

High Speed 2 Port Valve

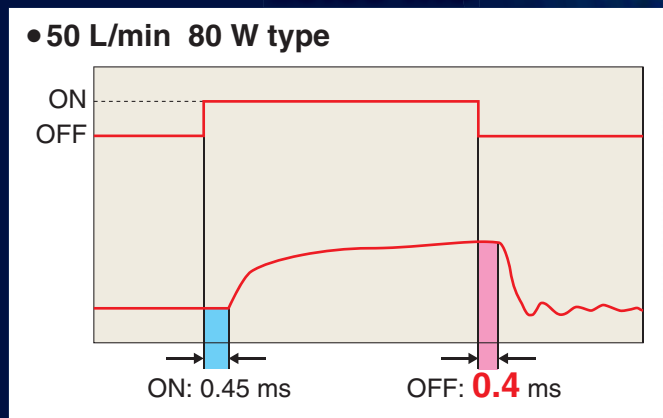


High speed response

ON **0.45 ms**
±0.05 ms

OFF **0.4 ms**
±0.05 ms

9mm Width



* The response time is measured based on SMC test conditions. (Not guaranteed values)

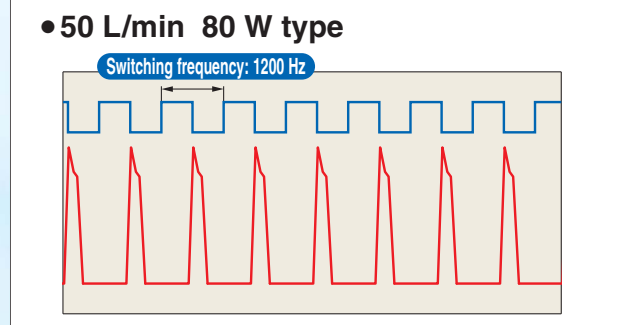
Long service life: 5 billion cycles or more

SMC's original valve and coil structure realizes a longer product life and requires less maintenance frequency.

(50 L/min type, 24 VDC, 0.25 MPa. Based on SMC life test conditions.)

High frequency: 1200 Hz

Good followability and response to successive electrical signal input. Continuous operation possible.



2 mounting types

Quick disconnect type

Screw mount type



The manifold base should be prepared by users.

Low power consumption: 4 w

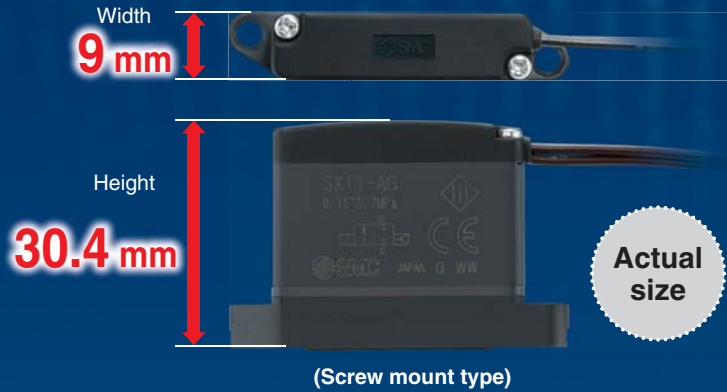
Continuous energisation for extended periods is possible.

Series SX10



CAT.EUS70-53A-UK

Compact and Space-saving * The manifold base should be prepared by users.



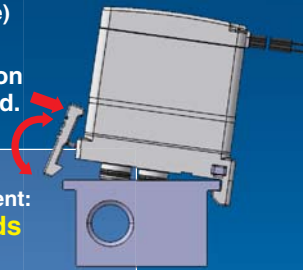
Reduction in installation labour

(Quick disconnect type)

Can be mounted/removed in one action and no tools required.

Required time for attachment/detachment: **Approx. 5 seconds** (per unit)

Reduces installation time for multiple numbers of valves.



