration resistance			m/s^2	150/30				
Mass	Without sub-base		g	60	75	79		
	With sub-base		g	143	161	166		

(Note) · Service kit not available
· When temperature of valve site goes down below 5℃, complete dry air should be supplied to prevent from freezing.
· Pressure range of external pilot supply : 0.25~0.7MPa
· Response time in bracket ( ) shows with surge suppressor.
· Response time shown above is in accordance with JIS B 8375.
· Effective area shown above is a value between ports 1 and 2, 4.

Electrical Specifications

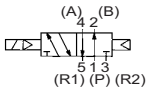
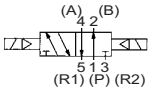
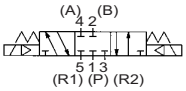
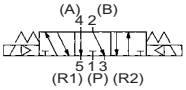
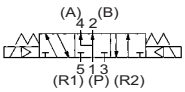
Rated voltage	DC	V	24
Permissible voltage fluctuation		%	+10, −10
Power consumption	DC	W	0.6 (with indicator light and surge suppressor), 0.55 (without indicator light and surge suppressor)
Grade of Insulation			JIS grade E
Wiring			Plug-in connector
Surge suppressor			Diode
Indicator light			LED

A12P Series

Ordering Instructions

A12P [S25] [ ] – [1] [P] – [02] – [E]

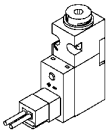
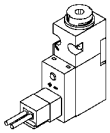
Function

S25 : 2-position, single solenoid	
D25 : 2-position, double solenoid	
D35 : 3-position, closed center	
E35 : 3-position, exhaust center	
O35 : 3-position, pressure center	

Wiring
No mark : Without connector
E : Connector with lead wire (Length : 500mm)

Port size
No mark : Without sub-base
02 : Rc 1/8
G2 : * G 1/8
N2 : * NPT 1/8
F2 : * NPTF 1/8
(Note) Valve without sub-base comes with a base gasket & two mounting screws.

Connector position

P :	S :
	
(With indicator light and surge suppressor)	(Without indicator light and surge suppressor)

Voltage
1 : DC24V

Special specification
No mark : Standard (Internal pilot)
X : * External pilot (Pilot air is exhaust through exclusive port Y.)

➔ * : Made to order

A12P Series

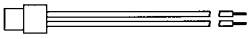
Optional Accessories and Spare parts

●Connector with lead wire

A 0 5 P — D C — C L 5

- ●Lead wire length
  - 5 : 500mm
  - 10 : * 1000mm
- ●Voltage
  - DC : For DC
- ●Type
  - P : For PR type

For PR type



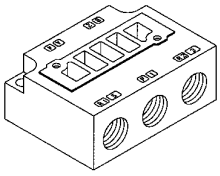
	DC
(−)	Black
(+)	Red

(Note) For common use with PR type of A05 and A12

●Sub-base

A 1 2 P — B — 0 2 X

- ●Special specifications
  - No mark : Standard
  - X : For external pilot (Port X)
- ●Port size
  - 02 : Rc1/8
  - G2 : * G 1/8
  - N2 : * NPT 1/8
  - F2 : * NPTF 1/8



●Locking cover

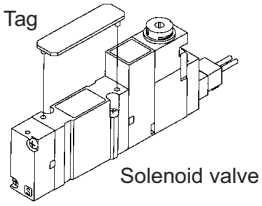
A 0 5 P — L A

- ●Color
  - A : Orange

(Note) For common use with all A05 and A12

●Tag for solenoid valve

A 0 5 P — N (Pack of 10)

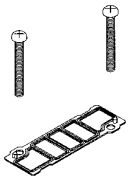


(Note) For common use with sub-base mounting type of A05 and A12

●Base gasket

A 1 2 P X — G

- ●Content of kit
  - SG : Gasket & mounting screws
  - G : Gasket only (Pack of 10)
  - S : Mounting screw only (Pack of 20)
- ●Special specifications
  - No mark : Standard
  - X : * For external pilot (With port X)

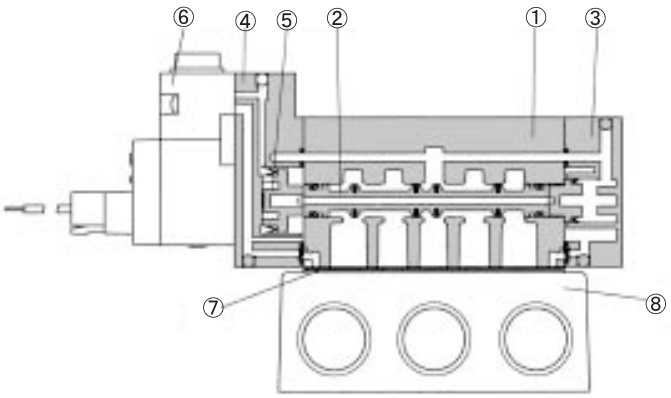


➲ * : Made to order

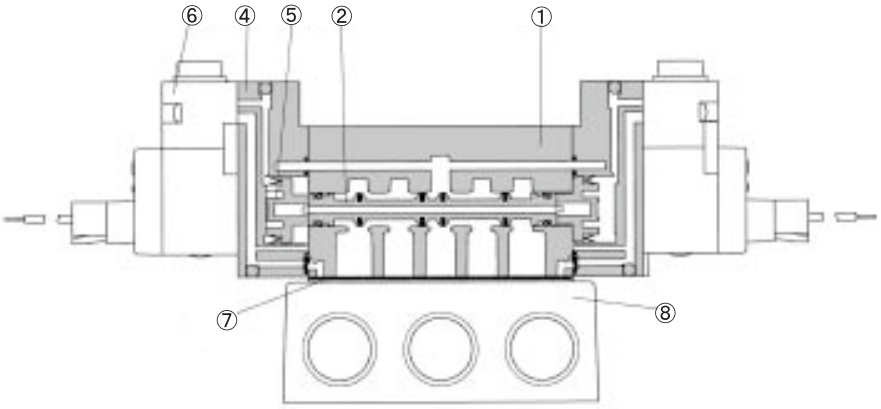
A12P Series

Material Specification

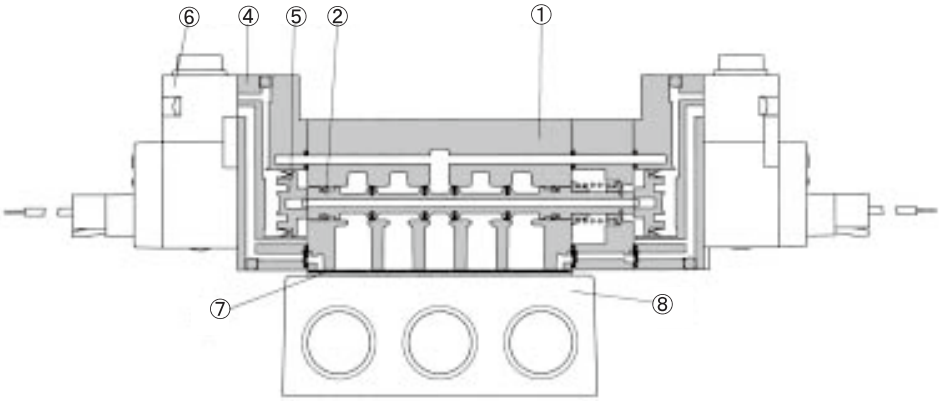
2-position
Single solenoid



2-position
Double solenoid



3-position
Closed center
3-position
Exhaust center
3-position
Pressure center



Main Components

No.	Description	Material
①	Body	Aluminium die-casting
②	Spool ass'y	Aluminium/NBR
③	End cover	Resin
④	Piston housing	Resin
⑤	Piston	Resin
⑥	Pilot valve	Refer to A00 Series
⑦	Base gasket	NBR
⑧	Sub-base	Aluminium die-casting

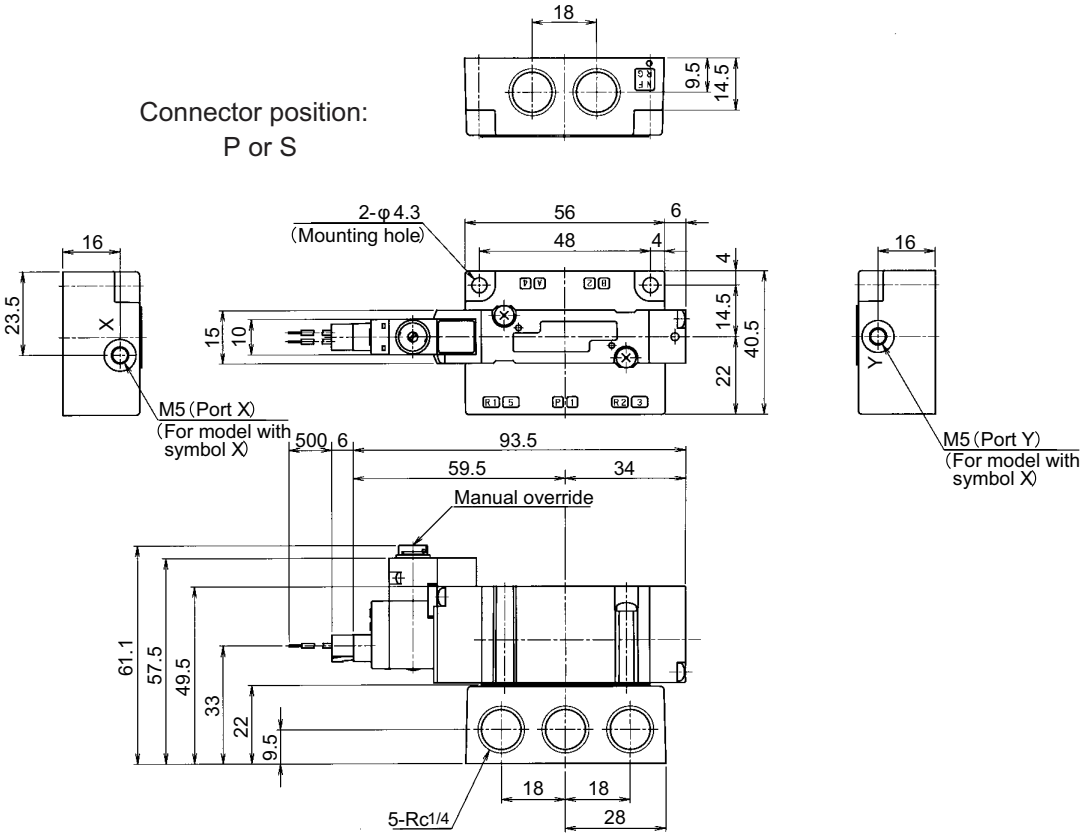
A12P Series

Dimensions

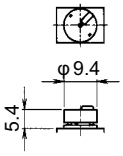
●A12PS25

(Unit : mm)

Connector position:
P or S



With locking cover



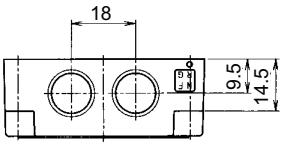
A12P Series

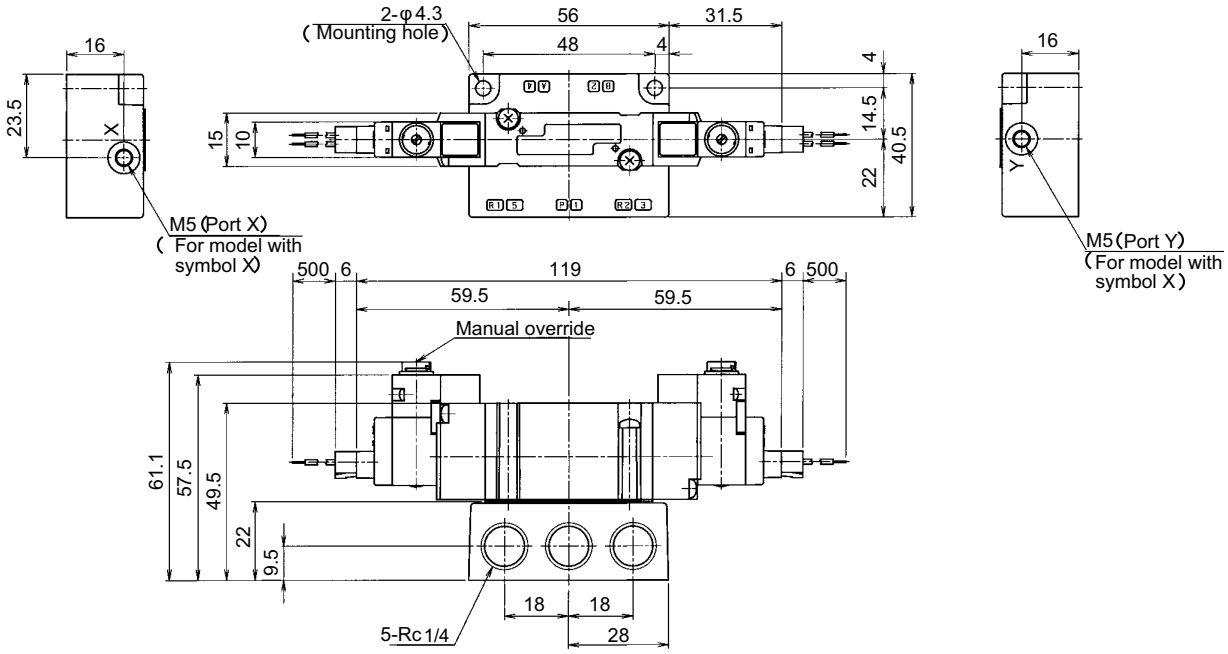
Dimensions

●A12PD25

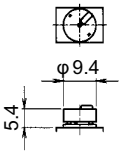
(Unit : mm)

