# Clean Design Manifold Valve

New

CE RoHS

IP69K

# Low fluid accumulation
# Easy to clean

## Large flow rate

**1,600** *1 **L/min (ANR)**

**Enclosure: IP69K**

**NSF-H1 grease**

**External parts: FDA-compliant materials** *2

Metal parts are made of stainless steel 316 with high anti-corrosion performance.

**Wiring: Lead wire/**
**Fieldbus type**
**IO-Link**

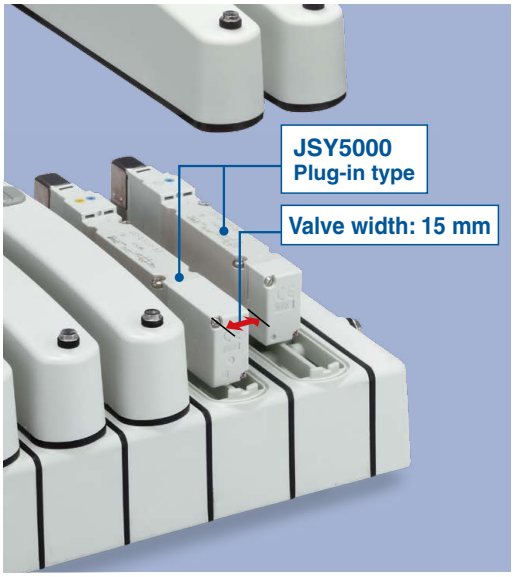
*1 When the inlet side is 0.6 MPa, and the outlet side is 0.5 MPa (20°C)
*2 The lead wire type cable is not made of FDA-compliant materials.


The photo shows the IO-Link compatible manifold.

**Crevice free exterior and can be cleaned without disassembly**

### Cleanable space between valves

### Valve width is 15 mm.




### Sub-plate (Single unit)


# *JSY5000-H Series*

SMC

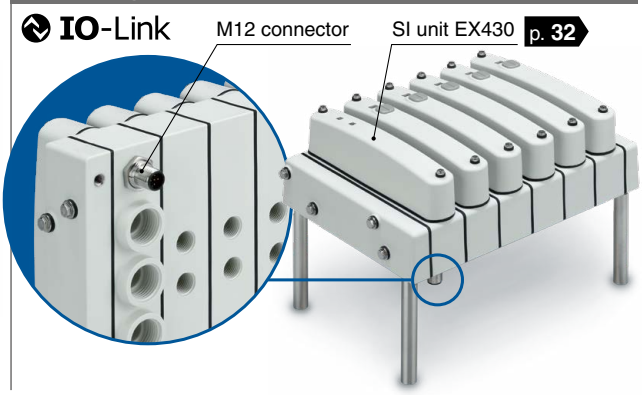
CAT.ES11-117A

# Wiring

## Manifold valve

### Lead wire type

### Fieldbus type

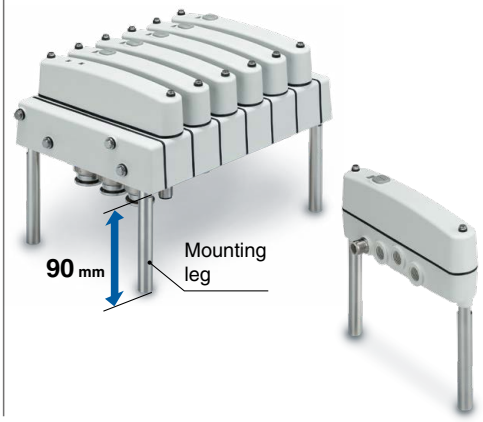



## Sub-plate (Single unit)

### M12 connector cable

# Manifold Parts

### Mounting leg



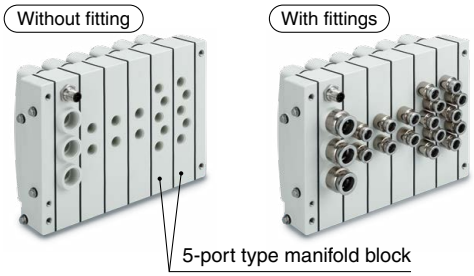

### With One-touch fittings

### 5-port type

**Manifold block assembly** p. 27

When the same manifold is used for different pressures, a manifold block assembly is used as a supply port for different pressures. It is also used for independent exhaust.

* Use with blocking disks.




# Series Variations

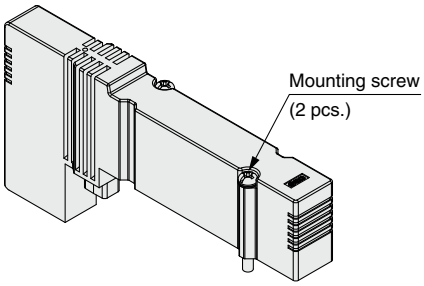
| Variations | 4(A), 2(B) port size | | | | | | | | Rated voltage | Wiring | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | One-touch fitting | | | | | | | | Common specifications | |
| | G1/4 (Without fitting) | Screw fitting | | | | | | | | Positive common | Negative common |
| | | ø8 | | ø10 | | ø5/16" | | ø3/8" | | | |
| | | Brass | Stainless steel | Brass | Stainless steel | Brass | Stainless steel | Brass | Stainless steel | | |
| Plug-in Lead wire type (34 cores) p. 11 | ● | ● | | ● | | ● | | ● | | ● | ● |
| Plug-in Fieldbus type IO-Link p. 11 | ● | ● | | ● | | ● | | ● | 24 VDC | — | ● |
| Sub-plate type p. 19 | ● | ● | | ● | | ● | | ● | | ● | ● |

● Standard ○ Option ▲ Made to order

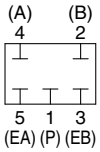
# Manifold Options

## Blanking plate [With two mounting screws] p. 34

Used when valve additions are expected or for maintenance




JSY51M-26P-1A




**Circuit diagram**

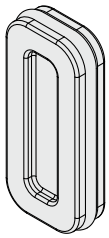
## SUP/EXH blocking disk p. 34

### [SUP blocking disk]

By inserting the SUP blocking disk in the pressure supply passage of the manifold valve, can provide two different high and low pressure in one manifold.

### [EXH blocking disk]

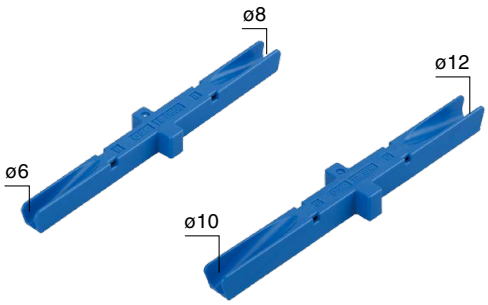
By inserting the EXH blocking disk in the exhaust passage of the manifold valve, can separate the exhaust from the valve so it does not affect the other valves. It can also be used for the manifold for the positive pressure and vacuum mixed manifold. (2 pieces are required to block EA/EB both sides of the EXH.)

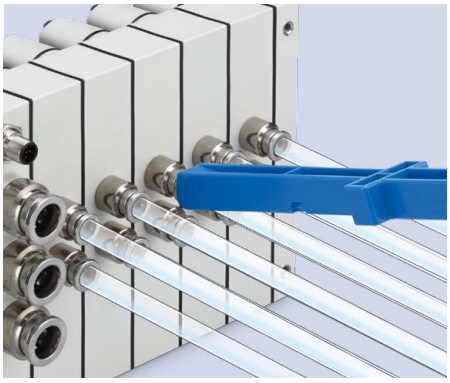


| Series | SUP blocking disk | EXH blocking disk |
|---|---|---|
| **JSY5000** | **JSY51M-40P-2A** | **JSY51M-40P-2A** |

## Tube releasing tool p. 33

This tool is used for removing the tube from port A and B.

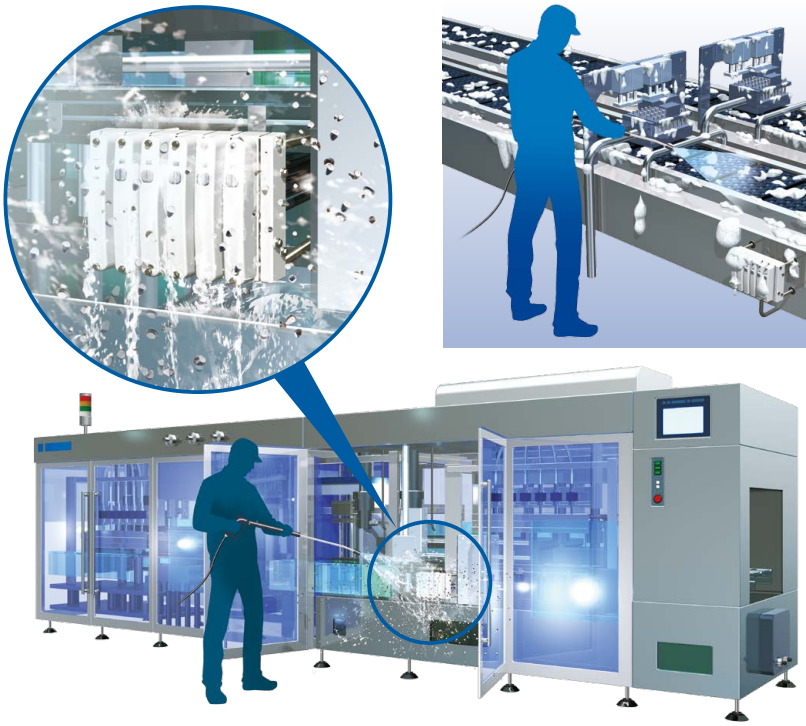


| | Manifold options | | Valve options | |
|---|---|---|---|---|
| | Blanking plate | SUP/EXH blocking disk | Vacuum/ Low pressure specification | Reverse pressure |
| | ○ p. 34 | ○ p. 34 | ▲ External pilot | ▲ External pilot |
| | ○ p. 34 | ○ p. 34 | ▲ External pilot | ▲ External pilot |
| | — | — | ▲ External pilot | ▲ External pilot |

# Applications

Installed inside equipment



Installed near actuators

# IP69K manifold

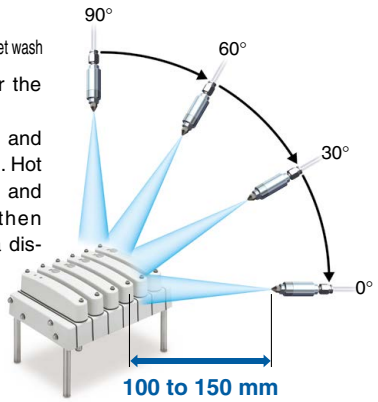
IP69K products are IP6X (IEC/EN 60529) and IPX9K (ISO 20653) compliant and protected against dust and high-pressure hot water.

**Glossary of Terms**

**IP6X**: Dust-tight

**IPX9K**: High-pressure and temperature jet wash

Not adversely affected under the following conditions.
Sample placed on a turntable and rotated at a speed of 5 ±1 rpm. Hot pressurized water at 80 ±5°C and pressure 8 to 10 MPa is then sprayed onto the sample at a distance of 100 to 150 mm with a jetwash nozzle from four position: 0°, 30°, 60°, and 90°, for 30 s for each position. Flow rate: 15 ±1 L/min




## Related Products

### EHEDG Compliant Fittings

EHEDG Compliant | IP69K | Hygienic Design | FDA Compliant

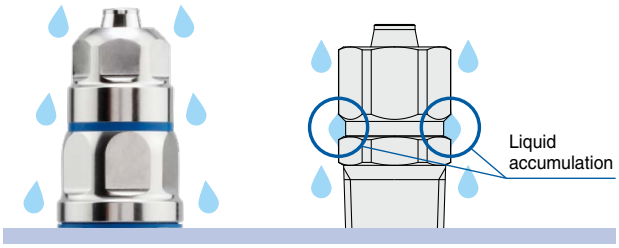
**KFG2H□-E Series**

∗ This product is not assembled when shipped.

### EHEDG Certification

This series satisfies EHEDG guidelines (hygienic design standards), preventing liquid and foreign matter from entering, and is easy to wash.

### Design for less residual liquid accumulation




**EHEDG compliant fitting**
Design for better liquid flow and less residual liquid accumulation

**Existing KFG2 model**
Design for poor liquid flow and more residual liquid accumulation

### Achieved IP69K rating

### Rubber parts

The material used is a special FKM that is compliant with the FDA (U.S. Food and Drug Administration) §177.2600 dissolution test. They are colored in blue for superior visibility.

### Body type: Male connector

### Connection thread: M, G∗1

∗1 ISO 16030 compliant

### Fluid temperature

–5 to 150°C

### EHEDG design standards

1. External surface roughness: Ra 0.8 μm or less
2. Corners of radius 3 mm or more or with an internal angle of 135°
3. Stainless material with high anti-corrosion performance: Stainless steel 316
4. No direct contact of external metal parts
5. Gasket seals made of FDA-compliant rubber materials

EHEDG Certificate of Compliance

# Related Products

## Clean Design Fittings

∗1 This product is not assembled when shipped.

Hygienic Design | FDA Compliant

Stainless Steel 316 Insert Fittings

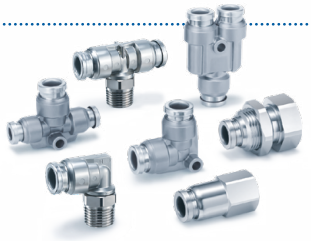
**KFG2H□-C Series**

## FDA Compliant Fittings

FDA Compliant

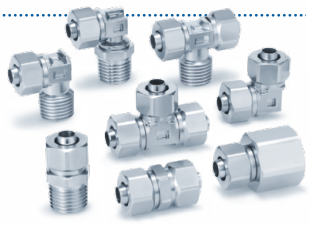
Stainless Steel 316 One-touch Fittings

**KQG2-F Series**



Metal One-touch Fittings

**KQB2-F Series**



Stainless Steel 316 Insert Fittings

**KFG2-F Series**

## FDA (U.S. Food and Drug Administration) Compliant Tubing

FDA Compliant

### Polyurethane Tubing

**TU-X214**

- Complies with the FDA (U.S. Food and Drug Administration) § 177.2600 dissolution test
- Complies with the EU No 10/2011 dissolution test

| Metric size | Color |
|---|---|
| ø4, ø6, ø8, ø10, ø12 | Black, White, Red, Blue, Yellow, Green, Clear, Orange |

### Fluoropolymer Tubing

**TL/TIL**

- Complies with the FDA (U.S. Food and Drug Administration) § 177.1550 dissolution test
- Food Sanitation Law compliant∗1

| Metric size | Inch size | Color |
|---|---|---|
| ø4, ø6, ø8, ø10, ø12, ø19 | ø1/8", ø3/16", ø1/4", ø3/8", ø1/2", ø3/4", ø1" | Translucent |

### Fluoropolymer Tubing (PFA)

**TLM/TILM**

- Complies with the FDA (U.S. Food and Drug Administration) § 177.1550 dissolution test
- Food Sanitation Law compliant∗1

| Metric size | Inch size | Color |
|---|---|---|
| ø2, ø3, ø4, ø6, ø8, ø10, ø12, ø16, ø19, ø25 | ø1/8", ø3/16", ø1/4", ø3/8", ø1/2", ø3/4", ø1", ø1 1/4" | Translucent, Black, Red, Blue |

### FEP Tubing (Fluoropolymer)

**TH/TIH**

- Complies with the FDA (U.S. Food and Drug Administration) § 177.1550 dissolution test
- Food Sanitation Law compliant∗1

| Metric size | Inch size | Color |
|---|---|---|
| ø4, ø6, ø8, ø10, ø12 | ø1/8", ø3/16", ø1/4", ø3/8", ø1/2", ø3/4" | Translucent, Black, Red, Blue |

### Soft Fluoropolymer Tubing

**TD/TID**



- Complies with the FDA (U.S. Food and Drug Administration) § 177.1550 dissolution test
- Food Sanitation Law compliant∗1

| Metric size | Inch size | Color |
|---|---|---|
| ø4, ø6, ø8, ø10, ø12 | ø1/8", ø3/16", ø1/4", ø3/8", ø1/2" | Translucent |

### Polyolefin Tubing

**TPH**



- Complies with the FDA (U.S. Food and Drug Administration) § 175.300 dissolution test

| Metric size | Color |
|---|---|
| ø4, ø6, ø8, ø10, ø12 | White, Blue, Yellow |

### Soft Polyolefin Tubing

**TPS**

- Complies with the FDA (U.S. Food and Drug Administration) § 175.300 dissolution test

| Metric size | Color |
|---|---|
| ø4, ø6, ø8, ø10, ø12 | White, Blue, Yellow |

∗1 Testing in compliance with Japan's Food Sanitation Law based on the 370th notice given by the Ministry of Health and Welfare in 1959

# CONTENTS

# *JSY5000-H Series*
# Valve Specifications

## Valve Specifications (JSY5000-H Plug-in Type)

| | | | |
|---|---|---|---|
| **Valve type** | | | Rubber seal |
| **Fluid** | | | Air |
| **Internal pilot operating pressure range MPa** | **2-position single** | | 0.15 to 0.7 |
| | **2-position double** | | 0.1 to 0.7 |
| | **3-position** | | 0.2 to 0.7 |
| | **4-position dual 3-port valve** | | 0.15 to 0.7 |
| **External pilot (Made to order) operating pressure range MPa** | **Operating pressure range** | | −100 kPa to 0.7 |
| | **Pilot pressure range** | **2-position single** | 0.25 to 0.7 |
| | | **2-position double** | |
| | | **3-position** | |
| **Ambient and fluid temperatures**∗1 **°C** | | | −10 to 50 (No freezing) |
| **Max. operating frequency Hz** | **JSY5000** | **2-position single/double** | 5 |
| | | **4-position dual 3-port valve** | 3 |
| | | **3-position** | 3 |
| **Manual override** | | | Non-locking push type |
| **Pilot exhaust type** | **Internal pilot** | | Common exhaust |
| | **External pilot (Made to order)** | | |
| **Lubrication** | | | Not required |
| **Mounting orientation**∗2 | | | Unrestricted |
| **Impact/Vibration resistance**∗2 **m/s²** | | | 150/30 |
| **Coil rated voltage DC** | | | 24 V |
| **Allowable voltage fluctuation V** | | | ±10% of the rated voltage |
| **Power consumption W** | **Standard** | | 0.4 |
| | **With power-saving circuit (Made to order)** | | 0.1∗3 [Inrush 0.4, Holding 0.1] |
| **Surge voltage suppressor** | | | Diode (Varistor for non-polar type) |
| **Indicator light** | | | LED |

∗1 The product is IPX9K compliant (protected against high-pressure hot water). However, operation of the valve must be within the specified valve ambient temperature and fluid temperature range.

∗2 Impact resistance: The value at which no malfunction occurs when tested in the axial direction and at right angles to the main valve and the armature in both energized and de-energized states, once for each condition (Values from the initial stage)
Vibration resistance: The value at which no malfunction occurs in a one-sweep test between 45 and 2000 Hz, performed in both energized and de-energized states in the axial direction and at right angles to the main valve and the armature (Values from the initial stage)

∗3 For details, refer to page 37.

## Manifold Specifications

| Type | | | Lead wire | Fieldbus (IO-Link)*1 |
|---|---|---|---|---|
| **Manifold type** | | | Plug-in connector connecting base | |
| **SUP/EXH port type** | | | Common SUP/EXH | |
| **Valve stations** | | | 2 to 16 stations | |
| **Internal wiring** | | | Positive common<br>Negative common<br>(Refer to "Electrical Wiring Specifications" on page 14.) | Negative common |
| **Port size** | **SUP/EXH block** | **1(P), 5(EA), 3(EB) port** | G1/2 (Based on ISO 16030) | |
| | **2-port type manifold block** | **4(A), 2(B) port** | G1/4 (Based on ISO 16030) | |
| | **5-port type manifold block** | **1(P), 4(A), 2(B), 5(EA), 3(EB) port** | G1/4 (Based on ISO 16030) | |
| **Enclosure** | | | IP69K<br>(Based on IEC/EN 60529/ISO 20653) | |
| **External parts material** | | | Resin parts: PA, Metal parts: Stainless steel 316, Rubber parts: EPDM | |

*1 Refer to page 32 for the Fieldbus type for output (EX430 series) specifications.

