

KONAN®

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For pneumatic

MAGSTER III Series 3 • 5 Port SOLENOID VALVES



1. More compact

2. More power-saving

3. Safer

MAGSTAR III

Magstar III series is a pneumatic solenoid valve for use in general industrial pneumatic systems.

Based on a thoroughly compact design, Magstar III series is designed to reduce configuration and functions to enhance ease of use and reliability of oil-less operation, in response to the latest trends in industry.

DIN connector connection

Magstar III series is available with a DIN connector (also available with a lamp) for reliable wiring in addition to the lead wire connection, which allows you to choose the most suitable connection method.

Low power consumption solenoid

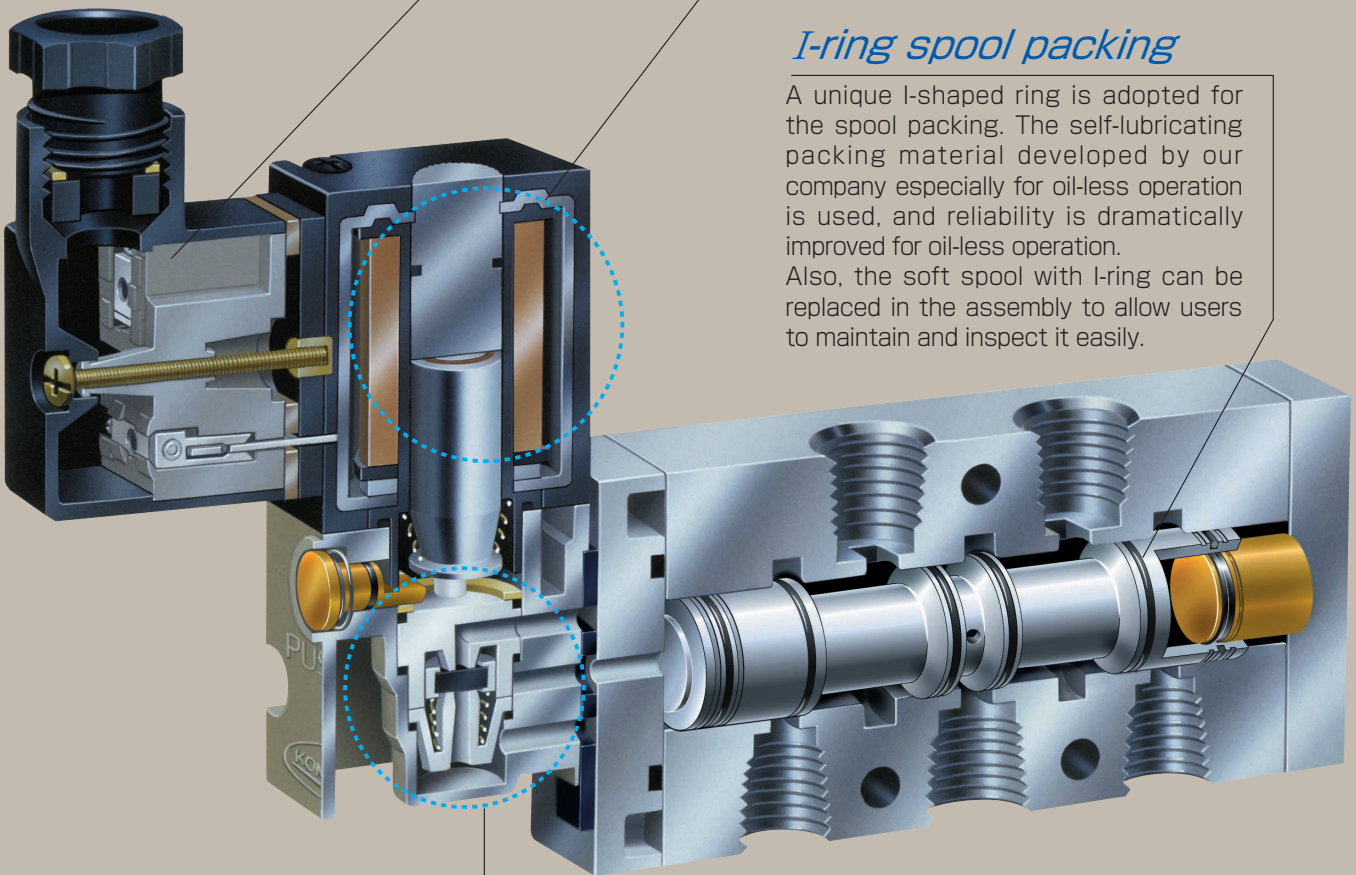
Equipped with a low power consumption solenoid that can be directly connected to a sequencer or IC. Uses a special resin mold to achieve high stability and long life.

I-ring spool packing

A unique I-shaped ring is adopted for the spool packing. The self-lubricating packing material developed by our company especially for oil-less operation is used, and reliability is dramatically improved for oil-less operation. Also, the soft spool with I-ring can be replaced in the assembly to allow users to maintain and inspect it easily.

Plastic cassette valve

The valve part is a maintenance-oriented cassette type that can be installed and removed in the assembly. In addition, the valve has a poppet structure with few sliding parts, which eliminates the sticking.



4. Easier

5. More lubrication-oil-less

Reliable
KONAN solenoid valves

Magstar III series with a wide variety of variations to meet every need

313 Type

3 Port Solenoid Valve



Gasket-connected type

There are two types of single-acting actuators and diaphragm valves : normally closed and normally open

Plastic cassette valve with low power consumption solenoid, equipped with DIN connectors.

| | |
|-------------------|----|
| Model code | 10 |
| Specification | 11 |
| Actuation | 11 |
| Dimension drawing | 11 |

Manifold type

Compact individual exhaust system and easy maintenance centralized exhaust system

Two forms are available, a laminated manifold (individual exhaust) form and an integrated manifold (collective exhaust) form, to meet a variety of applications.

| | |
|-------------------|----|
| Model code | 12 |
| Dimension drawing | 13 |
| Model code | 13 |

453 Type

5 Port Solenoid Valve



Direct Piping type

A design concept that focuses on the direction required by the times

The core of Magstar III series that collects cutting-edge technologies

Compact and low power consumption while handling high flow rates. A variety of newly developed functions make this high performance valve even more reliable.

| | |
|-------------------|-------|
| Model code | 14 |
| Specification | 15 |
| Actuation | 16~17 |
| Dimension drawing | 18~19 |

Manifold type

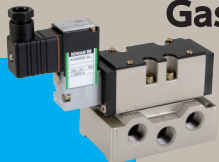
Light-weight condensation mechanism for power-saving design
Multi-functional manifold for a wide range of applications.

integrated easy manifold, equipped with two types of individual exhaust and collective exhaust.

| | |
|-------------------|-------|
| Model code | 20~21 |
| Dimension drawing | 22~25 |
| Model code | 23・25 |

413 Type

5 Port Solenoid Valve



Gasket-connected type

ISO and JIS standards are used for the body mounting surface.
Pursuing standardization as well as high flow rates

It is easy to use and maintain and maximizes the flow rate, while being compact, lightweight and energy efficient.

| | |
|-------------------|-------|
| Model code | 26~27 |
| Specification | 27 |
| Actuation | 28~29 |
| Dimension drawing | 30~33 |

Manifold type

Integrated exhaust system
The standard also applies to the manifold.

The dimensions of the body mounting surface are in accordance with ISO and JIS standards. It is designed with focusing on functionality, such as the collective exhaust system of the laminated manifold.

| | |
|-------------------|----|
| Model code | 34 |
| Dimension drawing | 35 |
| Model code | 35 |

Solenoid Valves for Fluid Control and Valve Systems

General Handling Instructions and Precautions


Please read the following general handling precautions carefully before ordering solenoid valves for fluid control.

Following information is based on a risk assessment for Konan general purpose solenoid valves used for fluid systems (hereafter referred to as Agvalve(s)Ah). Each section provides information essential for safe operation of valve systems and prevention of risk and damage that may affect operators. Please read carefully.

Safety Precautions

References:

JIS B9702:
Safety of machinery principles of risk assessment
JIS B8370:
Pneumatic fluid power general rules relating to systems

 **Warning** A valve is operated by switching electric signals to increase / decrease or stop/supply fluid. It is widely used for fluid control systems in general. For safe operation of the valve, care should be taken especially for the following points.

① Selection of solenoid valves

1.1 Applicable fluid

A valve should be used with compressed air only, except for cases where nitrogen gas tank¹⁾ is used for system inspection, emergency measure, or portable pressure source. If highly dry air with dew point of no more than -40°C is to be used, make sure to use the valve with lubrication taking into consideration the dryness measure.

For a general purpose solenoid valve (for liquid and gas fluid) for which air is not specified as one of applicable fluids, do not employ compressed air as a flow media. For anything unclear regarding applicable fluids, feel free to ask our sales personnel in the planning stage.

Note1) Be careful to avoid suffocation of operators and others around the valve system. For a system that uses portable air or nitrogen tank, the High Pressure Gas Safety Law will be applied where fluid pressure exceeds 1 MPa.

1.2 Safety of a valve

A pneumatic system may be exposed to various hazardous environment, including those derived from the system components as well as the condition for use and the system structure. In selecting a valve make sure to take into consideration the valve function as well as safety in installation, adjustment, actual operation, system failure, and disposal of the valve.

1.3 Electrical safety

A solenoid valve is activated by magnetic force (solenoid). Take into consideration the following matters when selecting a valve and electric options.

- 1) Dust-proof/water-proof specification Water-proof indication should follow JIS C0920.
- 2) Sudden shut down of power source (power failure, emergency shutdown, etc.)
- 3) Voltage fluctuation in power source and electrical surge
- 4) Leakage current at PLC (sequencer) power off Konan solenoid valves are not equipped with functions that meet the following conditions. Do not use the valves in these conditions or employ a safe electric distribution.
 - 1) External magnetic field effect
 - 2) Electric current from the relevant control circuit
 - 3) Lightning-induced voltage

1.4 Pilot valve

A compact size pilot valve is widely used in general, as it switches large main valve with a small output. However, a certain inlet pressure is essential for the valve operation. For control of minimal pressure, select a direct-acting type valve. With optional pilot supply (separate pilot piping needed), a pilot valve can be used even when the main valve pressure is zero.

1.5 Back pressure from exhaust port

In some poppet valves, back pressure from the exhaust port may affect the valve operation. There is no problem with the back pressure generated in the silencer set at the exhaust port, but do not force to narrow the exhaust port diameter or connect a long pipe to the port. Details of the effect of back pressure are described in a separate operation manual. For anything unclear feel free to contact our sales personnel.

1.6 Reverse flow

Use a valve complying with the flow direction indicated with arrow mark in the JIS figure of the catalogue and operation manual. Safe operation cannot be guaranteed if the valve is used with reverse pressure or reverse flow. There is no problem with the slow reverse flow exhaustion during maintenance or compressor power off. If valve operation is stopped abnormally, a failure may occur when restarting operation due to the stop position of the valve. If reverse flow is detected at abnormal stop or any trouble at the restart of the valve is concerned, feel free to ask our sales personnel.

1.7 Manual operation

- 1) If there is a possibility that manual operation button of a valve may be pushed unexpectedly, select a valve equipped with protection cover.
- 2) If failure to unlock manual operation of a valve may cause serious danger, select a valve without locking function.

② Solenoid valve installation

Solenoid valves have precise operational functions and are used for applications with versatile conditions and environment. It is therefore sometimes difficult to assume all concerned risks or risk factors when designing a valve. In such cases the valve function and performance may be deteriorated in a period shorter than the maintenance period set by the manufacturer. In order to avoid the risks, install the valve as instructed below.

2.1 Installation site

Install a valve in a place where setting and maintenance is easy. As a valve is often incorporated into an existing main system, consideration for maintenance is sometimes insufficient. Secure enough space for safety of the valve operation.

2.2 Operating procedure

When operating a valve to activate a pneumatic cylinder and other actuators, install the components and complete piping, and then start operation of the actuators with small load and slow speed, gradually adjusting them to rated conditions while confirming no abnormalities or air leakage in the valve and actuators.

2.3 Bursting out of a cylinder

After installation or maintenance, supply air after confirming that a cylinder is in a targeted valve control position. If not in

the position, the cylinder may rapidly shift to the control position. In order to avoid this risk, installation of a slow-start valve at the IN port of the valve is recommended.

Note) (See Section 2.4) When installing a slow-start valve at the IN port of a pilot valve, adjust a bypass valve of the slow-start valve in order to maintain minimal operational pressure of the pilot valve. If the bypass valve diameter is excessively narrowed, the pilot pressure will become less than the minimal operational pressure, which may cause valve malfunction.

Also, when restarting air supply, open a manual valve in a short period of time while checking manometer to secure minimal operational pressure of the pilot valve, and then supply air slowly.

2.4 Securing pilot pressure

Install a pilot valve taking care for the following matters.

- 1) Inlet pressure of a valve should be higher than the minimal operational pressure. Especially if air supply is not enough, pressure fluctuation may occur during the valve operation and pressure may be below the lower limit of the operational pressure.
- 2) If long piping is employed at the inlet of a valve or the pipe diameter is smaller than the port diameter, pressure drop may occur, resulting in the inlet pressure decrease.

Note: One countermeasure is to install a supplementary air tank in front of the inlet port. In order to confirm no decrease in inlet pressure, install a manometer around the port.

- 3) For a manifold type solenoid valve, make sure to connect allowable number of valves only. Simultaneous operation with excess number of valves (more than 3 units in standard) may cause centralized pressure drop at the manifold, decreasing the valve inlet pressure.

Note: For a manifold with two inlet ports, the number of valves can be increased by supplying air from both ports.

2.5 Indication

If a valve nameplate cannot be seen due to installation environment, place an alternative indication near the valve.

2.6 Residual pressure

Compressed air in a pneumatic valve system may not be completely exhausted after the valve power shut down. Residual pressure may cause unintended cylinder operation in the system. A valve should be installed taking into consideration the risks including sudden blowout of residual air.

2.7 Air exhaustion

At an exhaust port of a valve, sonic jet flow may occur, causing noise as well as damage to operator due to the fragments and dusts spread by the jet flow. If any personnel may come closer to the exhaust port, install a silencer to avoid noise and adjust air flow.

2.8 Training

A sufficiently trained person should be responsible for installation and maintenance of a pneumatic system. (Konan provides training for operation and maintenance of pneumatic components. Feel free to contact our sales personnel for details.)

③ Maintenance of solenoid valves

Maintenance should be performed in accordance with the following steps. Feel free to contact our sales personnel for separate maintenance manual.

3.1 Daily inspection

- 1) Drains contained in compressed air may inhibit the valve lubrication. Set an air filter in front of the valve and routinely exhaust drains.actuators.

- 2) During the valve system operation, check the valve visually and acoustically for external abnormalities or noise. Check also the loosening of screws and air leakage from exhaust port and piping joint without exhausting air from the system, and perform periodical inspection as necessary to recover any abnormalities.

3.2 Periodical inspection

Following periodical inspection should be conducted by-annually or annually.

- 1) Overhaul should be performed after pneumatic/electric shut-down and abnormalities recorded and repair conducted as necessary.
- 2) In the 2nd periodical inspection, perform an overhaul of the product, repair or exchange solenoid assAfy, coil, packings, and other components as necessary. However, even before 2 years has passed, the valve that reached the specified durable operation cycle²⁾ should be over hauled and parts exchanged if necessary.

Note2) [Laboratory durable operation cycle]: New Magstar 414 series and heavy duty series solenoid valves: 5 million cycles

Durable operation cycle for each valve is specified in the operation manual or drawing. This cycle is determined based on the Konan standard test results. Inspection interval should be determined referring to the actual installation environment or storage records.

- 3) If a valve is not used for a long time, the valve function may be deteriorated when restarting operation, due to precipitation or effusion of lubricant film. According to the JIS standard, minimal operation frequency of a valve is specified as once in 30 days. Before reaching that date perform periodical test operation or take other measures for preventing the valve deterioration.

3.3 Residual energy

Maintenance requiring actual operation of a system should be performed after pneumatic/electric shut-down and exhaustion of all residual electrical charge and compressed air from the system. Make sure the movable components do not move during the maintenance, and mechanically fix them if necessary for safety. Care should also be taken for components that may drop out during the maintenance operation and components with sharp edges to ensure safety.

3.4 Communication

If multiple persons are involved in the maintenance operation, keep all the personnel informed about the conditions including power-off, completion of residual pressure exhaustion, power-on, and resumption of air supply.

④ Solenoid valve installation site

Use of a valve at the following sites requires compliances with special functional specifications and regulations. Consult our sales personnel in the planning process for anything unclear. thing unclear.

- 1) Operating conditions not within the specified range
- 2) Significant risk for users, properties, or environment is anticipated

Eg: Use in explosive environment³⁾, use for nuclear power plants, vehicles, medical components, components related to the Occupational Health and Safety Law and/or the High Pressure Gas Safety Law, etc.

Note3) : Select Konan explosion-proof solenoid valves for use in general gas explosive environment.

Users Instructions

Followings are comprehensive precautions for operation of a solenoid valve and a system incorporating a valve. Make sure to keep in mind these matters for maintaining safety.

Caution ① **Transport of solenoid valves**

1.1 Weight

For safety of operators, heavy-weight valves and valve units should be transported with the aid of conveyer equipment. Valve weight can be confirmed by referring to Konan Pneumatic Solenoid Valve Catalogue and product drawings. Mini-size valves should be handled with care, as they may collapse by excessive force. Especially make sure not to hold the lead wire when transporting the valves.

1.2 Dropping

During lifting or horizontal transportation of a valve, handle the valve carefully not to drop or damage.

1.3 Dust prevention

Plastic plug is attached to the valve connection ports to prevent dusts and rusts from entering the valve. Do not remove the plug until immediately before piping. If the plug is lost, take a protection measure with alternative cover.

Caution ② **Storage**

2.1 Storage during transport

If a valve is to be installed where it is exposed to wind and rain or other adverse environment, transport the valve to the specified site just before installation. If the valve is to be stored at the installation site by necessity, keep it packed and protect with a sheet cover.

2.2 Storage

A valve should be stored as follows to prevent contamination and material deterioration.

- 1) Avoid high temperature and humidity as well as places with dusts.
- 2) If a valve is to be stored for more than 1 year, keep it packed or provide equivalent protection.
- 3) Long-term storage may result in sticking of packings or other components due to shortage of lubrication. In such cases, conduct pre-conditioning operation of the valve before regular use.
- 4) After a long period of storage, permanent deformation, change of size, or deterioration of packings and other components would be a concern. After such storage period, conduct a valve operation test. If any abnormalities are found, perform an overhaul or exchange deformed/deteriorated components as appropriate

Warning ③ **Surrounding environment**

3.1 Vibration/shock

- 1) Install a valve using hose connection to avoid the place where the valve is exposed to excessive shock or vibration. Care should be taken not to make outlet piping longer, which may affect system response.
- 2) If a valve is to be installed in a place where it is exposed to excessive shock or vibration, set the valve with a vibration isolation table. Ensure the valve is firmly fixed at the setting and connection portions fastened tightly. After start of operation, inspect the connections in a periodical manner to check any loose parts or deformation and re-fasten screws.

3.2 Handling during installation

For safety of operators

Do not ride on a valve and pipes or hang wires on the operational equipment during installation.

3.3 Surrounding environment

Environment surrounding a valve should be considered carefully. Avoid places where the valve is exposed to rain and wind, direct sunlight, salt, corrosive gas, chemical fluids, organic solvents, steam, etc. Corrosion resistance measure can be taken depending on the environment. Feel free to contact our sales personnel for details.