Connector position:
P or S





With locking cover



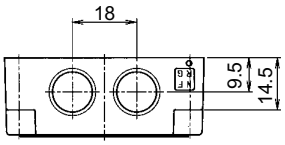
A12P Series

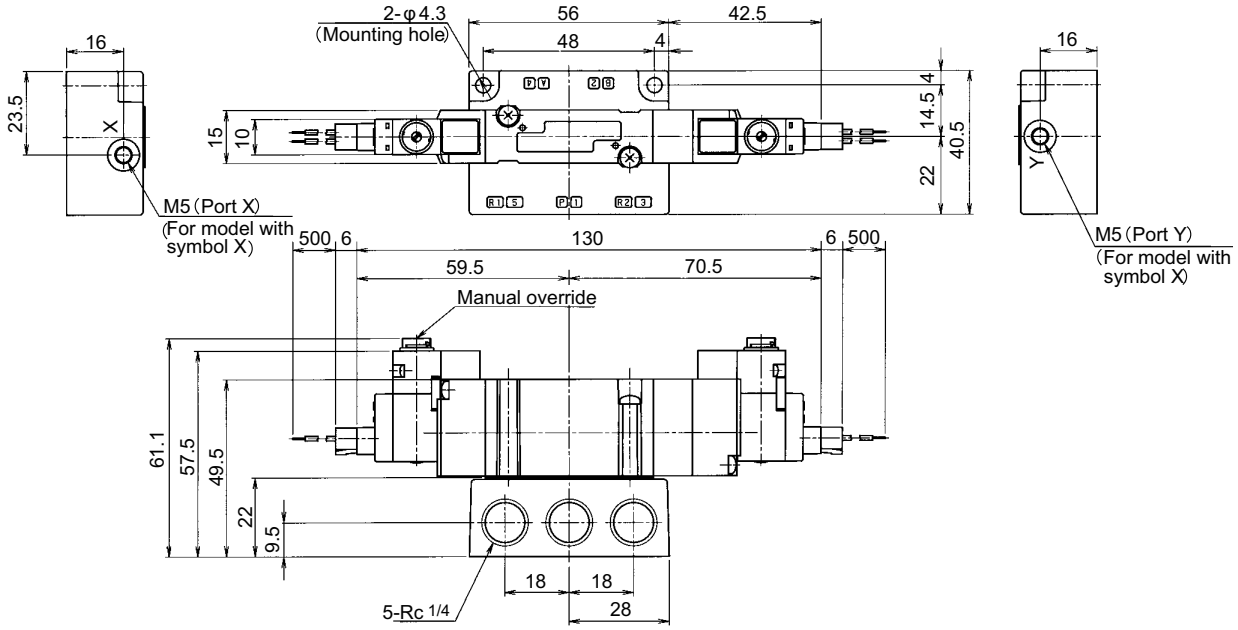
Dimensions

●A12PD35, A12PE35, A12PO35

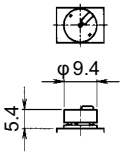
(Unit : mm)

Connector position:
P or S





With locking cover



5 Port pilot operated solenoid valve

A12R Series

Rubber Seal / In-line Mounting type

A12RS25	2-position Single solenoid
A12RD25	2-position Double solenoid
A12RD35	3-position Closed center
A12RE35	3-position Exhaust center
A12RO35	3-position Pressure center

Specifications

Model No.			Unit	A12RS25	A12RD25	A12RD35	A12RE35	A12RO35
Fluid				Non-lubricated / lubricated air				
Port size				Port 2, 4 : Rc1/8 , C6, C8 Port 1, 3, 5 : Rc 1/8				
Effective area			mm^2	8.8		8.5		12
Cv value				0.48		0.46		0.66
Operating ambient temperature			℃	−5~50				
Pressure range			MPa	0.15~0.7	0.1~0.7	0.2~0.7		
				−0.1~0.7 For external pilot operation				
Maximum frequency			cycle/min	600		500		
Response time	DC	ON	s	0.015	0.010	0.012		
		OFF	s	0.018 (0.024)	−	0.036 (0.042)		
Pilot air exhaust				Individual exhaust				
Manual override				Screwdriver-operated locking button				
Mounting position				Free				
Shock resistance, vibration resistance			m/s^2	150/30				
Mass			g	83	101	106		

(Note) · Service kit not available
· When temperature of valve site goes down below 5℃ , complete dry air should be supplied to prevent from freezing.
· Pressure range of external pilot supply : 0.25 ~ 0.7MPa
· Response time in bracket ( ) shows with surge suppressor.
· Response time shown above is in accordance with JIS B 8375.
· Effective area shown above is a value between ports 1 and 2, 4.

Electrical Specifications

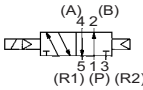
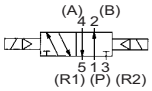
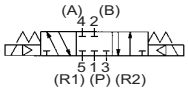
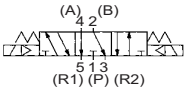
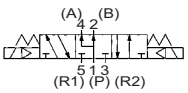
Rated voltage	DC	V	24
Permissible voltage fluctuation		%	+10, −10
Power consumption	DC	W	0.6 (with indicator light and surge suppressor), 0.55 (without indicator light and surge suppressor)
Grade of Insulation			JIS grade E
Wiring			Plug-in connector
Surge suppressor			Diode
Indicator light			LED

A12R Series

Ordering Instructions

A12R [S25] [ ] – [1] [P] – [01] – [E]

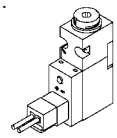
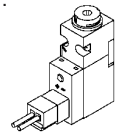
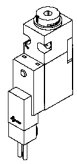
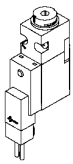
Function

S25 : 2-position, single solenoid	
D25 : 2-position, double solenoid	
D35 : 3-position, closed center	
E35 : 3-position, exhaust center	
O35 : 3-position, pressure center	

Wiring
No mark: Without connector
E : Connector with lead wire (Length : 500mm)

Size of ports 2 and 4
01 : Rc1/8
C6 : * With push-in fitting forφ 6
C8 : * With push-in fitting forφ 8
(Note) When using G, NPT, NPT threads, consult KURODA Pneumatics Ltd.

Connector position

P :  (With indicator light and surge suppressor)	S :  (Without indicator light and surge suppressor)
Q :  (With indicator light and surge suppressor)	B :  (Without indicator light and surge suppressor)

Voltage
1 : DC24V

Special specification
No mark: standard (Internal pilot)
X : * External pilot (Pilot air is exhaust through exclusive port Y.)

* : Made to order

A12R Series

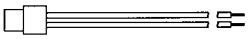
Optional Accessories and Spare parts

●Connector with lead wire

A 0 5 P — D C — C L 5

- ●Lead wire length
  - 5 : 500mm
  - 10 : * 1000mm
- ●Voltage
  - DC : For DC
- ●Type
  - P : For PR type

For PR type



	DC	AC
(−)	Black	Blue
(+)	Red	Blue

(Note) For common use with PR type of A05 and A12

●Voltage convertor with connector

Refer to page 16 for voltage convertor with connector.

●Locking cover

A 0 5 P — L A

- ●Color
  - A : Orange

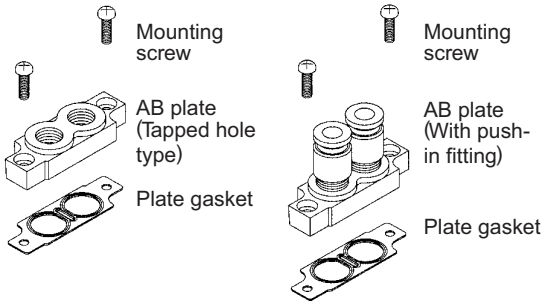
(Note) For common use with all A05 and A12

●AB plate

A 1 2 R — A B — 0 1 X

- ●Special specifications
  - No mark : Standard
  - X : * For external pilot (With port X)
- ●Port size
  - 01 : Rc1/8
  - C6 : * With push-in fitting forφ 6
  - C8 : * With push-in fitting forφ 8

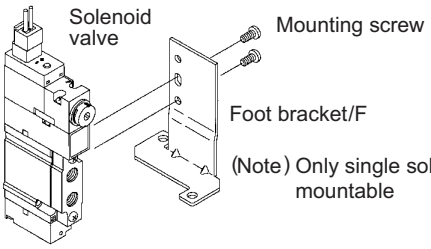
(Note) When using G, NPT, NPT threads, consult KURODA Pneumatics Ltd.



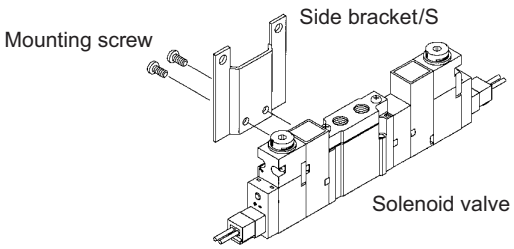
●Bracket

A 1 2 R — B F

- ●Mounting
  - F : Foot bracket
  - S : Side bracket



(Note) Only single solenoid mountable

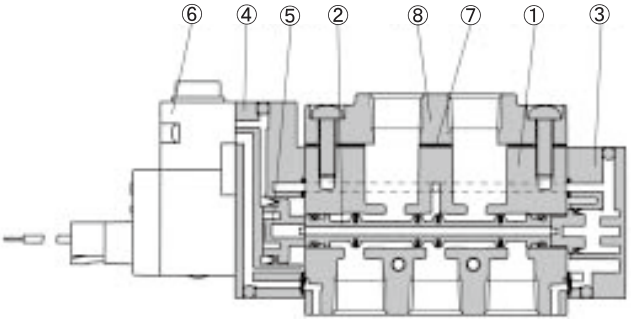


* : Made to order

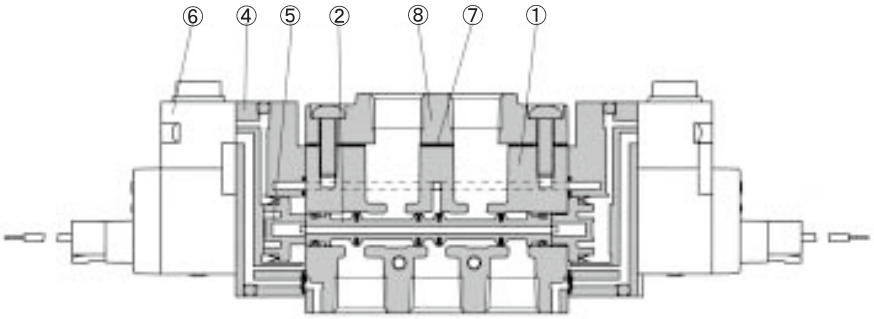
A12R Series

Material Specification

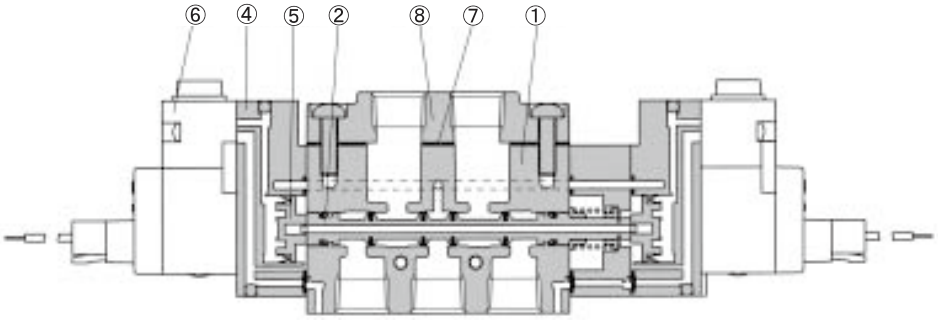
2-position
Single solenoid



2-position
Double solenoid



3-position
Closed center
3-position
Exhaust center
3-position
Pressure center



Main Components

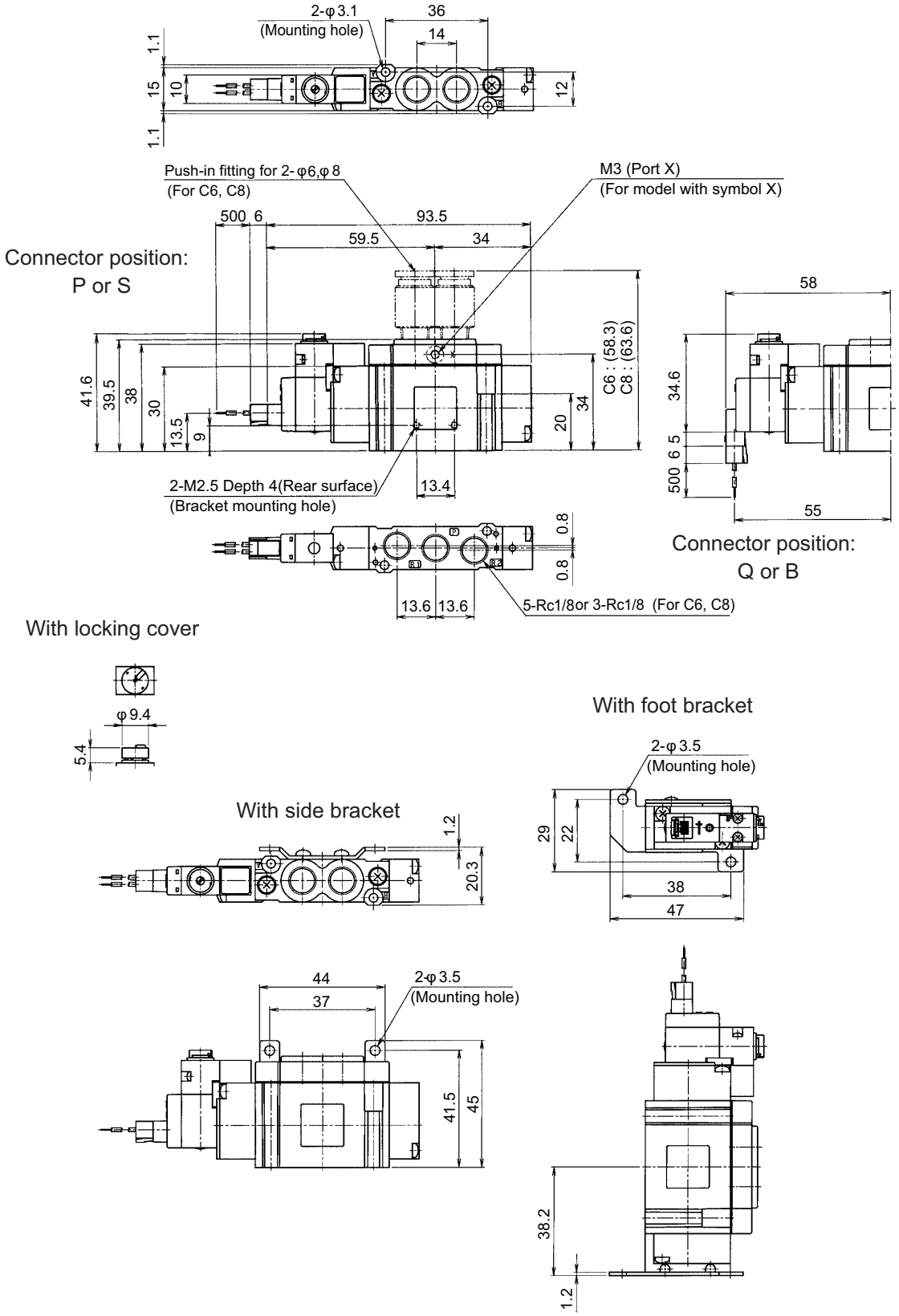
No.	Description	Material
①	Body	Aluminium die-casting
②	Spool ass'y	Aluminium/NBR
③	End cover	Resin
④	Piston housing	Resin
⑤	Piston	Resin
⑥	Pilot valve	Refer to A00 Series
⑦	Plate gasket	NBR
⑧	AB plate	Aluminium die-casting