## Manifold Flow Rate Characteristics

| Manifold block type | Port size | | Flow rate characteristics | | | |
|---|---|---|---|---|---|---|
| | 1, 5, 3 (P, EA, EB) | 4, 2 (A, B) | 1 → 4, 2 (P → A, B) | | 4, 2 → 5, 3(A, B → EA, EB) | |
| | | | C [dm³/(s·bar)] | b | C [dm³/(s·bar)] | b |
| 2-port type | G1/2 | G1/4 | 6.80 | 0.31 | 7.64 | 0.23 |
| 5-port type | G1/4 | | 5.60 | 0.21 | 5.67 | 0.22 |

* The flow rate characteristics values are for an individually operated 2-position type manifold base with 5 stations.

## Manifold Weight

| Manifold block type (2-port/5-port type) | Weight: g*1 (n: Number of stations) |
|---|---|
| Lead wire type | 227 n + 1070 |
| Fieldbus type | 227 n + 500 |

*1 Weight without fittings. For when a lead wire type cable is 5 m. Add the weight of the valves to be mounted from the table below to find the total weight.

## Valve Weight

| Valve model | Type of actuation | | Weight [g] |
|---|---|---|---|
| **JSY5□03-H** | 2-position | Single | 86 |
| | | Double | 96 |
| | 3-position | Closed center | 106 |
| | | Exhaust center | |
| | | Pressure center | |
| | 4-position | Dual 3-port | 92 |

## Response Time

| Valve model | Response time [ms]*1 | |
|---|---|---|
| | Z type | U type |
| **JSY5103-H** | 40 | 32 |
| **JSY5203-H** | 19 | 19 |
| **JSY53/4/503-H** | 46 | 44 |
| **JSY5A/B/C03-H** | 38*2 | 29*2 |

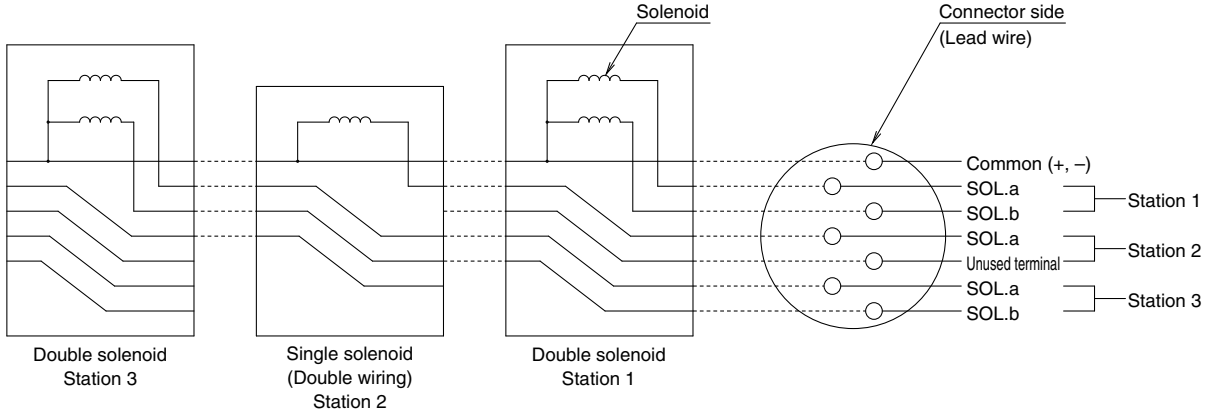
*1 Based on dynamic performance test, JIS B 8419:2010 (Coil temperature: 20°C, at rated voltage)

*2 There will be an approx. 10 ms delay on the 2(B) port side due to the length of the pilot passage.

## Connector Wiring Layout

For both Fieldbus and lead wire types, additional valves are sequentially assigned pins on the connector.
This makes it completely unnecessary to disassemble the connector unit.

### ■ Single solenoid valve is installed to all double wiring. (Double wiring specification) (Manifold specification sheet is not necessary.)

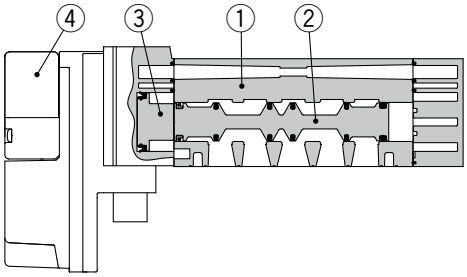



* These diagrams are for the purpose of explanation, and differ from the actual connector wiring.

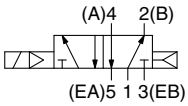
# *JSY5000-H Series*
# Valve Construction

## Rubber Seal

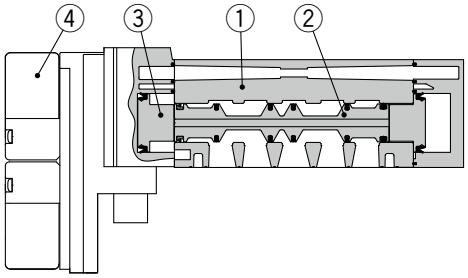
### 2-position single



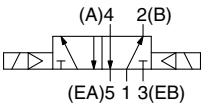

**2-position single**



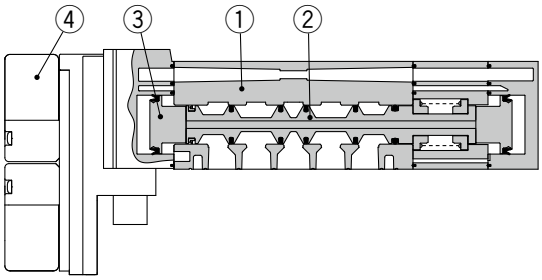

### 2-position double



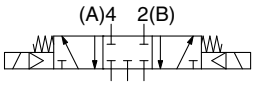

**2-position double**



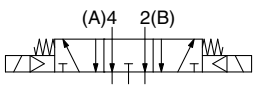

### 3-position closed center/exhaust center/pressure center



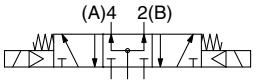

**3-position closed center**



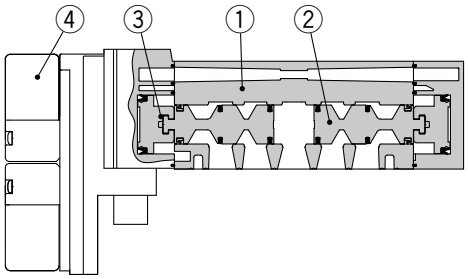

**3-position exhaust center**



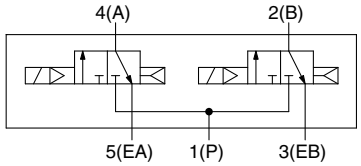

**3-position pressure center**



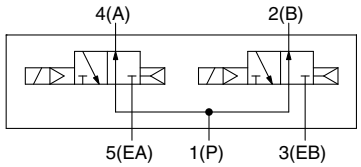

### 4-position dual 3-port



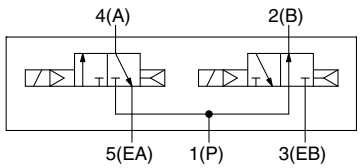

**4-position dual 3-port**
**N.C. x 2 pcs.**




**N.O. x 2 pcs.**




**N.C./N.O. 1 pc. of each**




## Component Parts

| No. | Description | Material |
|---|---|---|
| 1 | **Body** | Aluminum die-casted |
| 2 | **Spool valve** | Aluminum/HNBR (4-position dual 3-port: Resin/HNBR) |
| 3 | **Piston** | Resin |
| 4 | **Pilot valve** | — |

# *JSY5000-H Series*
# Valve Replacement Parts: Pilot Valve

## How to Order Pilot Valves (With a gasket and two mounting screws)

**V112 □ – 5 A**

**Coil type**

| | |
|---|---|
| **Nil** | Standard |
| **T** | With power-saving circuit (Made to order) |

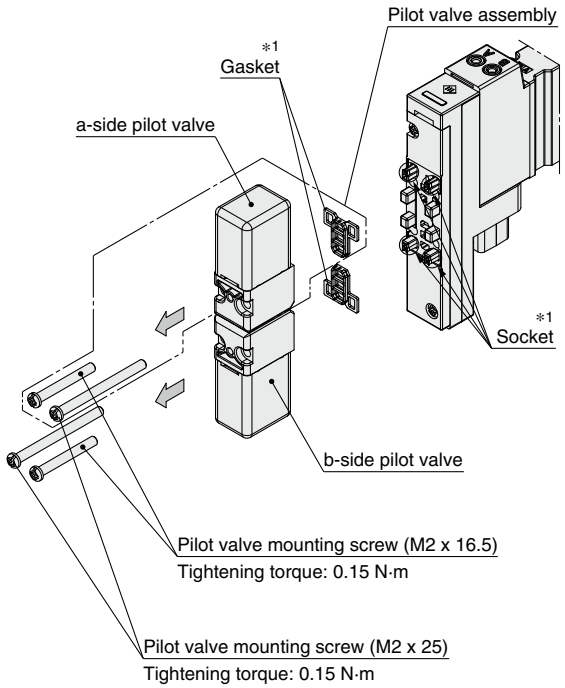
**Rated voltage**

| | |
|---|---|
| **5** | 24 VDC |

### ⚠Caution

1. The coil specification and voltage (including light/surge voltage suppressor) cannot be changed by changing the pilot valve.
2. When selecting the standard coil type, it is not possible to change to the power-saving circuit type.

### How to replace pilot valves




- Remove the pilot valve mounting screws.
- Remove the pilot valve in the direction indicated by the arrow.

∗1 Ensure the gasket is mounted, and take care not to bend the socket.

∗ Assemble by following the removal procedure in reverse.

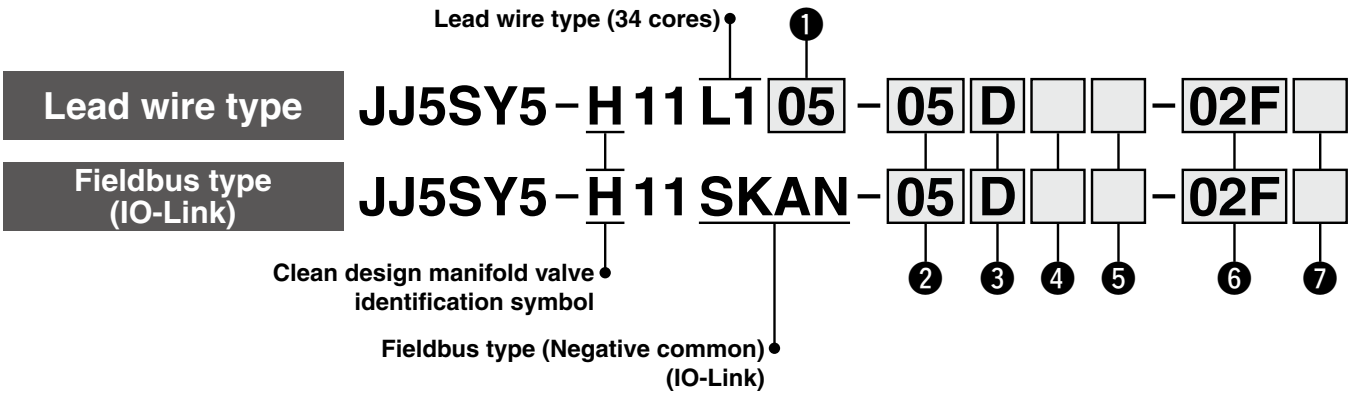
# Clean Design Manifold Valve

# JSY5000-H Series

## [IP69K Compliant]

**⚠ Caution** This is an IP69K compliant product. The manifold and valves are ordered as a set.

## How to Order Manifolds




### ❶ Lead wire length

| Symbol | Length |
|---|---|
| **05** | 5 m |
| **10** | 10 m |
| **15** | 15 m |

### ❷ Valve stations

| Symbol | Stations | Note |
|---|---|---|
| **02** | 2 stations | Double wiring∗1 |
| ⋮ | ⋮ | |
| **16** | 16 stations | |

∗1 Valve stations number includes stations with a blanking plate, and is the total number for all 2-port and 5-port type manifold blocks.

### ❸ SUP/EXH block 1(P), 5(EA), 3(EB) port entry

| | |
|---|---|
| **D** | D side (2 to 10 stations) |
| **B** | Both sides (2 to 16 stations) |

∗ SUP/EXH blocks with U side only is not available.

### ❹ Pilot type

| | |
|---|---|
| **Nil** | Internal pilot |
| **R**∗1 | External pilot |

∗1 External pilot port is on the D side end block.
The external pilot specification should be ordered as made to order.

### ❺ 5-port type manifold block stations

| Symbol | Stations | Note |
|---|---|---|
| **Nil** | None | Specify the number of stations with 5-port type manifold blocks, so this will be equal to or less than the total number of valve stations. **Specify the arrangement and blocking disk mounting position in the manifold specification sheet.** |
| **01** | 1 station | |
| ⋮ | ⋮ | |
| **16** | 16 stations | |

∗ E.g.) When the symbol is "02", 2 stations are 5-port type manifold blocks.
When the symbol is Nil or blank, all stations are of 2-port type manifold block.
∗ When different pressures are required, use 5-port type manifold blocks with blocking disks. Use of 5-port type manifold blocks without blocking disks can be used to provide an intermediate SUP/EXH block function.

### ❻ Manifold block port size [Thread piping/One-touch fitting (Metric/Inch size)]

| Symbol | Fitting specifications | | Manifold block port size | | Note | | |
|---|---|---|---|---|---|---|---|
| | | | | | SUP/EXH block | D side end block | |
| | | | 2-port type | 5-port type | | | |
| | | | A, B port | P, A, B, EA, EB port | P, EA, EB port | X, PE∗2 port | VENT port |
| **02F** | Without fitting | | G1/4 Thread piping | | G1/2 Thread piping | G1/8 Thread piping | M5 Thread piping |
| **B8** | Metric size Threaded One-touch fitting | Brass fitting | ø8∗1 | | ø16 | ø6 | ø4∗3 |
| **B10** | | | ø10 | | | | |
| **G8** | | Stainless steel fitting | ø8∗1 | | | | |
| **G10** | | | ø10 | | | | |
| **BN9** | Inch size Threaded One-touch fitting | Brass fitting | ø5/16"∗1 | | ø1/2" | ø1/4" | ø5/32"∗3 |
| **BN11** | | | ø3/8" | | | | |
| **GN9** | | Stainless steel fitting | ø5/16"∗1 | | | | |
| **GN11** | | | ø3/8" | | | | |

∗1 ø8 and ø5/16" One-touch fitting are common for mm and inch size.
∗2 In the case of external pilot type (made to order), fittings are attached to the X and PE ports according to the above fitting type.
∗3 For the VENT port ø4 and ø5/32", the same fitting is used.

### ❼ Mounting option

| | |
|---|---|
| **Nil** | None |
| **L**∗1 | Mounting leg (90 mm) |

∗1 Mounting legs are shipped together with the product.

**Made to Order** (Refer to page 35 for details.)

| Specifications |
|---|
| External pilot |
| Coil type: With power-saving circuit (Continuous duty type, 0.1 W) |



SMC

**⚠ Caution** This is an IP69K compliant product. The manifold and valves are ordered as a set.

## How to Order Valves

**JSY5 1 0 3 □ □ – 5 U – H**

❶ ❷ ❸ ❹ ❺ ❻ ❼

Clean design manifold valve identification symbol

### ❶ Type of actuation

| | | |
|---|---|---|
| 1 | 2-position | Single |
| 2 | | Double |
| 3 | 3-position | Closed center |
| 4 | | Exhaust center |
| 5 | | Pressure center |
| A*1 | 4-position dual 3-port | N.C./N.C. |
| B*1 | | N.O./N.O. |
| C*1 | | N.C./N.O. |

*1 External pilot specification is not applicable for 4-position dual 3-port valves.

### ❷ Body type

| | |
|---|---|
| 0 | Base mounted (For plug-in) |

### ❸ Pilot valve exhaust method

| | |
|---|---|
| 3 | Pilot valve common exhaust |

### ❹ Pilot type

| | |
|---|---|
| Nil | Internal pilot |
| R*1 | External pilot |

*1 The external pilot specification should be ordered as made to order.

### ❺ Coil type

| | |
|---|---|
| Nil | Standard |
| T*1 | With power-saving circuit (Continuous duty type) |

*1 "T" (With power-saving circuit) should be ordered as made to order.

### ❻ Rated voltage

| | |
|---|---|
| 5 | 24 VDC |

### ❼ Light/surge voltage suppressor

| Symbol | With light | Surge voltage suppressor | Common specification |
|---|---|---|---|
| U | ● | ● | Non-polar |
| Z | | | Positive common |
| NZ | | | Negative common |

* Only "Z" and "NZ" types are available with a power-saving circuit.
* For fieldbus type manifold, select non-polar (U) or negative common (NZ).

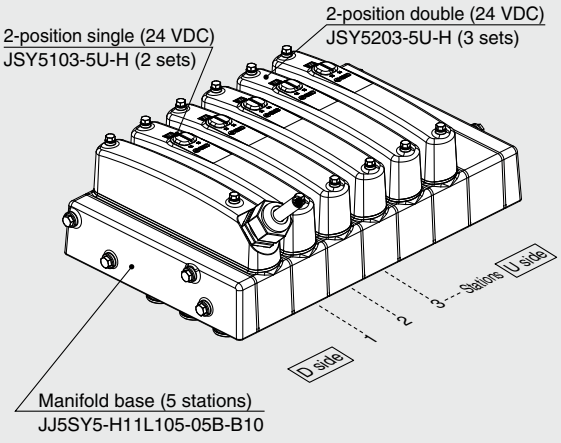
**⚠ Caution**

**● If the valve will be continuously energized, please be sure to use the power-saving circuit (continuous duty type). Refer to Made to Order on page 35.**

⚠ Protective class class Ⅲ (Mark: Ⅲ)

## How to Order Manifold Assembly

### Example (JJ5SY5-H11L105-□)




**⚠ Caution** This is an IP69K compliant product. The manifold and valves are ordered as a set.

**Ordering example**

**JJ5SY5-H11L105-05B-B10 ····· 1 set (Type H11 5-station manifold base part no.)**
*** JSY5103-5U-H ····· 2 sets (2-position single part no.)**
*** JSY5203-5U-H ····· 3 sets (2-position double part no.)**

**The asterisk denotes the symbol for the assembly. Prefix it to the part numbers of the valve, etc.**

· For the valve arrangement, the valve closest to the D side is considered the 1st station.
· Under the manifold part number, state the valves to be mounted in order starting with the 1st station as shown in the figure above. If the arrangement becomes too complicated, specify the details on a manifold specification sheet.