3.4 Working temperature

Use a valve with specified range of ambient temperature and fluid temperature. Care should be taken especially for the following cases.

- 1) Temperature of compressed air around an air compressor may become high, which may cause deterioration of packings or malfunction of the valve.
- 2) Coil life depends on thermal degradation of insulation material. Avoid high temperature environment or continuous energization as much as possible.
- 3) In a place where temperature is close to 0°C, remove moisture in the compressed air with an air dryer. If the dehumidification is not performed, significant amount of moisture may freeze inside the valve to cause malfunction.

Warning ④ **Modification**

Do not modify a solenoid valve. Unexpected risk may arise.

Caution ⑤ **Intermediate stop of a cylinder by control of a solenoid valve**

- 1) A pneumatic cylinder can be stopped intermediately by controlling with a 3-position closed-center type solenoid valve. Due to compressible nature of air, however, precise stop position or retention rigidity of the stop position cannot be secured.
- 2) If the piping area between the speed control valve and the closed-center solenoid valve is large, air shifts from inside the cylinder to the valve pipings even after the valve is closed, thus the stop position shifts. In order to avoid this, install a speed control valve in front of the closed-center valve to minimize piping length.
- 3) As sealing portions inside a valve or cylinder system allow minimal leakage, it is difficult to maintain the intermediate stop position for a long time. If long-term retention of the stop position is necessary, install mechanical retention equipment such as brake, lock, or latching system.

Caution ⑥ **Spray lubrication using a lubricator**

See Konan Solenoid Valve Catalogue if a valve needs lubrication. For valves that need lubrication, set a lubricator at the inlet of the valve and perform spray lubrication.

6.1 Type of lubricating oil

- 1) Use JIS K 2213 (ISO VG32 or VG46) type turbine oil for lubrication using a lubricator.
- 2) Spray volume of a lubricator is determined by the number of oil drops (typically 0.03cm³ per drop or 1.5 to 2.5 drops per 1m³ of air).

6.2 Centralized lubrication

In principle 1 lubricator should be used for 1 valve. Lubricating multiple valves may result in uneven oil supply to each valve or actuator, particularly if there are differences in the operation

frequency, pipe length, size, and installation height of the actuators. By grouping the valves and actuators with similar conditions, centralized lubrication can be achieved.

6.3 Selection of oilless solenoid valve

For control of an oilless actuator, select an oilless solenoid valve. If the valve is not frequently used, lubricated oil may not reach the valve or actuator due to little spray volume.

- 1) Use specified grease for overhaul of an oilless solenoid valve. Reconfirm the type of grease with our sales personnel.
- 2) A greased oilless valve or oilless actuator can be lubricated, but once lubricated, the grease will be exhausted. Although durability is enhanced after the lubrication, continual lubrication will be required.

Reference **⑦ Pneumatic system control**

7.1 Sequence control

Follow the below steps for sequence control of an actuator incorporating a pneumatic valve.

- 1) Detect the position.
- 2) Interlock the circuit of the valve that controls other actuators in the system.

7.2 Power failure and pneumatic pressure failure

- 1) In case of power failure or emergency stop during a sequence operation, select normal stop position of the valve so that the cylinder at operation stops or shifts to a safe position. Depending on the type of valve following action may be seen at emergency stop.
 - a) Single-acting return type: Shifts to the start position.
 - b) Double-acting detent (retention) type: Shifts to the final stop position.
 - c) Closed-center type: Stops at the current position.
- 2) If operation is stopped in the middle of sequence and restarting operation from the stopped position may cause any trouble, manually control each actuator to return to the start position. Indicate procedure to recover operation.
- 3) If operation is stopped in the middle of sequence and air inside the system exhausted, a cylinder piston may drop due to gravity or it may rapidly shift at the next air supply to damage operator or surrounding equipment. Make sure to return the piston to the start position before exhausting air from the system.
- 4) In order to complete a cycle operation even in case of pressure failure, reserve sufficient amount of pneumatic pressure in an air tank.

Warning **⑧ Residual pressure exhaustion**

In a system circuit using a check valve (non-return valve), a pilot check valve, and/or a closed center solenoid valve, exhaust residual pressure separately or indicate warnings for residual pressure, as air may be contained even the system is not in operation.

Indicate the manual type valve for residual pressure exhaustion in the system circuit drawing.

Reference **⑨ Circuit and piping**

9.1 Pressure drop

In a pneumatic control system employing long pipes at the end or entrance of the system, sufficient pressure may not be supplied due to pressure drop. Piping thus should be designed properly, or supplementary air tank should be installed to secure supply pressure if a valve is operated intermittently.

9.2 Air filtration

Air supplied to a valve should be filtrated by a filter with nominal filtration rating of no more than 40 mm to remove solid contaminants. Exhaust liquid drain or oil through the filter or drain separator after sufficient cooling of the air.

Exposure to contaminated, high temperature compressed air may deteriorate packings or other components, making the valve life shorter.

9.3 Piping

- 1) Use galvanized pipe for steel tube piping and remove dusts after screwing.
- 2) Before connection, clean the pipes by air flushing or washing to remove internal dusts, moisture, and oil.
- 3) If a seal tape is used for screwing, wrap the tape around twice or three times in a direction opposite to the screwing direction, leaving 1.5 to 2 threads from the screw edge.
- 4) When screwing pipes and joints into a valve, use an appropriate size of wrench and fasten the pipes and joints to the extent not causing air leakage. Forceful screwing may result in cracking of the valve connection port or leakage/malfunction due to contamination with fragments of sealing materials.
- 5) In case of 6A to 25A (Rc1/8 to 1) size pipes or joints, 4 to 5 threads should be screwed. An exercise for seal tape wrapping and screwing before actual work is recommended.
- 6) A valve (especially large-size valve) should be fixed not only with the piping but also with supporting components. For some mini-size solenoid valves with steel tube piping, supporting components may be used for the piping portion. In this case sufficiently support around the valve with piping clamp and other components.

Caution **⑩ Electrical circuit and piping**

- 1) Reconfirm that the voltage and current (AC or DC) of power source and the valve to be used are identical.
- 2) For DC solenoid, check the polarity of the connection terminal to avoid improper connection.
- 3) For a double solenoid valve with common terminal, make sure not to perform improper common connection.
- 4) If TRIAC is used for the AC output of the PLC (sequencer), leakage current at power shut down may affect action of solenoid or indicator lamp. In such case submit the PLC output specification to the PLC manufacturer or Konan sales personnel to discuss about a method to decrease leakage current.
- 5) Power surge due to electromagnetic induction at solenoid power off may significantly shorten the operating life of junction on the electrical circuit. For Konan solenoid valves without surge absorber, consult our sales personnel for a method to connect surge absorber.
- 6) For lead wire connection, wiring should be conducted using appropriate connecting terminal while keeping the wire loose.

Caution **⑪ Special valves**

For valves with special specifications like below, consult our sales personnel before ordering regarding the conditions for use.

- 1) Use with carbon gas or nitrogen gas
- 2) Use under conditions with high/low temperature or high radiant heat
- 3) Use at a place with ozone or salt
- 4) Use in explosive environment

Warning **⑫ Disposal**

- 1) Do not incinerate a valve for disposal. It may explode or emit poisonous gas.
- 2) Check the material of each component of a valve with catalogue or operation manual for segregation disposal. Konan solenoid valves do not include materials indisposable as general industrial waste.

1 Type

Magstar III solenoid valve series is classified as follows:

1-1. 3-port solenoid valve

3-port solenoid valve has 3 ports: fluid inlet (P-port), outlet (A-port), and exhaust port (R-port). This is mainly used for operation of single-acting actuators or diaphragm valves. The valve structure is as follows:

Normally closed : Air flow stops when solenoid is de-energized.

Normally open : Air flows when solenoid is de-energized.

1-2 5-port solenoid valve

5-port solenoid valve has 5 ports: a fluid inlet (P-port), 2 load connection ports (A- and B-ports), and 2 exhaust ports (R1- and R2-ports).

This valve is mainly used for operation of double-acting actuators. Two types (return, hold) are available, and three positioning (closed center, exhaust center, pressure center) can be selected. The exhaust port can be used as connection to flow control valve (exhaust valve).

1-3 Application

Magstar III solenoid valve is a general-purpose solenoid valve suitable for high flow rate, light weight and compact general industrial machinery and can be used without lubrication oil.

1-4 Bore

The bore diameter is indicated in terms of the nominal size of screw joint (Rc).

2 JIS symbols

Solenoid valves are expressed by JIS-specified graphic symbols and characters based on JIS B0125 "Fluid power systems and components." Each symbol is shown in the Model code section.

3 Model code

DC solenoid valves have no polarity.

4 Specifications

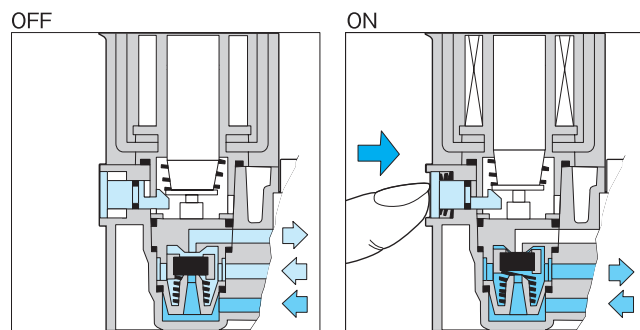
All specifications described in the catalogue are based on the results of varied tests performed in accordance with JIS B8374-1993 "Pneumatic system - 3-port solenoid operated valves" and JIS B8375-1993 "Pneumatic system - 5-port solenoid operated valves" The other parameters below are common to all solenoid valves.

| | |
|---------------------------|---|
| Internal leakage | Less than the value specified in JIS B8374/8375 |
| Ambient relative humidity | Not more than 95% |
| Insulation resistance | Not less than 10 M Ω (Measured by 500 V Megger test) |
| Withstand voltage | Commercial frequency, 1500 V, 1 min |

Consult with us if the product is to be used with specifications other than those listed above.

5 Manual operation mechanism

The manual operation mechanism (push button) is provided as standard on all models of Magstar III solenoid valve series.

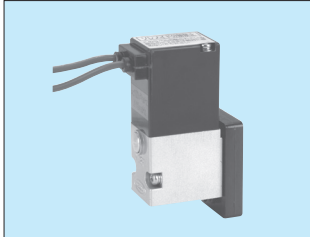
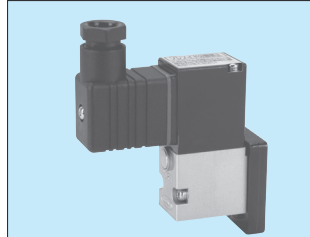
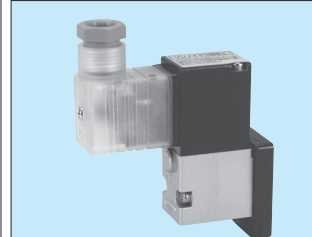

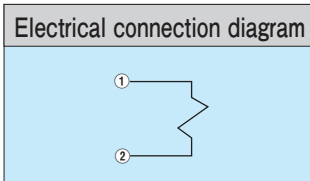
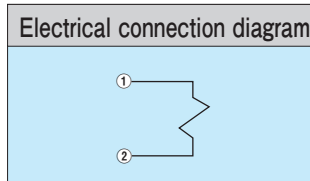
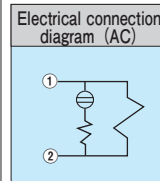
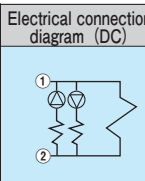
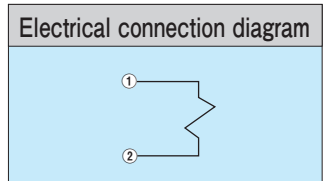
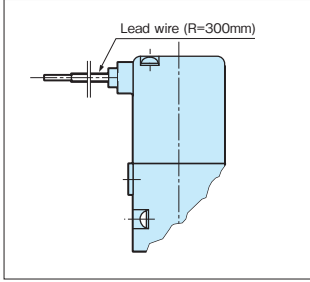

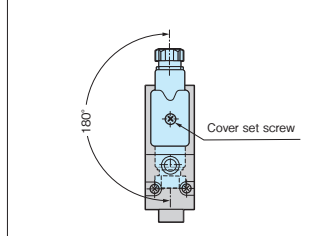
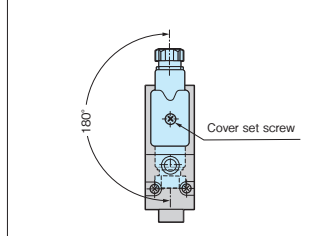


6 General Handling Precautions

General handling precautions common to all types of solenoid valves are listed on pages 3 to 6. Please read the details.

7 Wiring and connection

Select the most suitable wiring method for the solenoid valve from the following four types.

| L Lead wire type | D DIN connector type (w/o Lamp) | N DIN connector type (with Lamp) | W Waterproof connector type | | | | | | | | | | | | |
|--|--|--|--|---------------------------------|-----------------------|--------|----------|---------------------|-----|-----------|----------------------|-----|-----------|-----------------------|-----|
|  |  |  |  | | | | | | | | | | | | |
| <p>Electrical connection diagram</p>  | <p>Electrical connection diagram</p>  | <p>Electrical connection diagram (AC)</p>  <p>Electrical connection diagram (DC)</p>  | <p>Electrical connection diagram</p>  | | | | | | | | | | | | |
| <p>Lead wire attached are about 300mm long.</p>  <p>Be careful in wiring, not to give undue tension to the lead wires.</p> | <p>Compatible cable size</p> <p>Use a cable with a finished size of $\phi 6$ to $\phi 8$.</p> | <p>Compatible cable size</p> <p>Use a cable with a finished size of $\phi 6$ to $\phi 8$.</p> | <p>Cable take-out port</p> <p>Screw size of the cable take-out port of the waterproof terminal cover. $\dots G\frac{1}{2}$</p> | | | | | | | | | | | | |
| <p>Wiring order</p> <ol style="list-style-type: none"> Remove the cover fixing screw, push the exposed terminal block head (gray part) with a screwdriver, etc., and pull out the terminal block. Pass the cable through the gland nut, washer, packing, and cover, remove the lead wire coating, and twist both ends. Loosen the terminal fixing screws ① and ② on the terminal block, fully insert each lead wire, and tighten the screws. If ground wiring is required, connect the lead wire and to the three locations on the terminal board. After selecting the cable extraction direction (side where the cover is attached), tighten the cover fixing screw. | <p>Wiring order</p> <ol style="list-style-type: none"> Remove the cover fixing screw, push the exposed terminal block head (gray part) with a screwdriver, etc., and pull out the terminal block. Pass the cable through the gland nut, washer, packing, and cover, remove the lead wire coating, and twist both ends. Loosen the terminal fixing screws ① and ② on the terminal block, fully insert each lead wire, and tighten the screws. If ground wiring is required, connect the lead wire and to the three locations on the terminal board. After selecting the cable extraction direction (side where the cover is attached), tighten the cover fixing screw. | <p>Wiring order</p> <ol style="list-style-type: none"> Remove the cover fixing screw, push the exposed terminal block head (gray part) with a screwdriver, etc., and pull out the terminal block. Pass the cable through the gland nut, washer, packing, and cover, remove the lead wire coating, and twist both ends. Loosen the terminal fixing screws ① and ② on the terminal block, fully insert each lead wire, and tighten the screws. If ground wiring is required, connect the lead wire and to the three locations on the terminal board. After selecting the cable extraction direction (side where the cover is attached), tighten the cover fixing screw. | <p>Wiring order</p> <ol style="list-style-type: none"> Run the leads through the cover and insulation sleeve, then peel back the insulation from the leads (apprx. 4mm) and neatly twist the individual strands together. Insert the lead wire into the FASTON terminal, crimp it, fix it with an insulating sleeve, and insert it into the DIN terminal on the coil side. <p>NOTE: The FASTON terminals for connecting the ground wire is not supplied with an insulating sleeve.</p> <ol style="list-style-type: none"> After selecting the cable extraction direction (side where the cover is attached), tighten the cover fixing screw. <p>NOTE: The O-rings provided with the waterproof connector should not be lost.</p> | | | | | | | | | | | | |
| <p>FASTON terminal : 42232 - 3</p>  <p>Tool : 47417 Maker : Made by AMP</p> | <p>The change the cable take-out direction</p> <p>Either cable take-out direction can be selected by loosening the cover fixing screw and pulling out the cover.</p>  | <p>The change the cable take-out direction</p> <p>Either cable take-out direction can be selected by loosening the cover fixing screw and pulling out the cover.</p>  | <p>Option</p> <p>The ground part is included as an option. If you wish, please specify separately referring to the table below.</p> <p>Units:mm</p> <table border="1"> <thead> <tr> <th>Inner diameter of gland packing</th> <th>Compatible cable size</th> <th>Symbol</th> </tr> </thead> <tbody> <tr> <td>$\phi 9$</td> <td>$\phi 8.5 \sim 9.4$</td> <td>15a</td> </tr> <tr> <td>$\phi 10$</td> <td>$\phi 9.5 \sim 10.4$</td> <td>15b</td> </tr> <tr> <td>$\phi 11$</td> <td>$\phi 10.5 \sim 11.4$</td> <td>15c</td> </tr> </tbody> </table> | Inner diameter of gland packing | Compatible cable size | Symbol | $\phi 9$ | $\phi 8.5 \sim 9.4$ | 15a | $\phi 10$ | $\phi 9.5 \sim 10.4$ | 15b | $\phi 11$ | $\phi 10.5 \sim 11.4$ | 15c |
| Inner diameter of gland packing | Compatible cable size | Symbol | | | | | | | | | | | | | |
| $\phi 9$ | $\phi 8.5 \sim 9.4$ | 15a | | | | | | | | | | | | | |
| $\phi 10$ | $\phi 9.5 \sim 10.4$ | 15b | | | | | | | | | | | | | |
| $\phi 11$ | $\phi 10.5 \sim 11.4$ | 15c | | | | | | | | | | | | | |
| <p>● Other types with surge absorbers are also available. Please contact us if you wish.</p> | | | | | | | | | | | | | | | |

313 Type

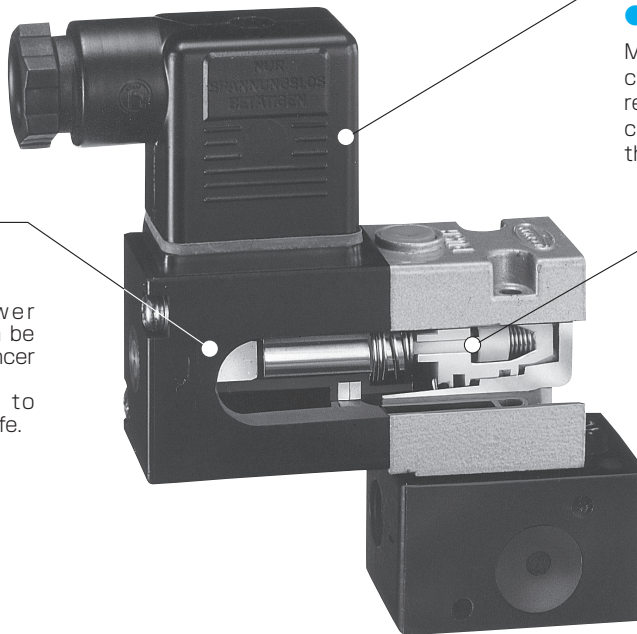
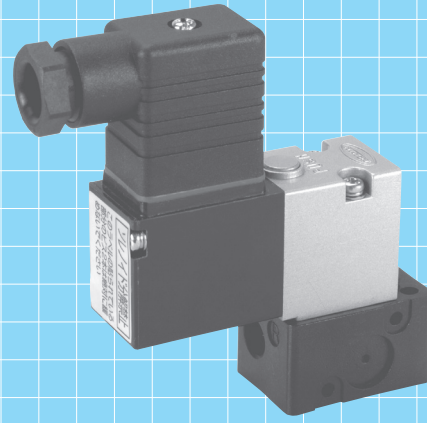
3 Port Solenoid Valve

Gasket-connected type

313C Normally Closed Rc 1/8

313O Normally Open Rc 1/8

This is a lightweight, compact, low power consumption, direct-acting 3-port solenoid valve that does not require much space for installation. Please make use of it for miniaturization of various devices and equipment by air pressure.