A12R Series

Dimensions

●A12RS25

(Unit : mm)

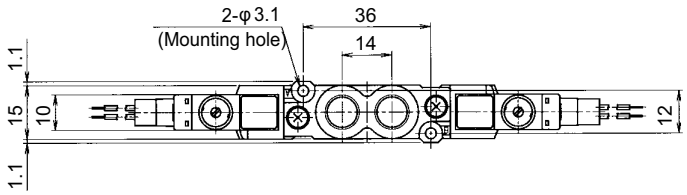


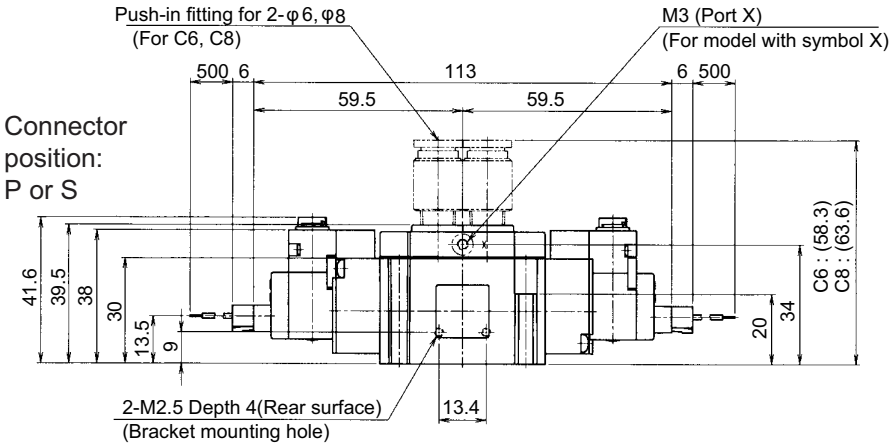
A12R Series

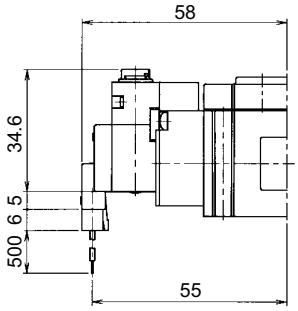
Dimensions

●A12RD24

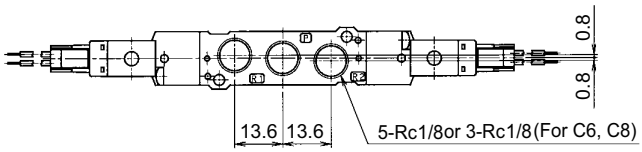
(Unit : mm)



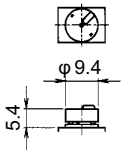




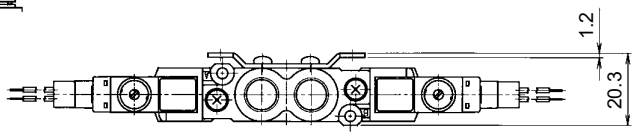
Connector position:
Q or B

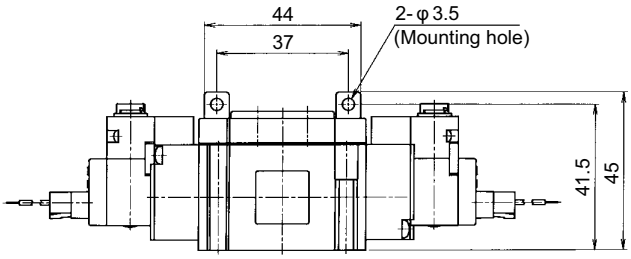


With locking cover



With side bracket



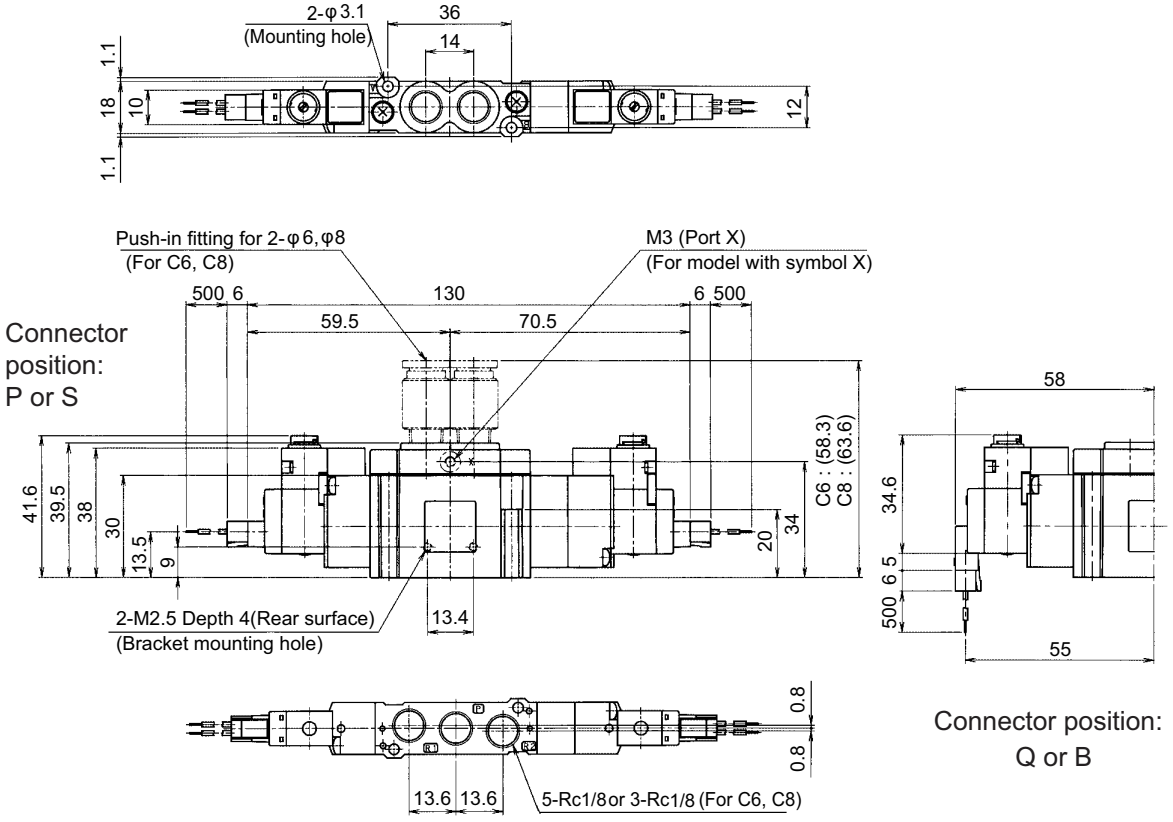


A12R Series

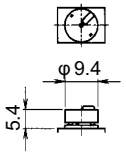
Dimensions

●A12RD35, A12RE35, A12RO35

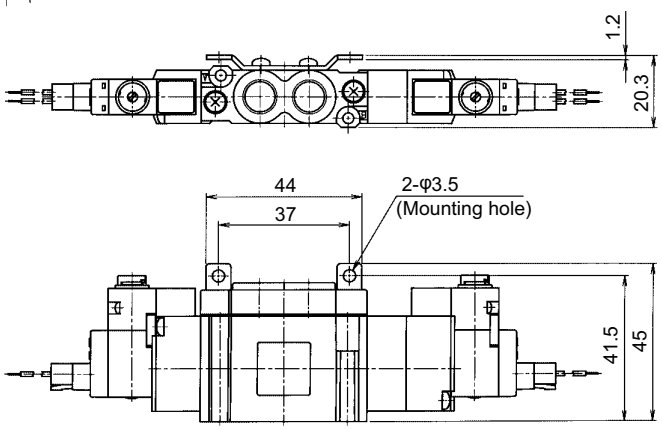
(Unit : mm)



With locking cover



With side bracket

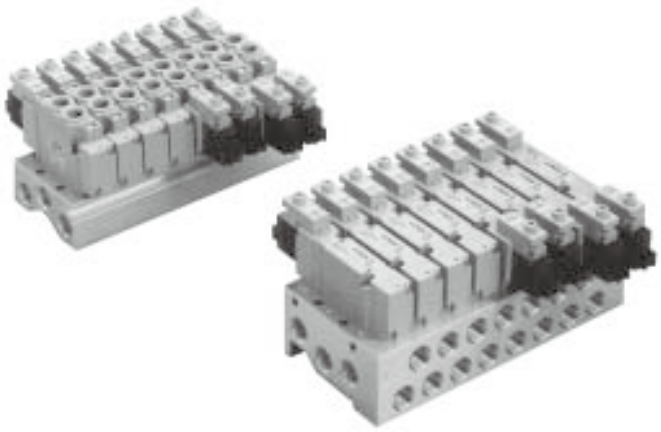


Individual wiring type manifold

MF○-A12 P/R

Bar type

MFS□-A12P	Common SUP, Common EXH Ports 2 & 4 on side
MFX□-A12P	Common SUP, Common EXH Common external pilot Ports 2 & 4 on side
MFU□-A12R	Common SUP, Common EXH Ports 2 & 4 on valve body



Manifold Specifications

		For A12P Series		For A12R Series
		MFS□-A12P	MFX□-A12P	MFU□-A12R
Type of manifold		Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Common external pilot Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on valve body
Port size	Ports 1, 3, 5	Rc1/4	Rc1/4	Rc1/4
	Ports 2, 4	Rc1/4, C6, C8	Rc1/4, C6, C8	Rc1/4, C6, C8
	Port Y	–	M5	–
	Port X	–	M5	–
Number of stations		2～20		
Mounting		Direct mount		
Mountable solenoid valve		A12PS25 A12PD25 A12PD35 A12PE35 A12PO35	A12PS25X A12PD25X A12PD35X A12PE35X A12PO35X	A12RS25 A05RD25 A05RD35 A05RE35 A05RO35
Blank plate		A12P-BP		A12R-BP

A12P, A12R Series

Ordering Instructions

Manifold for A12P Series

MFS 7 – A12P – 02

Type of manifold
MFS : Common SUP, Common EXH
Ports 2 & 4 on side
MFX : Common SUP, Common EXH
Common external pilot
Ports 2 & 4 on side

Size of ports 2 and 4
01 : Rc1/8
C4 : * With push-in fitting for φ 6
C6 : * With push-in fitting for φ 8

(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Number of stations
2 : 2 station
⋮ ⋮
20 : 20 station

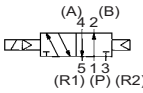
Mountable solenoid valve series
A12P

Mountable solenoid valve (For details refer to Pages 58～60.)

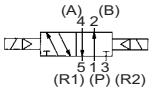
A12P S25 □ – 1 P – □ – E

Function

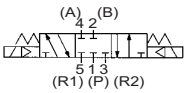
S25 : 2-position, single solenoid



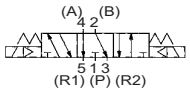
D25 : 2-position, double solenoid



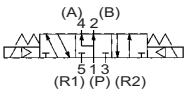
D35 : 3-position, closed center



E35 : 3-position, exhaust center



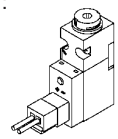
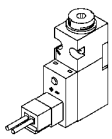
O35 : 3-position, pressure center



Wiring
No mark: Without connector
E : Connector with lead wire (Length : 500mm)

Port size
No mark: Without sub-base
(Note) A gasket & two mounting screws come with valve.

Connector position

P :	S :
	
(With indicator light and surge suppressor)	(Without indicator light and surge suppressor)

Voltage
1 : DC24V

Special specifications
No mark: Standard (Internal pilot)
X : * External pilot
(Note) External pilot valve is available only when it is mounted on MFX.