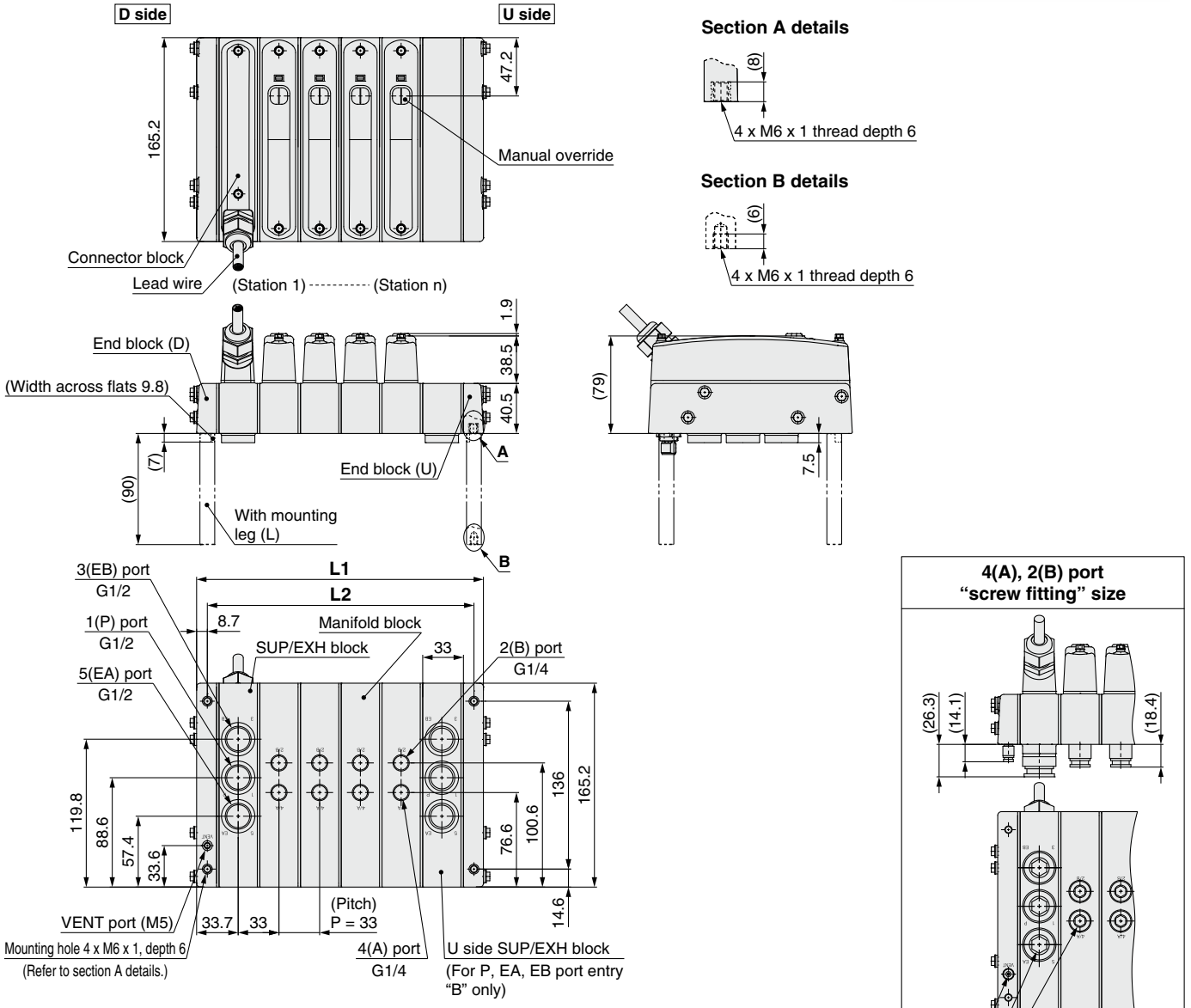
### Manifold Specifications

In order to assemble complex manifold patterns, or for arrangements including 5-port type manifold blocks, please use the manifold specification sheet.

Scan here to download.

## Dimensions: Lead Wire Type

**JJ5SY5-H11L1□-** Stations **D/B-02F, B□G□, BN□GN□ (L)**




∗ Refer to page 17 for the panel cutout dimensions for direct mounting.




∗ These figures show the "JJ5SY5-H11L105-04B-B10."

### 1(P), 5(EA), 3(EB) Port Entry: D Side (SUP/EXH Block)

**L: Dimensions**

n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| **L1** | 133.4 | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 |
| **L2** | 117 | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 |

### 1(P), 5(EA), 3(EB) Port Entry: Both Sides (SUP/EXH Block)

**L: Dimensions**

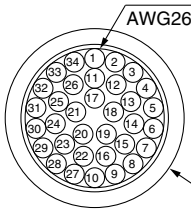
n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 | 430.4 | 463.4 | 496.4 | 529.4 | 562.4 | 595.4 | 628.4 |
| **L2** | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 | 414 | 447 | 480 | 513 | 546 | 579 | 612 |

## Electrical Wiring Specifications

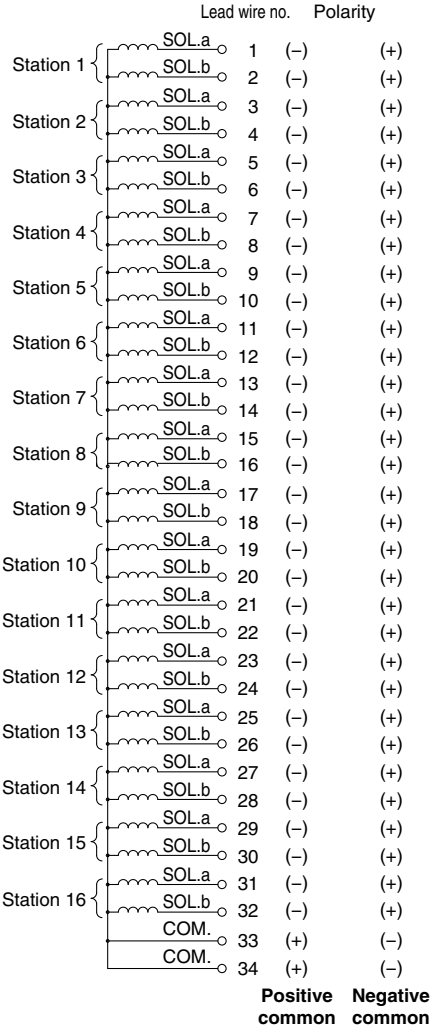
**Lead wire**

**34 cores** Lead wire
AWG26 (0.14 mm²) x 34 cores



If alignment is not specified, the internal wiring will be double wiring (connected to SOL. a and SOL. b) regardless of number of stations, valve types, and option types.

Sheath O.D.
Approx. ø8.8




| Lead wire color | Printed mark (Both sides) | |
|---|---|---|
| | Type | Color |
| Orange | – | Red / Black |
| Light gray | – | Red / Black |
| White | – | Red / Black |
| Yellow | – | Red / Black |
| Pink | – | Red / Black |
| Orange | – – | Red / Black |
| Light gray | – – | Red / Black |
| White | – – | Red / Black |
| Yellow | – – | Red / Black |
| Pink | – – | Red / Black |
| Orange | – – – | Red / Black |
| Light gray | – – – | Red / Black |
| White | – – – | Red / Black |
| Yellow | – – – | Red / Black |
| Pink | – – – | Red / Black |
| Orange | – – – – | Red / Black |
| Light gray | – – – – | Red / Black |

∗ For negative common specification, a valve for negative common or a valve without polarity should be used.

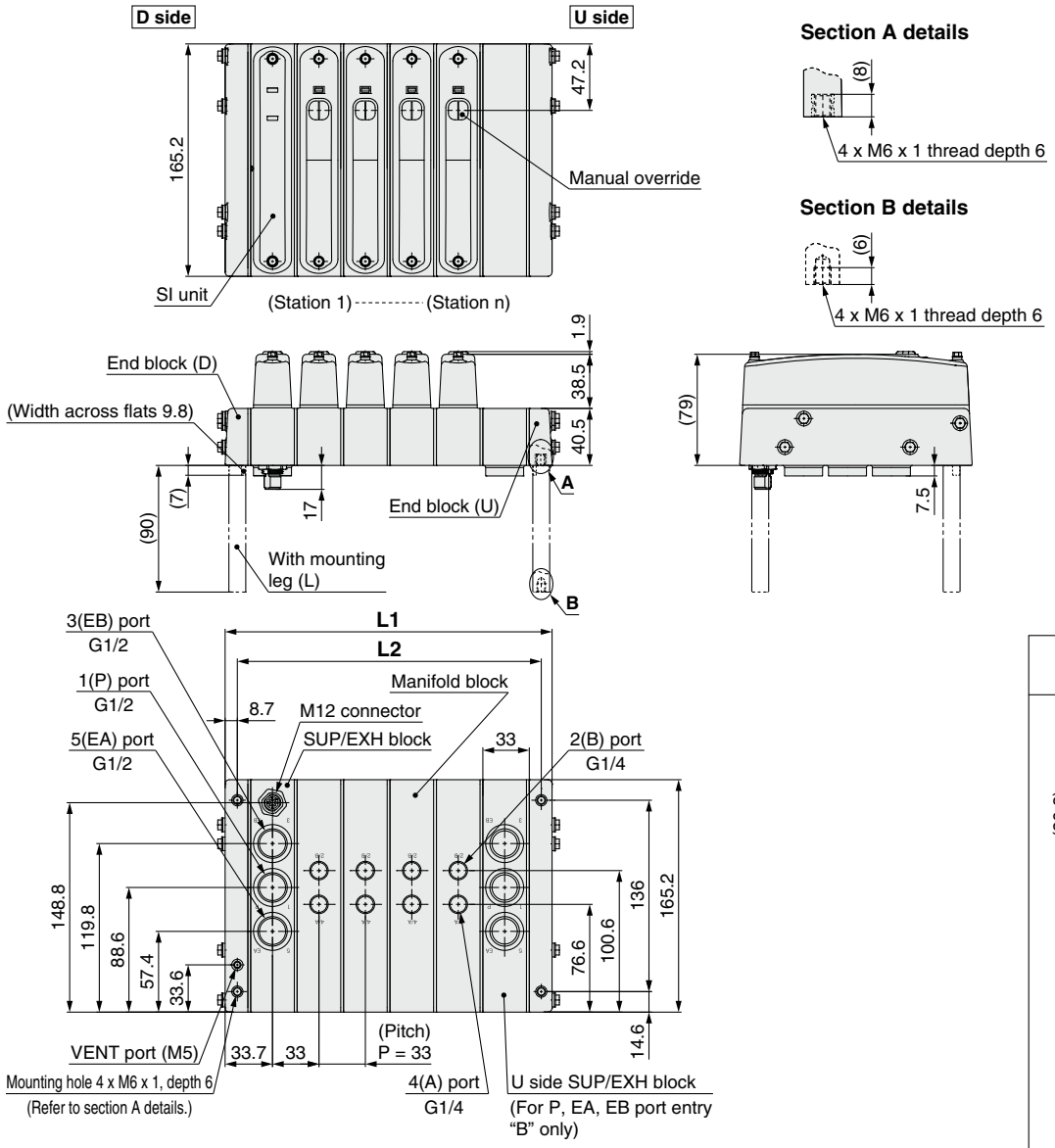
**Electrical characteristics**

| Item | Property |
|---|---|
| Conductor resistance Ω/km, 20°C | 143 or less |
| Voltage limit V, 1 minute, AC | 2000 |
| Insulation resistance MΩ/km, 20°C | 10 or more |

∗ Cannot be used for movable wiring
The minimum bending radius of the cable is 55 mm.

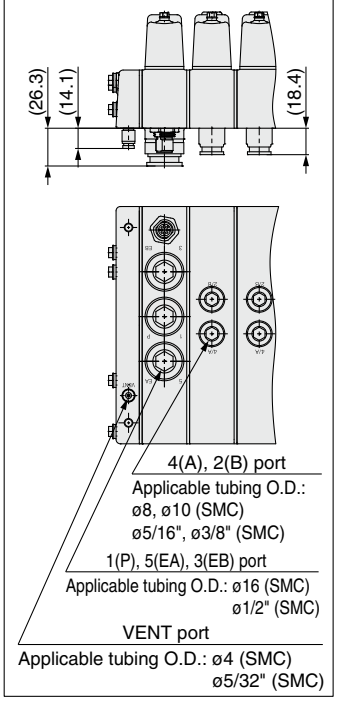
## Dimensions: Fieldbus Type (IO-Link)

**JJ5SY5-H11SKAN-** Stations $\begin{matrix}D\\B\end{matrix}$ **-** $\begin{matrix}02F, B\square\\G\square, BN\square\\GN\square\end{matrix}$ **(L)**




∗ Refer to page 17 for the panel cutout dimensions for direct mounting.

**4(A), 2(B) port "screw fitting" size**




∗ These figures show the "JJ5SY5-H11SKAN-04B-B10."

### 1(P), 5(EA), 3(EB) Port Entry: D Side (SUP/EXH Block)

**L: Dimensions** n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| **L1** | 133.4 | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 |
| **L2** | 117 | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 |

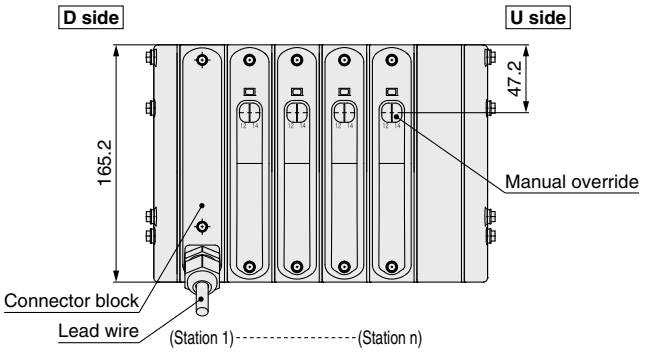
### 1(P), 5(EA), 3(EB) Port Entry: Both Sides (SUP/EXH Block)

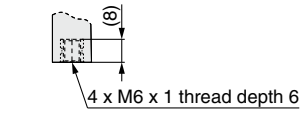
**L: Dimensions** n: Number of stations

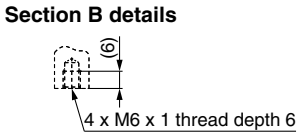
| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 | 430.4 | 463.4 | 496.4 | 529.4 | 562.4 | 595.4 | 628.4 |
| **L2** | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 | 414 | 447 | 480 | 513 | 546 | 579 | 612 |

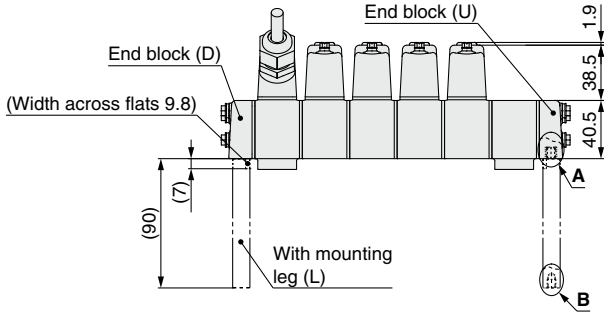
## Dimensions: 5-Port Type Manifold Block [Common to Lead Wire Type/Fieldbus Type (IO-Link)]

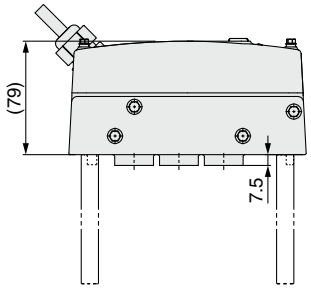
**JJ5SY5-H11$^{L1\square}_{SKAN}$ - Valve stations $^{D}_{B}$(R) 5-port type manifold block stations - 02F, B□ G□, BN□ GN□ (L)**

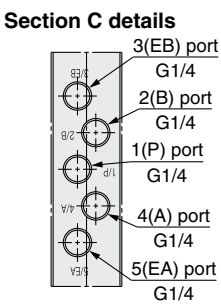


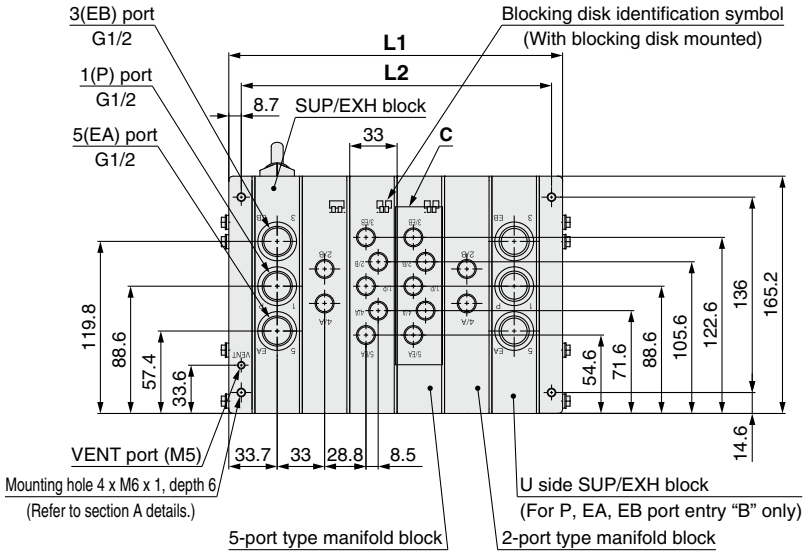



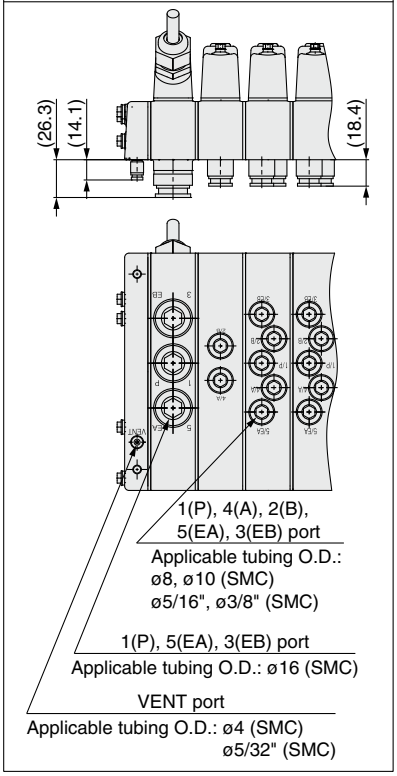




**4(A), 2(B) port "screw fitting" size**




* These figures show the "JJ5SY5-H11L105-04B02-02F."
* Refer to page 17 for the panel cutout dimensions for direct mounting.