Low power consumption solenoid

Equipped with a low power consumption solenoid that can be directly connected to a sequencer or IC. Uses a special resin mold to achieve high stability and long life.

DIN connector

Magster III series is available with a DIN connector (also available with a lamp) for reliable wiring in addition to the lead wire connection, which allows you to choose the most suitable connection method.

Plastic cassette valve

The valve part is a maintenance-oriented cassette type that can be installed and removed in the assembly. In addition, the valve has a poppet structure with few sliding parts, which eliminates the sticking phenomenon and ensures reliable operation for a long time.

Model Code

When ordering, specify the model as follows.



| 1 Type of valve flow path | | |
|---------------------------|------------|-------|
| Type of valve flow path | JIS symbol | Codes |
| Normally closed | | C |
| Normally open | | O |

| 2 Type of wiring | | |
|-----------------------|-----------|---|
| Type of wiring | Codes | |
| Lead wire | L | |
| DIN connector | With lamp | D |
| | w/o lamp | N |
| Water-proof connector | W | |

| 3 Rated voltage | |
|------------------|-------|
| Rated voltage | Codes |
| AC100V 50 / 60Hz | 1 |
| AC110V 50 / 60Hz | 2 |
| AC200V 50 / 60Hz | 3 |
| AC220V 50 / 60Hz | 4 |
| DC24V | 5 |
| DC48V | 6 |
| DC100V | 7 |
| DC110V | 9 |

An example of model code

313 C **011C-** D 1

● Normally closed / With DIN connector type (w/o Lamp)/AC100V 50/60Hz

Specification

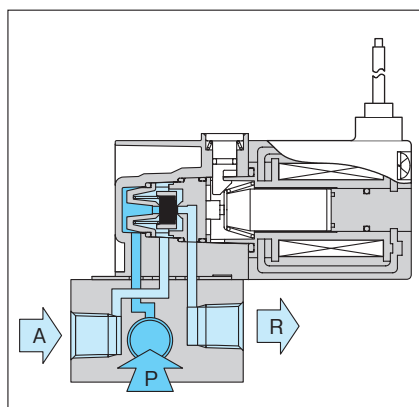
| Type symbol | 313C011C | 313O011C |
|--------------------------|--|------------------------------|
| Port size | Rc 1/8 | |
| Effective sectional area | 1.0mm ² | |
| Operating pressure | 0 ~ 0.7MPa | |
| Proof pressure | 1.05MPa | |
| Fluid temperature | - 5 ~ 50°C | |
| Ambient temperature | - 5 ~ 50°C (Remove moisture perfectly from the fluid to prevent freezing when used at 5°C or lower.) | |
| Solenoid | Rated voltage | See model code section. |
| | Allowable voltage fluctuation | ± :10% of applicable voltage |
| | Temperature rise | Max. 70°C |
| | Insulation class | JIS C 4003 Class B |
| Power consumption | AC.....6VA | DC.....5W |
| Response time | Less than 0.02s | |
| Performance frequency | Max. 4 cycle/s ; Min. 1 cycle/mon. | |
| Mass | See outside dimensions section. | |

● For specifications other than those listed above, please contact us.

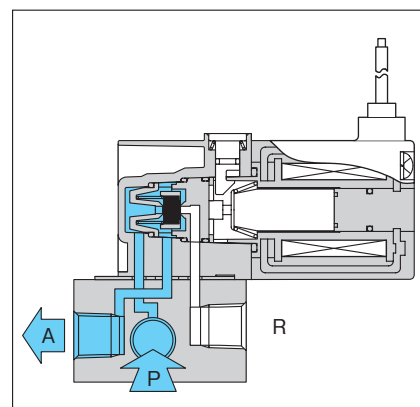
Actuation

313C Normally closed

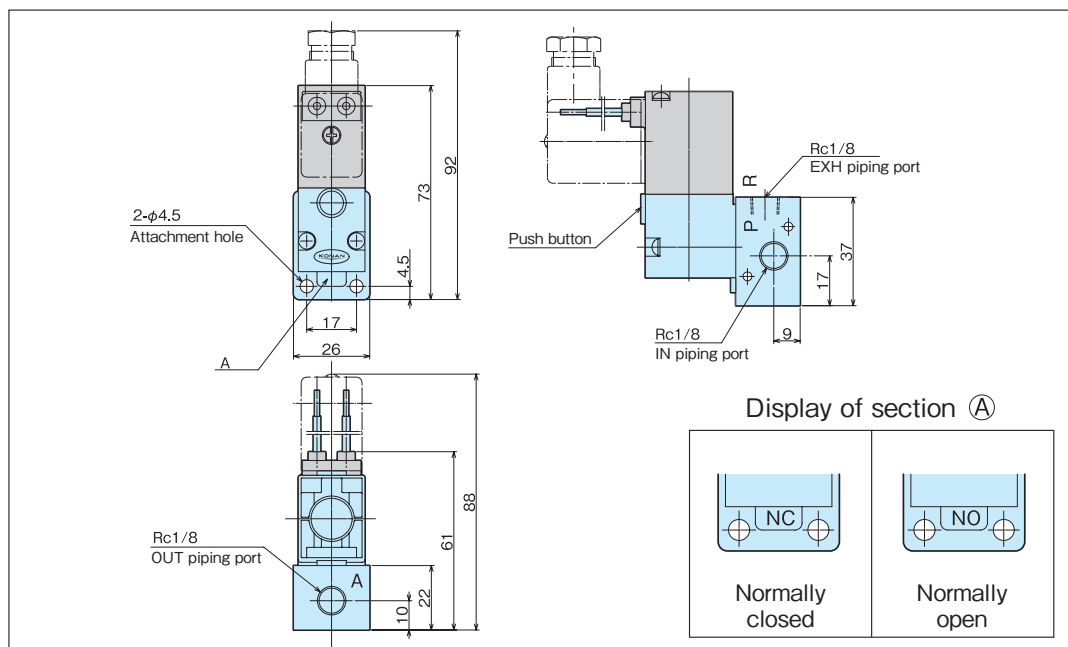
Sol de-energized



Sol energized



External Dimensions

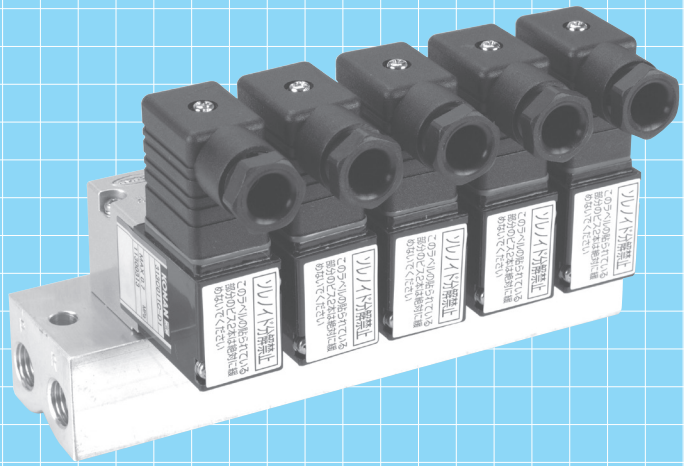


313 Type

3 Port Solenoid Valve

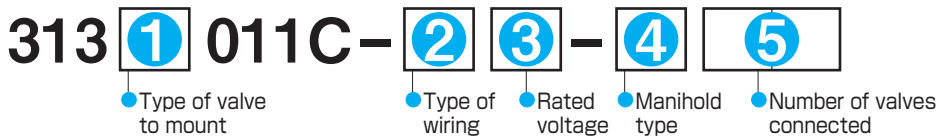
Manifold type

The valve body is equipped with a compact and light 313-type sub-plate 3-port solenoid valve, and is equipped with a light and compact individual exhaust system and a centralized exhaust manifold for easy maintenance to meet a variety of needs.



Model Code

When ordering, specify the model as follows.



1 Type of valve to mount

| Valve type | JIS symbol | Codes |
|-----------------------|------------|-------|
| Normally closed | | C |
| Normally open | | O |
| Case of compound type | | Z |

● In the case of a mixing system, use a separate form to specify the arrangement of solenoid valves.

2 Type of wiring

| Type of wiring | | Codes |
|-----------------------|-----------|-------|
| Lead wire | | L |
| DIN connector | With lamp | D |
| | w/o lamp | N |
| Water-proof connector | | W |

3 Rated voltage

| Rated voltage | Codes |
|------------------|-------|
| AC100V 50 / 60Hz | 1 |
| AC110V 50 / 60Hz | 2 |
| AC200V 50 / 60Hz | 3 |
| AC220V 50 / 60Hz | 4 |
| DC24V | 5 |
| DC48V | 6 |
| DC100V | 7 |
| DC110V | 9 |

4 Manifold type

| Manifold type | Piping direction | Codes |
|--------------------|------------------|-------|
| Individual exhaust | | A |
| Collective exhaust | | D |

5 Number of valves connected

| Number | Codes |
|--------|-------|
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| ⋮ | ⋮ |
| 9 | 09 |
| 10 | 10 |
| ※ | 00 |

※ When ordering a single solenoid valve for a manifold (without a manifold base) as a spare part, please specify ⑤ as "00".

● Contact us in the case of 10 or more -station manifold.

● An example of model code

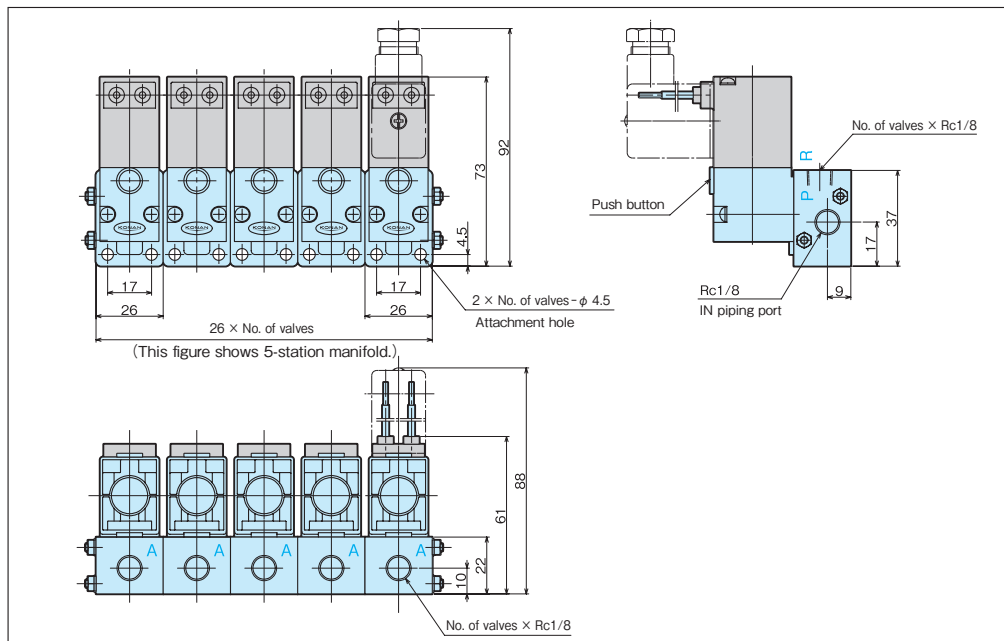
313 C **011C-** N 1 - A 08

● A mixture of normally closed and normally open manifold / DIN connector with lamp / AC100V 50/60Hz/ Laminated manifold/

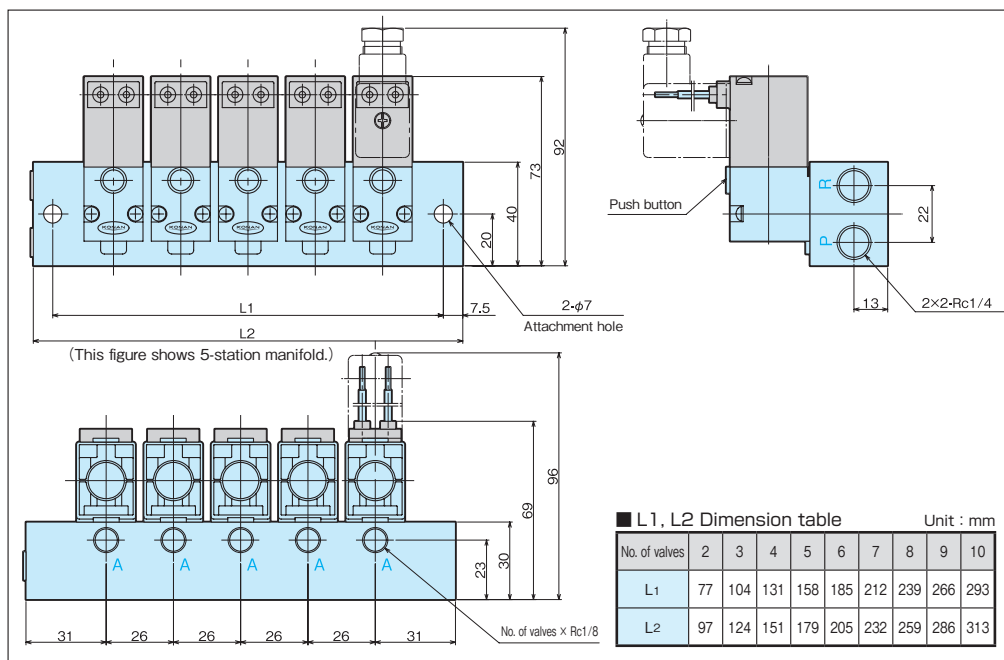
※ Total number of connected units: 8

※ Fill out a separate form for information on the number of units used and the order of sequences for normally closed and normally open.

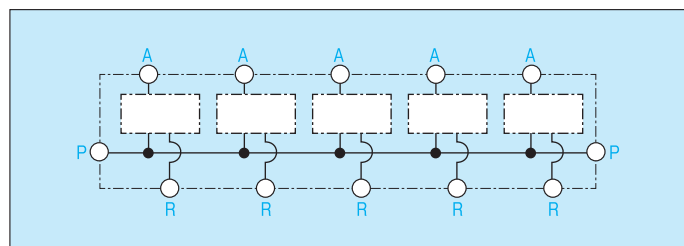
External Dimensions
313 ■ 011C- ■ ■ -A



313 ■ 011C- ■ ■ -D

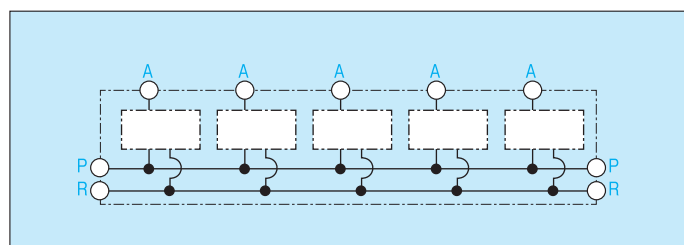


JIS symbol
313 ■ 011C- ■ ■ -A



Any of the mounted valve type JIS symbol is applicable to the blank space in the figure on the left.

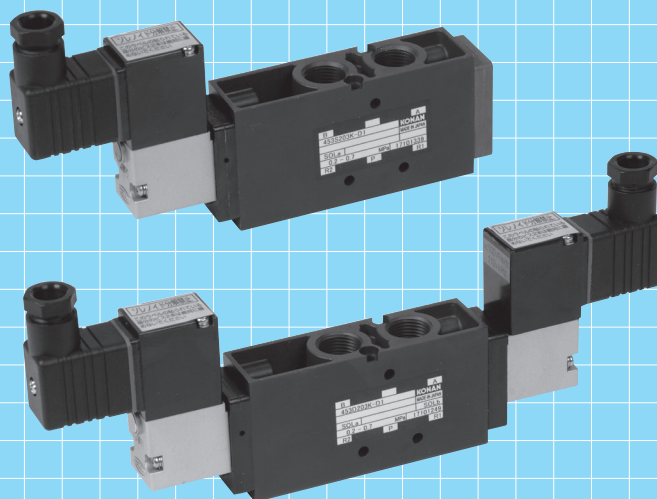
313 ■ 011C- ■ ■ -D



453 Type

5 Port Solenoid Valve

Direct Piping type



| | | |
|-------------|---|-----------------------|
| 453S | 2 Positions, Return | Rc 1/8·1/4·1/8·1/4 |
| 453D | 2 Positions, Hold | Rc 1/8·1/4·1/8·1/4 |
| 453H | 3 Positions, Closed center | Rc 1/4·1/8·1/4 |
| 453J | 3 Positions, Center open to exhaust | Rc 1/4·1/8·1/4 |
| 453I | 3 Positions, Center open to pressure | Rc 1/4·1/8·1/4 |

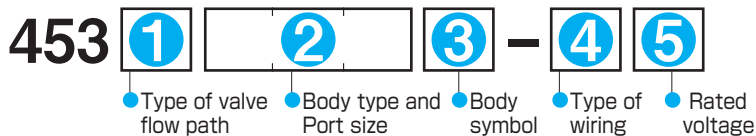
Specification

| | | | | | | |
|---|--|------------------------------|-------------------|-----------|-------------------|----------|
| Type symbol | 453S101C | 453S102C | 453S202K | 453S203K | 453S403C | 453S404C |
| | 453D101C | 453D102C | 453D202K | 453D203K | 453D403C | 453D404C |
| | — | — | 453H202C | 453H203C | 453H403C | 453H404C |
| | — | — | 453J202C | 453J203C | 453J403C | 453J404C |
| | — | — | 453I202C | 453I203C | 453I403C | 453I404C |
| Port size | Rc 1/8 | Rc 1/4 | | Rc 3/8 | | Rc 1/2 |
| Effective sectional area | 10mm ² | | 22mm ² | | 40mm ² | |
| Operating pressure | 0.2 ~ 0.7MPa | | | | | |
| Proof pressure | 1.05MPa | | | | | |
| Fluid temperature | - 5 ~ 50°C | | | | | |
| Ambient temperature | - 5 ~ 50°C (Remove moisture perfectly from the fluid to prevent freezing when used at 5°C or lower.) | | | | | |
| Solenoid | Rated voltage | See model code section. | | | | |
| | Allowable voltage fluctuation | ± :10% of applicable voltage | | | | |
| | Temperature rise | Max. 70°C | | | | |
| | Insulation class | JIS C 4003 Class B | | | | |
| | Power consumption | AC·····6VA | | DC·····5W | | |
| Response time | Less than 0.03s | | | | Less than 0.05s | |
| Performanse frequency | Max. 4 cycle/s ; Min. 1 cycle/mon. | | | | | |
| Mass | See outside dimensions section. | | | | | |
| Applicable cylinder size(for reference) | φ 32 ~ 100 | | φ 80 ~ 140 | | φ 125 ~ 180 | |

● For specifications other than those listed above, please contact us.

Model Code

When ordering, specify the model as follows.