* : Made to order

A12P, A12R Series

Ordering Instructions

Manifold for A12R Series

MFU 7 – A12R – 01

Type of manifold
MFU : Common SUP, Common EXH
Ports 2 & 4 on valve body

Number of stations
2 : 2 station
⋮ ⋮
20 : 20 station

Mountable solenoid valve series
A12R

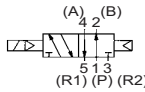
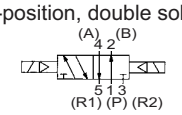
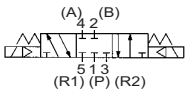
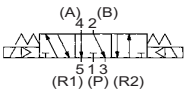
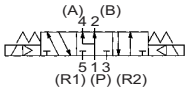
Size of ports 2 and 4
01 : Rc1/8
C4 : *With push-in fitting for φ 6
C6 : *With push-in fitting for φ 8

(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Mountable solenoid valve (For details refer to Pages 65~67.)

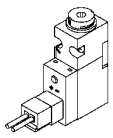
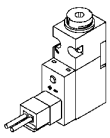
A12R S25 – 1 P – 01 – E – ☐

Function

S25 : 2-position, single solenoid	
D25 : 2-position, double solenoid	
D35 : 3-position, closed center	
E35 : 3-position, exhaust center	
O35 : 3-position, pressure center	

Voltage
1 : DC24V

Connector position

P :	S :
	
(With indicator light and surge suppressor)	(Without indicator light and surge suppressor)

Size of ports 2 and 4
01 : Rc1/8
C6 : *With push-in fitting for φ 6
C8 : *With push-in fitting for φ 8
(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Wiring
No mark: Without connector
E : Connector with lead wire (Length : 500mm)

For mounting on manifold
MF : For mounting on manifold
(Note) A gasket & two mounting screws come with valve.

* : Made to order

A12P, A12R Series

Optional Accessories and Spare parts

●Collective wiring connector

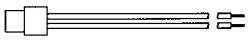
A 0 5 P — D C — C L 5

●Lead wire length
5 : 500mm
10 : * 1000mm

●Voltage
DC : For DC

●Type
P : For PR type

For PR type



DC
(−)Black
(+)Red

(Note) For common use with PR type of A05 and A12

●Locking cover

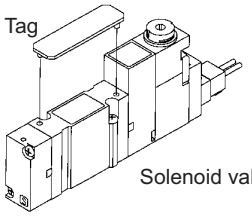
A 0 5 P — L A

●Color
A : Orange

(Note) For common use with all A05 and A12

●Tag for solenoid valve

A 0 5 P — N (Pack of 10)



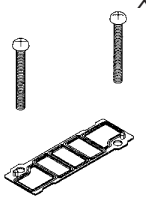
(Note) For common use with sub-base mountig type of A05, and A12

●Base gasket

A 1 2 P X — G

●Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)

●Special specifications
No mark : Standard
X : * For external pilot (With port X)

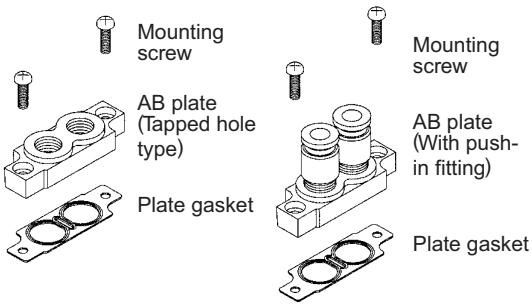


●AB plate

A 1 2 R — A B — 0 1

●Port size
01 : Rc1/8
C4 : * With push-in fitting for φ 6
C6 : * With push-in fitting for φ 8

(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.



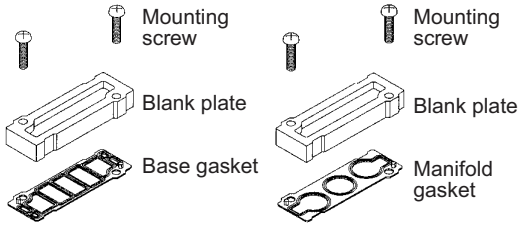
●Blank plate

For A12P

A 1 2 P — B P

For A12R

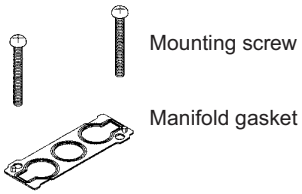
A 1 2 R — B P



●Manifold gasket

A 1 2 R — G

●Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)



➲ * : Made to order

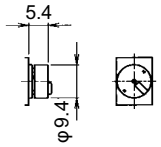
A12P, A12R Series

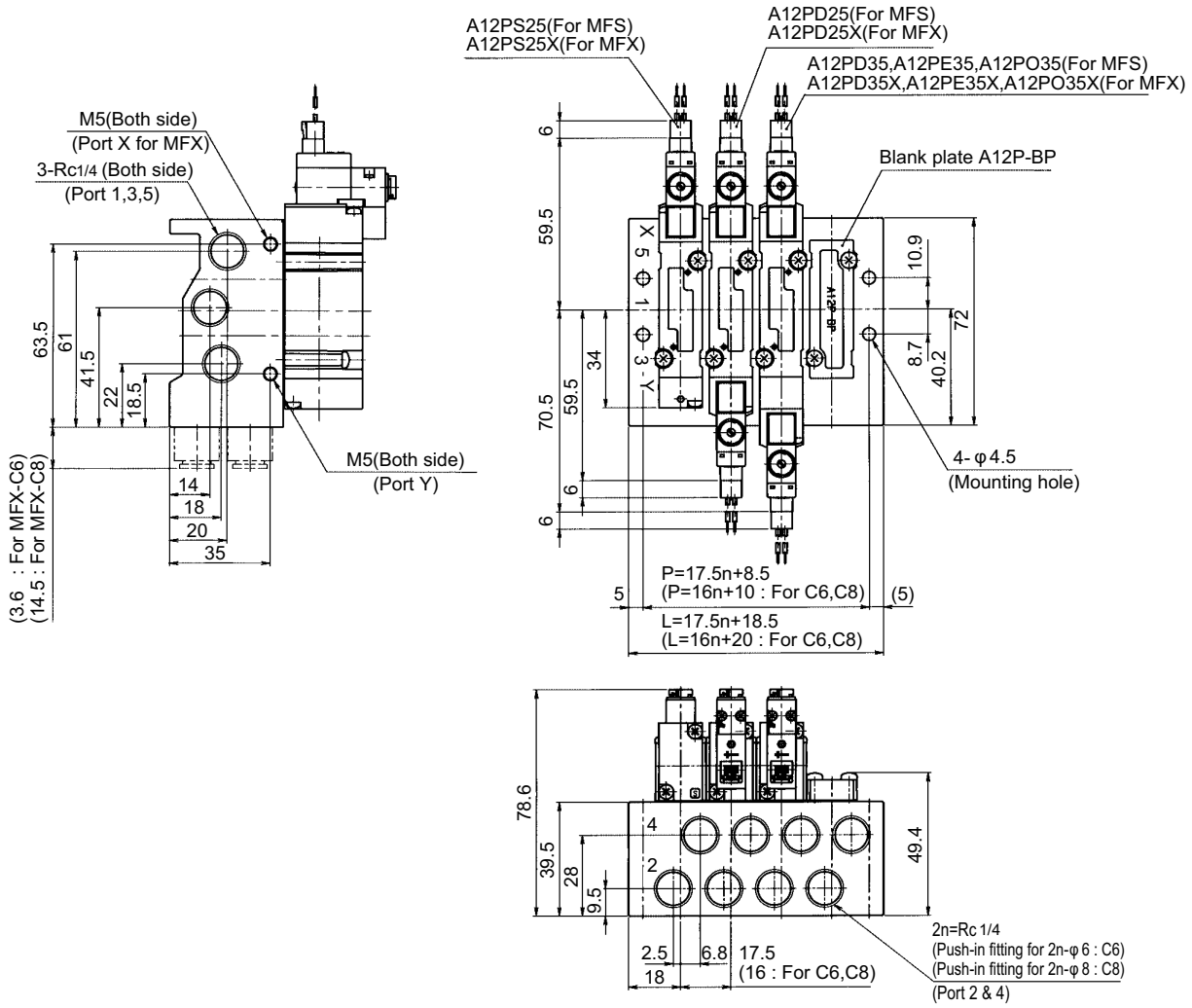
Dimensions

●MFS□-A12P-02（C6, C8）, MFX□-A12P-02（C6, C8）

(Unit : mm)

With locking cover





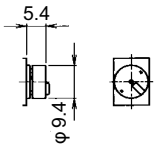
A12P, A12R Series

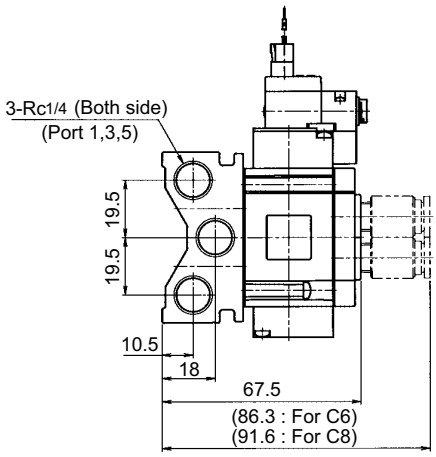
Dimensions

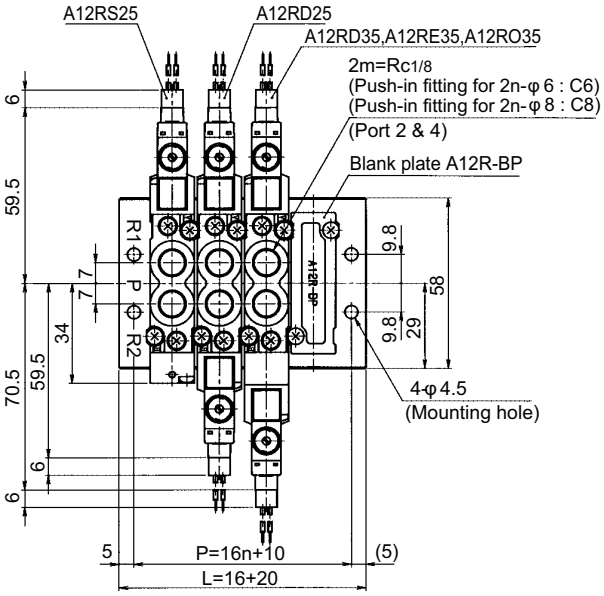
●MFU□-A12R-01（C6, C8）

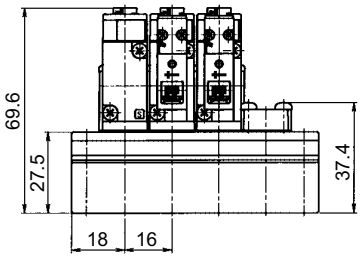
(Unit : mm)

With locking cover







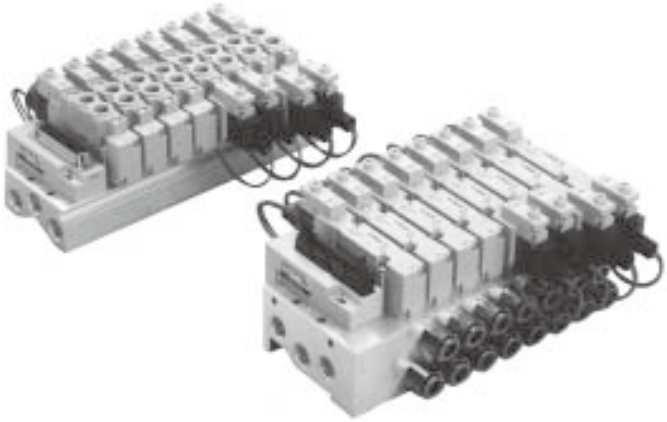


Multipin connector type manifold

MC○-A12 P/R

Bar type

MCS□-A12P	Common SUP, Common EXH Ports 2 & 4 on side
MCX□-A12P	Common SUP, Common EXH Common external pilot Ports 2 & 4 on side
MCU□-A12R	Common SUP, Common EXH Ports 2 & 4 on valve body



Manifold Specifications

		For A12P Series		For A12R Series
		MCS□-A12P	MCX□-A12P	MCU□-A12R
Type of manifold		Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Common external pilot Pilot valve captured exhaust Ports 2 & 4 on side	Common SUP, Common EXH Pilot valve captured exhaust Ports 2 & 4 on valve body
Port size	Ports 1, 3, 5	Rc1/4	Rc1/4	Rc1/4
	Ports 2, 4	Rc1/4, C6, C8	Rc1/4, C6, C8	Rc1/8, C6, C8
	Port Y	–	M5	–
	Port X	–	M5	–
Number of stations		2～12		
Mounting		Direct mount		
Mountable solenoid valve		A12PS25 A12PD25 A12PD35 A12PE35 A12PO35	A12PS25X A12PD25X A12PD35X A12PE35X A12PO35X	A12RS25 A05RD25 A05RD35 A05RE35 A05RO35
Blank plate		A12PG-BP		A12RG-BP

WIRING

When doing wiring work, be sure to turn off power beforehand.
For wiring instructions, refer to Pages 23 and 24.

A12P, A12R Series

Ordering Instructions

Manifold for A12P Series

MCS 7 – A12P – 02 – ML P – [ ]

Type of manifold
MCS : Common SUP, Common EXH
Ports 2 & 4 on side
MCX : Common SUP, Common EXH
Common external pilot
Ports 2 & 4 on side

Number of stations
2 : 2 station
⋮ ⋮
12 : 12 station

Mountable solenoid valve series
A12P

Size of ports 2 and 4
02 : Rc1/8
C6 : * With push-in fitting for φ 4
C8 : * With push-in fitting for φ 6
(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Connector specification
ML : Flat cable connector
DL : D sub-connector

Polarity
P : NPN type
M : *PNP type

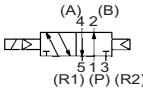
Ootion 2
DMF : With Manifold drive unit
No mark : Without Manifold drive unit
(Note) Manifold drive unit can be mounted for ML type only.