### 1(P), 5(EA), 3(EB) Port Entry: D Side (SUP/EXH Block)

**L: Dimensions**

n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| **L1** | 133.4 | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 |
| **L2** | 117 | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 |

### 1(P), 5(EA), 3(EB) Port Entry: Both Sides (SUP/EXH Block)

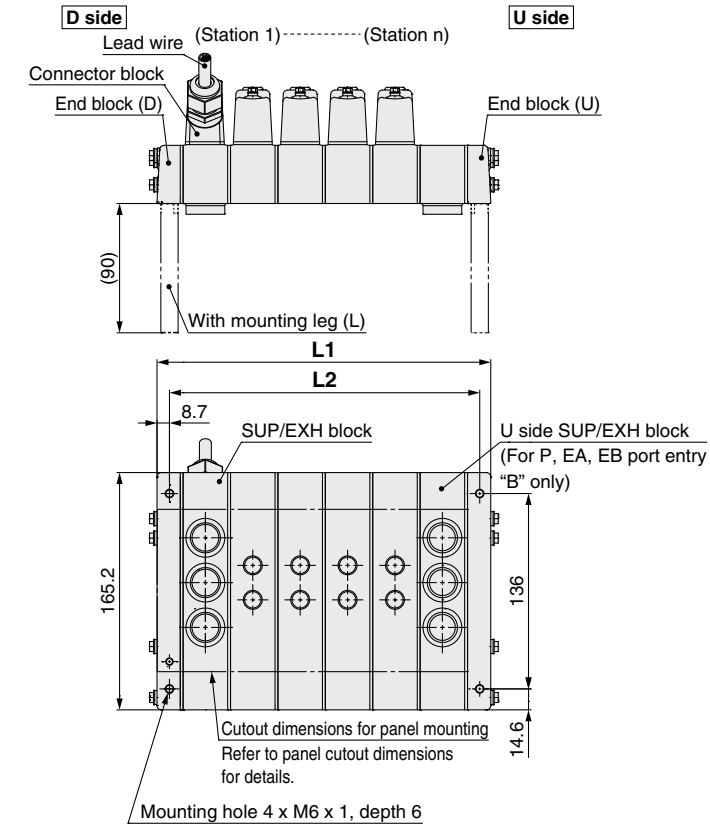
**L: Dimensions**

n: Number of stations

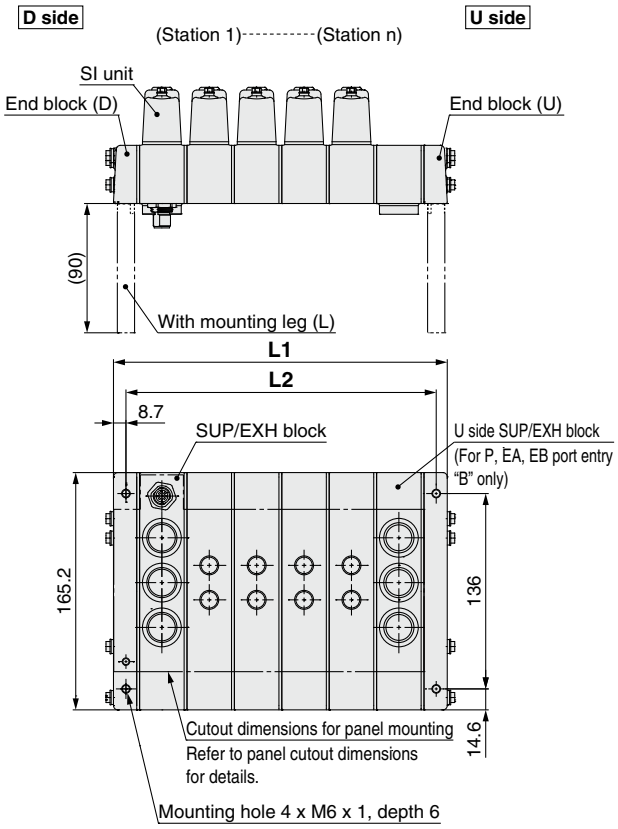
| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 | 430.4 | 463.4 | 496.4 | 529.4 | 562.4 | 595.4 | 628.4 |
| **L2** | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 | 414 | 447 | 480 | 513 | 546 | 579 | 612 |

## Dimensions: Panel Cutout Dimensions

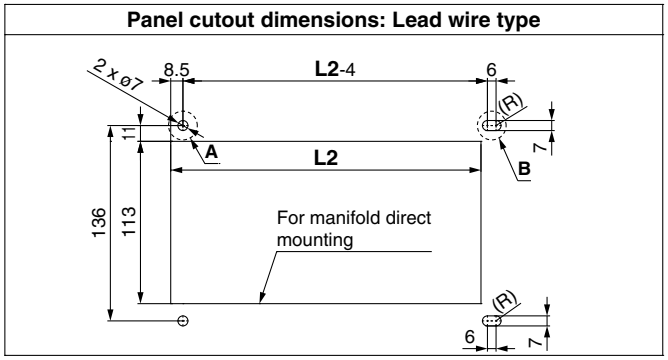
**JJ5SY5-H11L1□-Stations $^{D}_{B}$(R)-$^{02F, B□}_{G□, BN□, GN□}$(L)**




**JJ5SY5-H11SKAN-Stations $^{D}_{B}$(R)-$^{02F, B□}_{G□, BN□, GN□}$(L)**

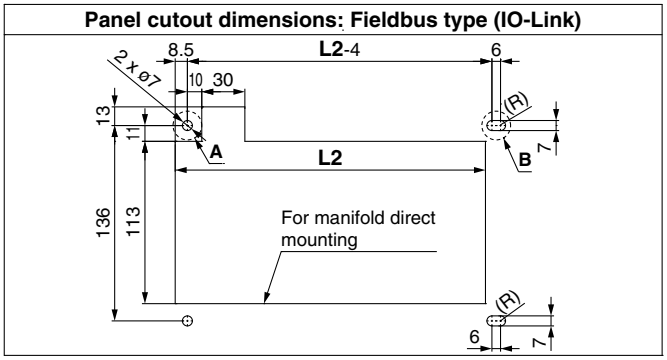



**Panel cutout dimensions: Lead wire type**




∗ When mounting with the mounting leg (L), only the leg mounting holes (round/elongated) are machined.

**Panel cutout dimensions: Fieldbus type (IO-Link)**




∗ When mounting with the mounting leg (L), only the leg mounting holes (round/elongated) are machined.

**Section A mounting hole details** **Section B mounting hole details**


∗ Tolerance: ±0.2

### 1(P), 5(EA), 3(EB) Port Entry: D Side (SUP/EXH Block)

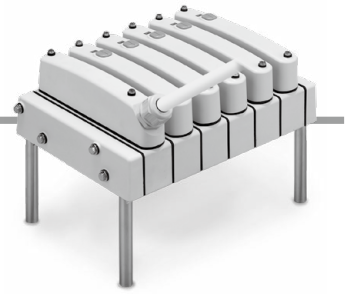
**L: Dimensions** n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| **L1** | 133.4 | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 |
| **L2** | 117 | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 |

### 1(P), 5(EA), 3(EB) Port Entry: Both Sides (SUP/EXH Block)

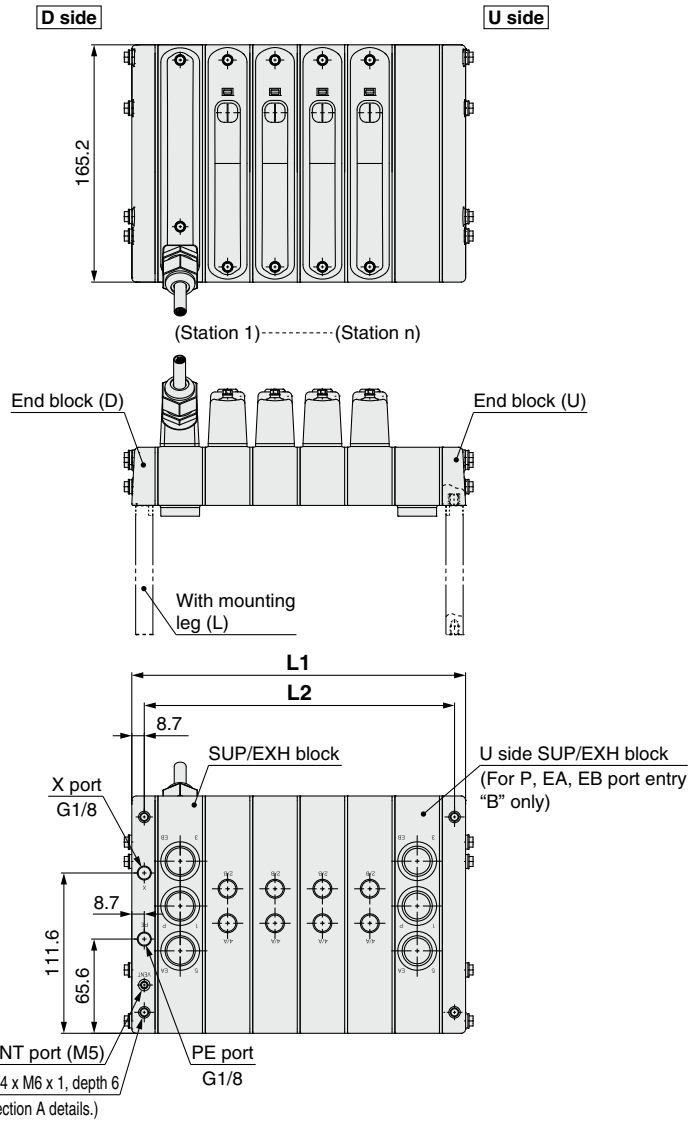
**L: Dimensions** n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 | 430.4 | 463.4 | 496.4 | 529.4 | 562.4 | 595.4 | 628.4 |
| **L2** | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 | 414 | 447 | 480 | 513 | 546 | 579 | 612 |

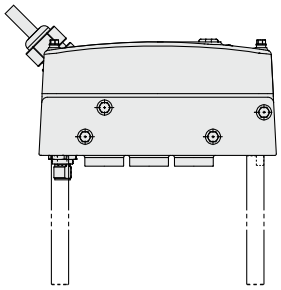


## Dimensions: External Pilot (Made to Order)

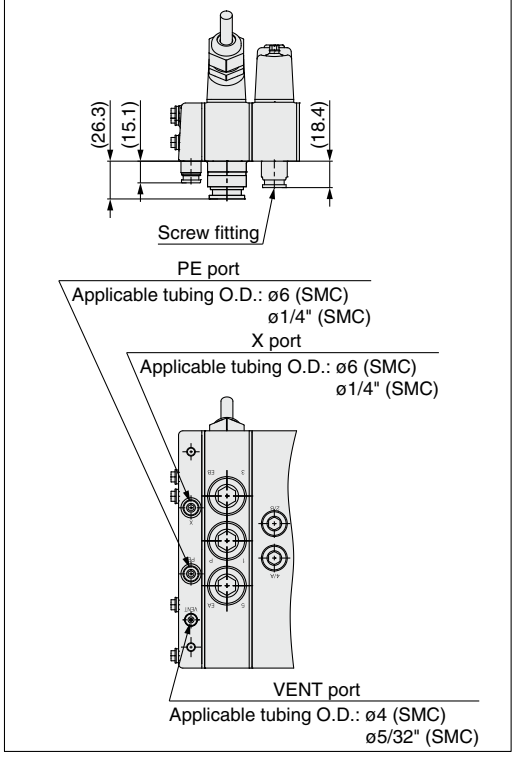
**JJ5SY5-H11 L1□ SKAN - Stations D B R- 02F, B□ G□, BN□ GN□ (L)**




∗ Refer to page 17 for panel cutout dimensions.



**4(A), 2(B) port "screw fitting" size**




∗ These figures show the "JJ5SY5-H11L105-04BR-B10."

### 1(P), 5(EA), 3(EB) Port Entry: D Side (SUP/EXH Block)

**L: Dimensions** n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| **L1** | 133.4 | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 |
| **L2** | 117 | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 |

### 1(P), 5(EA), 3(EB) Port Entry: Both Sides (SUP/EXH Block)

**L: Dimensions** n: Number of stations

| L \ n | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **L1** | 166.4 | 199.4 | 232.4 | 265.4 | 298.4 | 331.4 | 364.4 | 397.4 | 430.4 | 463.4 | 496.4 | 529.4 | 562.4 | 595.4 | 628.4 |
| **L2** | 150 | 183 | 216 | 249 | 282 | 315 | 348 | 381 | 414 | 447 | 480 | 513 | 546 | 579 | 612 |

# *JSY5000-H Series*
# Sub-plate (Single Unit) [IP69K Compliant]

## Sub-plate Specifications

| Type | | Plug-in single unit type with M12 plug connector |
|---|---|---|
| **SUP/EXH port type** | | 1(P), 5, 3(EA, EB) individual port |
| **Internal wiring** | | Positive common<br>Negative common<br>(Refer to the pin arrangement on page 20.) |
| **Port size** | **1(P), 5/3(EA/EB)** | G1/4 (Based on ISO 16030) |
| | **4(A), 2(B)** | |
| **Enclosure** | | IP69K<br>(Based on IEC/EN 60529/ISO 20653) |
| **External parts material** | | Resin parts: PA, Metal parts: Stainless steel 316, Rubber parts: EPDM |

## Sub-plate Flow Rate Characteristics/Weight

| Port size | | Flow rate characteristics | | | | Weight: g*1 |
|---|---|---|---|---|---|---|
| 1, 5, 3 (P, EA, EB) | 4, 2 (A, B) | 1 → 4, 2 (P → A, B) | | 4, 2 → 5, 3 (A, B → EA, EB) | | |
| | | C [dm³/(s·bar)] | b | C [dm³/(s·bar)] | b | |
| G1/4 | G1/4 | 6.75 | 0.31 | 6.53 | 0.22 | 180 |

*1 Weight without fittings, valve, and M12 cable. Valve weight can be added from page 7.

## How to Order Sub-plates (With Valve/Valve Cover)

**JSY5 1 0 3 ❷ ❸ – 5 U – H – WO – U 02F ❽**

❶ Body type • ❷❸ Pilot valve exhaust method • ❹ Clean design • ❺ sub-plate identification symbol

### ❶ Type of actuation

| | | |
|---|---|---|
| **1** | 2-position | Single |
| **2** | | Double |
| **3** | 3-position | Closed center |
| **4** | | Exhaust center |
| **5** | | Pressure center |
| **A**∗1 | 4-position dual 3-port | N.C./N.C. |
| **B**∗1 | | N.O./N.O. |
| **C**∗1 | | N.C./N.O. |

∗1 External pilot specification is not applicable for 4-position dual 3-port valves.

### ❷ Pilot type

| | |
|---|---|
| **Nil** | Internal pilot |
| **R**∗1 | External pilot |

∗1 The external pilot specification should be ordered as made to order.

### ❸ Coil type

| | |
|---|---|
| **Nil** | Standard |
| **T**∗1 | With power-saving circuit (Continuous duty type) |

∗1 "T" (With power saving circuit) should be ordered as made to order.

### ❹ Light/surge voltage suppressor

| Symbol | With light | Surge voltage suppressor | Common specification |
|---|---|---|---|
| **U** | ● | ● | Non-polar |
| **Z** | | | Positive common |
| **NZ** | | | Negative common |

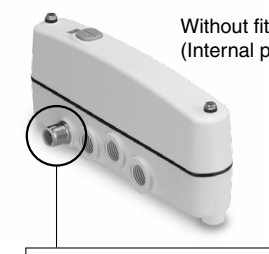
∗ Only "Z" and "NZ" types are available with a power-saving circuit.

### ❺ Wiring specification

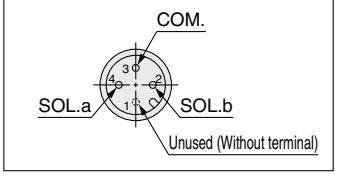
| | |
|---|---|
| **WO** | Without M12 connector cable |

### ❻ Port location

| | |
|---|---|
| **U** | Bottom ported |




**Sub-plate side pin arrangement**
(No numeric indication)




∗ Plug connector type

### ❼ 1(P), 4(A), 2(B), 5(EA), 3(EB) port size [Thread piping/One-touch fitting (Metric/Inch size)]

| Symbol | Fitting specifications | | P, A, B, EA, EB port One-touch fitting size | Note: X, PE∗2 port | Note: VENT port |
|---|---|---|---|---|---|
| **02F** | Without fitting | | G1/4 Thread piping | M5 Thread piping | M5 Thread piping |
| **B8** | Metric size Threaded One-touch fitting | Brass fitting | ø8∗1 | ø4 | ø4∗3 |
| **B10** | | | ø10 | | |
| **G8** | | Stainless steel fitting | ø8∗1 | | |
| **G10** | | | ø10 | | |
| **BN9** | Inch size Threaded One-touch fitting | Brass fitting | ø5/16"∗1 | ø5/32" | ø5/32"∗3 |
| **BN11** | | | ø3/8" | | |
| **GN9** | | Stainless steel fitting | ø5/16"∗1 | | |
| **GN11** | | | ø3/8" | | |

∗1 For B8/G8 (ø8) and BN9/GN9 (ø5/16"), the same fitting is used for them.
∗2 In the case of external pilot type, fittings are attached to the X and PE ports according to the above fitting type.
∗3 For X, PE port and VENT port of ø4 and ø5/32", the same fitting is used.

### ❽ Mounting option

| | |
|---|---|
| **Nil** | None |
| **L**∗1 | Mounting leg (90 mm) |

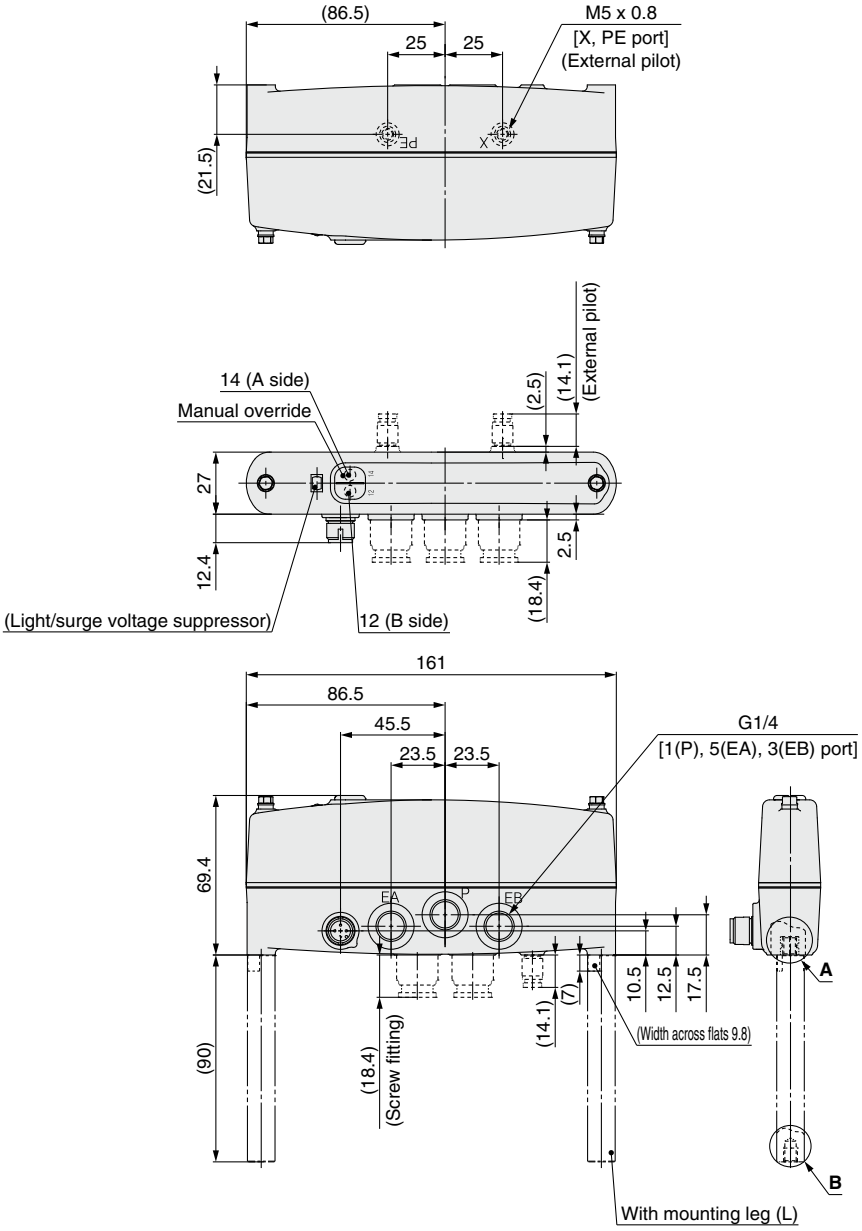
∗1 Mounting legs are shipped together with the product.

### Recommended M12 Connector Cables (IP69K and FDA-compliant products)

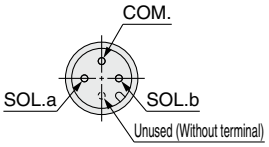
| Cable length | PHOENIX CONTACT Product no. | PHOENIX CONTACT Order no. | Note |
|---|---|---|---|
| 1.5 m | SAC-4P-1,5-600/M12FS HD | 1403956 | Produced upon receipt of order |
| 3 m | SAC-4P-3,0-600/M12FS HD | 1403957 | |
| 5 m | SAC-4P-5,0-600/M12FS HD | 1403958 | |
| 10 m | SAC-4P-10,0-600/M12FS HD | 1403959 | |

**⚠Caution** **Order the Phoenix Contact products from the manufacturer or the distributors.**

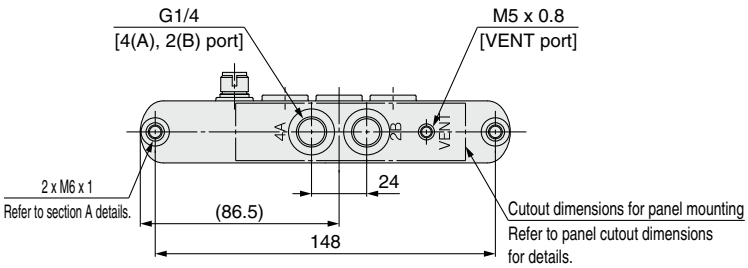
## Dimensions: Sub-plate

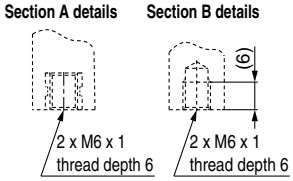



**Sub-plate side pin arrangement**
(No numeric indication)

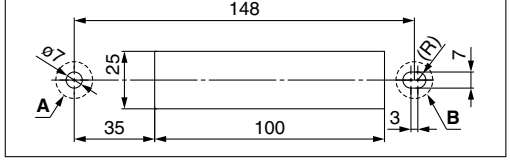



∗ Plug connector type




**Panel cutout dimensions: Sub-plate (Single unit)**




∗ When mounting with the mounting leg (L), only the leg mounting holes (round/elongated) are machined.