Coil temperature rise: 5°C

(4 W type)

| Power consumption | Temperature rise |
|-------------------|------------------|
| 4 W type | 5°C |
| 10 W type | 14°C |

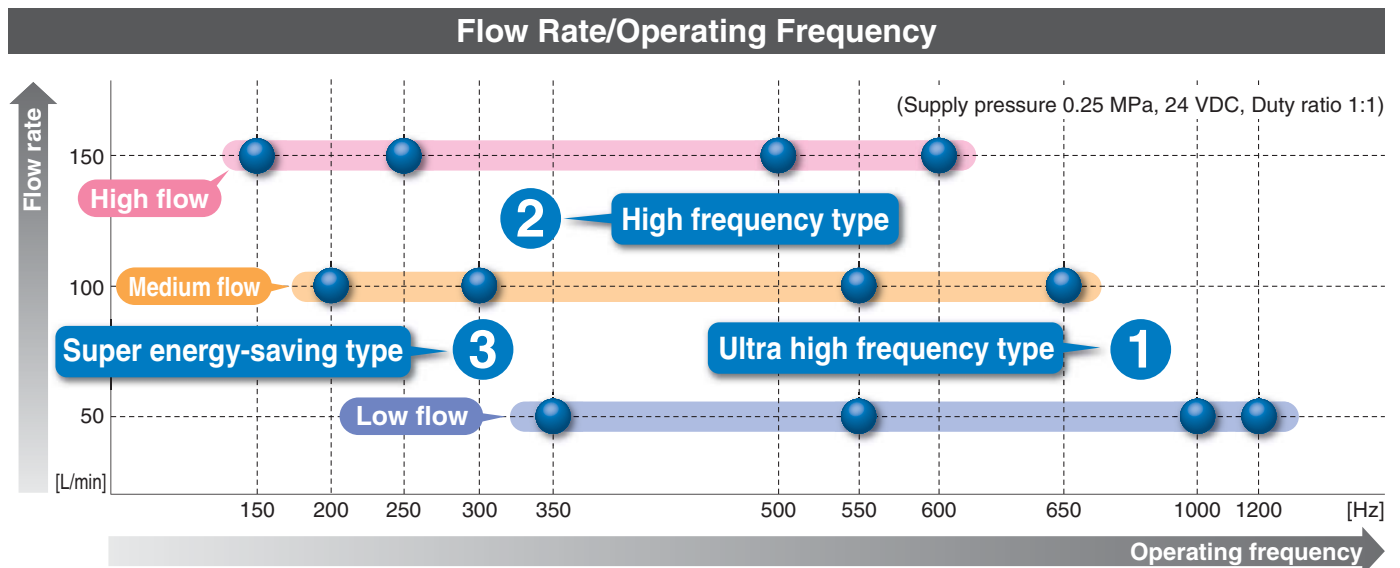
During continuous operation at 24 VDC, 0.25 MPa, 300 Hz

Filter attached type available



Filter is mounted to port 1 (IN).
Filter is mounted to port 1 (IN) for quick disconnect type as well.

Variations/Purpose of Usage (Guide)