Mountable solenoid valve (For details refer to Pages 58～60.)

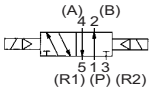
A12P S25 [ ] – 1 P – [ ] – PS

Function

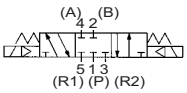
S25 : 2-position, single solenoid



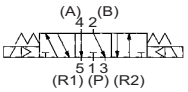
D25 : 2-position, double solenoid



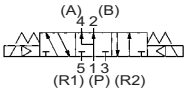
D35 : 3-position, closed center



E35 : 3-position, exhaust center



O35 : 3-position, pressure center

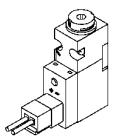
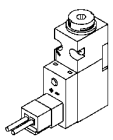


Special specifications
No mark : Standard (Internal pilot)
X : * External pilot
(Note) External pilot valve is available only when it is mounted on MCX.

Voltage
1 : DC24V

Port size
No mark : Without sub-base
(Note) A gasket & two mounting screws come with valve.

Connector position

P :	S :
	
(With indicator light and surge suppressor)	(Without indicator light and surge suppressor)

Wiring
No mark : Without connector
PS : With connector for collective wiring (For single solenoid)
PD : With connector for collective wiring (For double solenoid)
(Note) For minus common (PNP), order a connector in addition

➲ * : Made to order

A12P, A12R Series

Ordering Instructions

Manifold for A12R Series

MCU 7 – A12R – 01 – ML P – [ ]

Type of manifold
MCU : Common SUP, Common EXH
Ports 2 & 4 on valve body

Number of stations
2 : 2 station
⋮ ⋮
12 : 12 station

Mountable solenoid valve series
A12R

Size of ports 2 and 4
01 : Rc 1/8
C6 : * With push-in fitting for φ 6
C8 : * With push-in fitting for φ 8
(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Connector specification
ML : Flat cable connector
DL : D sub-connector

Polarity
P : NPN type
M : * PNP type

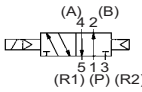
Ootion 2
DMF : With Manifold drive unit
No mark : Without Manifold drive unit
(Note) Manifold drive unit can be mounted for ML type only.

Mountable solenoid valve (For details refer to Pages 65～67.)

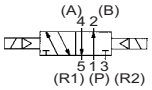
A12R S25 – 1 P – 01 – PS – [ ]

Function

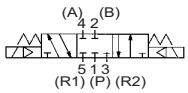
S25 : 2-position, single solenoid



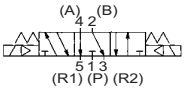
D25 : 2-position, double solenoid



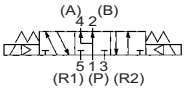
D35 : 3-position, closed center



E35 : 3-position, exhaust center



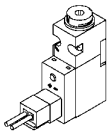
O35 : 3-position, pressure center



Voltage
1 : DC24V

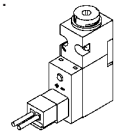
Connector position

P :



(With indicator light and surge suppressor)

S :



(Without indicator light and surge suppressor)

Size of ports 2 and 4
01 : Rc 1/8
C6 : * With push-in fitting for φ 6
C8 : * With push-in fitting for φ 8
(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Wiring
No mark : Without connector
PS : With connector for collective wiring (For single solenoid)
PD : With connector for collective wiring (For double solenoid)
(Note) For minus common (PNP), order a connector in addition

For mounting on manifold
MF : For mounting on manifold
(Note) A gasket & two mounting screws come with valve.

➔ * : Made to order

A12P, A12R Series

Optional Accessories and Spare parts

●Collective wiring connector

A 1 2 P S — C C — □

●Polarity
No mark : NPN type
M : * PNP type

●Type
PS : For PR type single solenoid
PD : For PR type double solenoid

For PR type single solenoid

For PR type double solenoid

●Locking cover

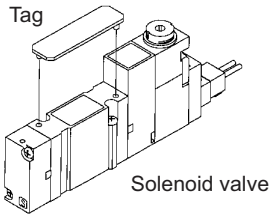
A 0 5 P — L A

●Color
A : Orange

(Note) For common use with all A05 and A12

●Tag for solenoid valve

A 0 5 P — N (Pack of 10)



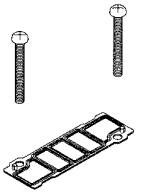
(Note) For common use with sub-base mountig type of A05, and A12.

●Base gasket

A 1 2 P X — G

●Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)

●Special specifications
No mark : Standard
X : * For external pilot (With port X)

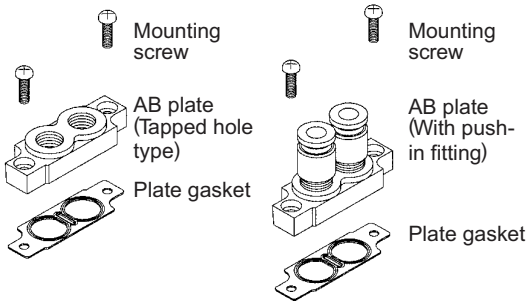


●AB plate

A 1 2 R — A B — 0 1

●Port size
01 : Rc1/8
C6 : * With push-in fitting for φ 6
C8 : * With push-in fitting for φ 8

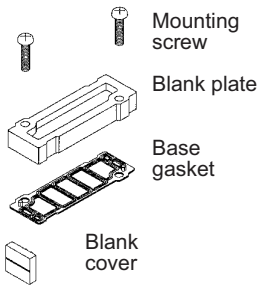
(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.



●Blank plate

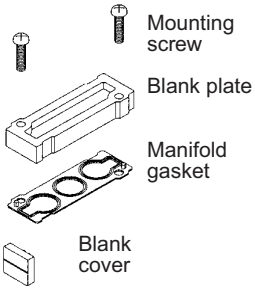
For A12P

A 1 2 P G — B P



For A12R

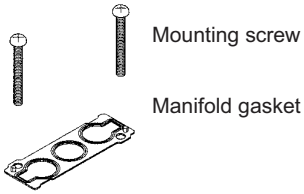
A 1 2 R G — B P



●Manifold gasket

A 1 2 R — G

●Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)



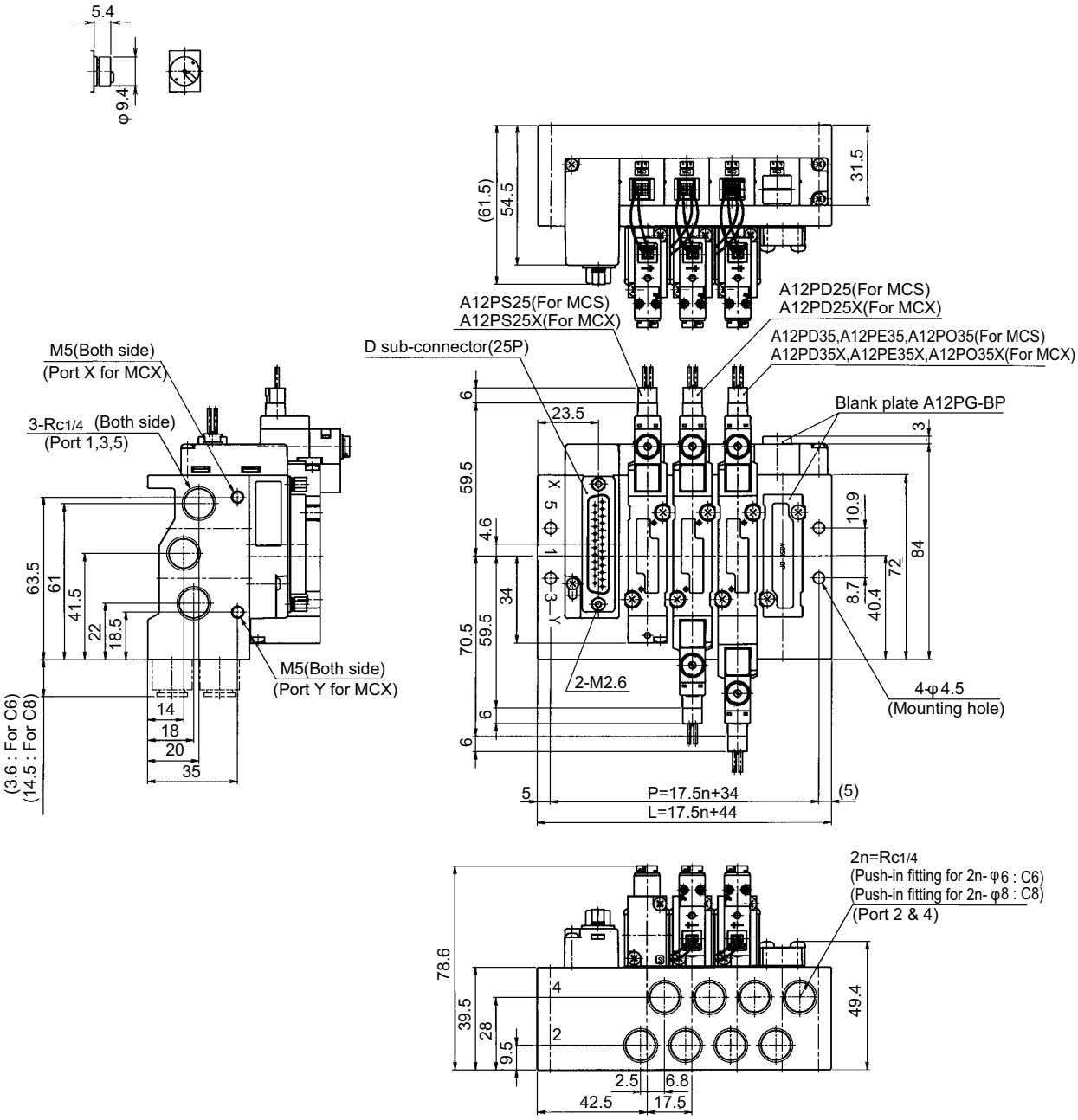
➲ * : Made to order

A12P, A12R Series

Dimensions

●MCS□-A12P-02（C6, C8）-DL, MCX□-A12P-02（C6, C8）-DL (Unit : mm)

With locking cover

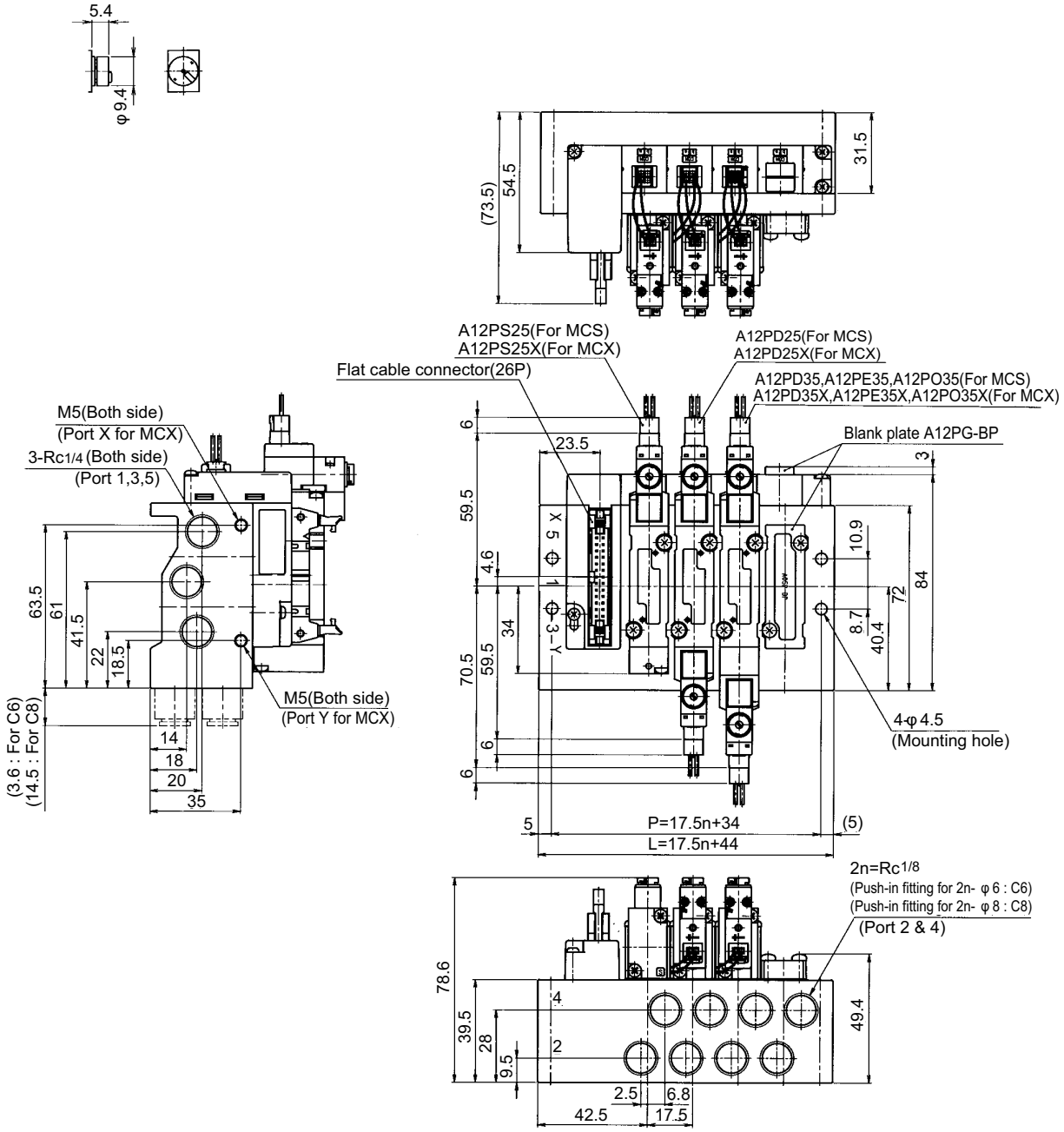


A12P, A12R Series

Dimensions

●MCS□-A12P-02（C6, C8）-ML，MCX□-A12P-02（C6, C8）-ML (Unit : mm)