**Section A mounting hole details**

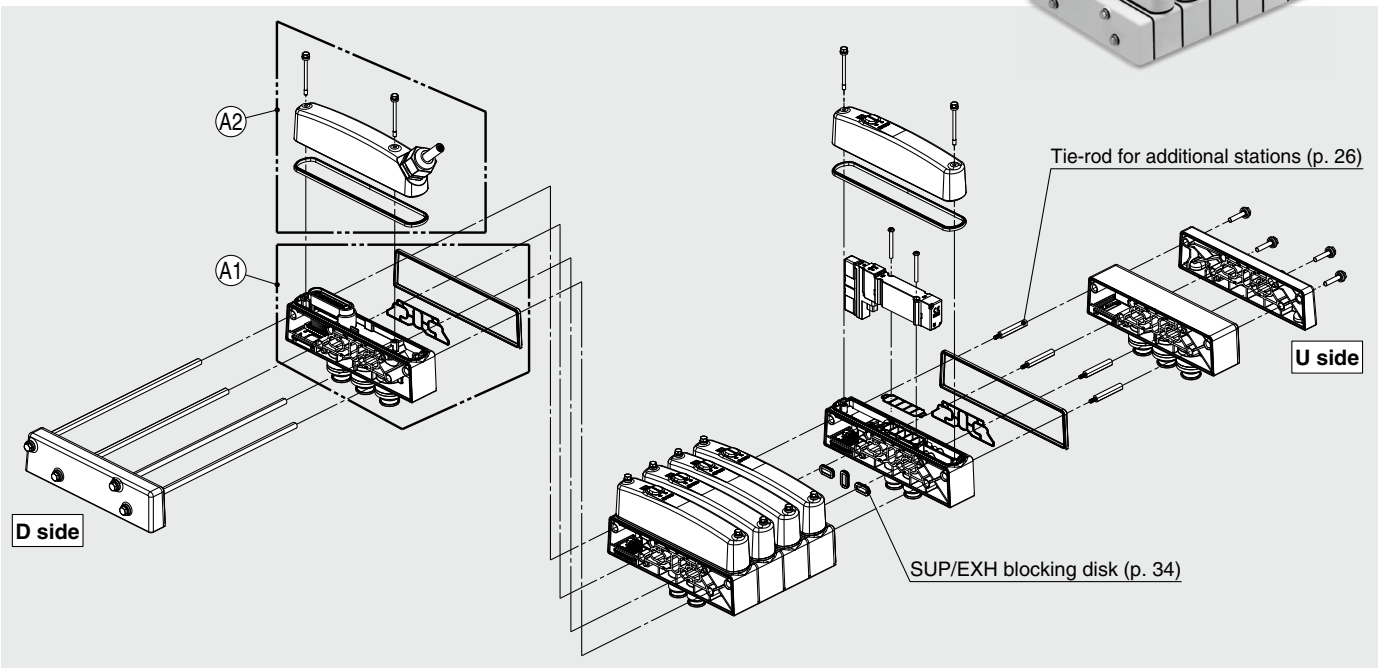

**Section B mounting hole details**


∗ Tolerance: ±0.2

# *JSY5000-H Series*
# Manifold Exploded View

**Wiring**

## Lead Wire Type




## Manifold Parts Nos.

### Ⓐ1 SUP/EXH block assembly

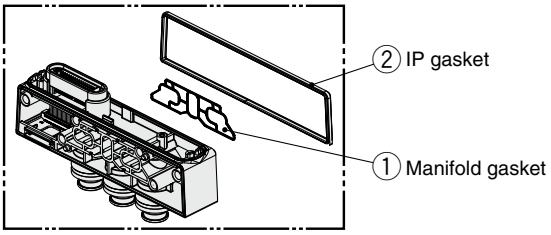
**JSY51M − 101P − 1 A − 04F**

**Lead wire type**

**1(P), 5(EA), 3(EB) port size**

**[Thread piping/One-touch fitting (Metric/Inch size)]**

| Symbol | Fitting specifications | | P, EA, EB port One-touch fitting size |
|---|---|---|---|
| **04F** | Without fitting | | G1/2, Thread piping |
| **B12** | Metric size Threaded One-touch fitting | Brass fitting | ø12 |
| **B16** | | | ø16 |
| **G12** | | Stainless steel fitting | ø12 |
| **G16** | | | ø16 |
| **BN11** | Inch size Threaded One-touch fitting | Brass fitting | ø3/8" |
| **BN13** | | | ø1/2" |
| **GN11** | | Stainless steel fitting | ø3/8" |
| **GN13** | | | ø1/2" |




Gaskets are mounted.
(When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

**SUP/EXH block assembly accessories and the number of accessories**

| Accessories | Quantity (Mounted) |
|---|---|
| ① **Manifold gasket** | 1 pc. |
| ② **IP gasket** | 1 pc. |

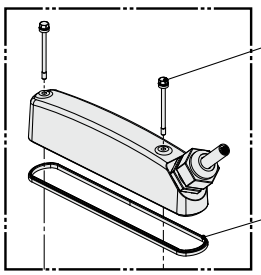
∗ Refer to page 26 for ordering single unit.

### Ⓐ2 Lead wire connector block assembly

**JSY51M − 114P − 1A − 1 − 05**

**Lead wire length**

| | |
|---|---|
| **05** | 5 m |
| **10** | 10 m |
| **15** | 15 m |




Hexagon bolts with flange and the gasket are mounted.
(When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

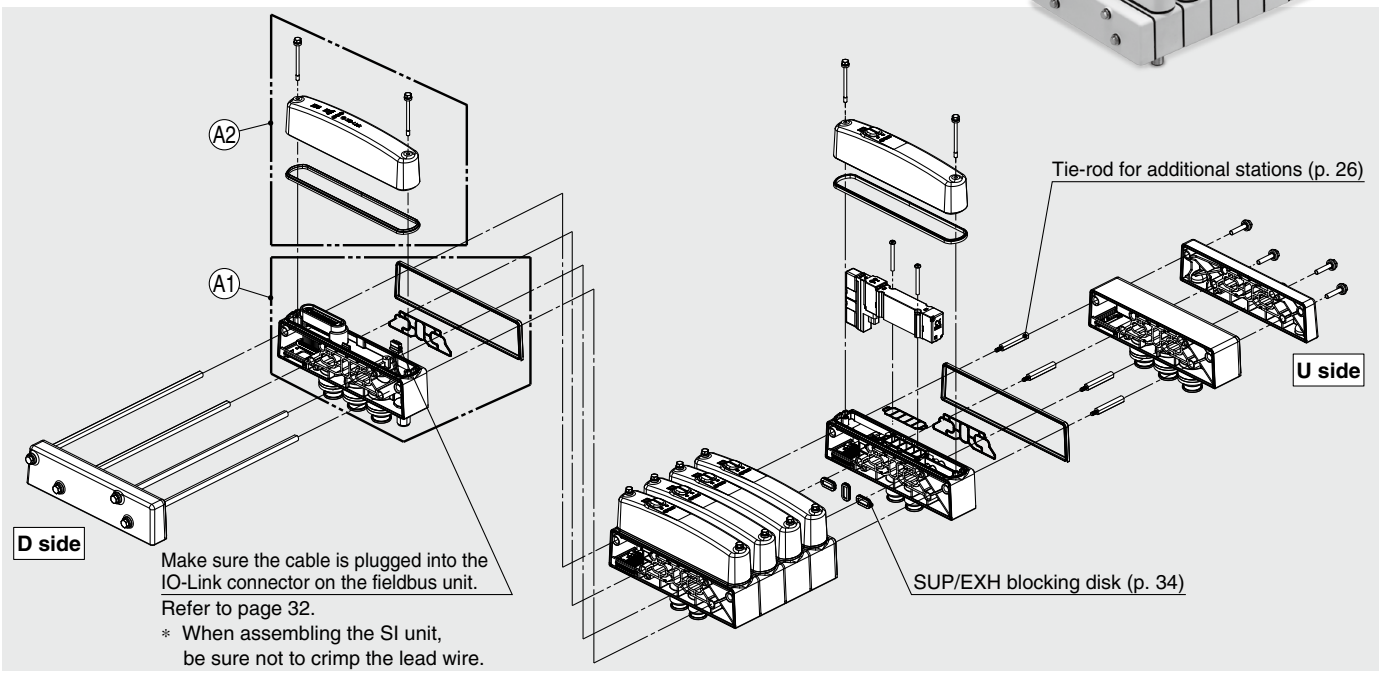
**Lead wire connector block assembly accessories and the number of accessories**

| Accessories | Quantity (Mounted) |
|---|---|
| ⑦ **Hexagon bolt with flange (M3) (With washer)** | 2 pcs. |
| ⑧ **Cover gasket** | 1 pc. |

∗ Refer to page 26 for ordering single unit.

## Wiring

### Fieldbus Type




## Manifold Parts Nos.

### A1 SUP/EXH block assembly

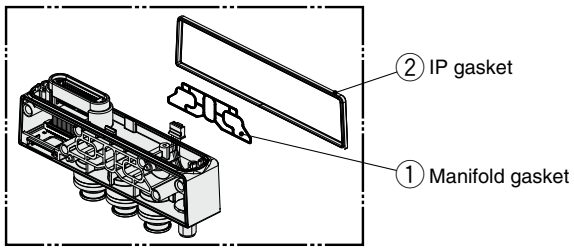
**JSY51M − 101P − 2 A − 04F**

**Fieldbus type**

**1(P), 5(EA), 3(EB) port size**

**[Thread piping/One-touch fitting (Metric/Inch size)]**

| Symbol | Fitting specifications | | P, EA, EB port One-touch fitting size |
|---|---|---|---|
| **04F** | Without fitting | | G1/2, Thread piping |
| **B12** | Metric size Threaded One-touch fitting | Brass fitting | ø12 |
| **B16** | | | ø16 |
| **G12** | | Stainless steel fitting | ø12 |
| **G16** | | | ø16 |
| **BN11** | Inch size Threaded One-touch fitting | Brass fitting | ø3/8" |
| **BN13** | | | ø1/2" |
| **GN11** | | Stainless steel fitting | ø3/8" |
| **GN13** | | | ø1/2" |




Gaskets are mounted.
(When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

**SUP/EXH block assembly accessories and the number of accessories**

| Accessories | Quantity (Mounted) |
|---|---|
| ① **Manifold gasket** | 1 pc. |
| ② **IP gasket** | 1 pc. |

* Refer to page 26 for ordering single unit.

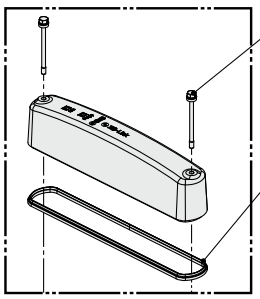
### A2 Fieldbus system

**EX430 − S IL1** * Refer to page 32 for details.

**Communication protocol**

| Symbol | Protocol | Output polarity | Communication connector | Manifold symbol |
|---|---|---|---|---|
| **IL1** | IO-Link | Source/PNP (Negative common) | M12*1 | SKAN |

*1 The M12 connector is located on the SUP/EXH block on the D side.



⑦ Hexagon bolt with flange (M3) (With washer)
Tightening torque: 0.8 N·m (2 pcs.)

⑧ Cover gasket

Hexagon bolts with flange and the gasket are mounted.
(When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

**SI unit accessories and the number of accessories**

| Accessories | Quantity (Mounted) |
|---|---|
| ⑦ **Hexagon bolt with flange (M3) (With washer)** | 2 pcs. |
| ⑧ **Cover gasket** | 1 pc. |

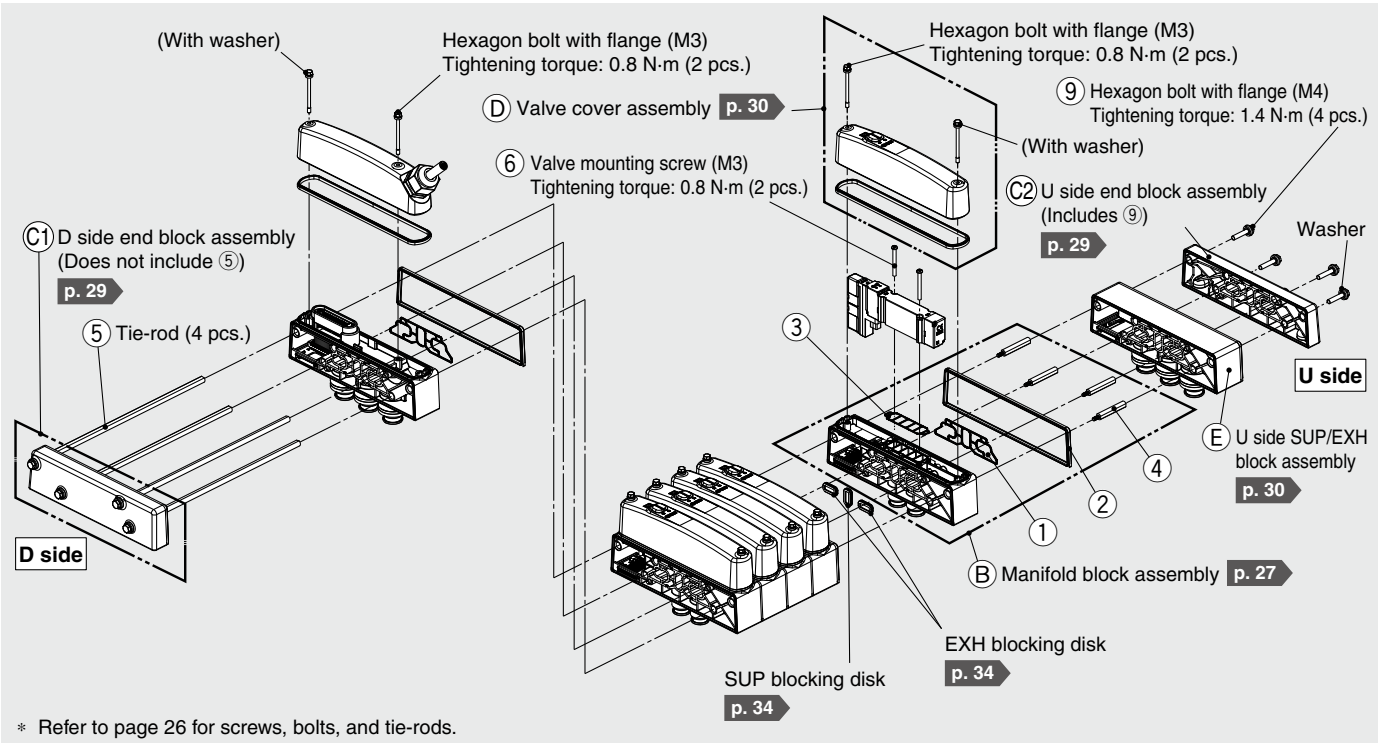
* Refer to page 26 for ordering single unit.

**Communication cable (IO-Link compatible, With M12 connector on both sides (plug/socket))**
**[Recommended IP69K and FDA-compliant products]**

| Cable length | PHOENIX CONTACT Product no. | PHOENIX CONTACT Order no. | Note |
|---|---|---|---|
| 1.5 m | SAC-5P-M12MS/1,5-600/M12FS HD | 1404065 | Produced upon receipt of order |
| 3 m | SAC-5P-M12MS/3,0-600/M12FS HD | 1404066 | |
| 5 m | SAC-5P-M12MS/5,0-600/M12FS HD | 1413144 | |
| 10 m | SAC-5P-M12MS/10,0-600/M12FS HD | 1413143 | |

**⚠ Caution** **Order the Phoenix Contact products from the manufacturer or the distributors.**

## Manifold Exploded View (Common Parts)




∗ Refer to page 26 for screws, bolts, and tie-rods.

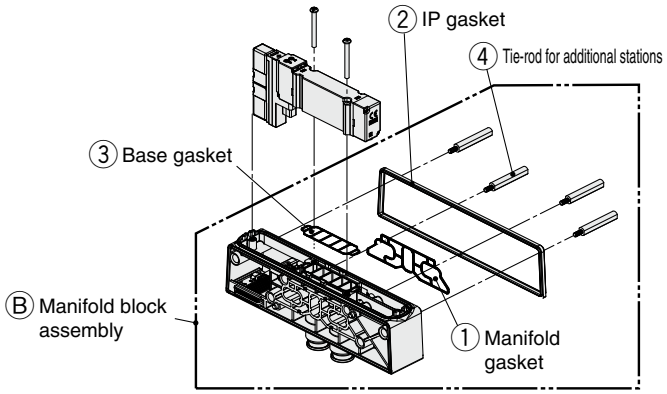
## How to Increase Manifolds

**1** **Loosen the hexagon bolt with flange ⑨ on the U side, and remove the Ⓒ2 U side end block assembly.**
**(For SUP/EXH from both sides, remove the Ⓔ U side SUP/EXH block assembly.)**
**∗ Do not loosen the hexagon bolt with flange of D side as the tie-rod is fixed to the Ⓒ1 D side end block assembly.**

**2** **Screw in ④ tie-rods for additional stations to the ⑤ tie-rod of the manifold.**
**(Screw them in until there is no gap between the tie-rods.)**

**3** **Connect Ⓑ manifold block assembly and Ⓒ2 U side end block assembly that need to be added, and tighten ⑨ hexagon bolt with flange on the U side. For SUP/EXH from both sides, also connect the Ⓔ U side SUP/EXH block. (4 places, more than 2 turns)**
**(Make sure that the washers are assembled to the hexagon bolt with flange. When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)**

| | |
|---|---|
| **Hexagon bolt with flange** | **(M4) Tightening torque: 1.4 N·m**<br>**(M3) Tightening torque: 0.8 N·m** |




Gaskets are mounted.

**Manifold block assembly**

| No. | Description | Quantity |
|---|---|---|
| ① | Manifold gasket | 1 pc. (Mounted) |
| ② | IP gasket | 1 pc. (Mounted) |
| ③ | Base gasket | 1 pc. (Mounted) |
| ④ | Tie-rod for additional stations | 4 pcs. (Included) |

∗ Refer to page 26 for ordering single unit.

## ⚠ Caution

1. **Be sure to shut off the power and air supplies before disassembly. Furthermore, since air may remain inside the actuator, piping, and manifold, confirm that the air is completely exhausted before performing any work.**
2. **When disassembly and assembly are performed, air leakage may result if the tightening of the hexagon bolt with flange is inadequate.**
3. **Rubber parts are attached to the metal parts of the washer. If they are misaligned or dislodged, return them to their normal position.**

## Manifold Parts Nos.

| No. | Description | | Part no. | Note |
|---|---|---|---|---|
| ① | **Manifold block assembly** | **Manifold gasket** | JSY51M-109P-1A | For 10 valves (10 pcs.) |
| ② | | **IP gasket** | JSY51M-109P-3A | For 10 valves (10 pcs.) |
| ③ | | **Base gasket** | JSY51M-9P-1A | For 10 valves (10 pcs.) |
| ④ | | **Tie-rod for additional stations** | JSY51M-49P-2A | For 1 station (4 pcs.) |
| ⑤ | **Tie-rod** | | JSY51M-49P-1-□A | Refer to the table below for the number of □.<br>4 tie-rods per manifold |
| ⑥ | **Valve mounting screw** | | JSY51V-23-1A<br>(M3 x 29) | For 10 valves (20 pcs.) |
| ⑦ | **Hexagon bolt with flange (M3) (With washer)<br>(For connector block/SI unit cover/valve cover)** | | JSY51M-123P-1A<br>(M3 x 40) | For 5 valves (10 pcs.) |
| ⑧ | **Cover gasket<br>(For connector block/SI unit cover/valve cover)** | | JSY51M-109P-2A | For 10 valves (10 pcs.) |
| ⑨ | **Hexagon bolt with flange (M4) (With washer)<br>(For end block)** | | JSY51M-123P-2A<br>(M4 x 24) | 8 bolts per manifold |

**Tie-rod Order Nos. (1 set includes 4 pcs.)**

| Manifold stations | Tie-rod part no. | |
|---|---|---|
| | SUP/EXH block assembly:<br>D side | SUP/EXH block assembly:<br>B (Both sides) |
| 2 | JSY51M-49P-1-2A | JSY51M-49P-1-3A |
| 3 | JSY51M-49P-1-3A | JSY51M-49P-1-4A |
| 4 | JSY51M-49P-1-4A | JSY51M-49P-1-5A |
| 5 | JSY51M-49P-1-5A | JSY51M-49P-1-6A |
| 6 | JSY51M-49P-1-6A | JSY51M-49P-1-7A |
| 7 | JSY51M-49P-1-7A | JSY51M-49P-1-8A |
| 8 | JSY51M-49P-1-8A | JSY51M-49P-1-9A |
| 9 | JSY51M-49P-1-9A | JSY51M-49P-1-10A |
| 10 | JSY51M-49P-1-10A | JSY51M-49P-1-11A |
| 11 | For a manifold of 11 or more stations, only the SUP/EXH block assembly: B (Both sides) can be selected. | JSY51M-49P-1-12A |
| 12 | | JSY51M-49P-1-13A |
| 13 | | JSY51M-49P-1-14A |
| 14 | | JSY51M-49P-1-15A |
| 15 | | JSY51M-49P-1-16A |
| 16 | | JSY51M-49P-1-17A |

### ■Mounting leg (4 pcs./set): For manifold

## JSY51M−115P−1A

Mounting leg (M6)
Tightening torque: 4.9 N·m

∗ When the manifold part number (L) is ordered, the mounting legs are not assembled but included in the same package.