◆ 1, 2 and 3 is ordering In three items set.

1 Type of valve flow path

| Type of valve flow path | JIS symbol | Codes |
|-------------------------|-----------------------------|-------|
| 2 Position | Return | S |
| | Hold | D |
| 3 Position | Closed center | H |
| | Center open to exhaust | J |
| | Center open to pressure | I |

2 Body type and Port size **3** Body symbol

| Body symbol | Effective sectional area | Port size | Codes | Codes |
|-------------|--------------------------|-----------|-------|-------|
| B10 | 10mm ² | Rc1/8 | 101 | C |
| | | Rc1/4 | 102 | |
| B20 | 22mm ² | Rc1/4 | 202 | K |
| | | Rc3/8 | 203 | |
| B40 | 40mm ² | Rc3/8 | 403 | C |
| | | Rc1/2 | 404 | |

2 Body type and Port size **3** Body symbol

| Body symbol | Effective sectional area | Port size | Codes | Codes |
|-------------|--------------------------|-----------|-------|-------|
| B20 | 22mm ² | Rc1/4 | 202 | C |
| | | Rc3/8 | 203 | |
| B40 | 40mm ² | Rc3/8 | 403 | C |
| | | Rc1/2 | 404 | |

4 Type of wiring

| Type of wiring | Codes | |
|-----------------------|-----------|---|
| Lead wire | L | |
| DIN connector | With lamp | D |
| | w/o lamp | N |
| Water-proof connector | W | |

5 Rated voltage

| Rated voltage | Codes |
|------------------|-------|
| AC100V 50 / 60Hz | 1 |
| AC110V 50 / 60Hz | 2 |
| AC200V 50 / 60Hz | 3 |
| AC220V 50 / 60Hz | 4 |
| DC24V | 5 |
| DC48V | 6 |
| DC100V | 7 |
| DC110V | 9 |

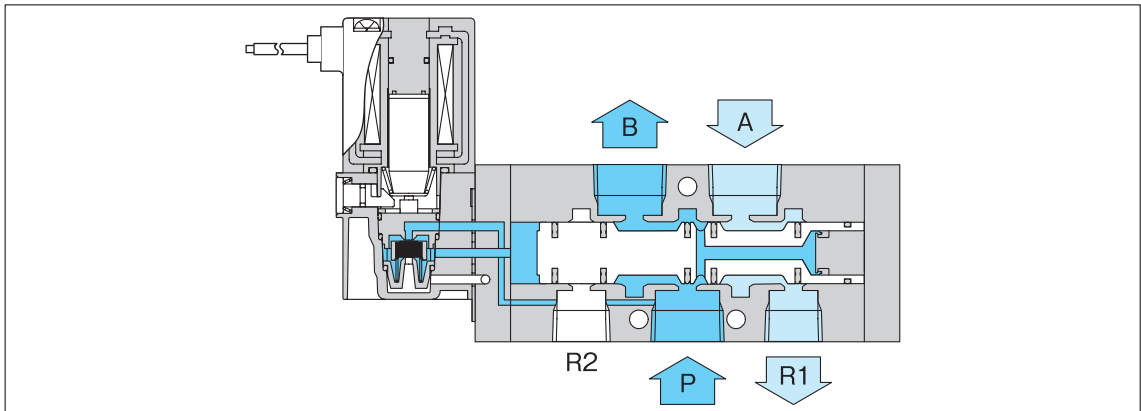
Actuation

453S

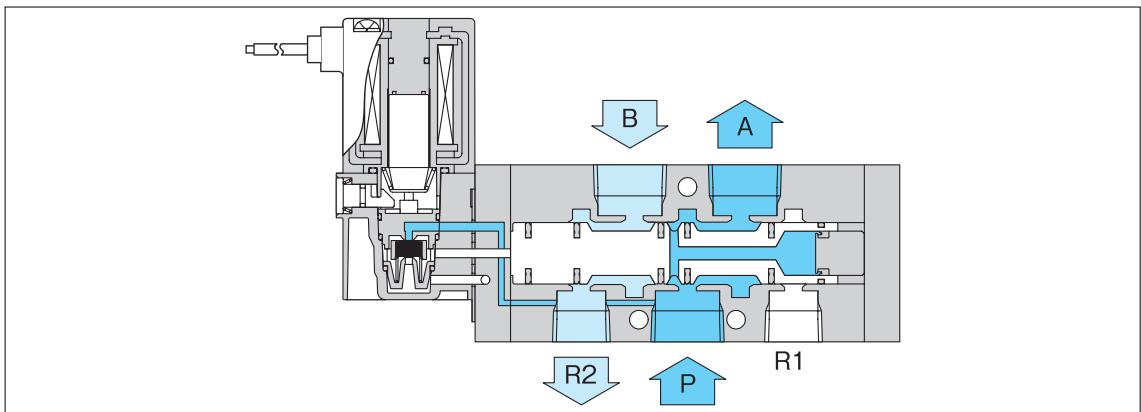
Return

The figure shows the 453S40 □ C.

Sol a de-energized



Sol a energized

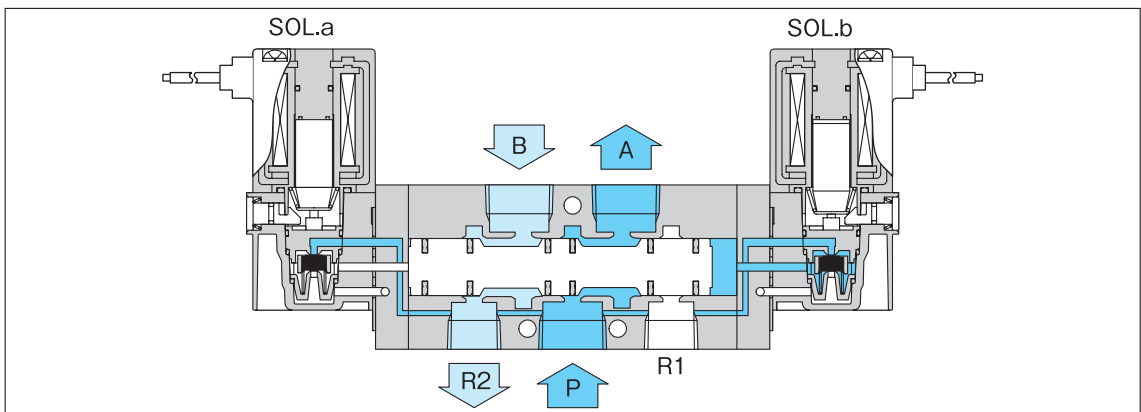


453D

Hold

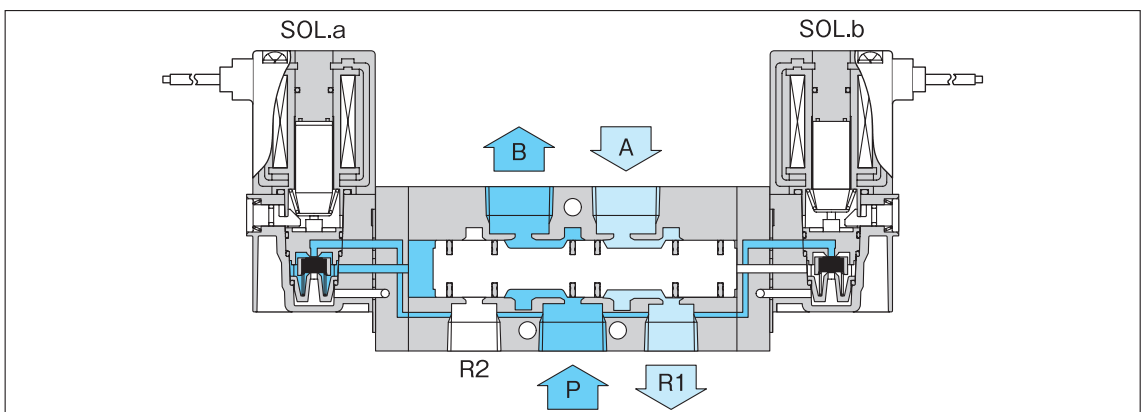
Sol a energized

Sol b de-energized



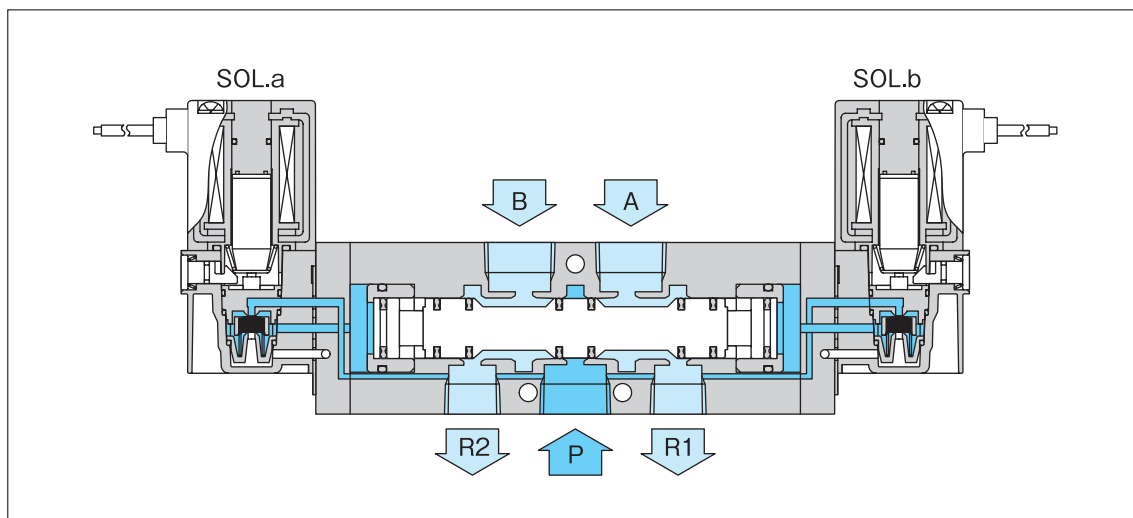
Sol a de-energized

Sol b energized

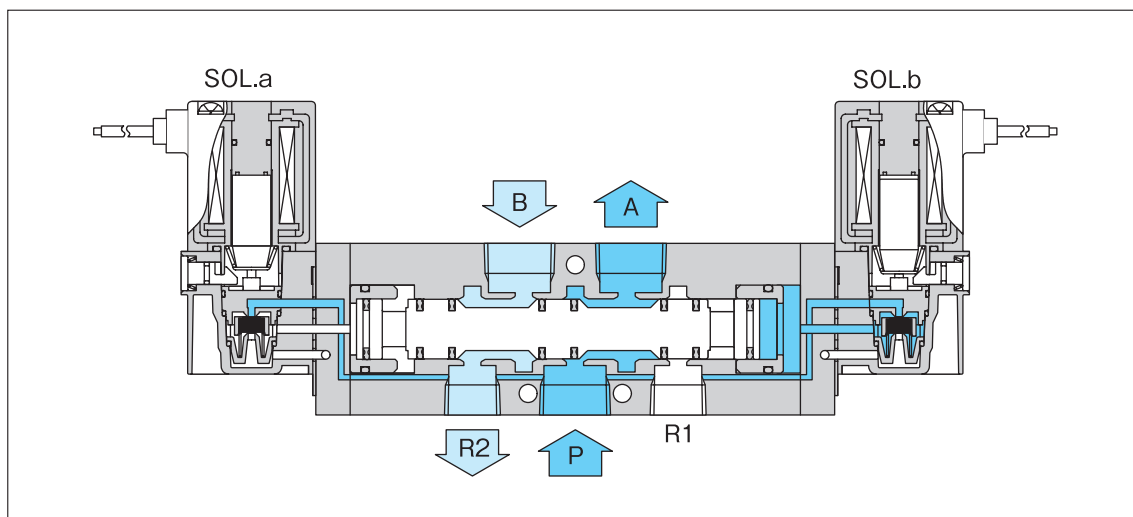


453J Center open to exhaust

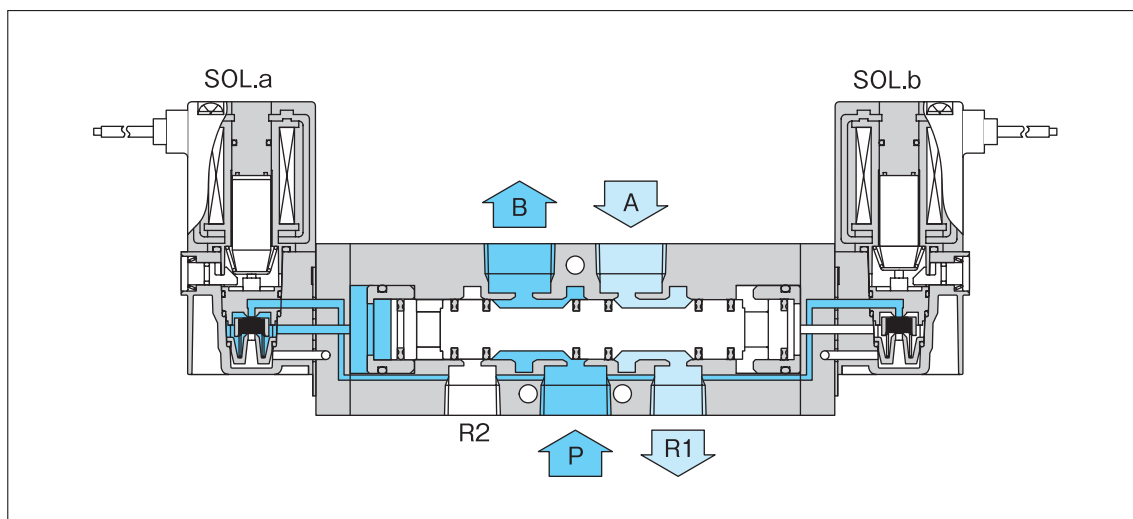
Sol a de-energized
 Sol b de-energized



Sol a energized
 Sol b de-energized



Sol a de-energized
 Sol b energized

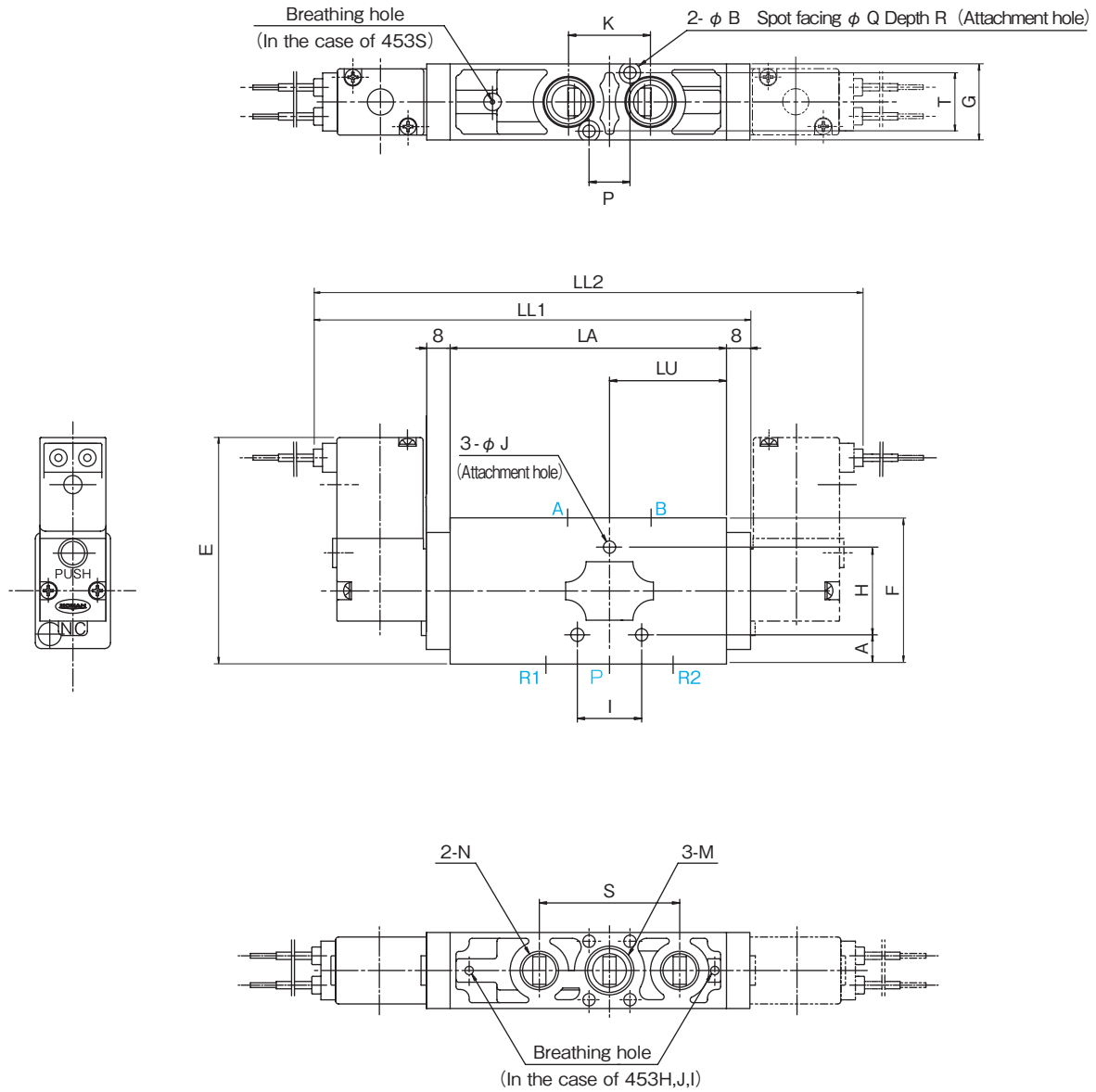


External Dimensions

453 □ 10 □ C – L/D/N/W
 453 □ 20 □ K/C – L/D/N/W
 453 □ 40 □ C – L/D/N/W

< Pilot valve connection method: Lead wire (L) >

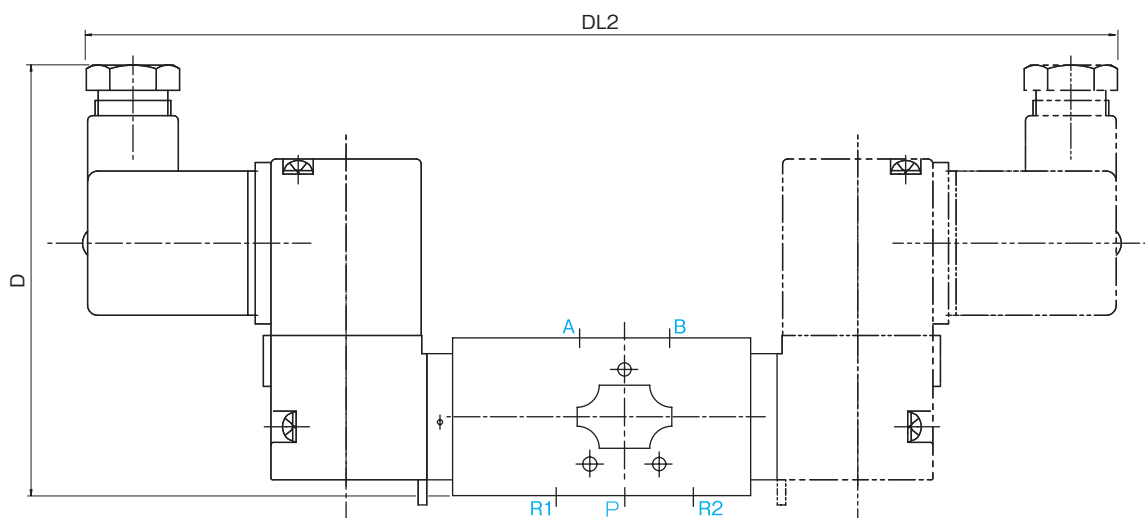
(In the case of 453H,J,I)