With locking cover



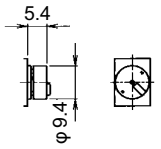
A12P, A12R Series

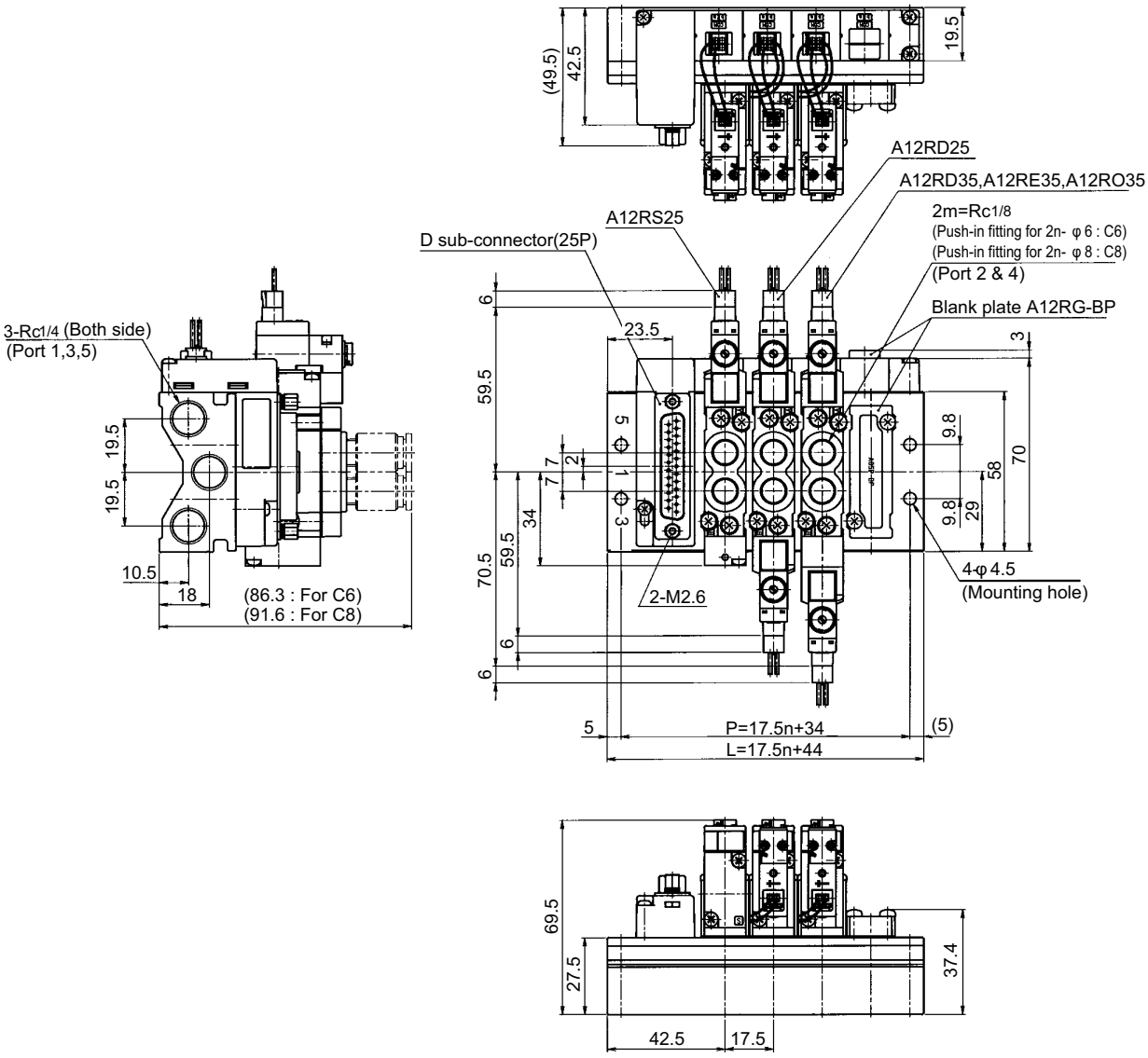
Dimensions

●MCU□-A12R-01（C6, C8）-DL

(Unit : mm)

With locking cover





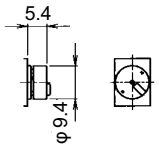
A12P, A12R Series

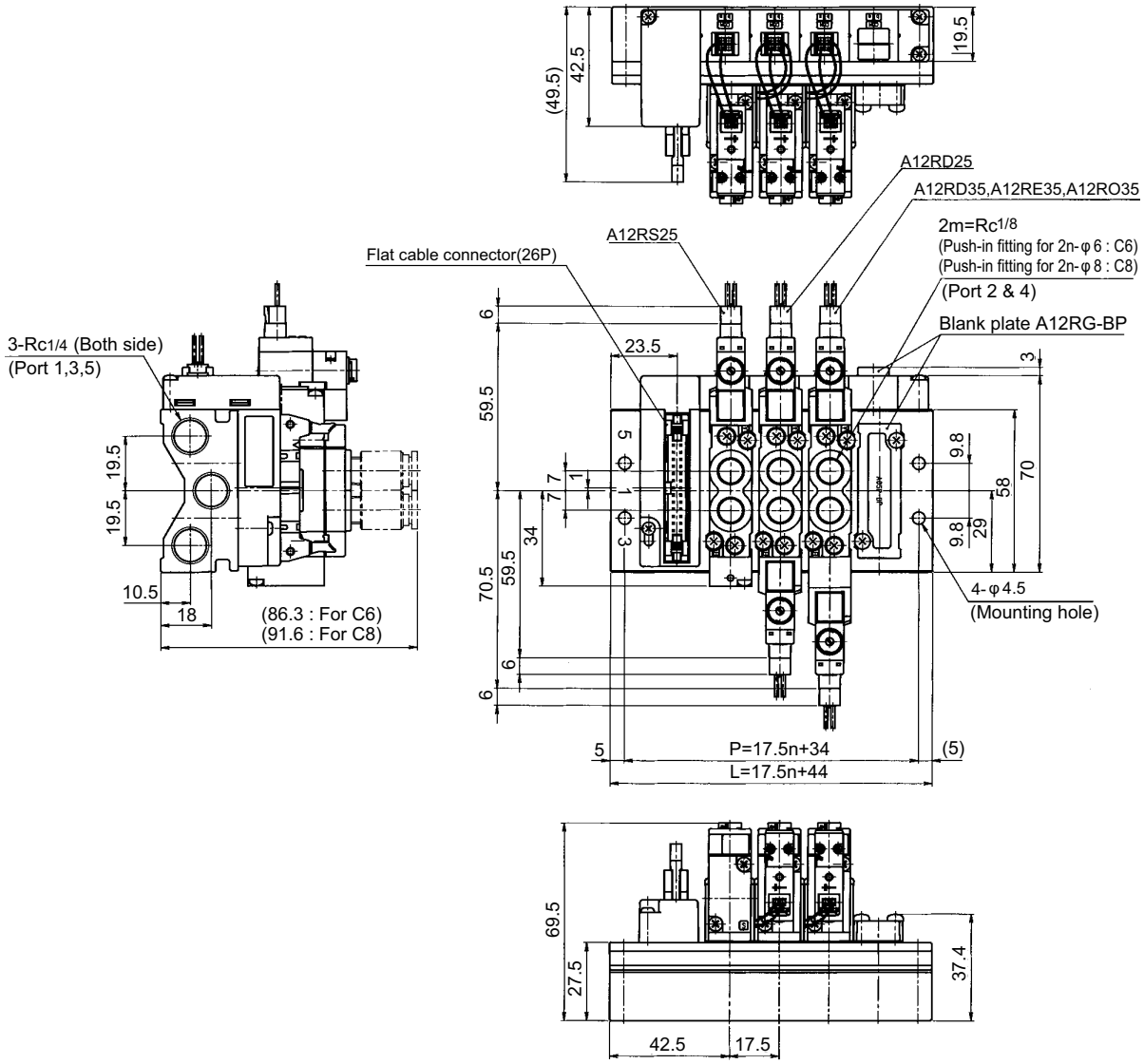
Dimensions

●MCU□-A12R-01（C6, C8）-ML

(Unit : mm)

With locking cover





ADEX

VALVE

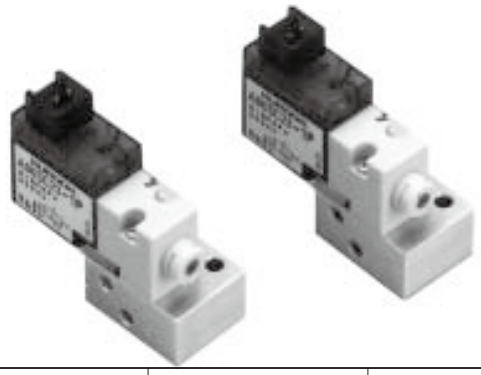
A00S SERIES

3 Port direct operated solenoid valve

A00S Series

Poppet Seal /Sub-base Mounting type

A00SO23	2-position Single solenoid Normal open
A00SC23	2-position Single solenoid Normal closed



Specifications

Model No.			Unit	A00SO23	A00SC23	A00SO23J	A00SC23J
Fluid				Non-lubricated/lubricated air			
Port size				M3			
Effective area			mm²	0.14		0.22	
Cv value				0.008		0.012	
Operating ambient temperature			℃	−5～50			
Pressure range			MPa	0～0.5	0～0.7	0～0.5	0～0.7
Vacuum version			MPa	−0.1～0.4 Port 3 → Vacuum Port 1 → Pressured air	−0.1～0.6 Port 1 → Pressured air Port 3 → Vacuum	−0.1～0.5 Port 3 → Vacuum Port 1 → Pressured air	−0.1～0.6 Port 1 → Pressured air Port 3 → Vacuum
Maximum frequency			cycle/min	600			
Response time	DC	ON	s	0.005			
		OFF	s	0.005(0.01)			
Manual override				Screwdriver-operated locking button			
Mounting position				Free			
Shock resistance. vibration resistance			m/s²	150/30			
Mass	No base		g	12.6			
	With sub-base		g	20.6			

(Note)・ Service kit not available
・ When temperature of valve site goes down below 5℃ , complete dry air should be supplied to prevent from freezing.
・ Response time in bracket ( ) shows with surge suppressor.
・ Response time shown above is in accordance with JIS B 8375.
・ Effective area shown above is a value between ports 1 and 2, 4.

Electrical Specifications

Rated voltage	DC		V	24	
Permissible voltage fluctuation			%	+10, −10	
Power consumption	DC		W	0.6 (with indicator light and surge suppressor) 0.55 (without indicator light and surge suppressor)	0.91 (with indicator light and surge suppressor) 0.86 (without indicator light and surge suppressor)
Grade of insulation				JIS grade E	
Wiring				Plug-in connector	
Surge suppressor				Diode	
Indicator light				LED	

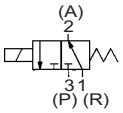
A00S Series

Ordering Instructions

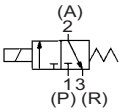
A00S O23 J – 1 P – M3 – E

Function

O23 : Single solenoid, normal open



C23 : Single solenoid, normal closed



Flow

No mark : Standard type
J : Large flow type

Voltage

1 : DC24V

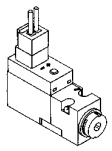
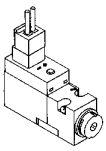
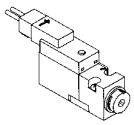
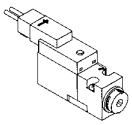
Wiring

No mark : Without connector
E : Connector with lead wire (Length : 500mm)

Port size

No mark : Without sub-base
M3 : M3
(Note) Valve without sub-base comes with a base gasket & two mounting screws.