2-port type  2-port / 5-port types mixed

## Manifold Parts Nos.

### Ⓑ Manifold block assembly

**JSY51M − 102P − 1 D A − □ − 02F**

**Piping specification**

| | |
|---|---|
| **1** | 2-port type (4(A), 2(B) port) |
| **2** | 5-port type (1(P), 4(A), 2(B), 5(EA), 3(EB) port) |

**Double wiring**

**With blocking disk (Laser marking)**

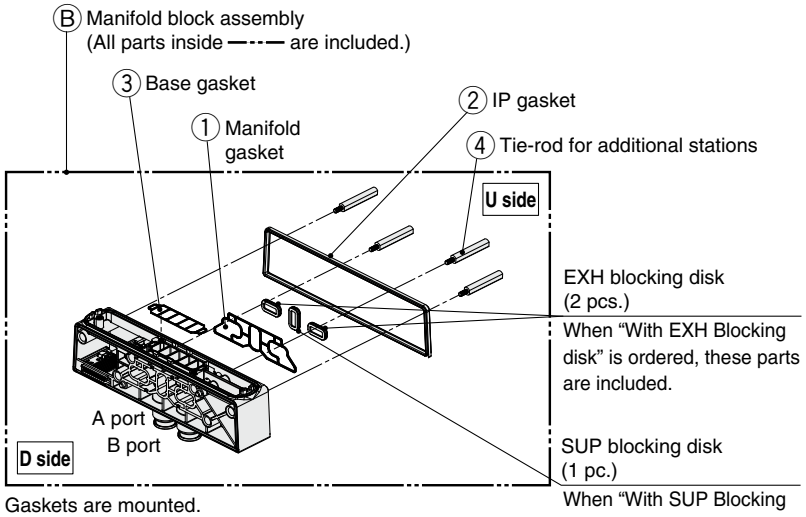
| | |
|---|---|
| **Nil** | Without blocking disk (Without laser marking) |
| **P** | With SUP blocking disk |
| **E** | With EXH blocking disk |
| **PE** | With SUP/EXH blocking disk |

∗ Laser printed blocking disk symbol on the piping surface of the fitting of A and B port.
For blocking disks, refer to “Manifold Options” on page 34.

**Manifold block port size**
**[Thread piping/One-touch fitting (Metric/Inch size)]**

| Symbol | Fitting specifications | | Manifold block port size | |
|---|---|---|---|---|
| | | | 2-port type | 5-port type |
| | | | A, B port | P, A, B, EA, EB port |
| **02F** | Without fitting | | G1/4 Thread piping | |
| **B8** | Metric size Threaded One-touch fitting | Brass fitting | ø8∗1 | |
| **B10** | | | ø10 | |
| **G8** | | Stainless steel fitting | ø8∗1 | |
| **G10** | | | ø10 | |
| **BN9** | Inch size Threaded One-touch fitting | Brass fitting | ø5/16"∗1 | |
| **BN11** | | | ø3/8" | |
| **GN9** | | Stainless steel fitting | ø5/16"∗1 | |
| **GN11** | | | ø3/8" | |

∗1 ø8 and ø5/16" One-touch fitting are common for mm and inch size.




Gaskets are mounted.
(When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

**Manifold block assembly accessories and the number of accessories**

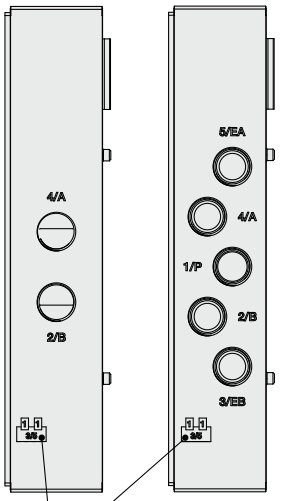
| Accessories | Quantity |
|---|---|
| ① **Manifold gasket** | 1 pc. (Mounted) |
| ② **IP gasket** | 1 pc. (Mounted) |
| ③ **Base gasket** | 1 pc. (Mounted) |
| ④ **Tie-rod for additional stations** | 4 pcs. (Included) |

∗ Refer to page 26 for ordering single unit.

## Manifold Parts Nos.

**<Manifold block port surface>**

**[2-port type]** **[5-port type]**

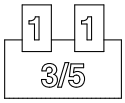



Blocking disk identification symbol (Laser marking)

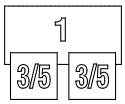
This is the symbol to indicate the location of the manifold block that contains the blocking disk.

∗ The blocking disk is mounted to U side.

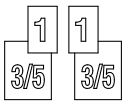
**SUP blocking disk (Identification symbol)**




**EXH blocking disk (Identification symbol)**




**SUP/EXH blocking disk (Identification symbol)**




**[2-port / 5-port types mixed]**

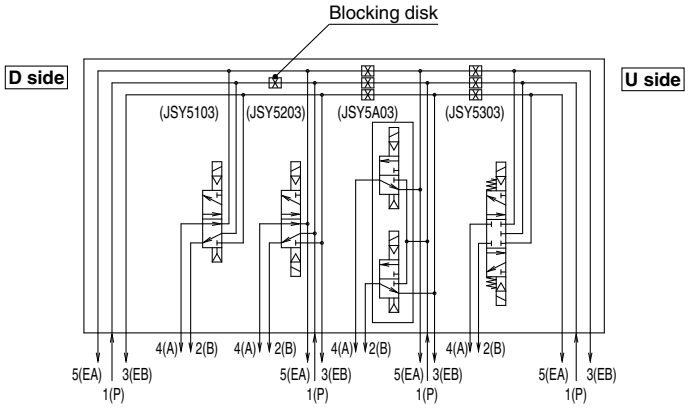
**<Example>**

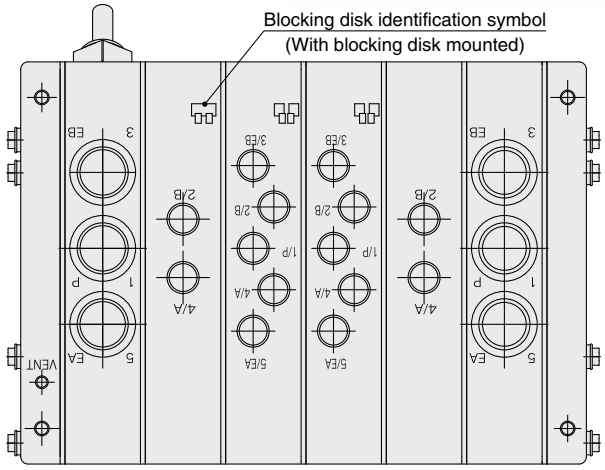
Use a blocking disk in the 1(P) SUP passage for each additional different pressure required.

Use blocking disk in the 5(EA)/3(EB) EXH passages for individual valve exhaust.

5-port type manifold blocks can be used to provide additional SUP/EXH if low flow rate occurs.

∗ Specify **the arrangement and blocking disk position in the manifold specification sheet.**



## Manifold Parts Nos.

### ⓒ1 D side end block assembly

# JSY51M − 103P − 1 □ A − M5

**Pilot type**

| | |
|---|---|
| **Nil** | Internal pilot |
| **R**∗1 | External pilot |

∗1 The external pilot specification should be ordered as made to order.

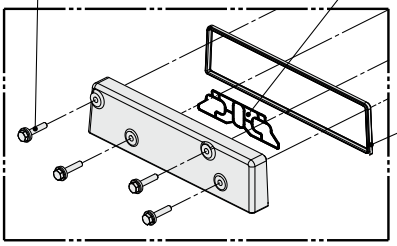
**For internal pilot**
**VENT port size**
**[Thread piping/One-touch fitting (Metric/Inch size)]**

| Symbol | Fitting specifications | | One-touch fitting size |
|---|---|---|---|
| **M5** | Without fitting | | M5, Thread piping |
| **B4** | Metric size Threaded One-touch fitting | Brass fitting | ø4∗1 |
| **G4** | | Stainless steel fitting | |
| **BN3** | Inch size Threaded One-touch fitting | Brass fitting | ø5/32"∗1 |
| **GN3** | | Stainless steel fitting | |

∗1 For the VENT port of ø4 and ø5/32", the same fitting is used for them.

⑨ Hexagon bolt with flange (M4)
Tightening torque: 1.4 N·m (4 pcs.)

① Manifold gasket



② IP gasket

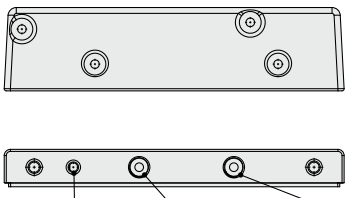
Gaskets are mounted.
(Make sure that the washers are assembled to the hexagon bolt with flange. When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

**For external pilot "R" (Made to order)**
**VENT, X, PE port size**
**[Thread piping/One-touch fitting (Metric/Inch size)]**

| Symbol | Fitting specifications | | One-touch fitting size | |
|---|---|---|---|---|
| | | | VENT port | X, PE port |
| **01F** | Without fitting | | M5, Thread piping | G1/8, Thread piping |
| **B6** | Metric size Threaded One-touch fitting | Brass fitting | ø4∗1 | ø6 |
| **G6** | | Stainless steel fitting | | |
| **BN7** | Inch size Threaded One-touch fitting | Brass fitting | ø5/32"∗1 | ø1/4" |
| **GN7** | | Stainless steel fitting | | |

∗1 For the VENT port of ø4 and ø5/32", the same fitting is used for them.

**D side end block port location**



VENT port (M5)
(Common to internal/external pilot)

PE port (G1/8)
(External pilot only)

X port (G1/8)

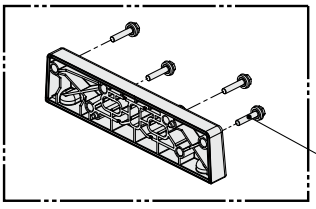
**D side end block assembly accessories and the number of accessories**

| Accessories | Quantity |
|---|---|
| ① **Manifold gasket** | 1 pc. (Mounted) |
| ② **IP gasket** | 1 pc. (Mounted) |
| ⑨ **Hexagon bolt with flange (M4) (With washer)** | 4 pcs. (Included) |

∗ Refer to page 26 for ordering single unit.

### ⓒ2 U side end block assembly

# JSY51M − 103P − 2A



⑨ Hexagon bolt with flange (M4)
Tightening torque: 1.4 N·m (4 pcs.)

**U side end block assembly accessories and the number of accessories**

| Accessories | Quantity (Included) |
|---|---|
| ⑨ **Hexagon bolt with flange (M4) (With washer)** | 4 pcs. |

∗ Refer to page 26 for ordering single unit.

## Manifold Parts Nos.

### Ⓓ Valve cover assembly (For manifold/sub-plate)

**JSY51M − 104P − 1A − 1 □**

**Type of actuation (Symbol laser marking)**

| | | |
|---|---|---|
| **Nil** | Without laser marking | |
| **1** | 2-position | Single |
| **2** | | Double |
| **3** | 3-position | Closed center |
| **4** | | Exhaust center |
| **5** | | Pressure center |
| **A**∗1 | 4-position dual 3-port | N.C./N.C. |
| **B**∗1 | | N.O./N.O. |
| **C**∗1 | | N.C./N.O. |

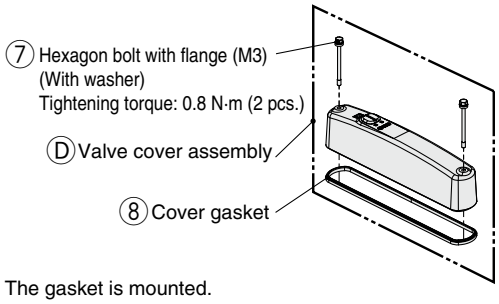
∗1 External pilot specification is not applicable for 4-position dual 3-port valves.

∗ Laser printed JIS symbols corresponding to the valve switching method. (Part Ⓐ below)

**Pilot type**

| | |
|---|---|
| **Nil** | Internal pilot |
| **R**∗1 | External pilot |

∗1 The external pilot specification should be ordered as made to order.



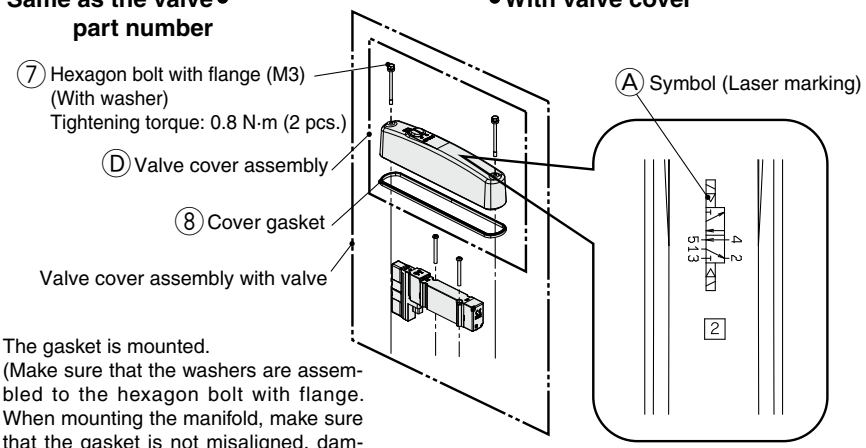

The gasket is mounted.
(Make sure that the washers are assembled to the hexagon bolt with flange. When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

### Valve cover assembly with valve (For manifold/sub-plate)

**JSY5□03(R)(T) − 5□ − HC**

**Same as the valve part number**

**With valve cover**




The gasket is mounted.
(Make sure that the washers are assembled to the hexagon bolt with flange. When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

∗ 2 is an identification symbol for the assembly for the production department of SMC.

**Valve cover assembly/**
**Valve cover assembly with valve accessories and the number of accessories**

| Accessories | Quantity (Mounted) |
|---|---|
| ⑦ **Hexagon bolt with flange (M3) (With washer)** | 2 pcs. |
| ⑧ **Cover gasket** | 1 pc. |

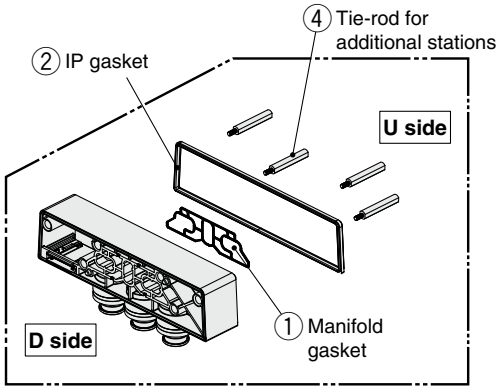
∗ Refer to page 26 for ordering single unit.

### Ⓔ U side SUP/EXH block assembly

**JSY51M − 101P − 3A − 04F**

**1(P), 5(EA), 3(EB) port size**
**[Thread piping/One-touch fitting (Metric/Inch size)]**

| Symbol | Fitting specifications | | P, EA, EB port One-touch fitting size |
|---|---|---|---|
| **04F** | Without fitting | | G1/2, Thread piping |
| **B12** | Metric size Threaded One-touch fitting | Brass fitting | ø12 |
| **B16** | | | ø16 |
| **G12** | | Stainless steel fitting | ø12 |
| **G16** | | | ø16 |
| **BN11** | Inch size Threaded One-touch fitting | Brass fitting | ø3/8" |
| **BN13** | | | ø1/2" |
| **GN11** | | Stainless steel fitting | ø3/8" |
| **GN13** | | | ø1/2" |



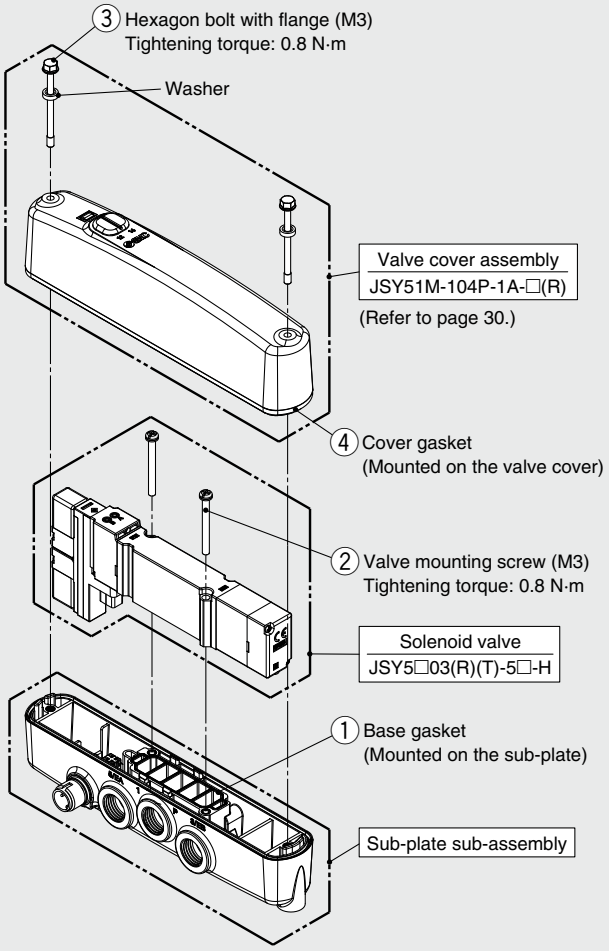

Gaskets are mounted.
(When mounting the manifold, make sure that the gasket is not misaligned, damaged, forgotten to be attached, and that there are not foreign objects.)

**U side SUP/EXH block assembly accessories and the number of accessories**

| Accessories | Quantity |
|---|---|
| ① **Manifold gasket** | 1 pc. (Mounted) |
| ② **IP gasket** | 1 pc. (Mounted) |
| ④ **Tie-rod for additional stations** | 4 pcs. (Included) |

∗ Refer to page 26 for ordering single unit.