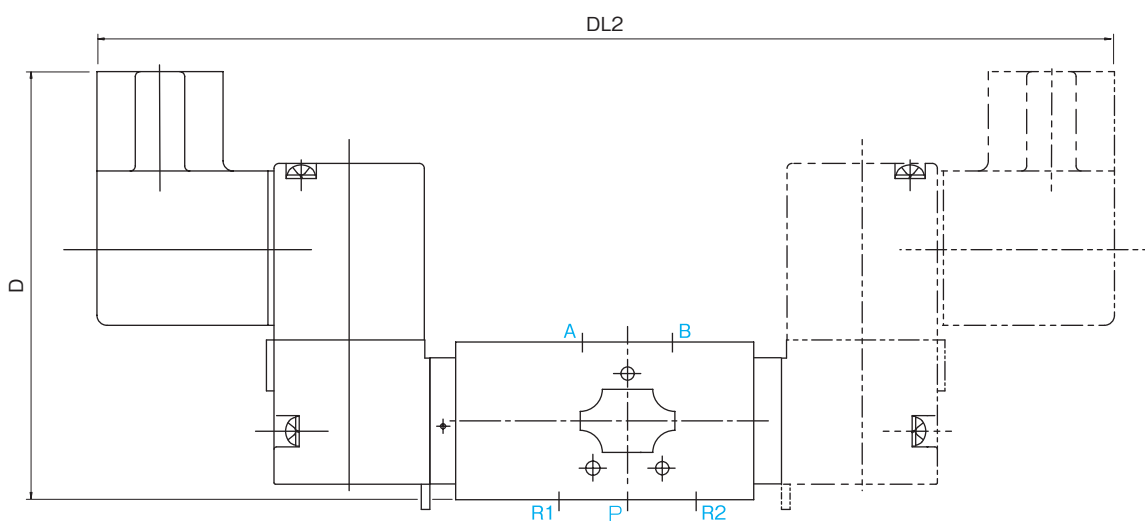
Unit : mm

| Model code | M | N | LA | LL1 | LL2 | F | E | G | H | I | J | K | S | LU | B | Q | R | P | A | T | Mass (kg) | |
|--------------|-------|-------|------|-----|-----|----|----|----|----|----|-----|----|------|-----|-----|---|---|---|----|----|-----------|------|
| 453S101C | Rc1/8 | Rc1/8 | 60 | 115 | — | 40 | 73 | | | | | 24 | 40 | 30 | | | | | 5 | | | 0.4 |
| 453S102C | Rc1/4 | | | — | 154 | | | | | | | | | | | | | | | | | |
| 453D101C | Rc1/8 | | | | | | | | | | | | | | | | | | | | | |
| 453D102C | Rc1/4 | Rc1/4 | 94.5 | 150 | — | 50 | 78 | 26 | 30 | 22 | 4.2 | | 40 | 4.2 | 7.2 | 3 | | | 10 | 20 | | 0.4 |
| 453S202K | Rc1/4 | | | — | 189 | | | | | | | | | | | | | | | | | |
| 453D202K | Rc1/4 | | | | | | | | | | | | | | | | | | | | | |
| 453D203K | Rc3/8 | Rc1/4 | 105 | — | 199 | 40 | 73 | | | | | | 52.5 | | | | | | 5 | | | 0.8 |
| 453H/J/I203C | Rc3/8 | | | — | 229 | | | | | | | | | | | | | | | | | |
| 453D404C | Rc1/2 | | | | | | | | | | | | | | | | | | | | | |
| 453S403C | Rc3/8 | Rc3/8 | 110 | 165 | — | 56 | 81 | 36 | 40 | 30 | 5.3 | 36 | 68 | 5.3 | 9.5 | 4 | | | 8 | 28 | | 0.75 |
| 453S404C | Rc1/2 | Rc1/2 | | — | 204 | | | | | | | | | | | | | | | | | |
| 453D403C | Rc3/8 | Rc3/8 | | | | | | | | | | | | | | | | | | | | |
| 453D404C | Rc1/2 | Rc1/2 | 135 | — | 229 | | | | | | | | 67.5 | | | | | | 8 | | | 0.9 |
| 453H/J/I403C | Rc3/8 | Rc3/8 | | | | | | | | | | | | | | | | | | | | |
| 453H/J/I404C | Rc1/2 | Rc1/2 | | | | | | | | | | | | | | | | | | | | |

< In the case of DIN connectors >



< In the case of waterproof connectors >



Unit : mm

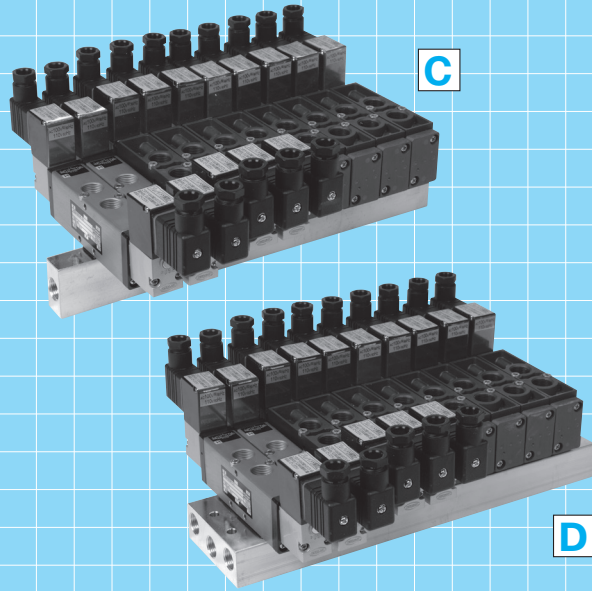
| Model code | DL2 | D |
|--------------|-----|-----|
| 453S101C | 144 | 92 |
| 453S102C | | |
| 453D101C | 211 | 92 |
| 453D102C | | |
| 453S202K | 178 | 97 |
| 453S203K | | |
| 453D202K | | |
| 453D203K | 245 | 97 |
| 453H/J/1202C | 256 | 92 |
| 453H/J/1203C | | |
| 453S403C | 194 | 100 |
| 453S404C | | |
| 453D403C | 261 | |
| 453D404C | | |
| 453H/J/1403C | 285 | |
| 453H/J/1404C | | |

453 Type

5 Port Solenoid Valve

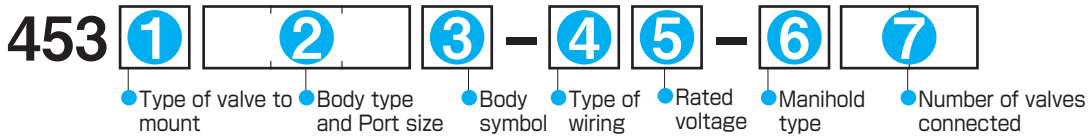
Manifold type

An easy-to-maintain, easy-manifold solenoid valve that uses a 453 type direct piping type 5-port solenoid valve that pursues the concept of "saving" for the mounted valve. The manifold is a multi-function, multi-use manifold that is fully equipped with an individual exhaust system and a collective exhaust system.



Model Code

When ordering, specify the model as follows.



◆ 1, 2 and 3 is ordering In three items set.

1 Type of valve to mount

| Type of valve flow path | JIS symbol | Codes |
|-------------------------|------------|-------|
| 2 Position | Return | S |
| | Hold | D |
| Case of compound type | | Z |

2 Body type and Port size

3 Body symbol

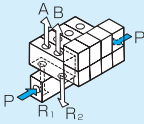
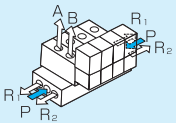
| Body symbol | Effective sectional area | Port size | Codes | Codes |
|-------------|--------------------------|-----------|-------|-------|
| B10 | 10mm ² | Rc1/8 | 101 | C |
| | | Rc1/4 | 102 | |
| B20 | 22mm ² | Rc1/4 | 202 | K |
| | | Rc3/8 | 203 | |
| B40 | 40mm ² | Rc3/8 | 403 | C |
| | | Rc1/2 | 404 | |

● In the case of a mixing system, use a separate form to specify the arrangement of solenoid valves.

| 3 Position | Closed center | H | <h4>2 Body type and Port size</h4> <h4>3 Body symbol</h4> <table border="1"> <thead> <tr> <th>Body symbol</th> <th>Effective sectional area</th> <th>Port size</th> <th>Codes</th> <th>Codes</th> </tr> </thead> <tbody> <tr> <td rowspan="2">B20</td> <td rowspan="2">22mm²</td> <td>Rc1/4</td> <td>202</td> <td rowspan="6">C</td> </tr> <tr> <td>Rc3/8</td> <td>203</td> </tr> <tr> <td rowspan="2">B40</td> <td rowspan="2">40mm²</td> <td>Rc3/8</td> <td>403</td> </tr> <tr> <td>Rc1/2</td> <td>404</td> </tr> </tbody> </table> | Body symbol | Effective sectional area | Port size | Codes | Codes | B20 | 22mm ² | Rc1/4 | 202 | C | Rc3/8 | 203 | B40 | 40mm ² | Rc3/8 | 403 | Rc1/2 | 404 |
|-----------------------------|-------------------|--------------------------|---|-------------|--------------------------|-----------|-------|-------|-----|-------------------|-------|-----|---|-------|-----|-----|-------------------|-------|-----|-------|-----|
| | Body symbol | Effective sectional area | | Port size | Codes | Codes | | | | | | | | | | | | | | | |
| | B20 | 22mm ² | | Rc1/4 | 202 | C | | | | | | | | | | | | | | | |
| Rc3/8 | | | 203 | | | | | | | | | | | | | | | | | | |
| B40 | 40mm ² | Rc3/8 | 403 | | | | | | | | | | | | | | | | | | |
| | | Rc1/2 | 404 | | | | | | | | | | | | | | | | | | |
| Center open to exhaust | J | | | | | | | | | | | | | | | | | | | | |
| Center open to pressure | I | | | | | | | | | | | | | | | | | | | | |

| ④ Type of wiring | | |
|-----------------------|-----------|-------|
| Type of wiring | | Codes |
| Lead wire | | L |
| DIN connector | With lamp | D |
| | w/o lamp | N |
| Water-proof connector | | W |

| ⑤ Rated voltage | |
|------------------|-------|
| Rated voltage | Codes |
| AC100V 50 / 60Hz | 1 |
| AC110V 50 / 60Hz | 2 |
| AC200V 50 / 60Hz | 3 |
| AC220V 50 / 60Hz | 4 |
| DC24V | 5 |
| DC48V | 6 |
| DC100V | 7 |
| DC110V | 9 |

| ⑥ Manifold type | | |
|--------------------------|---|-------|
| Manifold type | Piping direction | Codes |
| Integrated easy manifold | Individual exhaust  | C |
| | Collective exhaust  | D |

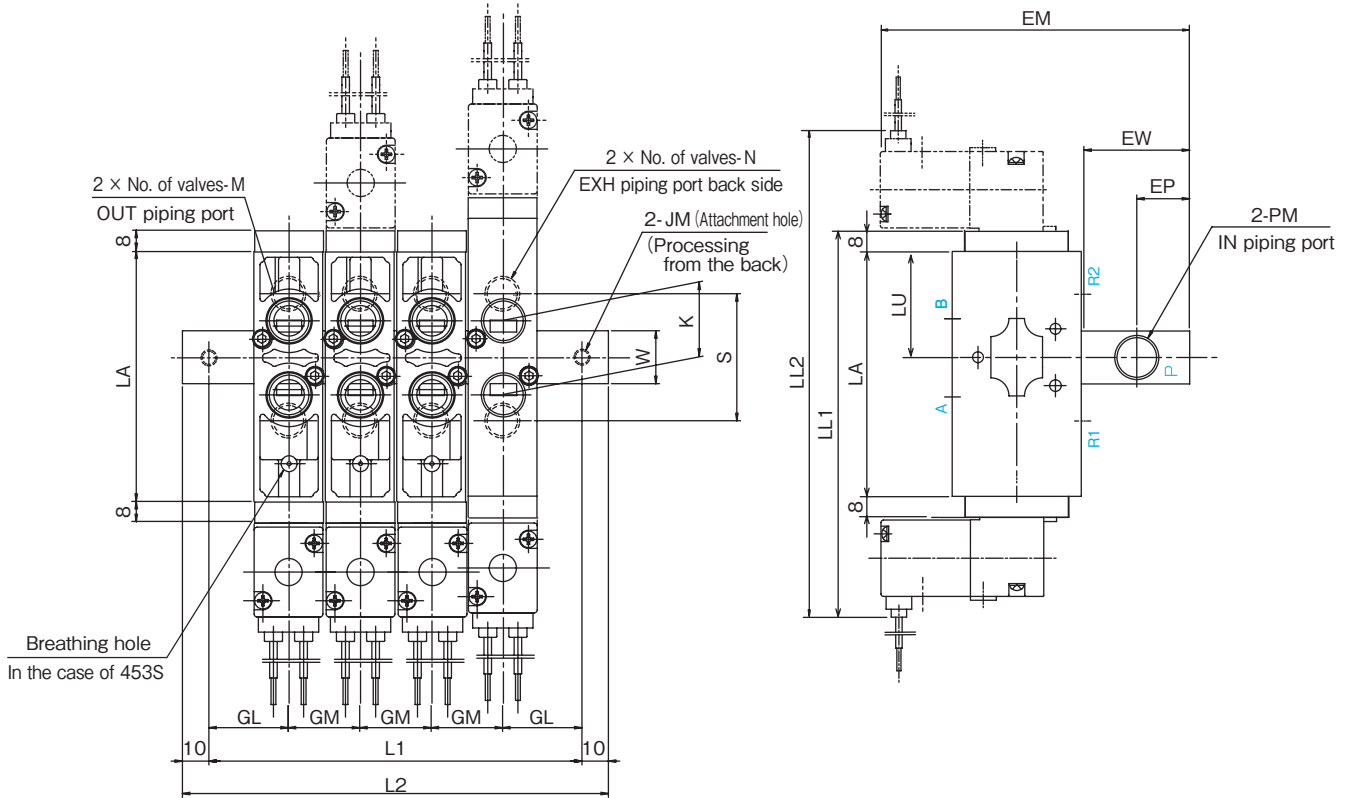
| ⑦ Number of valves connected | |
|------------------------------|-------|
| Number of valves connected | Codes |
| 2 | 02 |
| 3 | 03 |
| 4 | 04 |
| ⋮ | ⋮ |
| 9 | 09 |
| 10 | 10 |
| ※ | 00 |

※ When ordering a single solenoid valve for a manifold (without a manifold base) as a spare part, please specify ⑤ as "00" .

External Dimensions

453 □ 10 □ C - L/D/N/W - C
 453 □ 20 □ K/C - L/D/N/W - C
 453 □ 40 □ C - L/D/N/W - C

< Pilot valve connection method: Lead wire (L) >



Unit : mm

| Model code | M | N | PM | LA | LL1 | LL2 | LU | EM | EP | EW | GM | GL | JM | K | S | W |
|-------------------|-------|-------|----|------|-----|-----|------|-----|----|----|----|----|-------------------|----|----|----|
| 453S101C-□□-C | Rc1/8 | Rc1/8 | | 60 | 115 | - | 30 | 114 | | | | | | 24 | 40 | |
| 453S102C-□□-C | Rc1/4 | | | | - | 154 | | | | | | | | | | |
| 453D101C-□□-C | Rc1/8 | Rc3/8 | | 94.5 | 150 | - | 40 | 119 | 20 | 40 | 27 | 30 | M6 depth 8 | 28 | 48 | 20 |
| 453S202K-□□-C | Rc1/4 | | | | - | 189 | | | | | | | | | | |
| 453S203K-□□-C | Rc3/8 | Rc1/4 | | 105 | - | 199 | 52.5 | 114 | | | | | | | | |
| 453D202K-□□-C | Rc1/4 | | | | - | 199 | | | | | | | | | | |
| 453D203K-□□-C | Rc3/8 | Rc3/8 | | 110 | 165 | - | 55 | 133 | 25 | 50 | 37 | 40 | M8 depth 11 | 36 | 68 | 30 |
| 453H/J/I202C-□□-C | Rc1/4 | | | | - | 204 | | | | | | | | | | |
| 453H/J/I203C-□□-C | Rc3/8 | Rc1/2 | | 135 | - | 229 | 67.5 | | | | | | | | | |
| 453S403C-□□-C | Rc3/8 | | | | - | 229 | | | | | | | | | | |
| 453S404C-□□-C | Rc1/2 | Rc1/2 | | | | | | | | | | | | | | |
| 453D403C-□□-C | Rc3/8 | Rc3/8 | | | | | | | | | | | | | | |
| 453D404C-□□-C | Rc1/2 | Rc1/2 | | | | | | | | | | | | | | |
| 453H/J/I403C-□□-C | Rc3/8 | Rc3/8 | | | | | | | | | | | | | | |
| 453H/J/I404C-□□-C | Rc1/2 | Rc1/2 | | | | | | | | | | | | | | |

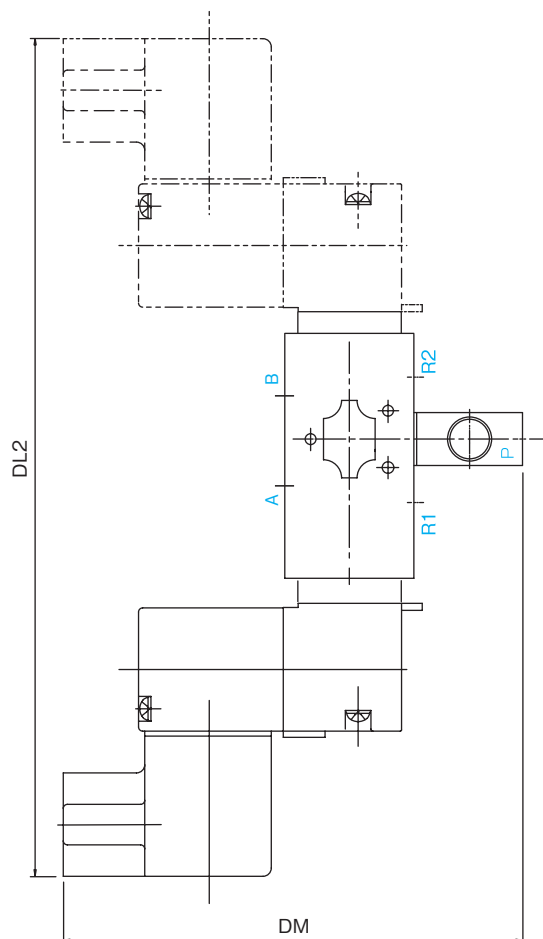
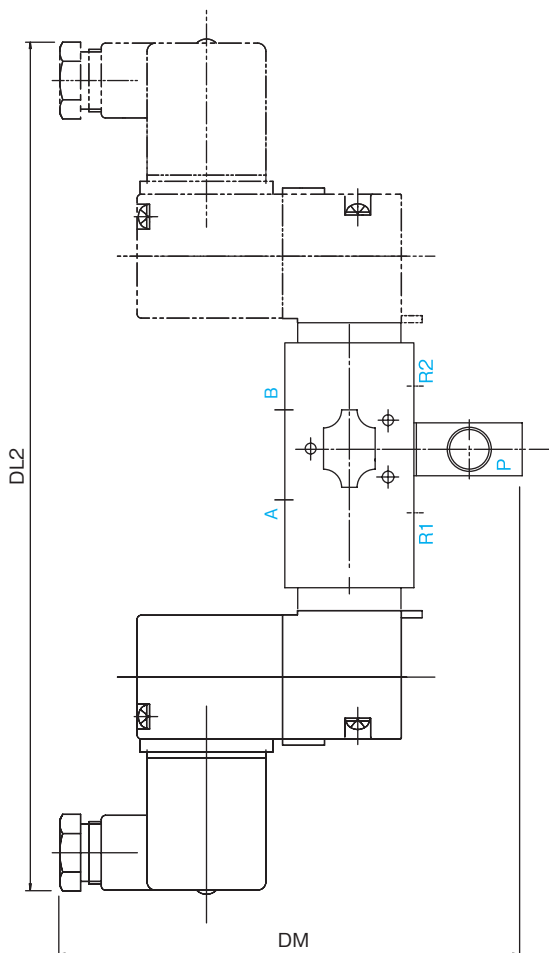
■ L1, L2 Dimension table