Connector position

P :  (With indicator light and surge suppressor)	S :  (Without indicator light and surge suppressor)
Q :  (With indicator light and surge suppressor)	B :  (Without indicator light and surge suppressor)

A00S Series

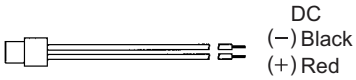
Optional Accessories and Spare parts

● Connector with lead wire

A 0 5 P − D C − C L 5

● Lead wire length
5 : 500mm
10 : *1000mm

● Voltage
DC : For DC

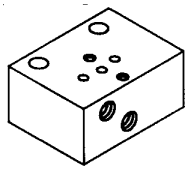


(Note) For common use with PR type of A05, A12 and A00S

● Sub-base

A 0 0 S − B − M 3

● Port size
M3 : M3



● Base gasket

A 0 0 S − G

● Content of kit
SG : Gasket & mounting screws
G : Gasket only(Pack of 10)
S : Mounting screw only (Pack of 20)


Mounting screw


Base gasket

● Locking cover

A 0 5 P − L A

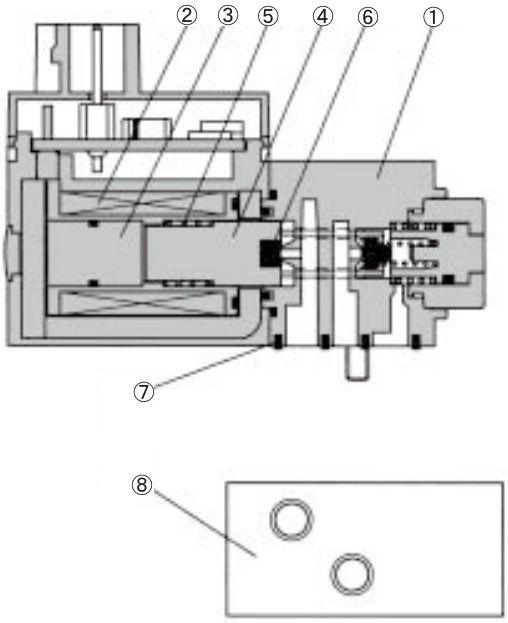
● Color
A : Orange

(Note) For common use with all A05, A12 and A00S

➔ * : Made to order

A00S Series

Material Specification



Main Parts

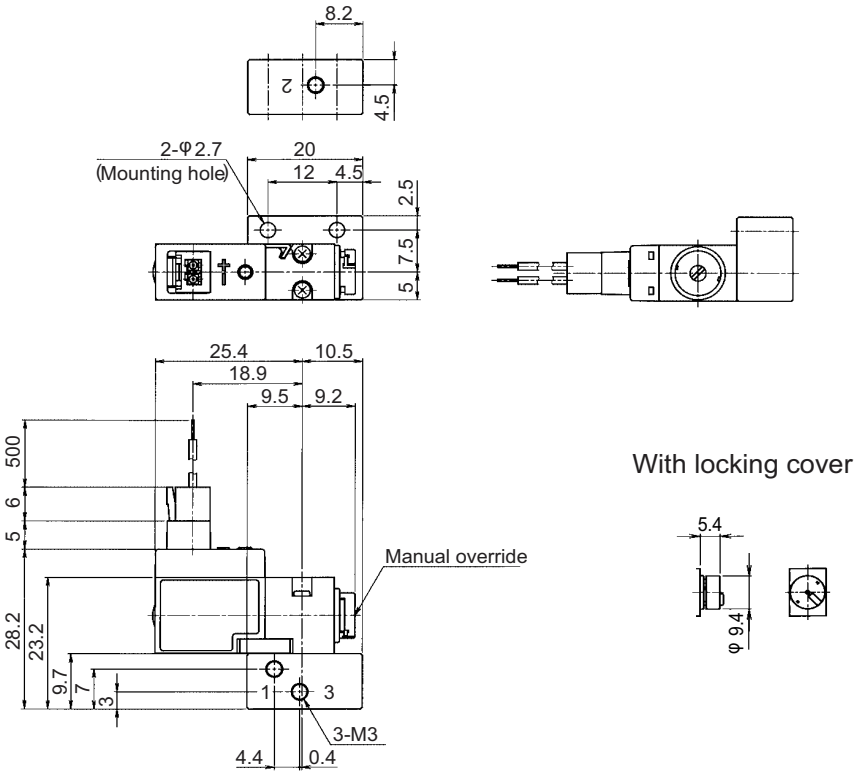
No.	Description	Material
①	Body	Resin
②	Solenoid coil	—
③	Core	Stainless
④	Armature ass'y	Stainless/NBR
⑤	Return spring	Stainless
⑥	Valve seat	NBR
⑦	Base gasket	NBR
⑧	Sub-base	Aluminium alloy

A00S Series

Dimensions

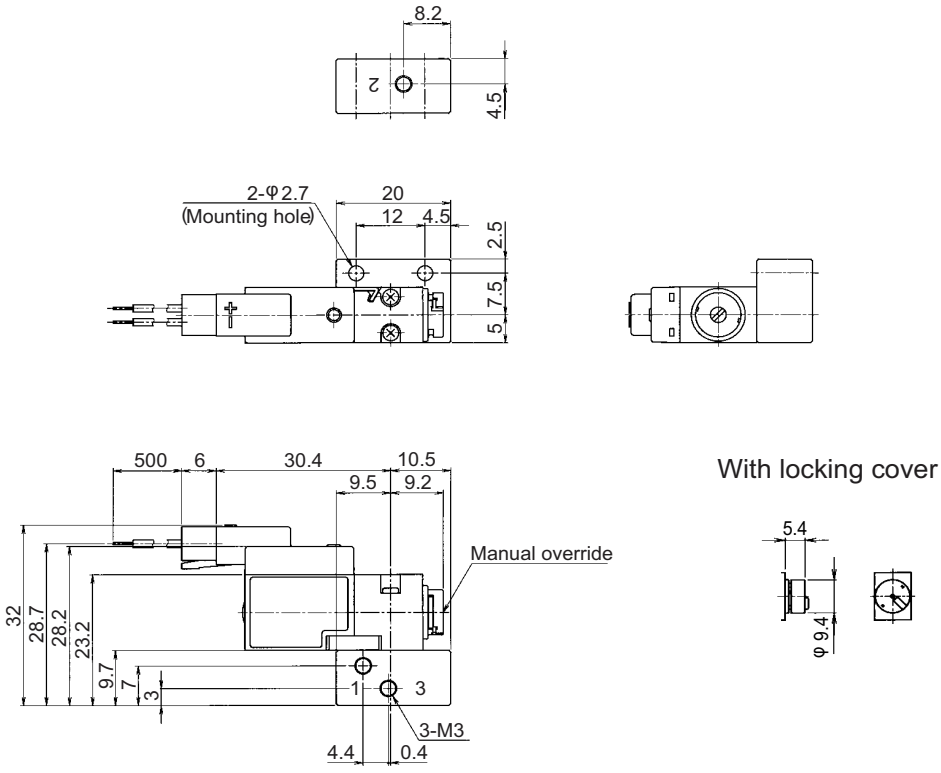
●A00SO23-□P（S）, A00SC23-□P（S）

(Unit : mm)



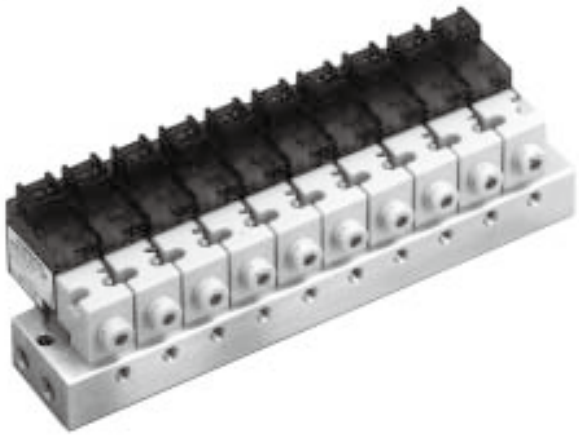
●A00SO23-□Q（B）, A00SC23-□Q（B）

(Unit : mm)



Individual Wiring type manifold
MFS-A00S
Bar type

MFS□-A00S Common SUP, Common EXH
Port 2 on side



Manifold Specifications

		MFS□-A00S
Type of manifold		Common SUP, Common EXH Port 2 on side
Port size	Port 1, 3	M5
	Port 2	M3, M5
Number of stations		2～20
Mounting		Direct mount
Mountable solenoid valve		A00SO23, A00SO23J A00SC23, A00SC23J
Blank plate		A00S-BP

(Note) A00SO23(J) cannot be mounted on the same manifold together with A00SC23(J).

A00S Series

Ordering Instructions

Manifold for A00S Series

MFS 7 – A00S – M3

Type of manifold
MFS : Common SUP, Common EXH
A port on side

Number of stations
2 : 2 station
⋮ ⋮
20 : 20 station

Mountable solenoid valve series
A00S
(Note) A00SO23 (J) cannot be mounted on the same manifold together with A00SC23 (J).

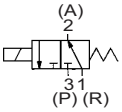
Size of port 2
M3 : M3

Mountable solenoid valve (For details refer to Pages 87 ~89.)

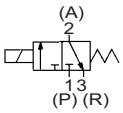
A00S O23 J – 1 P – ☐ – E

Function

O23 : Single solenoid, normal open



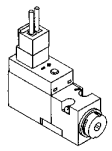
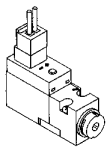
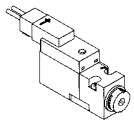
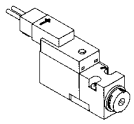
C23 : Single solenoid, normal closed



Flow
No mark: Standard type
J : Large flow type

Voltage
1 : DC24V

Connector position

P :  (With indicator light and surge suppressor)	S :  (Without indicator light and surge suppressor)
Q :  (With indicator light and surge suppressor)	B :  (Without indicator light and surge suppressor)

Wiring
No mark: Without connector
E : Connector with lead wire (Length : 500mm)

Port size
No mark : Without sub-base
(Note) A gasket & two mounting screws come with a valve.

A00S Series

Optional Accessories Spare parts

● Connector with lead wire

A 0 5 P — D C — C L 5

● Lead wire length
5 : 500mm
10 : * 1000mm

● Voltage
DC : For DC

DC
(−) Black
(+) Red

(Note) For common use with PR type of A05, A12 and A00S

● Locking cover

A 0 5 P — L A

● Color
A : Orange

(Note) For common use with all A05, A12 and A00S

● Base gasket

A 0 0 S — G

● Content of kit
SG : Gasket & mounting screws
G : Gasket only (Pack of 10)
S : Mounting screw only (Pack of 20)

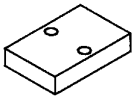
Mounting screw

Base gasket

● Blank plate

A 0 0 S — B P

Mounting screw



Blank plate

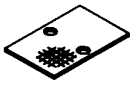


Plate gasket

➔ * : Made to order

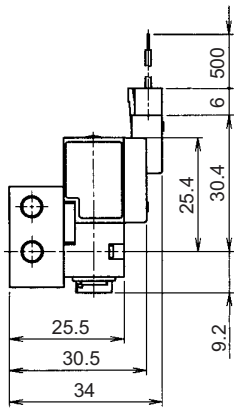
A00S Series

Dimensions

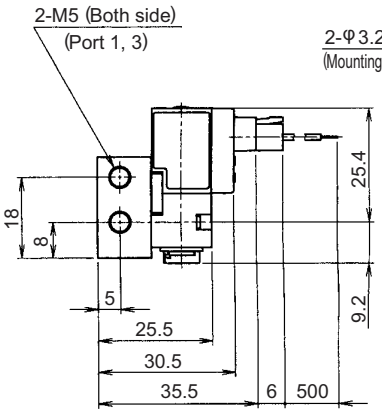
●MFS□-A00S-M3

(Unit : mm)

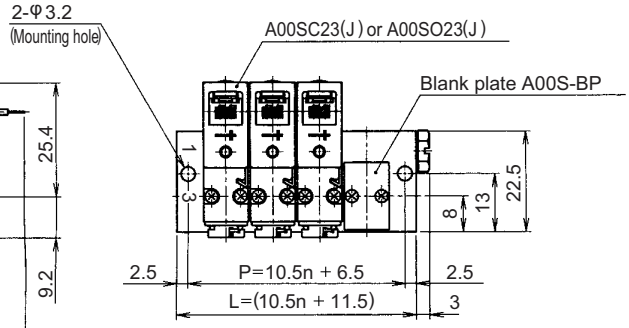
Connector position : Q or B



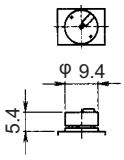
Connector position : P or S



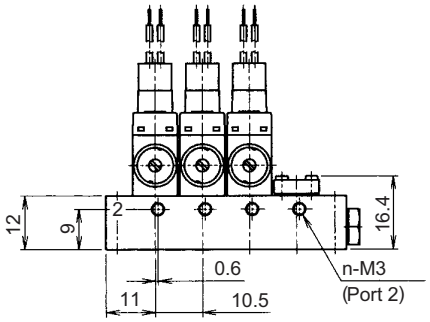
(Note) A00SO23 (J) cannot be mounted on the same manifold together with A00SC23 (J).



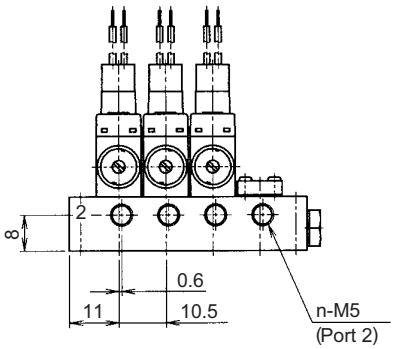
With locking cover



Port 2 : M3



Port 2 : M5



ADEX

VALVE

Manifold Specifications

INDIVIDUAL WIRING TYPE/MFC

MANIFOLD SPECIFICATIONS

(Duplicate this page and fill in this form).

Date of issue . .

Your company name			
Person in charge			
Specification No.			
Order No.			
Quantity	Set (s)	Date of delivery	

Type of manifold

Write a mark of circle in□ at the head of the type of manifold to be used and fill in this form.

(Note) * : Made to order

□ PR type MFC □ -A05P - □ - □

● Number of stations
2 : 2 station
⋮ ⋮
20 : 20 station

● Size of ports 2 and 4

M5	○
C4	
C6	
CZ	

(Note) CZ : For use with tubes of different diameter

● Bracket
No mark : Without bracket
B : With bracket
(Note) Bracket can be mounted only when A05PS25 alone is mounted.

Type of mountable solenoid valve

Fill in blanks for type of solenoid valve.

A05P * * * - □ □

Function

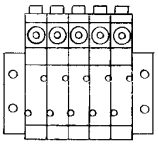
● Voltage
1 : DC24V

● Wiring
NPN type
P : With indicator light and surge suppressor
S : Without indicator light and surge suppressor
* PNP type (Only GF type)
M : With indicator light and surge suppressor
J : Without indicator light and surge suppressor

Number of stations

Specify the type and arrangement of solenoid valve to be mounted by a mark of circle.
Standard manifold is so designed that all ports open.
When plugging a port, specify the intended place to be plugged by writing"×" in the column of port specification.
When using tubes of different diameter on the same manifold, specify the required size by writing a symbol C4 or C6 in the column of port specification.