# *JSY5000-H Series*
# Sub-plate (Single Unit) Exploded View

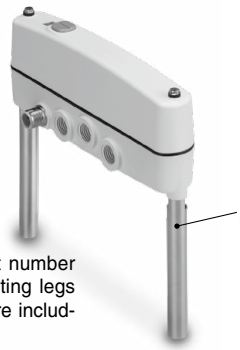



## Sub-plate Parts Nos.

| No. | Description | Part no. | Note |
|---|---|---|---|
| ① | **Base gasket** | JSY51M-9P-1A | For 10 valves (10 pcs.) |
| ② | **Valve mounting screw** | JSY51V-23-1A (M3 x 29) | For 10 valves (20 pcs.) |
| ③ | **Hexagon bolt with flange (M3) (With washer) (For valve cover)** | JSY51M-123P-1A (M3 x 40) | For 5 valves (10 pcs.) |
| ④ | **Cover gasket (For valve cover)** | JSY51M-109P-2A | For 10 valves (10 pcs.) |

### ■ Mounting leg (2 pcs./set): For sub-plate

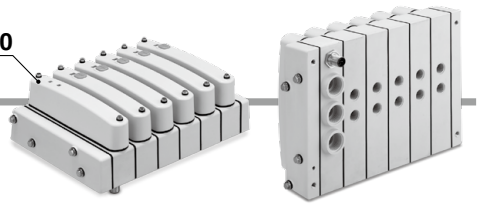
## JSY51M − 115P − 2A




∗ When the sub-plate part number (L) is ordered, the mounting legs are not assembled but are included in the same package.

# Fieldbus System: For Output
# *EX430* Series

EX430



## How to Order SI Units

**EX430 – S IL1**

**Communication protocol**

| Symbol | Protocol | Output polarity | Communication connector | Manifold symbol |
|---|---|---|---|---|
| **IL1** | IO-Link | Source/PNP (Negative common) | M12*1 | SKAN |

*1 The M12 connector is located on the SUP/EXH block on the manifold D side.

## Specifications

| Model | | EX430-SIL1 |
|---|---|---|
| Applicable system | Protocol | IO-Link (Class B) |
| | Version | V1.1 |
| | Configuration file*1 | IODD file |
| I/O occupation area (Inputs/Outputs) | | 0/32, 16/32*2 |
| Communication speed | | COM3/COM2*2 |
| Communication connector specification | | M12*3 |
| Power supply for control | Power supply voltage | 18 to 30 VDC |
| | Internal current consumption | 50 mA or less |
| Power supply for output | Power supply voltage | 22.8 to 26.4 VDC |
| Output | Output type | Source/PNP (Negative common) |
| | Number of outputs | 32 |
| | Load | Solenoid valve with surge voltage suppressor of 24 VDC, 0.4 W or less (SMC) |
| | Supplied voltage | 24 VDC |
| | Supplied current | Max. 0.54 A |
| Environmental resistance | Operating temperature range | –10 to 50°C |
| | Operating humidity range | 35% to 85% RH (No condensation) |
| | Withstand voltage | 500 VAC for 1 minute between terminals and housing |
| | Insulation resistance | 10 MΩ or more (500 VDC measured via megohmmeter) between terminals and housing |
| Standards | | CE marking (EMC directive/RoHS directive) |
| Weight | | 100 g |

*1 The configuration file can be downloaded from the SMC website: https://www.smcworld.com
*2 A selection can be made using the setting switch.
*3 The M12 connector is located on the SUP/EXH block on the manifold D side.

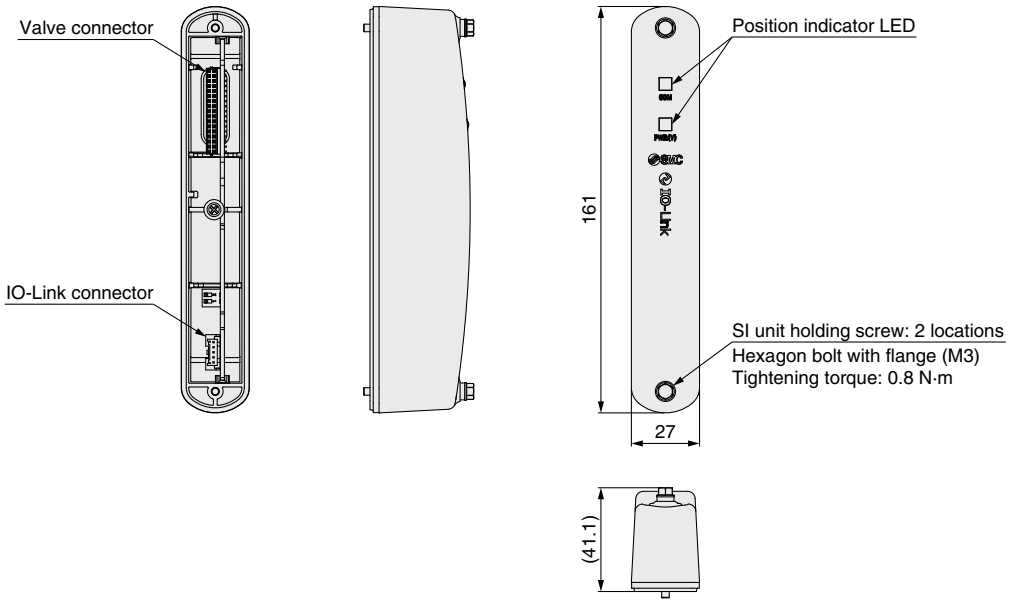
### Y Branch Connector for IO-Link

This connector is used to supply power to the valve manifold by branching the IO-Link communication cable in cases where a port class A IO-Link master is used.

This branch connecter has an IP67 enclosure.

**Click here for details.**

## Dimensions



# One-touch Fittings, Plugs, Tube Releasing Tools

## ■ FDA Compliant Metal One-touch Fittings
### Hexagon Socket Head Male Connector

| Port size | | | | Brass C3604 (Electroless nickel plating) | Stainless steel 316 |
|---|---|---|---|---|---|
| Metric size | Manifold block | 2-port type: 4(A), 2(B) port 5-port type: 1(P), 4(A), 2(B), 5(EA), 3(EB) port | ø8*1 | KQB2S08-G02-F | KQG2S08-G02-F |
| | | | ø10 | KQB2S10-G02-F | KQG2S10-G02-F |
| | SUP/EXH block | 1(P), 5(EA), 3(EB) port | ø12 | KQB2S12-G04-F | KQG2S12-G04-F |
| | | | ø16 | KQB2S16-G04-F | KQG2S16-G04-F |
| | D side end block | VENT port | ø4*2 | KQB2S04-M5-F | KQG2S04-M5-F |
| | | X, PE port | ø6 | KQB2S06-G01-F | KQG2S06-G01-F |
| Inch size | Manifold block | 2-port type: 4(A), 2(B) port 5-port type: 1(P), 4(A), 2(B), 5(EA), 3(EB) port | ø5/16"*1 | KQB2S08-G02-F | KQG2S08-G02-F |
| | | | ø3/8" | KQB2S11-G02-F-X73 | KQG2S11-G02-F-X73 |
| | SUP/EXH block | 1(P), 5(EA), 3(EB) port | ø3/8" | KQB2S11-G04-F-X73 | KQG2S11-G04-F-X73 |
| | | | ø1/2" | KQB2S13-G04-F-X73 | KQG2S13-G04-F-X73 |
| | D side end block | VENT port | ø5/32"*2 | KQB2S04-M5-F | KQG2S04-M5-F |
| | | X, PE port | ø1/4" | KQB2S07-G01-F-X73 | KQG2S07-G01-F-X73 |

**Metal One-touch fitting**

∗1 For the 4(A) and 2(B) port of ø8 or ø5/16", the same fitting is used for them.
∗2 For the VENT port of ø4 and ø5/32", the same fitting is used for them.

## ■ FDA Compliant Metal Plugs

When the plug is used, use it with a One-touch fitting.

| Port size | | | | Brass C3604 (Electroless nickel plating) | Stainless steel 316 |
|---|---|---|---|---|---|
| Metric size | Manifold block | 2-port type: 4(A), 2(B) port 5-port type: 1(P), 4(A), 2(B), 5(EA), 3(EB) port | ø8*1 | KQB2P-08-F | KQG2P-08 |
| | | | ø10 | KQB2P-10-F | KQG2P-10 |
| | SUP/EXH block | 1(P), 5(EA), 3(EB) port | ø12 | KQB2P-12-F | KQG2P-12 |
| | | | ø16 | KQB2P-16-F | KQG2P-16 |
| | D side end block | VENT port | ø4*2 | KQB2P-04-F | KQG2P-04 |
| | | X, PE port | ø6 | KQB2P-06-F | KQG2P-06 |
| Inch size | Manifold block | 2-port type: 4(A), 2(B) port 5-port type: 1(P), 4(A), 2(B), 5(EA), 3(EB) port | ø5/16"*1 | KQB2P-08-F | KQG2P-08 |
| | | | ø3/8" | KQB2P-11-F | KQG2P-11 |
| | SUP/EXH block | 1(P), 5(EA), 3(EB) port | ø3/8" | KQB2P-11-F | KQG2P-11 |
| | | | ø1/2" | KQB2P-13-F | KQG2P-13 |
| | D side end block | VENT port | ø5/32"*2 | KQB2P-04-F | KQG2P-04 |
| | | X, PE port | ø1/4" | KQB2P-07-F | KQG2P-07 |

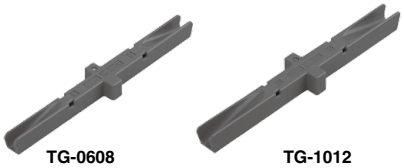
**Metal plug**

∗1 For the 4(A) and 2(B) port of ø8 or ø5/16", the same fitting is used for them.
∗2 For the VENT port of ø4 and ø5/32", the same fitting is used for them.

## ■ Tube Releasing Tools (This tool is used for removing the tube from the 4(A) and 2(B) port.)

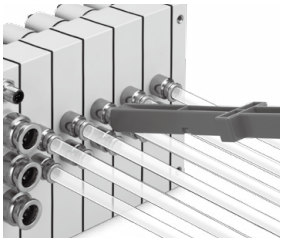
| Part no. | TG-0608 | TG-1012 |
|---|---|---|
| Applicable tubing O.D. | ø6/ø8 | ø10/ø12 |

∗ Tube releasing tools are not applicable for all port sizes.



**TG-0608** **TG-1012**

**Tube releasing tools**



**For details on the tube removal procedure, refer to the JSY1000/3000/5000 Web Catalog.**

The catalog can be viewed here.

# *JSY5000-H Series*
# Manifold Options

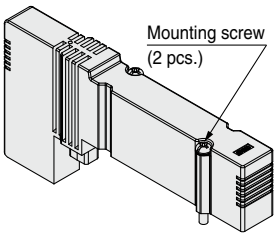
## ■ Blanking plate

[With two mounting screws]

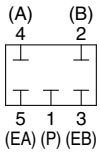
Used when valve additions are expected or for maintenance

**Blanking plate (Single unit)**

**JSY51M − 26P − 1A**




**JSY51M-26P-1A**



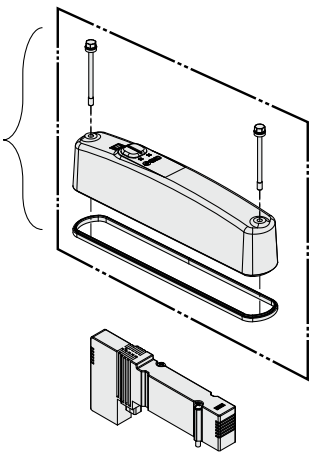

**Circuit diagram**

**Valve cover assembly with blanking plate**

**JSY51M − 26P − 1A C**

**With valve cover**

For the valve cover assembly, refer to "Manifold Parts Nos." on page 30.



## ■ SUP/EXH blocking disk

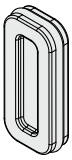
**[SUP blocking disk]**

By inserting the SUP blocking disk in the pressure supply passage of the manifold valve, can provide two different high and low pressure in one manifold.

**[EXH blocking disk]**

By inserting the EXH blocking disk in the exhaust passage of the manifold valve, can separate the exhaust from the valve so it does not affect the other valves. It can also be used for the manifold for the positive pressure and vacuum mixed manifold. **(2 pieces are required to block EA/EB both sides of the EXH.)**

* When ordering a manifold, if the blocking disk is ordered at the same time in the manifold specifications, the laser printed blocking disk symbol will be displayed in the manifold block assembly that includes the blocking disk. Refer to the manifold block assembly on page 27 for the contents.



| Series | SUP blocking disk | EXH blocking disk |
|---|---|---|
| **JSY5000** | JSY51M-40P-2A | JSY51M-40P-2A |

# *JSY5000-H Series*
# Made to Order

Please contact SMC for detailed dimensions, specifications, and delivery times.

Made to Order

## 1 External Pilot

### How to Order Manifolds

Refer to the How to Order manifolds for each type on page 11.

**⚠ Caution** This is an IP69K compliant product. The manifold and valves are ordered as a set.

**Lead wire type**

**JJ5SY5 – H11L1 □ – □□R – □□**

**Fieldbus type (IO-Link)**

**JJ5SY5 – H11SKAN – □□R – □□**

**Pilot type**

| | |
|---|---|
| **R** | External pilot |

### How to Order Valves

**JSY5□03R□ – 5□□ – H**

**Coil type (Refer to 2.)**

**Pilot type**

| | |
|---|---|
| **R** | External pilot |

∗ External pilot specification is not applicable for 4-position dual 3-port valves.
∗ When pilot type "R" is selected, select the external pilot type "R" for the manifold pilot type.

### How to Order Sub-plates (With Valve/Valve Cover)

Refer to the How to Order sub-plates on page 20.

**JSY5□03R□ – 5□□ – H – WO – U□□**

**Coil type (Refer to 2.)**

**Pilot type**

| | |
|---|---|
| **R** | External pilot |

∗ External pilot specification is not applicable for 4-position dual 3-port valves.

## 2 Coil Type: With Power-Saving Circuit (Continuous Duty Type, 0.1 W)

Be sure to select the power-saving circuit type when the valve is continuously energized for long periods of time.
Be careful of the energizing time when the power-saving circuit is selected. Refer to page 37 for details.

### How to Order Valves

**JSY5□03□T – 5Z□ – H**

**Pilot type (See above.)**

**Coil type**

| | |
|---|---|
| **T** | With power-saving circuit (Continuous duty type) |

∗ Only "Z" and "NZ" types are available with a power-saving circuit.

**Light/surge voltage suppressor and common specification**

| Symbol | With light | Surge voltage suppressor | Common specification |
|---|---|---|---|
| **Z** | ● | ● | Positive common |
| **NZ** | | | Negative common |

# *JSY5000-H Series*
# Specific Product Precautions 1

**Be sure to read this before handling the products.**



## Environment

### ⚠Warning

**1. Do not use valves in atmospheres of corrosive gases, chemicals*1, sea water, water vapor, or where there is direct contact with any of these.**

*1 Check section on cleaning and the product component list of the external materials used, and ensure compatibility with any chemicals used in the cleaning solution.

**2. Avoid installing and using inside a food zone.**

· Not installable
Food zone: An environment where food which will be sold as merchandize, directly touches the manifold parts
· Installable
Splash zone: An environment where food which will not be sold as merchandize, directly touches the manifold parts
Non-food zone: An environment where there is no contact with food

**■IP69K (IEC/EN 60529/ISO 20653) compliant product**

**1. IP69K is only guaranteed to the factory condition (finished as a manifold).**

**2. IP69K compliant products are protected against dust and high pressure hot water. However, when using the valve, keep within the ambient temperature and fluid temperature. (No freezing)**

**3. IPX9K compliant products are protected against dust and high pressure hot water jetwash.**

When cleaning the manifold, it is recommended to keep the distance from the washer nozzle to the manifold at least 20 cm. Wash the manifold while moving the nozzle. Do not fix the cleaning point to one place.

**4. Refer to the tightening torque in the disassembly drawing of the manifold (p. 25) when increasing or decreasing the number of stations for IP69K compliance. When installing the manifold, make sure that the gasket is not misaligned, forgotten to be attached, and that there are not foreign objects.**

## How to Use

### ⚠Caution

**■VENT port**

**1. A VENT port is installed on the manifold so that even if a valve leaks, the leaked pressure does not accumulate inside.**

**2. Prevent liquid from entering the VENT port.**

**3. Do not block the VENT port. If the VENT port is used with the port closed, internal pressure may build up and the product gasket may come off and IP69K is not satisfied.**

**4. Do not pressurize the VENT port. The sealing performance of the gasket will be reduced and the IP69K may not be satisfied.**

**5. Do not pipe the VENT port and the exhaust port (3/5 port) in the same piping. The back pressure of the exhaust port may be applied to the VENT port, increasing the internal pressure.**


## How to Use

### ⚠Caution

Hexagon socket head male connector (KQB2S)

**■Metal One-touch fittings**

**1. When tightening the hexagon socket head male connector, use a suitable hexagon wrench, and connect the piping carefully so as not to deform or damage the inside of the connector. If the inside of the connector is deformed or damaged, the falling out of tubes may occur.**

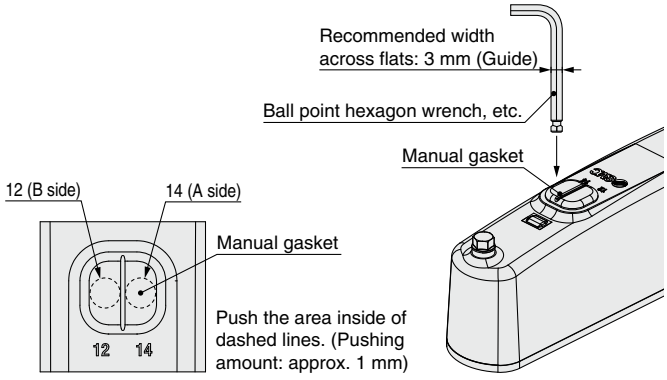
**2. Uni thread fittings cannot be used. When using Uni thread fittings, the tightening load on the chamfered part of the female thread on the manifold side can cause the female thread side to deform or break.**

**3. Tighten fittings with the proper tightening torques in the table below.**

| Connection port | Connection thread size | Proper tightening torque [N·m] |
|---|---|---|
| VENT | M5 | 1 to 1.5 |
| X, PE | G1/8 | 2.9 to 3.2 |
| 2(B), 4(A) | G1/4 | 5.7 to 6.3 |
| 1(P), 3(EB), 5(EA) | G1/2 | 14.3 to 15.8 |

**■Manual override**

Use a rounded tool (such as a ballpoint hex wrench) for manual override operations. Manipulating manual override with a sharp tool will damage the manual gasket and the IP69K is not satisfied.




## Valve/Manifold Parts Mounting

### ⚠Caution

**Mount it so that there is no slippage or deformation in gaskets, and tighten with the tightening torque shown below.**

| Thread size | Tightening torque | Tightening location |
|---|---|---|
| M3 | 0.8 N·m | Valve, Valve cover, SI unit |
| M4 | 1.4 N·m | End block |
| M6 | 4.9 N·m | Mounting leg (Option) |

# Specific Product Precautions 2

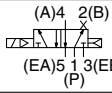
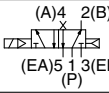
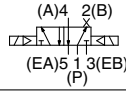
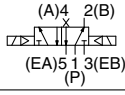
**Be sure to read this before handling the products.**

## Used as a 3-Port Valve

## ⚠Caution

### ■In case of using a 5-port valve as a 3-port valve

The JSY5000 series can be used as normally closed (N.C.) or normally open (N.O.) 3-port valves by closing one of the cylinder ports 4(A) or 2(B) with a plug. However, they should be used with the exhaust ports kept open. Use them when a double solenoid type 3-port valve is required.

| Plug position | | B port | A port |
|---|---|---|---|
| Type of actuation | | N.C. | N.O. |
| Number of solenoids | Single |  |  |
| | Double |  |  |

## Light/Surge Voltage Suppressor

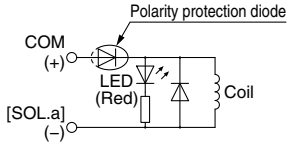
## ⚠Caution

### ■Polar type

**Positive common**

**Single solenoid**

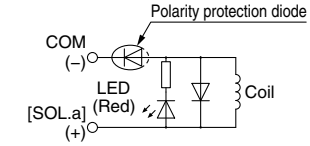
Light/surge voltage suppressor (□Z)




**Negative common**

**Single solenoid**

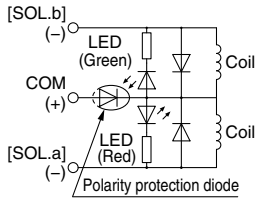
Light/surge voltage suppressor (□NZ)




**Positive common**

**Double solenoid, 3-position, 4-position**

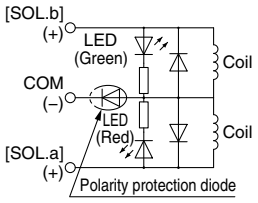
Light/surge voltage suppressor (□Z)




**Negative common**

**Double solenoid, 3-position, 4-position**

Light/surge voltage suppressor (□NZ)

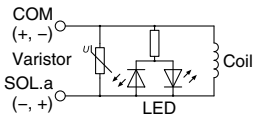



∗ Serial transmission type is not applicable for the positive common.