Unit : mm

| Model code | No. of valves | | | | | | | | | | |
|--------------------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 453 □ 101C-□□-C | L1 | 87 | 114 | 141 | 168 | 195 | 222 | 249 | 276 | 303 | |
| 453 □ 102C-□□-C | L2 | 107 | 134 | 161 | 188 | 215 | 242 | 269 | 296 | 323 | |
| 453 □ 202C/K-□□-C | L1 | 87 | 114 | 141 | 168 | 195 | 222 | 249 | 276 | 303 | |
| 453 □ 203C/K/-□□-C | L2 | 107 | 134 | 161 | 188 | 215 | 242 | 269 | 296 | 323 | |
| 453 □ 403C-□□-C | L1 | 117 | 154 | 191 | 228 | 265 | 302 | 339 | 376 | 413 | |
| 453 □ 404C-□□-C | L2 | 137 | 174 | 211 | 248 | 285 | 322 | 359 | 396 | 433 | |

< In the case of DIN connectors (D/N) >

< In the case of waterproof connectors (W) >

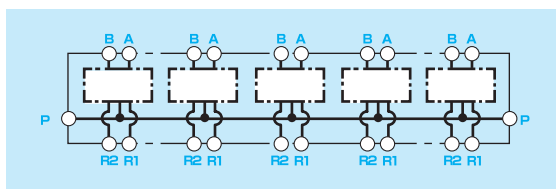


Unit : mm

| Model code | DL2 | DM |
|-------------------|-----|-----|
| 453S101C-□□-C | 144 | 133 |
| 453S102C-□□-C | | |
| 453D101C-□□-C | 211 | 138 |
| 453D102C-□□-C | | |
| 453S202K-□□-C | 178 | 133 |
| 453S203K-□□-C | 245 | |
| 453D202K-□□-C | | |
| 453D203K-□□-C | | |
| 453H/J/1202C-□□-C | 256 | 133 |
| 453H/J/1203C-□□-C | | |
| 453S403C-□□-C | 194 | 151 |
| 453S404C-□□-C | 261 | |
| 453D403C-□□-C | | |
| 453D404C-□□-C | 285 | |
| 453H/J/1403C-□□-C | | |
| 453H/J/1404C-□□-C | | |

JIS symbol

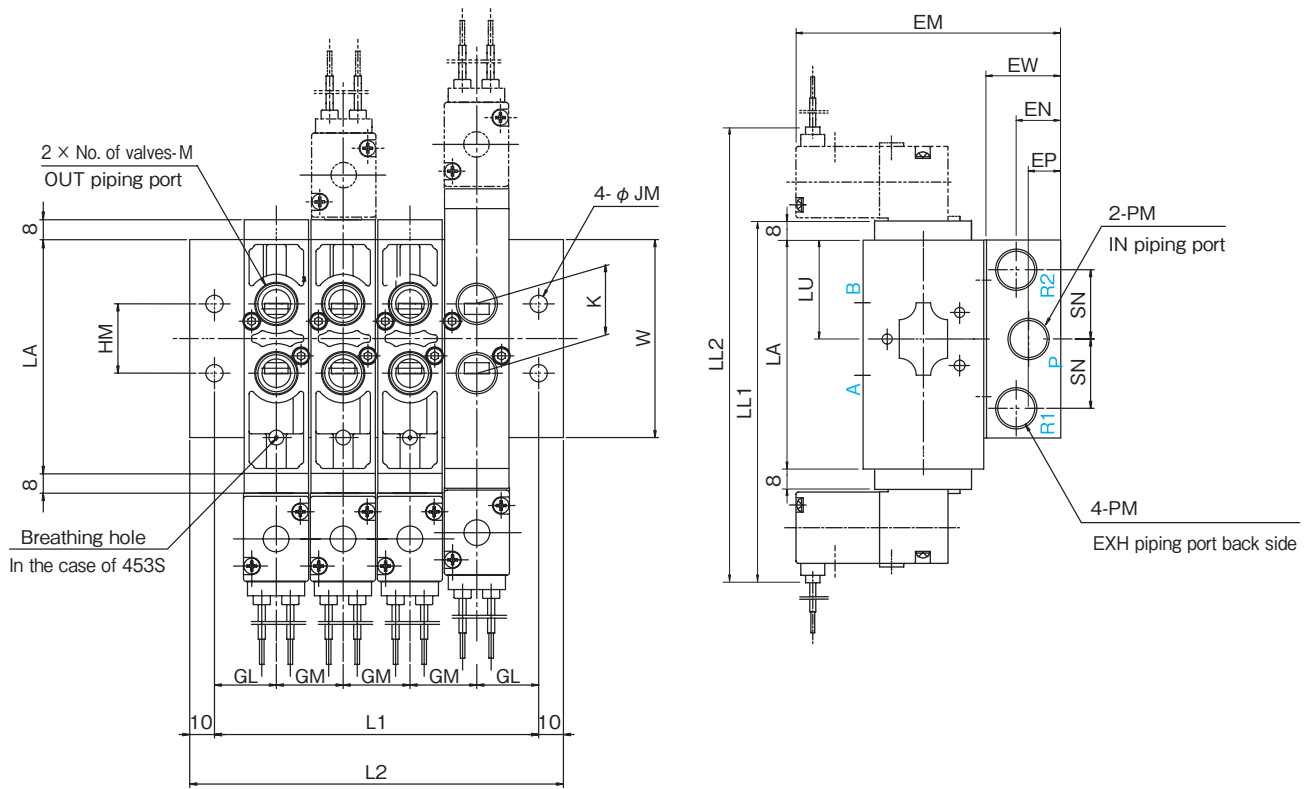
Any of the mounted valve type JIS symbol is applicable to the blank space in the figure on the below.



External Dimensions

453 □ 10 □ C - L/D/N/W - D
 453 □ 20 □ K/C - L/D/N/W - D
 453 □ 40 □ C - L/D/N/W - D

< Pilot valve connection method: Lead wire (L) >



Unit : mm

| Model code | M | PM | LA | LL1 | LL2 | LU | EM | EW | EN | EP | SN | GM | GL | JM | K | W | HM | | | | | | | | | | | |
|-------------------|-------|-------|-------|------|-----|-----|------|------|----|----|----|----|----|----|----|----|----|-----|----|-----|-----|----|----|----|----|----|----|----|
| 453S101C-□□-D | Rc1/8 | Rc3/8 | 60 | 115 | - | 30 | 103 | | | | | | | | 24 | 80 | 28 | | | | | | | | | | | |
| 453S102C-□□-D | Rc1/4 | | | - | 154 | | | | | | | | | | | | | | | | | | | | | | | |
| 453D101C-□□-D | Rc1/8 | | | 94.5 | 150 | | | | | | | | | | | | | - | 40 | 109 | 30 | 18 | 13 | 28 | 27 | 25 | 7 | 28 |
| 453S203K-□□-D | Rc3/8 | | | | - | | | | | | | | | | | | | 189 | | | | | | | | | | |
| 453D202K-□□-D | Rc1/4 | | Rc1/2 | 105 | - | 199 | 52.5 | 103 | | | | | | | | | | | | | | | | | | | | |
| 453H/J/1203C-□□-D | Rc3/8 | | | | - | 204 | | | | | | | | | | | | | | | | | | | | | | |
| 453S403C-□□-D | Rc3/8 | | | | 110 | 165 | | | | | | | | | | | | | - | 55 | 123 | 40 | 23 | 18 | 38 | 37 | 30 | 9 |
| 453S404C-□□-D | Rc1/2 | | | - | | 229 | | | | | | | | | | | | | | | | | | | | | | |
| 453D403C-□□-D | Rc3/8 | | | 135 | | - | 229 | 67.5 | | | | | | | | | | | | | | | | | | | | |
| 453D404C-□□-D | Rc1/2 | | | | - | 229 | | | | | | | | | | | | | | | | | | | | | | |
| 453H/J/1403C-□□-D | Rc3/8 | - | 229 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 453H/J/1404C-□□-D | Rc1/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | |

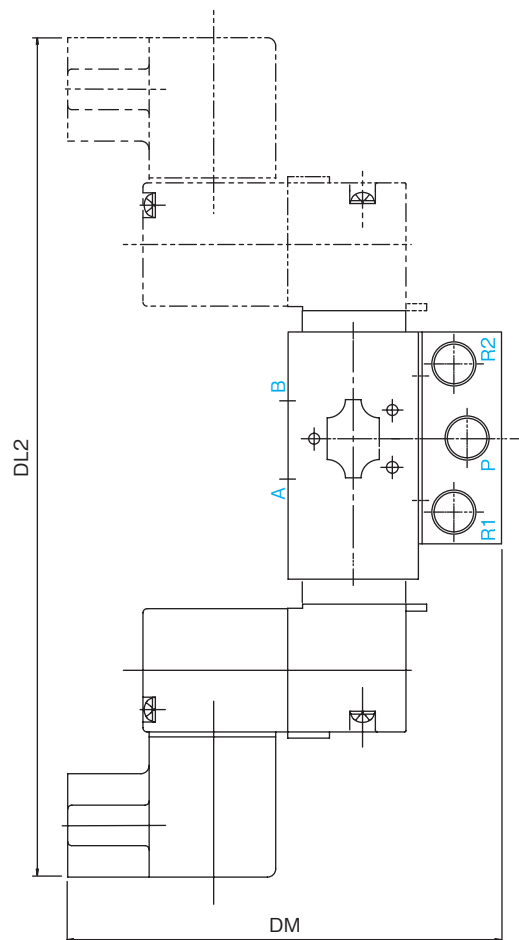
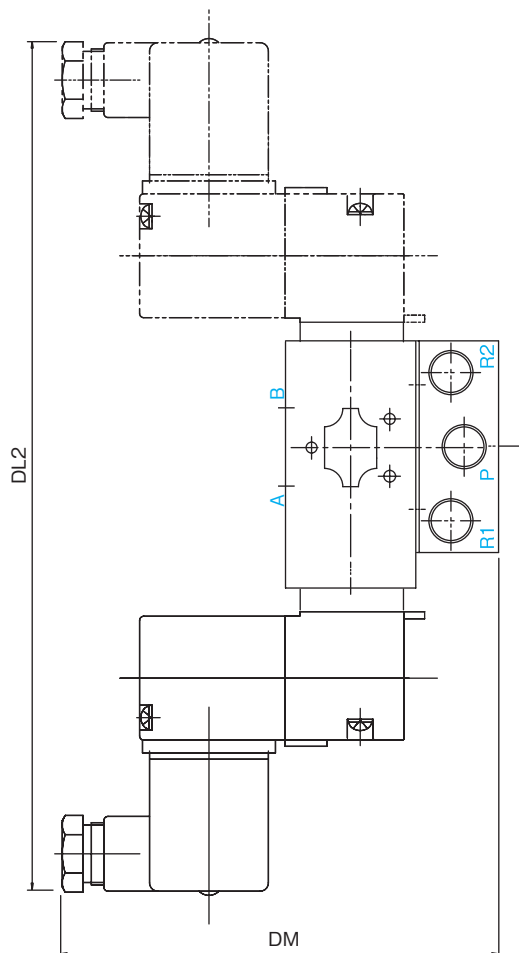
■ L1, L2 Dimension table

Unit : mm

| Model code | No. of valves | | | | | | | | | | |
|--------------------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 453 □ 101C-□□-D | L1 | 77 | 104 | 131 | 158 | 185 | 212 | 239 | 266 | 293 | |
| 453 □ 102C-□□-D | L2 | 97 | 124 | 151 | 178 | 205 | 232 | 259 | 286 | 313 | |
| 453 □ 202C/K-□□-D | L1 | 77 | 104 | 131 | 158 | 185 | 212 | 239 | 266 | 293 | |
| 453 □ 203C/K/-□□-D | L2 | 97 | 124 | 151 | 178 | 205 | 232 | 259 | 286 | 313 | |
| 453 □ 403C-□□-D | L1 | 97 | 134 | 171 | 208 | 245 | 282 | 319 | 356 | 393 | |
| 453 □ 404C-□□-D | L2 | 117 | 154 | 191 | 228 | 265 | 302 | 339 | 376 | 413 | |

< In the case of DIN connectors (D/N) >

< In the case of waterproof connectors (W) >

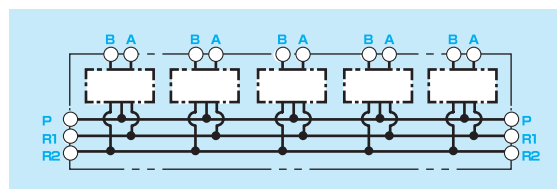


Unit : mm

| Model code | DL2 | DM |
|-------------------|-----|-----|
| 453S101C-□□-D | 144 | 122 |
| 453S102C-□□-D | | |
| 453D101C-□□-D | 211 | 122 |
| 453D102C-□□-D | | |
| 453S202K-□□-D | 178 | 128 |
| 453S203K-□□-D | 245 | |
| 453D202K-□□-D | 256 | 122 |
| 453D203K-□□-D | | |
| 453S403C-□□-D | 194 | 141 |
| 453D403C-□□-D | 261 | |
| 453H/J/1403C-□□-D | 285 | 141 |
| 453H/J/1404C-□□-D | | |

JIS symbol

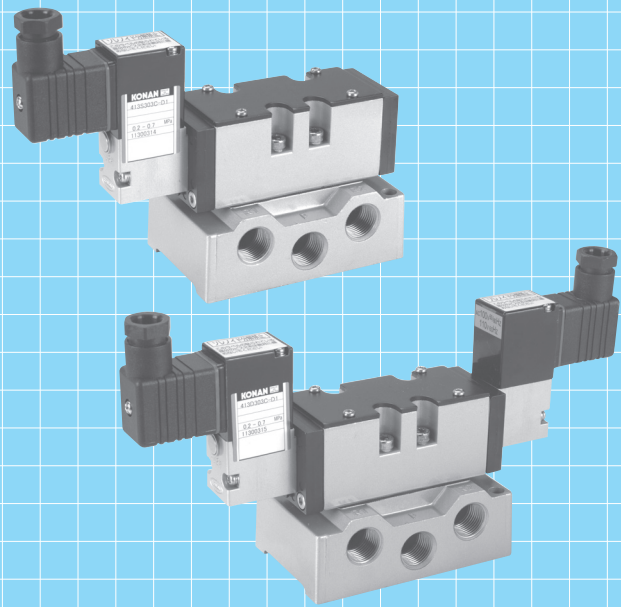
Any of the mounted valve type JIS symbol is applicable to the blank space in the figure on the below.



413 Type

5 Port Solenoid Valve

Gasket-connected type

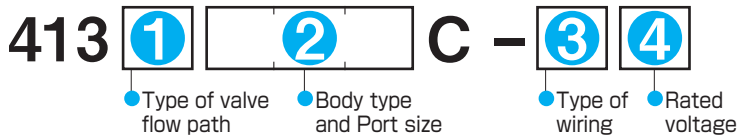


| | | |
|-------------|---|-----------------------|
| 413S | 2 Positions, Return | Rc 1/4·3/8·1/2·3/4 |
| 413D | 2 Positions, Hold | Rc 1/4·3/8·1/2·3/4 |
| 413H | 3 Positions, Closed center | Rc 1/4·3/8·1/2·3/4 |
| 413J | 3 Positions, Center open to exhaust | Rc 1/4·3/8·1/2·3/4 |
| 413I | 3 Positions, Center open to pressure | Rc 1/4·3/8·1/2·3/4 |

This is a sub-plate type 5-port solenoid valve that has achieved an extremely high flow rate in addition to a compact, lightweight, low power consumption design. ISO and JIS standards are used for the mounting surface dimensions of the solenoid valve body in order to pursue thorough standardization.

Model Code

When ordering, specify the model as follows.



| 1 Type of valve flow path | | |
|---------------------------|-----------------------------|-------|
| Type of valve flow path | JIS symbol | Codes |
| 2 Position | Return | S |
| | Hold | D |
| 3 Position | Closed center | H |
| | Center open to exhaust | J |
| | Center open to pressure | I |

| 2 Body type and Port size | | | |
|---------------------------|--------------------------|-----------|-------|
| Body symbol | Effective sectional area | Port size | Codes |
| B30 | 25mm ² | Rc1/4 | 302 |
| | 28mm ² | Rc3/8 | 303 |
| B60 | 55mm ² | Rc3/8 | 603 |
| | 60mm ² | Rc1/2 | 604 |
| B80 | 70mm ² | Rc1/2 | 804 |
| | 80mm ² | Rc3/4 | 806 |

| 4 Rated voltage | |
|------------------|-------|
| Rated voltage | Codes |
| AC100V 50 / 60Hz | 1 |
| AC110V 50 / 60Hz | 2 |
| AC200V 50 / 60Hz | 3 |
| AC220V 50 / 60Hz | 4 |
| DC24V | 5 |
| DC48V | 6 |
| DC100V | 7 |
| DC110V | 9 |

| 3 Type of wiring | | |
|-----------------------|-----------|---|
| Type of wiring | Codes | |
| Lead wire | L | |
| DIN connector | With lamp | D |
| | w/o lamp | N |
| Water-proof connector | W | |

● An example of model code

413 H 303 C - N 7

● 3 Position Closed center / Body symbol "B30" / Port size Rc3/8 / with DIN connector type (with Lamp) / DC100V

Specification

| | | | | | | |
|---|--|------------------------------|-------------------|-------------------|-------------------|-------------------|
| Type symbol | 413S302C | 413S303C | 413S603C | 413S604C | 413S804C | 413S806C |
| | 413D302C | 413D303C | 413D603C | 413D604C | 413D804C | 413D806C |
| | 413H302C | 413H303C | 413H603C | 413H604C | 413H804C | 413H806C |
| | 413J302C | 413J303C | 413J603C | 413J604C | 413J804C | 413J806C |
| | 413I302C | 413I303C | 413I303C | 413I304C | 413I804C | 413I806C |
| Port size | Rc 1/4 | Rc 3/8 | | Rc 1/2 | | Rc 3/4 |
| Effective sectional area | 25mm ² | 28mm ² | 55mm ² | 60mm ² | 70mm ² | 80mm ² |
| Operating pressure | 0.2 ~ 0.7MPa | | | | | |
| Proof pressure | 1.05MPa | | | | | |
| Fluid temperature | - 5 ~ 50°C (Remove moisture perfectly from the fluid to prevent freezing when used at 5°C or lower.) | | | | | |
| Ambient temperature | - 5 ~ 50°C | | | | | |
| Solenoid | Rated voltage | See model code section. | | | | |
| | Allowable voltage fluctuation | ± :10% of applicable voltage | | | | |
| | Temperature rise | Max. 70°C | | | | |
| | Insulation class | JIS C 4003 Class B | | | | |
| | Power consumption | AC.....6VA DC.....5W | | | | |
| Response time | Less than 0.03s | | Less than 0.06s | | Less than 0.1s | |
| Performanse frequency | Max. 4 cycle/s ; Min. 1 cycle/mon. | | | | | |
| Mass | See outside dimensions section. | | | | | |
| Applicable cylinder size(for reference) | φ 80 ~ 100 | | φ 140 ~ 220 | | φ 160 ~ 250 | |

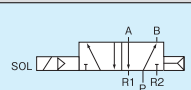
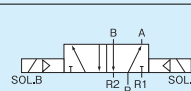
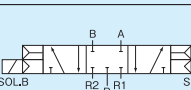
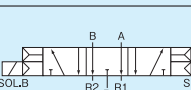
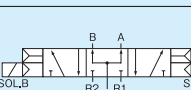
● For specifications other than those listed above, please contact us.