Number of stations →① ② ③ ④ ⑤



Number of stations for manifold			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Quantity
Mounted solenoid valve	Single solenoid	S25																					
	Double solenoid	D25																					
	Closed center	D35																					
	Exhaust center	E35																					
	Pressure center	O35																					
Blank plate																							
Port specification	Port 2																						
	Port 4																						

For factory use				For sales department use		
Control No.	Approved by :	Checked by :	Received by:	Manufacture No.	Approved by :	Person in charge

INDIVIDUAL WIRING TYPE/MFS,MFX

MANIFOLD SPECIFICATIONS

(Duplicate this page and fill in this form).

Date of issue . .

Your company name			
Person in charge			
Specification No.			
Order No.			
Quantity	Set(s)	Date of delivery	

Type of manifold

Write a mark of circle in□ at the head of the type of manifold to be used and fill in this form.

(Note) * : Made to order

□ PR type MF □ □ -A □ P - □ - □

- Special specifications
  - S : Standard
  - X : Common external pilot
- Number of stations
  - 2 : 2 station
  - ⋮ ⋮
  - 20 : 20 station
- Mountable solenoid
  - Value series
  - A05 Series
  - A12 Series
- Size of ports 2 and 4

	05	12	20
01	○	—	—
02	—	○	○
C4	*	—	—
C6	*	*	—
C8	—	*	*
C10	—	—	*
CZ	*	*	*

- Bracket
  - No mark : Without bracket
  - B : With bracket
  - (Note) Bracket can be mounted only when A05PS25 alone is mounted.
  - (Note) C4 and C6 of A05 series can be applied to MFX alone.
  - CZ : For use with tubes of different diameter
  - When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Type of mountable solenoid valve

Fill in blanks for type of solenoid valve.

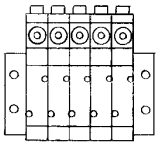
A □ P * * * □ - □ □

- Solenoid valve series
  - A05 : Series
  - A12 : Series
- Function
- Special specifications
  - No mark : Standard
  - X : External pilot
  - (Note) X is used only when solenoid valve is mounted on manifold for common external pilot.
- Wiring
  - NPN type
  - P : With indicator light and surge suppressor
  - S : Without indicator light and surge suppressor
  - * PNP type (Only GF type)
  - M : With indicator light and surge suppressor
  - J : Without indicator light and surge suppressor
- Voltage
  - 1 : DC24V

Number of stations

Specify the type and arrangement of solenoid valve to be mounted by a mark of circle.
Standard manifold is so designed that all ports open.
When plugging a port, specify the intended place to be plugged by writing"×" in the column of port specification.
When using tubes of different diameter on the same manifold, specify the required size by writing a symbol C4, C6, C8 or C10 in the column of port specification.

Number of stations →①②③④⑤



Number of stations for manifold			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Quantity
Mounted solenoid valve	Single solenoid	S25																					
	Double solenoid	D25																					
	Closed center	D35																					
	Exhaust center	E35																					
	Pressure center	O35																					
Blank plate																							
Port specification	Port 2																						
	Port 4																						

For factory use				For sales department use		
Control No.	Approved by :	Checked by :	Received by :	Manufacture No.	Approved by :	Person in charge

INDIVIDUAL WIRING TYPE/MFU

MANIFOLD SPECIFICATIONS

(Duplicate this page and fill in this form).

Date of issue . .

Your company name			
Person in charge			
Specification No.			
Order No.			
Quantity	Set(s)	Date of delivery	

Type of manifold

Write a mark of circle in□ at the head of the type of manifold to be used and fill in this form.

(Note) * : Made to order

□ PR type MFU □ -A □ R - □

- Number of stations
  2 : 2 station
  ⋮ ⋮
  20 : 20 station
- Mountable solenoid valve series
  A05 Series
  A12 Series
- Size of ports 2 and 4

	05	12
M5	○	—
01	—	○
02	—	—
C4	*	—
C6	*	*
C8	—	*
C10	—	—

(Note) When using G. NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Type of mountable solenoid valve

Fill in blanks for type of solenoid valve.

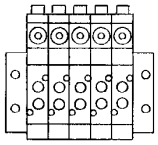
A □ R * * * - □ □

- Solenoid valve series
  A05 Series
  A12 Series
- Function
- Voltage
  1 : DC24V
- Wiring
  NPN type
  P : With indicator light and surge suppressor
  S : Without indicator light and surge suppressor
  M : With indicator light and surge suppressor
  J : Without indicator light and surge suppressor

Number of stations

Specify the type and arrangement of solenoid valve to be mounted by a mark of circle.
Standard manifold is so designed that all ports open.
When plugging a port, specify the intended place to be plugged by writing"×" in the column of port specification.

Number of stations →① ② ③ ④ ⑤



Number of stations for manifold			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Quantity
Mounted solenoid valve	Single solenoid	S25																					
	Double solenoid	D25																					
	Closed center	D35																					
	Exhaust center	E35																					
	Pressure center	O35																					
Blank plate																							
Port specification	Port 2																						
	Port 4																						

For factory use				For sales department use		
Control No.	Approved by :	Checked by :	Received by:	Manufacture No.	Approved by :	Person in charge

MULTIPIN CONNECTOR TYPE/MCC

MANIFOLD SPECIFICATIONS

(Duplicate this page and fill in this form).

Date of issue . .

Your company name			
Person in charge			
Specification No.			
Order No.			
Quantity	Set(s)	Date of delivery	

Type of manifold

Write a mark of circle in□ at the head of the type of manifold to be used and fill in this form.

(Note) * : Made to order

□ PR type MCC □ - A05P - □ - □ □

- Number of stations
  - 2 : 2 station
  - ⋮ ⋮
  - 12 : 12 station
- Size of ports 2 and 4

M5	○
C4	*
C6	*
CZ	*

(Note) CZ : For use with tubes of different diameter

- Connector specification
  - DL : D sub-connector
  - ML : Flat cable connector
- Polarity
  - P : NPN type
  - M : * PNP type

Type of mountable solenoid valve

Fill in blanks for type of solenoid valve.

(Note) * : Made to order

A05P * * * - □ □

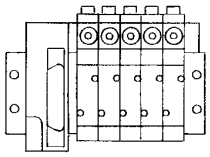
- Function
- Voltage
  - 1 : DC24V
- Wiring

NPN type
- P : With indicator light and surge suppressor
- S : Without indicator light and surge suppressor
- M : With indicator light and surge suppressor
- J : Without indicator light and surge suppressor

Number of stations

Specify the type and arrangement of solenoid valve to be mounted by a mark of circle.
Standard manifold is so designed that all ports open.
When plugging a port, specify the intended place to be plugged by writing"x" in the column of port specification.
When using tubes of different diameter on the same manifold, specify the required size by writing a symbol C4 or C6 in the column of port specification.

Number of stations →① ② ③ ④ ⑤



Number of stations for manifold			1	2	3	4	5	6	7	8	9	10	11	12	Quantity
Mounted solenoid valve	Single solenoid	S25													
	Double solenoid	D25													
	Closed center	D35													
	Exhaust center	E35													
	Pressure center	O35													
Blank plate															
Port specification	Port 2														
	Port 4														

For factory use				For sales department use		
Control No.	Approved by :	Checked by :	Received by :	Manufacture No.	Approved by :	Person in charge

MULTIPIN CONNECTOR TYPE/MCS, MCX

MANIFOLD SPECIFICATIONS

(Duplicate this page and fill in this form.)

Date of issue . .

Your company name			
Person in charge			
Specification No.			
Order No.			
Quantity	Set (s)	Date of delivery	

Type of manifold

Write a mark of circle in□ at the head of the type of manifold to be used and fill in this form.

(Note) * : Made to order

□ PR type MC □ □ -A □ P - □ - □ □

- Special specifications
  - S : Standard
  - X : Common external pilot
- Number of stations
  - 2 : 2 station
  - ⋮ ⋮
  - 12 : 12 station
- Mountable solenoid Valve series
  - A05 Series
  - A12 Series
- Size of ports 2 and 4

	05	12
01	○	—
02	—	○
C4	*	—
C6	*	*
C8	—	*
C10	—	—
CZ	*	*

- Polarity
  - P : NPN type
  - M : *PNP type
- Connector specification
  - DL : D sub-connector
  - ML : Flat cable connector

(Note) C4 and C6 of A05 series can be applied to MCX alone.
CZ : For use with tubes of different diameter
When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Type of mountable solenoid valve

Fill in blanks for type of solenoid valve.

(Note) * : Made to order

A □ P * * * □ - □ □

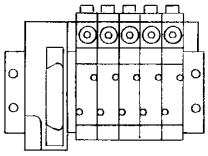
- Solenoid valve series
  - A05 Series
  - A12 Series
- Function
- Special specifications
  - No mark : Standard
  - X : External pilot
- Wiring NPN type
  - P : With indicator light and surge suppressor
  - S : Without indicator light and surge suppressor
  - M : With indicator light and surge suppressor
  - J : Without indicator light and surge suppressor
- Voltage
  - 1 : DC24V

(Note) X is used only when solenoid valve is mounted on manifold for common external pilot.

Number of stations

Specify the type and arrangement of solenoid valve to be mounted by a mark of circle.
Standard manifold is so designed that all ports open.
When plugging a port, specify the intended place to be plugged by writing" " in the column of port specification.
When using tubes of different diameter on the same manifold, specify the required size by writing a symbol C4, C6, C8 or C10 in the column of port specification.

Number of stations →① ② ③ ④ ⑤



Number of stations for manifold			1	2	3	4	5	6	7	8	9	10	11	12	Quantity
Mounted solenoid valve	Single solenoid	S25													
	Double solenoid	D25													
	Closed center	D35													
	Exhaust center	E35													
	Pressure center	O35													
Blank plate															
Port specification	Port 2														
	Port 4														

For factory use				For sales department use		
Control No.	Approved by :	Checked by :	Received by:	Manufacture No.	Approved by :	Person in charge

MULTIPIN CONNECTOR TYPE/MCU

MANIFOLD SPECIFICATIONS

(Duplicate this page and fill in this form).

Date of issue . .

Your company name			
Person in charge			
Specification No.			
Order No.			
Quantity	Set(s)	Date of delivery	

Type of manifold

Write a mark of circle in□ at the head of the type of manifold to be used and fill in this form.

(Note) *: Made to order

□ PR type MCU □ -A □ F - □ - □ □

- Number of stations
  - 2 : 2 station
  - ⋮ ⋮
  - 12 : 12 station
- Mountable solenoid
  - Value series
  - A05 Series
  - A12 Series
- Size of ports 2 and 4

	05	12
M5	○	—
01	—	○
02	—	—
C4	*	—
C6	*	*
C8	—	*
C10	—	—

- Connector specification
  - DL : D sub-connector
  - ML : Flat cable connector
- Polarity
  - P : NPN type
  - M : *PNP type

(Note) When using G, NPT, NPTF threads, consult KURODA Pneumatics Ltd.

Type of mountable solenoid valve

Fill in blanks for type of solenoid valve.

(Note) *: Made to order

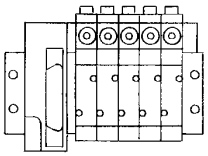
A □ R * * * - □ □

- Solenoid valve series
  - A05 Series
  - A12 Series
- Function
- Voltage
  - 1 : DC24V
- Wiring
  - NPN type
  - P : With indicator light and surge suppressor
  - S : Without indicator light and surge suppressor
  - *PNP type (Only GF type)
  - M : With indicator light and surge suppressor
  - J : Without indicator light and surge suppressor

Number of stations

Specify the type and arrangement of solenoid valve to be mounted by a mark of circle.
Standard manifold is so designed that all ports open.
When plugging a port, specify the intended place to be plugged by writing"×" in the column of port specification.

Number of stations →①②③④⑤



Number of stations for manifold			1	2	3	4	5	6	7	8	9	10	11	12	Quantity
Mounted solenoid valve	Single solenoid	S25													
	Double solenoid	D25													
	Closed center	D35													
	Exhaust center	E35													
	Pressure center	O35													
Blank plate															
Port specification	Port 2														
	Port 4														

For factory use				For sales department use		
Control No.	Approved by :	Checked by :	Received by:	Manufacture No.	Approved by :	Person in charge

INDIVIDUAL WIRING TYPE/MFS

MANIFOLD SPECIFICATIONS

(Duplicate this page and fill in this form.)

Date of issue . .

Your company name			
Person in charge			
Specification No.			
Order No.			
Quantity	Set (s)	Date of delivery	

Type of manifold

Fill in blanks for type of manifold.

MFS □ – A00S – M3

- Number of stations
  2 : 2 station
  ⋮ ⋮
  20 : 20 station
- Mountable solenoid Value series
  A00S Series
- Size of port 2
  M3 : M3

Type of mountable solenoid valve

Fill in blanks for type of solenoid valve.

(Note) * : Made to order

A00S ＊＊＊ □ – □ □ – □

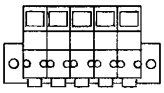
Function

- Flow
  No mark : Standard type
  J : Large flow type
  (Note) J is DC only.
- Voltage
  1 : DC24V
- Wiring
  P : With indicator light and surge suppressor
  S : Without indicator light and surge suppressor
  Q : With indicator light and surge suppressor
  B : Without indicator light and surge suppressor
  (Note) S & B : In case of AC, without indicator light with surge suppressor
- Connector
  No mark : Without connector
  E : With connector

Number of stations

Specify the type and arrangement of solenoid valve to be mounted by a mark of circle. However, A00SO23(J) cannot be mounted on the same manifold together with A00SC23(J).
Standard manifold is so designed that all ports open.
When plugging a port, specify the intended place to be plugged by writing"×" in the column of port specification.

Number of stations →① ② ③ ④ ⑤



Number of stations for manifold			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Quantity
Mounted solenoid valve	Normal open	O23																					
	Normal closed	C23																					
Blank plate																							
Port specification	Port 2																						

For factory use				For sales department use		
Control No.	Approved by :	Checked by :	Received by:	Manufacture No.	Approved by :	Person in charge

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7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitations, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer, or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets (hereinafter "Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgements resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure"). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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