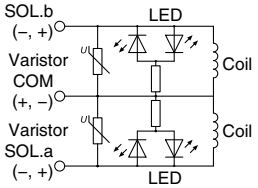
### ■Non-polar type

**With light/surge voltage suppressor (□U)**

**Single solenoid**




**Double solenoid**



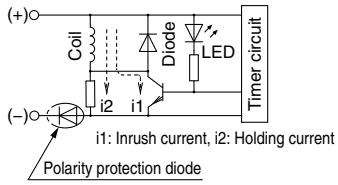

## Light/Surge Voltage Suppressor

## ⚠Caution

### ■With power-saving circuit (Made to order)

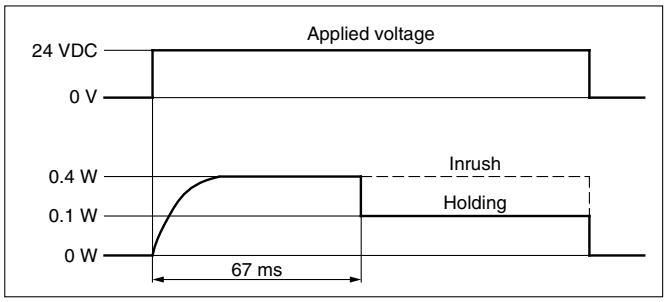
Power consumption is decreased to approx. 1/4 compared with the standard product by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 67 ms at 24 VDC.)

Electric circuit diagram (With power-saving circuit)
In the case of single solenoid




The circuit shown above reduces the power consumption for holding in order to save energy. Refer to the electrical power waveform as shown below.

**<Electrical power waveform with power-saving circuit>**




· Since the voltage will drop by approx. 0.5 V due to the transistor, pay attention to the allowable voltage fluctuation. (For details, refer to the solenoid specifications of each type of valve.)

### Residual voltage of the surge voltage suppressor

∗ If a varistor or diode surge voltage suppressor is used, there is some residual voltage to the protection element and rated voltage. Therefore, refer to the table below and pay attention to the surge voltage protection on the controller side. Also, since the response time does change, refer to the response time on page 7.

### Residual Voltage

| Surge voltage suppressor | 24 VDC |
|---|---|
| Z | Approx. 1 V |
| U | Approx. 47 V |

## Continuous Duty

## ⚠Caution

If a valve is energized continuously for long periods of time, the rise in temperature due to heat-up of the coil assembly may cause a decline in solenoid valve performance, reduce service life, or have adverse effects on peripheral equipment. If the valve is energized continuously or if the A side and B side of the dual 3-port valve are energized simultaneously, be sure to use a valve with power-saving circuit.

## Energization of a 2-Position Double Solenoid Valve

## ⚠Caution

To avoid operation failure, do not energize the A side and B side of 2-position double solenoid valve at the same time.

# *JSY5000-H Series*
# Specific Product Precautions 3

**Be sure to read this before handling the products.**

## Countermeasure for Surge Voltage Intrusion

## ⚠Caution

**■ Surge voltage intrusion**

With non-polar type valves, at times of sudden interruption of the loading power supply, such as emergency shutdown, surge voltage intrusion may be generated from loading equipment with a large capacity (power consumption), and a valve in a de-energized state may switch over (see Fig. 1).
When installing a breaker circuit for the loading power supply, consider using a valve with polarity (with polarity protection diode), or install a surge absorption diode between the loading equipment COM line and the output equipment COM line (see Fig. 2).

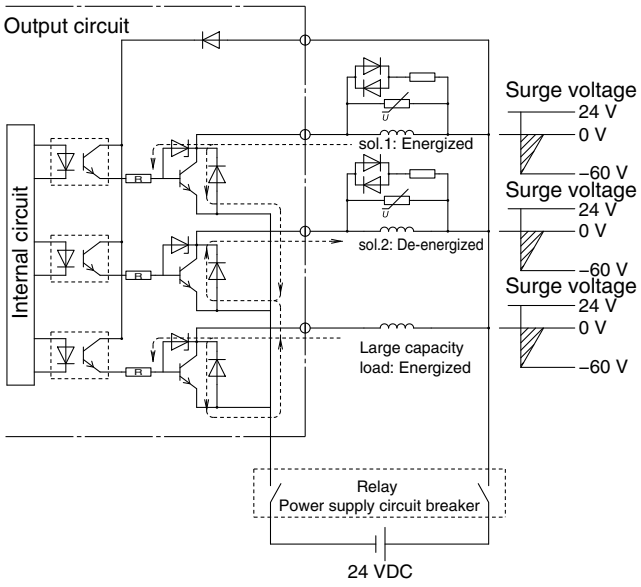



**Fig. 1 Surge intrusion circuit example (NPN outlet example) (24 VDC)**

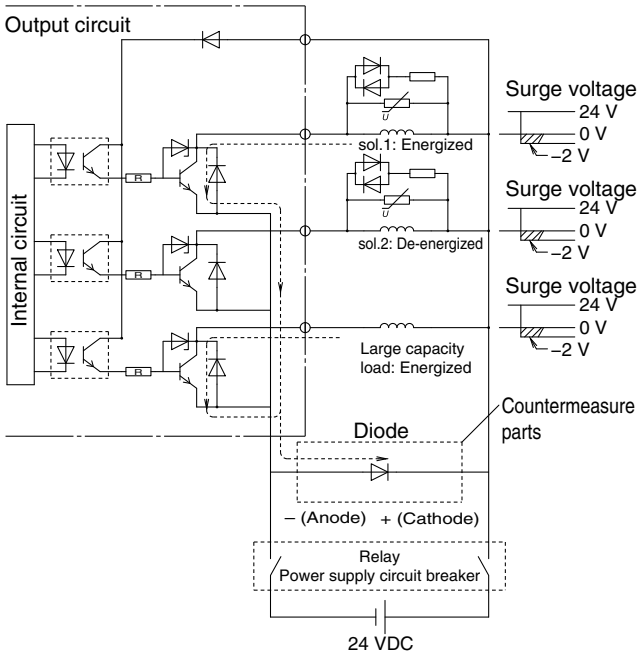
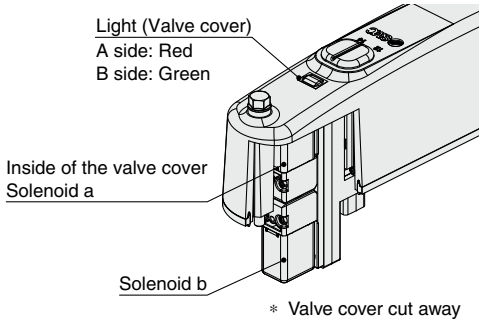



**Fig. 2 Surge intrusion countermeasure example (NPN outlet example) (24 VDC)**

## Light Indication

## ⚠Caution

When equipped with indicator light and surge voltage suppressor, the light window turns red when solenoid a is energized, and it turns green when solenoid b is energized.




## Substrate inside Manifolds

## ⚠Caution

The substrate inside of manifolds cannot be taken apart.
Attempting to do so may damage parts.

## Other Tube Brands

## ⚠Caution

**1. When using other than SMC brand tube, confirm that the following specifications are satisfied with respect to the tube outside diameter tolerance.**

1) Nylon tubing Within ±0.1 mm
2) Soft nylon tubing Within ±0.1 mm
3) Polyurethane tubing Within +0.15 mm, Within –0.2 mm

Do not use tubing which does not satisfy the specified tubing O.D. accuracy, or tubing with an I.D., material, hardness, or surface roughness that differs from SMC's tubing. Please consult SMC if anything is unclear. It may cause difficulty in connecting the tubing, leakage, disconnection of the tubing, or fitting damage.
When used with tubing other than those from SMC, due to their properties, the KQG2 and KQB2 are not subject to warranty.

**2. When using fittings other than those from SMC, be certain to confirm that the operating conditions are such that no problems will arise.**

# *JSY5000-H Series*
# Specific Product Precautions 4

**Be sure to read this before handling the products.**

## One-touch Fittings

## ⚠Caution

**■Installation and removal of tubing for One-touch fittings**

**1) Installation of tubing**

(1) Cut the tubing perpendicularly, being careful not to damage the outside surface. Use an SMC tube cutter TK-1, 2, 3, 5, or 6. Do not cut the tubing with pliers, nippers, scissors, etc., otherwise the tubing will be deformed and problems may result. Allow some extra length in the tube.

(2) The outside diameter of the polyurethane tubing swells when internal pressure is applied to it. Therefore, it may be impossible to re-insert the tubing into the One-touch fitting. Check the tubing outside diameter, and when the accuracy of the outside diameter is +0.07 mm or larger for ø2, +0.15 mm or larger for other sizes, re-insert it into the One-touch fitting without cutting the tubing. When the tubing is re-inserted into the One-touch fitting, confirm that the tubing goes through the release button smoothly.

(3) Grasp the tubing, and slowly push it straight (0 to 5°) into the One-touch fitting until it comes to a stop.

(4) Pull the tubing back gently to make sure it has a positive seal. Insufficient installation may cause air to leak or the tubing to release.

As a guide for checking if the tubing is pulled out or not, refer to the following table.

| Tubing size | Tensile force of tubing [N] |
|---|---|
| ø2, ø3.2, ø1/8" | 5 |
| ø4, ø5/32", ø3/16" | 8 |
| ø6, ø1/4" | 12 |
| ø8, ø5/16" | 20 |
| ø10, ø3/8" | 30 |
| ø12, ø1/2" | 35 |
| ø16 | 50 |

**2) Removal of tubing**

Use the release tool when the removal of tube is difficult due to the tube size. Refer to page 33 for releasing tools.

(1) Push the release button flange evenly and sufficiently to release the tube. Do not push in the tubing before pressing the release button.

(2) Pull out the tubing while keeping the release button depressed. If the release button is not held down sufficiently, the tubing cannot be withdrawn.

(3) To reuse the tubing, remove the previously lodged portion of the tubing. If the lodged portion is left on without being removed, it may result in air leakage and make the removal of the tubing difficult.

## Installation

## ⚠Caution

Even though the inlet pressure is within the operating pressure range, when the piping diameter is restricted due to size reduction of supply port 1(P), the flow will be insufficient. In this case, the valve does not switch completely and the cylinder may malfunction.

## Maintenance

## ⚠Caution

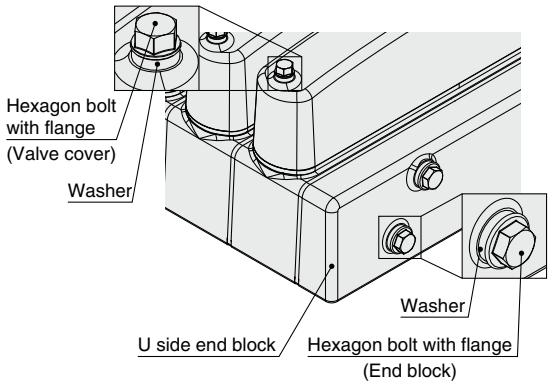
**1. Regular inspection and tightening of the hexagon bolts with flange is recommended at 3 months intervals, to satisfy IP69K. (Recommended inspection interval: 3 months)**

For the tightening location and tightening torque, see the exploded view of the manifold (p. 25).

Please replace the washer if it is damaged.

**2. When disassembling by removing the hexagon bolt with flange, make sure that there is not moisture on the outer surface of the product. If the product is disassembled or assembled with moisture attached, moisture may enter the inside of the manifold and cause damage.**

**3. Make sure that the washers are in good condition, in position and assembled when tightening the hexagon bolt with flange.**



# *EX430 Series*
# Specific Product Precautions 1

**Be sure to read this before handling the products.**

## Design / Selection

### ⚠ Warning

1. **Do not use beyond the specification range.**
   Using beyond the specification range may result in a fire, malfunction, or damage to the system.
   Check the specifications before operation.
2. **When using for an interlock circuit:**
   - **Provide a multiple interlock system which is operated by another system (such as a mechanical protection function).**
   - **Perform an inspection to confirm that it is working properly.**
     Failure to do so may result in possible injuries due to malfunction.

### ⚠ Caution

1. **Use within the specified voltage range.**
   Using beyond the specified voltage range is likely to cause product damage or malfunction.
2. **Do not install in places where it can be used as a foothold.**
   Applying any excessive load such as stepping on the product by mistake or placing a foot on it will cause it to break.
3. **Keep the surrounding space free for maintenance.**
   When designing a system, take into consideration the amount of free space needed to perform maintenance.
4. **Beware of inrush currents when the power supply is turned on.**
   Some connected loads can apply an initial charge current which will trigger the over current protection function, causing the product to malfunction.

## Mounting

### ⚠ Caution

1. **When handling and assembling products:**
   - **Do not apply excessive force to the product when disassembling.**
     The connecting parts of the product are firmly joined with seals.
   - **When joining units, take care not to get your fingers caught between the products.**
     Injury may result.
2. **Do not drop, bump, or apply excessive impact to the product.**
   Doing so may result in damage, equipment failure, or malfunction.

## Mounting

### ⚠ Caution

3. **Observe the tightening torque range.**
   Tightening outside of the allowable torque range will likely damage the screw.
   IP69K cannot be guaranteed if the screws are not tightened to the specified torque.
4. **When lifting a large solenoid valve manifold, take care to avoid causing stress to the valve connection joint.**
   The connection parts of the product may be damaged.
   Because the product may be heavy, carrying and installation should be performed by more than one operator to avoid strain or injury.
5. **When installing the product, mount it on a flat surface.**
   Torsion in the whole product may lead to problems such as air leakage or contact failure.

## Wiring

### ⚠ Caution

1. **Avoid repeatedly bending or stretching the cable and applying heavy objects or force to it.**
   Wiring where repeated bending and tensile stress are applied to the cable may result in circuit breakage.
2. **Avoid miswiring.**
   If miswired, there is a danger of malfunction or damage to the product.
3. **Do not wire while energizing the product.**
   There is a danger of malfunction or damage to the product or input/output device.
4. **Avoid wiring the power line and high-voltage line in parallel.**
   Signal line noise or surge from the power line or high-pressure line could cause a malfunction.
   Wiring of the product or input/output device and the power line or high-voltage line should be separated from each other.
5. **Check the wiring insulation.**
   Defective insulation (contact with other circuits, improper insulation between terminals, etc.) may cause damage to the product or input/output device due to excessive voltage or current.

# *EX430 Series*
# Specific Product Precautions 2

**Be sure to read this before handling the products.**

## Wiring

## ⚠ Caution

**6. When the product is installed in machinery/equipment, provide adequate protection against noise by using noise filters, etc.**

Noise in signal lines may cause a malfunction.

**7. When connecting wires, prevent the entry of water, solvent, or oil from the connector section.**

Failure to do so may result in damage, equipment failure, or malfunction.

**8. Avoid wiring patterns in which excessive stress is applied to the connector.**

Failure to do so may result in equipment failure or malfunction due to contact failure.

## Operating Environment

## ⚠ Warning

**1. Do not use in atmospheres containing inflammable or explosive gases.**

Use in such atmospheres is likely to cause a fire or explosion.

This product is not explosion proof.

## ⚠ Caution

**1. Provide adequate protection when operating in locations such as the following.**

Failure to do so may cause a malfunction or equipment failure. The effect of countermeasures should be checked in individual equipment and machines.

1) Where noise is generated by static electricity, etc.

2) Where there is a strong electric field

3) Where there is a danger of exposure to radiation

4) When in close proximity to power lines or high-voltage lines

**2. Do not use in environments where oil and chemicals are used.**

Operating in environments where coolants, cleaning solvents, various oils, or chemicals are present may cause adverse effects (damage, malfunction, etc.) to the product even within a short period of time.

**3. Do not use in environments where the product could be exposed to corrosive gases or liquids.**

Use in such environments may cause product damage or malfunction.

## Operating Environment

## ⚠ Caution

**4. Select the proper type of enclosure according to the operating environment.**

IP69K is achieved when the following conditions are met.

1) Provide appropriate wiring using communication cables with M12 connectors.

2) Appropriately mount the SI unit and the manifold valve.

**5. Do not use in locations with sources of surge generation.**

Installation of the product in an area around equipment (electromagnetic lifters, high-frequency induction furnaces, welding machines, motors, etc.) which generates large surge voltages could cause an internal circuitry element of the product to deteriorate or result in damage. Implement countermeasures against the surge from the generating source, and avoid contact between the lines.

**6. When directly driving a load which generates a surge voltage by relay, solenoid valve, or lamp, use a load that has an integrated surge-absorption element.**

When a surge generating load is directly driven, the product may be damaged.

**7. The product is CE marked but not immune to lightning strikes. Take measures against lightning strikes in your system.**

**8. Keep dust, wire scraps, and other foreign matter from entering the product.**

Such materials may cause equipment failure or malfunction.

**9. Mount the product in a location, which is not affected by vibration or shock.**

Failure to do so may cause equipment failure or malfunction.

**10. Do not use in direct sunlight.**

This may cause equipment failure or malfunction.

**11. Use within the ambient temperature range.**

Failure to do so may cause a malfunction.

**12. Do not use in places where radiated heat may affect the product.**

Such places are likely to cause a malfunction.

# *EX430 Series*
# Specific Product Precautions 3

**Be sure to read this before handling the products.**

## Adjustment / Operation

### ⚠ Warning

1. **Do not perform operation or setting with wet hands.**
   There is a risk of electrical shock.

### ⚠ Caution

1. **Use a watchmaker's screwdriver with a thin blade for the setting switch.**
   When setting the switch, do not touch any unrelated parts.
   This may cause parts damage or malfunction due to a short circuit.
2. **Perform appropriate setting for the operating conditions.**
   Failure to do so could result in malfunction.
   Refer to the Operation Manual for details on setting each switch.
3. **For details on programming and address setting, refer to the manual from the PLC manufacturer.**
   The programming content related to the protocol is designed by the manufacturer of the PLC used.

## Maintenance

### ⚠ Warning

1. **Do not disassemble, modify (including circuit board replacement), or repair this product.**
   Such actions are likely to cause injuries or equipment failure.
2. **When an inspection is performed:**
   - **Turn off the power supply.**
   - **Stop the air supply, exhaust the residual pressure in the piping, and confirm that the air has been released before performing maintenance work.**

   Failure to do so may result in the unexpected malfunction of system components or injury.

### ⚠ Caution

1. **When removing from/attaching to the valve manifold:**
   - **Do not apply excessive force to the unit.**
     The connecting parts are firmly joined with seals.
   - **Take care not to get your fingers caught.**
     Injury may result.
2. **Perform periodic inspection.**
   Unexpected malfunction in the system composition devices is likely to occur due to malfunction of machinery or equipment.
3. **After maintenance, make sure to perform an appropriate functionality inspection.**
   When abnormalities such as faulty operation occur, stop operation immediately. Unexpected malfunction in the system composition devices is likely to occur.
4. **Do not use benzine or thinner for cleaning the product.**
   Damage to the surface or erasure of the display may result.
   Wipe off any stains with a soft cloth.
   If the stain is persistent, soak a cloth in a dilute solution of neutral detergent, wring it out sufficiently, wipe the product, and then finish with a dry cloth.

## Other

### ⚠ Caution

1. **Refer to the catalog of each series for Common Precautions and Specific Product Precautions for valve manifolds.**

# ⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

**⚠ Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

**⚠ Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

**⚠ Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

## ⚠ Warning

**1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

**2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

**3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

**4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

## ⚠ Caution

**1. The product is provided for use in manufacturing industries.**

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

## Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

### Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## ⚠ Caution

**SMC products are not intended for use as instruments for legal metrology.**

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.