Model Code

For this model, we also accept orders for the main unit only (without sub-plate).
When ordering, specify the model as follows.

413 **1** **2** C - **3** **4** - B00

● Type of valve flow path ● Body type and Port size ● Type of wiring ● Rated voltage

| 1 Type of valve flow path | | | 2 Body type and Port size | | | | 4 Rated voltage | |
|---------------------------|-------------------------|---|---------------------------|--------------------------|-----------|-------|------------------|-------|
| Type of valve flow path | JIS symbol | Codes | Body symbol | Effective sectional area | Port size | Codes | Rated voltage | Codes |
| 2 Position | Return |  | B30 | 25mm ² | Rc1/4 | 302 | AC100V 50 / 60Hz | 1 |
| | Hold |  | | 28mm ² | Rc3/8 | 303 | AC110V 50 / 60Hz | 2 |
| 3 Position | Closed center |  | B60 | 55mm ² | Rc3/8 | 603 | AC200V 50 / 60Hz | 3 |
| | | | | 60mm ² | Rc1/2 | 604 | AC220V 50 / 60Hz | 4 |
| | Center open to exhaust |  | B80 | 70mm ² | Rc1/2 | 804 | DC24V | 5 |
| | Center open to pressure |  | | 80mm ² | Rc3/4 | 806 | DC48V | 6 |
| | | | | | | | DC100V | 7 |
| | | | | | | Other | 9 | |

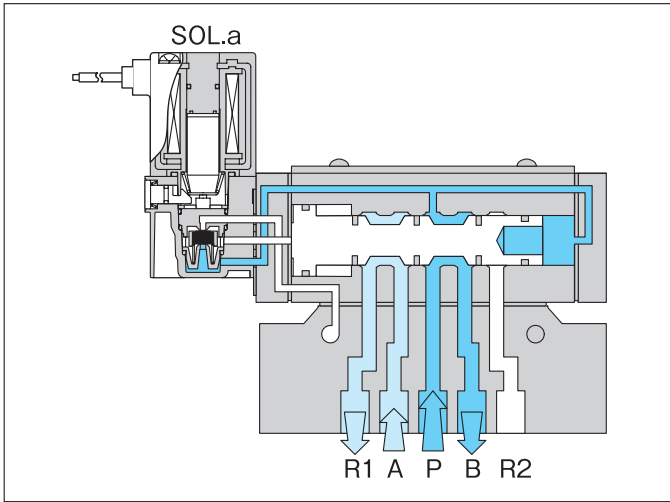
| 3 Type of wiring | | |
|-----------------------|-----------|---|
| Type of wiring | Codes | |
| Lead wire | L | |
| DIN connector | With lamp | D |
| | w/o lamp | N |
| Water-proof connector | W | |

Actuation

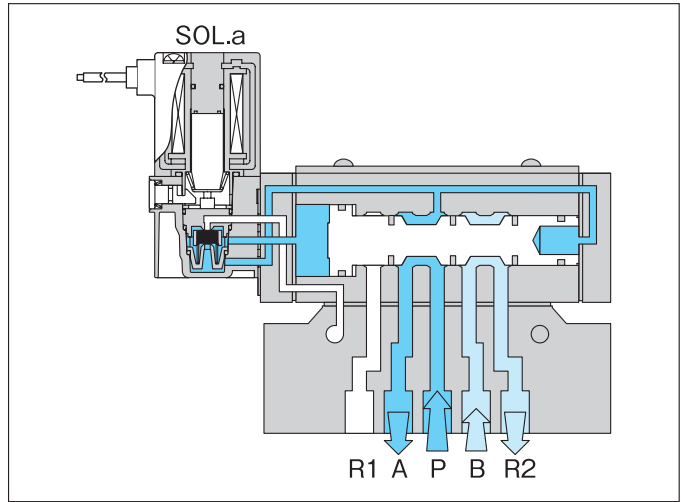
413S

Return

Sol a de-energized



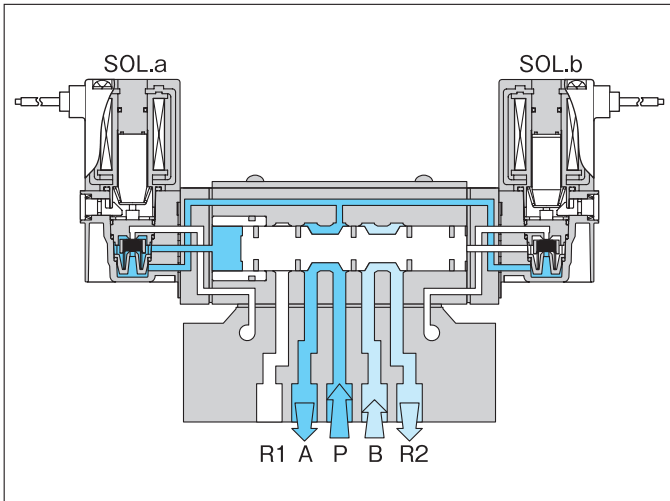
Sol a energized



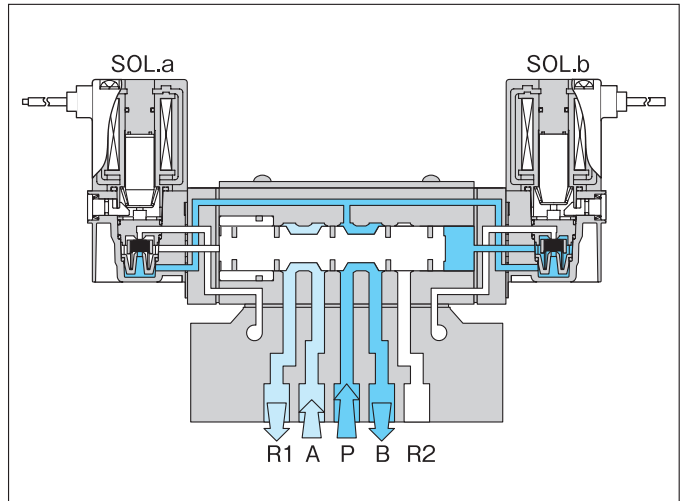
413D

Hold

Sol a energized Sol b de-energized

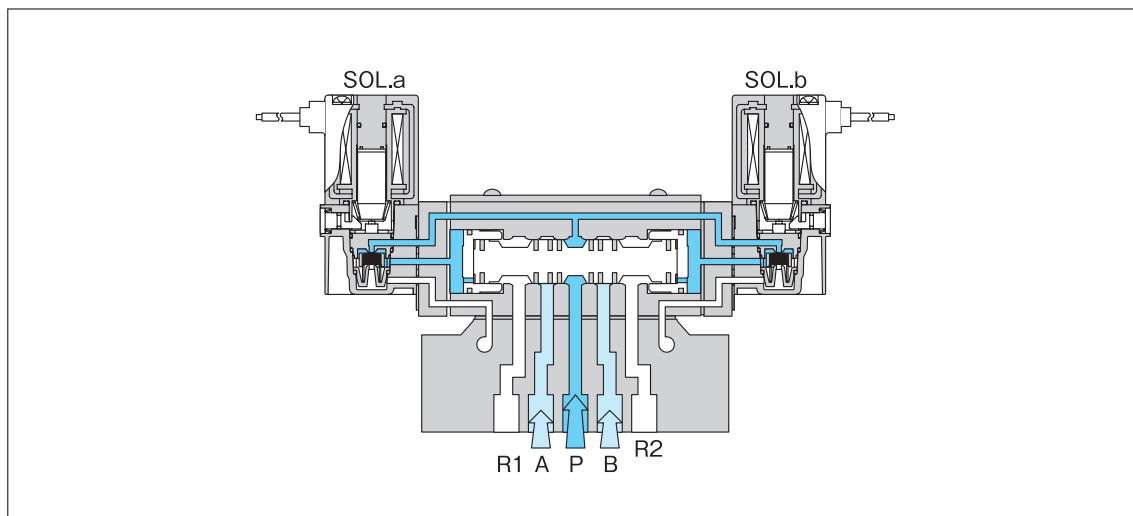


Sol a de-energized Sol b energized

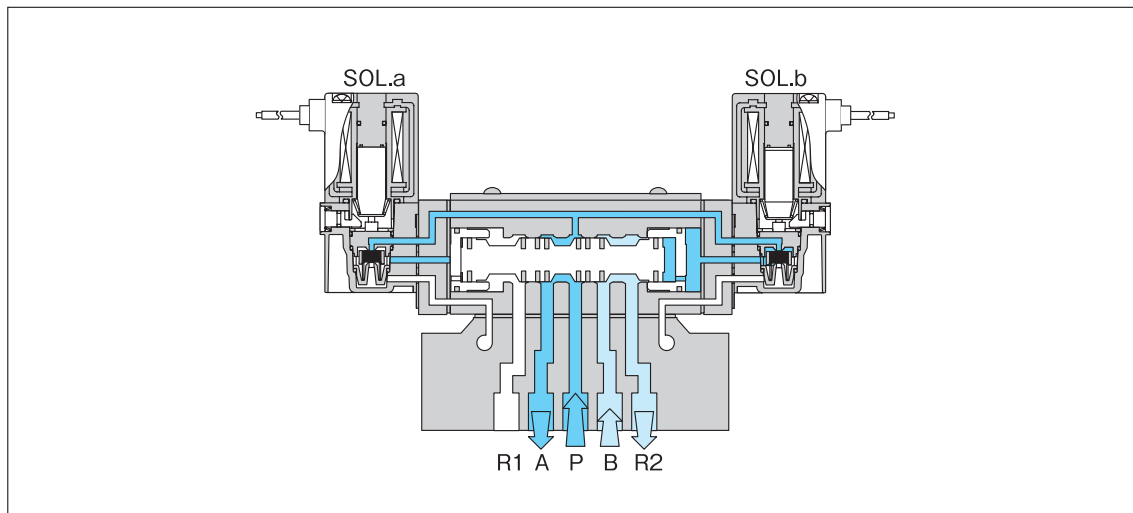


413H Closed center

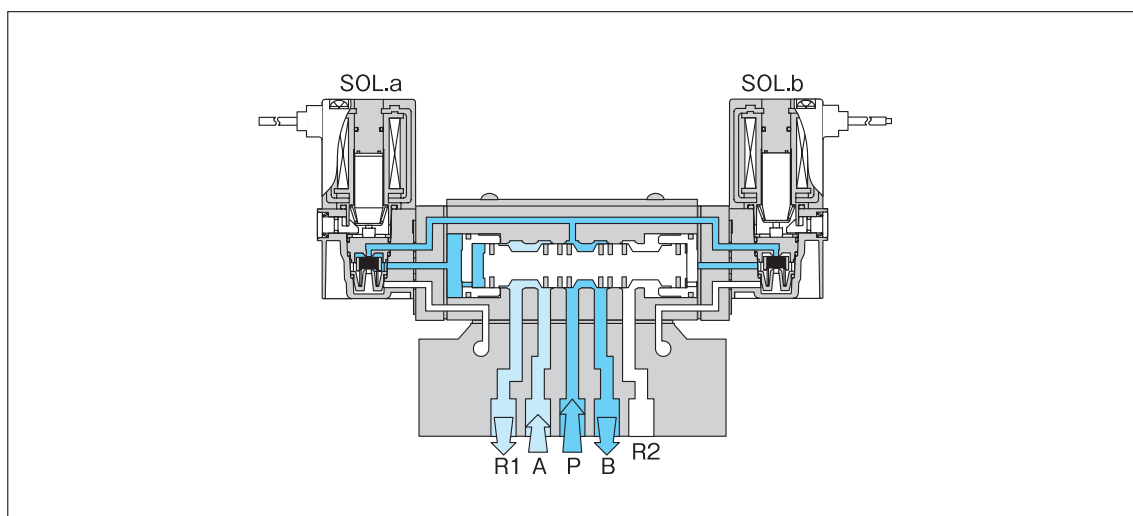
Sol a de-energized
Sol b de-energized



Sol a energized
Sol b de-energized

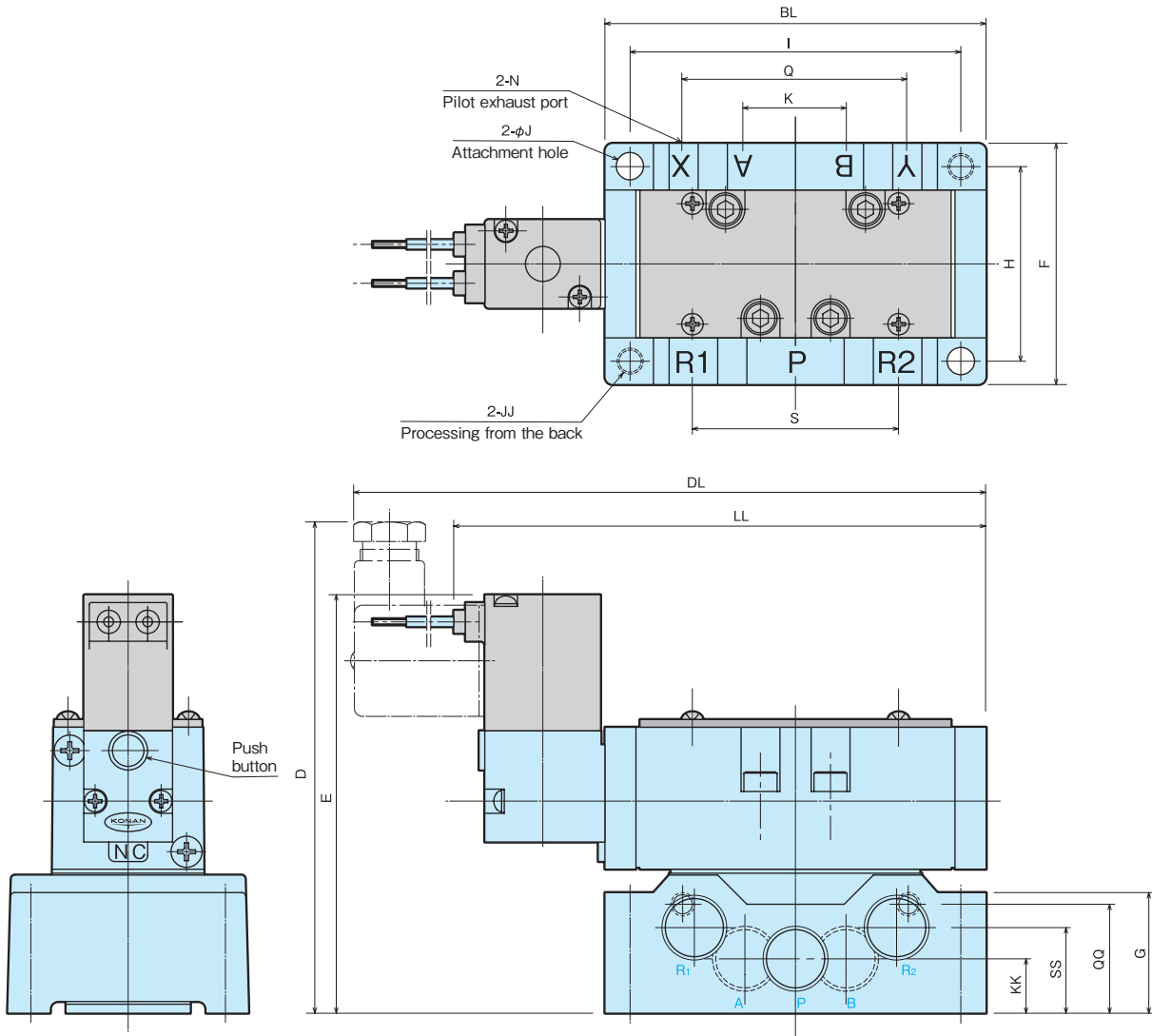


Sol a de-energized
Sol b energized



External Dimensions

2 Positions, Return 413S ■■■ C

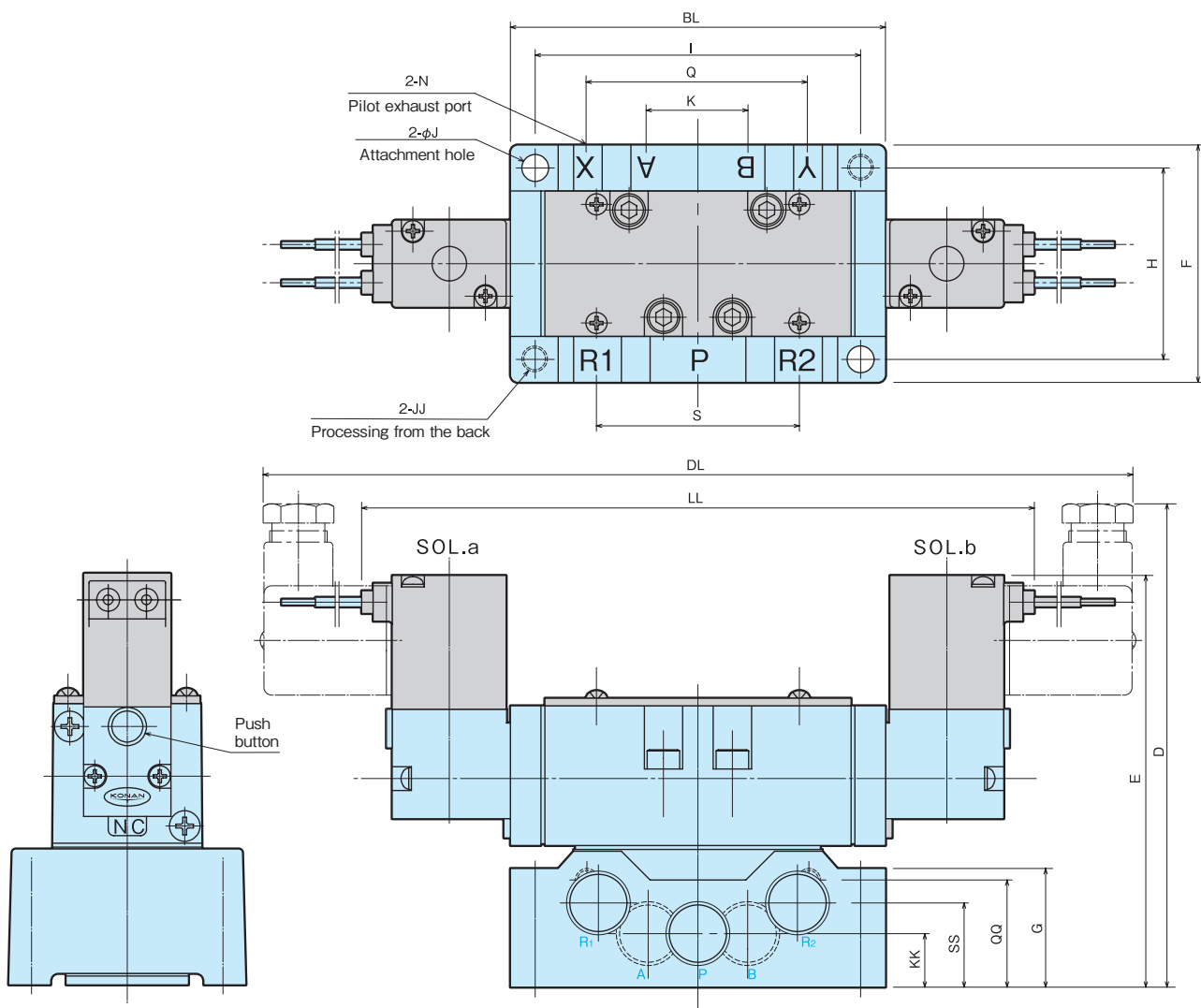


Unit : mm

| Model code | M | N | DL | LL | BL | D | E | F | G | H | I | J | JJ | K | KK | S | SS | Q | QQ | Mass (kg) |
|------------|-------|-------|-----|-----|-----|-----|-----|----|----|----|-----|-----|-------------------|----|----|----|----|----|----|-----------|
| 413S302C | Rc1/4 | Rc1/8 | 164 | 137 | 98 | 127 | 108 | 62 | 31 | 50 | 85 | 6.4 | M6 depth 10 | 26 | 14 | 52 | 22 | 58 | 28 | 1.2 |
| 413S303C | Rc3/8 | | 198 | 171 | 110 | 138 | 119 | 65 | 33 | 53 | 98 | | | 32 | 18 | 60 | 28 | 70 | 36 | 1.7 |
| 413S603C | Rc3/8 | | 211 | 184 | 150 | 156 | 137 | 84 | 47 | 66 | 132 | 9 | M8 depth 15 | 40 | 22 | 80 | 35 | 90 | 47 | 2.3 |
| 413S604C | Rc1/2 | | | | | | | | | | | | | 40 | 22 | 80 | 35 | 90 | 47 | 2.3 |
| 413S804C | Rc1/2 | | | | | | | | | | | | | 40 | 22 | 80 | 35 | 90 | 47 | 2.3 |
| 413S806C | Rc3/4 | | | | | | | | | | | | | | | | | | | |

External Dimensions

2 Positions, Hold 413D ■■■ C

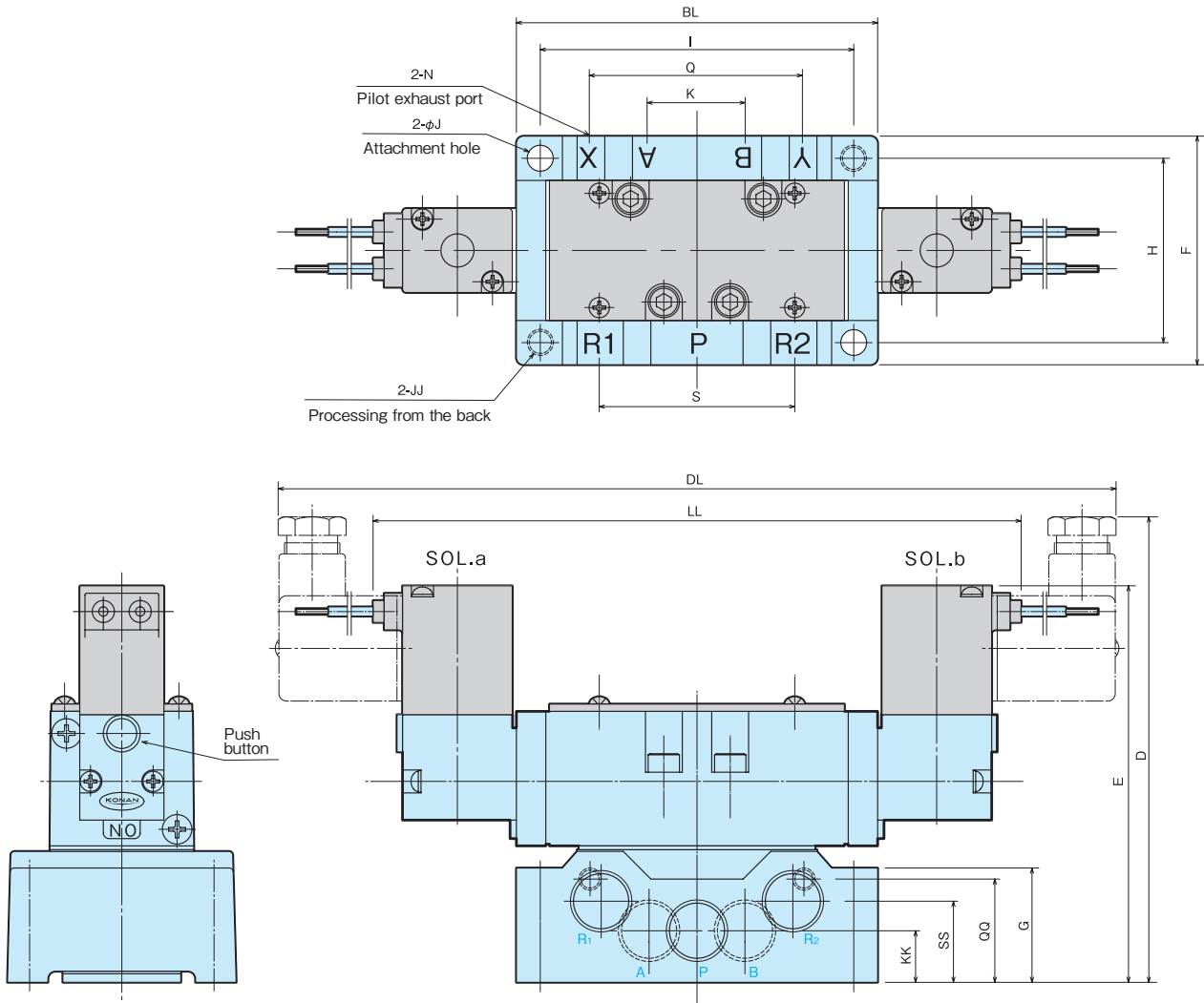


Unit : mm

| Model code | M | N | DL | LL | BL | D | E | F | G | H | I | J | JJ | K | KK | S | SS | Q | QQ | Mass (kg) | | | | | | | | | |
|------------|-------|-------|-----|-----|-----|-----|-----|----|----|----|----|-----|-------------------|----|-------------------|-----|-----|-----|----|-----------|----|-----|----|----|----|----|----|----|-----|
| 413D302C | Rc1/4 | Rc1/8 | 230 | 176 | 98 | 127 | 108 | 62 | 31 | 50 | 85 | 6.4 | M6 depth 10 | 26 | 14 | 52 | 22 | 58 | 28 | 1.2 | | | | | | | | | |
| 413D303C | Rc3/8 | | 264 | 210 | 110 | 138 | 119 | 65 | 33 | 53 | 98 | | | 9 | M8 depth 15 | 32 | 18 | 60 | 28 | 70 | 36 | 1.7 | | | | | | | |
| 413D603C | Rc3/8 | | | | | | | | | | | 272 | 218 | | | 150 | 156 | 137 | 84 | 47 | 66 | 132 | 40 | 22 | 80 | 35 | 90 | 47 | 2.3 |
| 413D604C | Rc1/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 413D804C | Rc1/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 413D806C | Rc3/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

External Dimensions

3 Positions 413H/J/I ■■■ C



Unit : mm

| Model code | M | N | DL | LL | BL | D | E | F | G | H | I | J | JJ | K | KK | S | SS | Q | QQ | Mass (kg) | | | | | | | | | |
|--------------|-------|-------|-----|-----|-----|-----|-----|----|----|----|----|-----|-------------------|----|-------------------|-----|-----|-----|----|-----------|----|-----|----|----|----|----|----|----|-----|
| 413H/J/1302C | Rc1/4 | Rc1/8 | 230 | 176 | 98 | 127 | 108 | 62 | 31 | 50 | 85 | 6.4 | M6 depth 10 | 26 | 14 | 52 | 22 | 58 | 28 | 1.3 | | | | | | | | | |
| 413H/J/1303C | Rc3/8 | | 264 | 210 | 110 | 138 | 119 | 65 | 33 | 53 | 98 | | | 9 | M8 depth 15 | 32 | 18 | 60 | 28 | 70 | 36 | 1.9 | | | | | | | |
| 413H/J/1603C | Rc3/8 | | | | | | | | | | | 288 | 234 | | | 150 | 156 | 137 | 84 | 47 | 66 | 132 | 40 | 22 | 80 | 35 | 90 | 47 | 3.0 |
| 413H/J/1604C | Rc1/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 413H/J/1804C | Rc1/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 413H/J/1806C | Rc3/4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

413 Type 5 Port Solenoid Valve

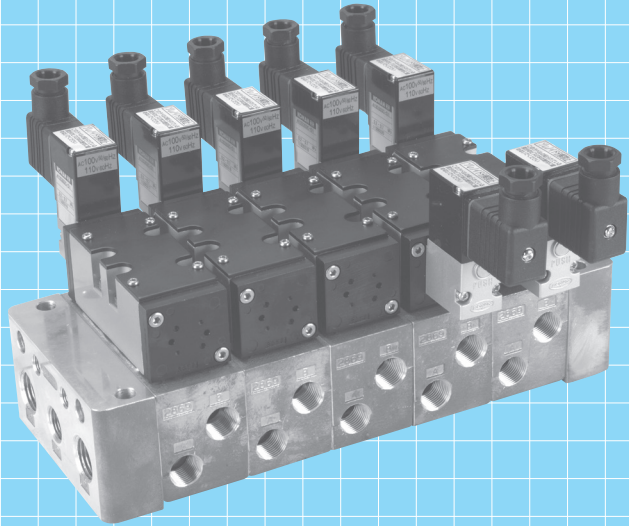
Gasket-connected type

413 Type

5 Port Solenoid Valve

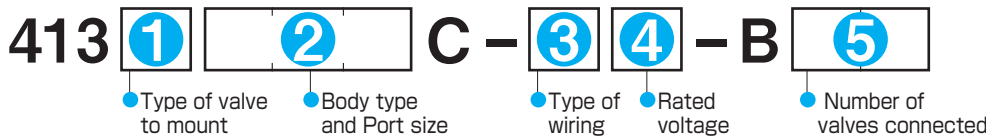
Manifold type

This is a manifold solenoid valve that uses the 413-type sub-plate 5 port solenoid valve, which has been adopted in pursuit of standardization. The manifold is highly reliable with integrated functions and ease of use, by pursuing thorough standardization of the manifold as well as the ISO/JIS compliant mounting dimensions of the main body, and by unifying the form with the collective exhaust system of the laminated manifold.



Model Code

When ordering, specify the model as follows.



| ① Type of valve to mount | | |
|--------------------------|-----------------------------|-------|
| Type of valve flow path | JIS symbol | Codes |
| 2 Position | Return | S |
| | Hold | D |
| 3 Position | Closed center | H |
| | Center open to exhaust | J |
| | Center open to pressure | I |
| Case of compound type | | Z |

| ② Body type and Port size | | | |
|---------------------------|--------------------------|-----------|-------|
| Body symbol | Effective sectional area | Port size | Codes |
| B30 | 25mm ² | Rc1/4 | 302 |
| | 28mm ² | Rc3/8 | 303 |
| B60 | 55mm ² | Rc3/8 | 603 |
| | 60mm ² | Rc1/2 | 604 |

| ③ Type of wiring | | Codes |
|-----------------------|-----------|-------|
| Type of wiring | | |
| Lead wire | | L |
| DIN connector | With lamp | D |
| | w/o lamp | N |
| Water-proof connector | | W |

| ④ Rated voltage | | Codes |
|------------------|--|-------|
| Rated voltage | | |
| AC100V 50 / 60Hz | | 1 |
| AC110V 50 / 60Hz | | 2 |
| AC200V 50 / 60Hz | | 3 |
| AC220V 50 / 60Hz | | 4 |
| DC24V | | 5 |
| DC48V | | 6 |
| DC100V | | 7 |
| DC110V | | 9 |

| ⑤ Number of valves connected | | Codes |
|------------------------------|--|-------|
| Number of valves connected | | |
| 2 | | 02 |
| 3 | | 03 |
| 4 | | 04 |
| ⋮ | | ⋮ |
| 9 | | 09 |
| 10 | | 10 |
| ※ | | 00 |

※ When ordering a single solenoid valve for a manifold (without a manifold base) as a spare part, please specify ⑤ as "00" .

● An example of model code

413 Z 604 - C - L 1 - B 05

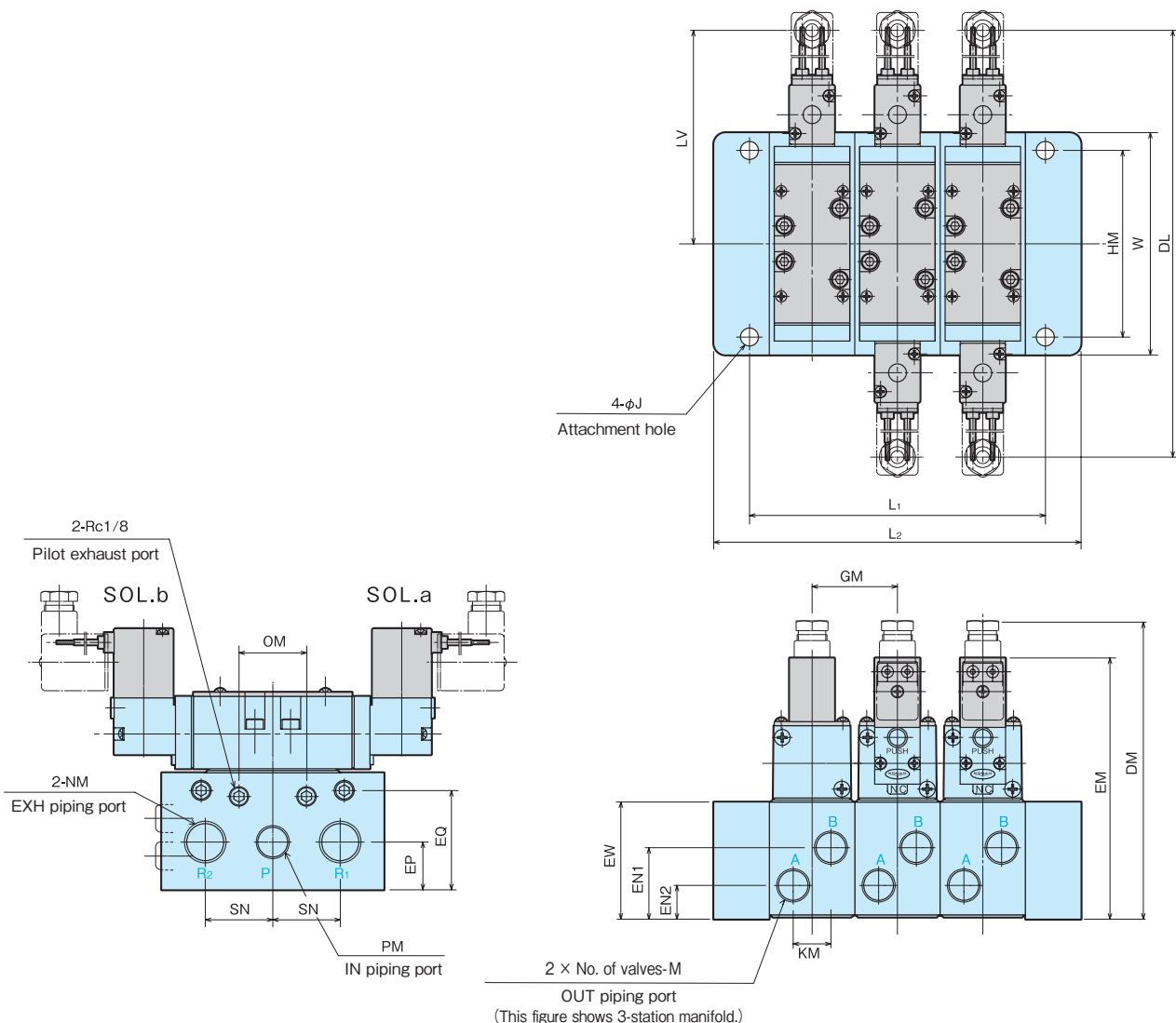
● Compound type (It is equipped with different valves at the same time) / Body symbol "B60" / Port size Rc1/2 / Lead wire type /AC100V50/60Hz /

※ Total number of connected units: 3

※ Fill out a separate form for information on the number of valve types and the order of sequences.

External Dimensions

413 ■■■■ - ■■-B



Unit : mm

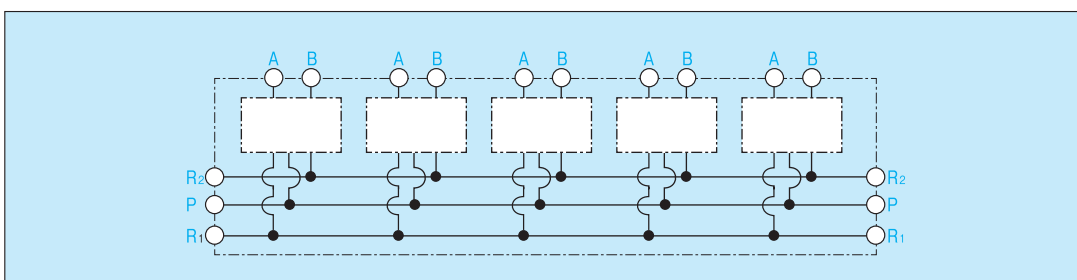
| Model code | M | NM | PM | DL | LV | DM | EM | EQ | EP | EN1 | EN2 | EW | W | KM | HM | J | QM | GM | SN | L1, L2 Dimension table | | | | | | | | | |
|---------------|-------|-------|-------|-----|-----|-----|-----|----|----|-----|-----|----|-----|----|-----|----|----|----|----|------------------------|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | | No. of valves | | | | | | | | | |
| 413□302C-□□-B | Rc1/4 | Rc1/2 | Rc3/8 | 230 | 115 | 151 | 132 | 47 | 24 | 36 | 17 | 60 | 112 | 19 | 94 | 9 | 34 | 43 | 34 | | | | | | | | | | |
| 413□303C-□□-B | Rc3/8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 413□603C-□□-B | Rc3/8 | Rc3/4 | Rc1/2 | 264 | 132 | 170 | 151 | 63 | 25 | 36 | 17 | 75 | 140 | 28 | 120 | 11 | 40 | 56 | 38 | | | | | | | | | | |
| 413□604C-□□-B | Rc1/2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Unit : mm

| Model code | No. of valves | | | | | | | | | | |
|--------------------|---------------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 413□302C/303C-□□-B | L1 | 63 | 106 | 149 | 192 | 235 | 278 | 321 | 364 |
| | L2 | 97 | 140 | 183 | 226 | 269 | 312 | 355 | 398 | 441 | 484 |
| 413□603C/604C-□□-B | L1 | 106 | 162 | 218 | 274 | 330 | 386 | 442 | 498 | 554 | 610 |
| | L2 | 126 | 182 | 238 | 294 | 350 | 406 | 462 | 518 | 574 | 630 |

JIS symbol

Any of the mounted valve type JIS symbol is applicable to the blank space in the figure on the below.



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