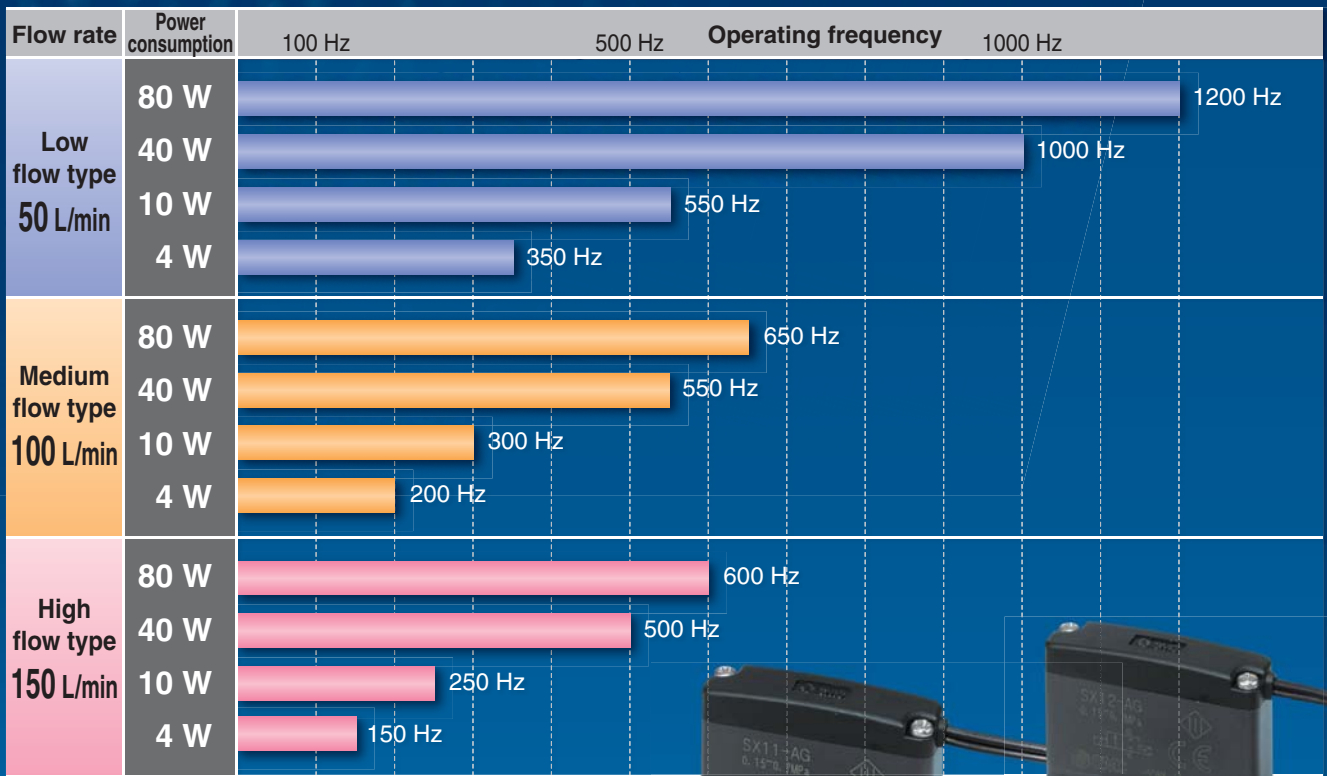


| Specifications | Driver | Continuous energisation | Power consumption | OFF response time | | |
|--|--|-------------------------|-------------------|-------------------|-----------|-----------|
| | | | | 50 L/min | 100 L/min | 150 L/min |
| ① Ultra high frequency type 500 to 1200 Hz | For power saving driver (Refer to page 4.) | — | 80 W, 40 W | 0.4 ms | 0.55 ms | 0.75 ms |
| ② High frequency type 250 to 550 Hz | Control driver is not necessary. | (Note) | 10 W | 0.4 ms | 0.55 ms | 0.75 ms |
| ③ Super energy-saving type 150 to 350 Hz | Control driver is not necessary. | Possible | 4 W | 0.4 ms | 0.55 ms | 0.75 ms |

(Note) Please consult with SMC for continuous energisation.

Variations

All models have the same body size.



Select a model according to applications and purposes.

High speed response required for both ON and OFF

Select the 80 W or 40 W type.

| Model | Power consumption | Flow rate | Max. operating frequency | Response time [ms] | |
|-----------------|-------------------|-----------|--------------------------|--------------------|------|
| | | | | ON | OFF |
| SX1 □ -A | 80 W | 50 L/min | 1200 Hz | 0.45 | 0.4 |
| -B | 40 W | 50 L/min | 1000 Hz | 0.55 | 0.4 |
| -E | 80 W | 100 L/min | 650 Hz | 0.55 | 0.55 |
| -F | 40 W | 100 L/min | 550 Hz | 0.7 | 0.55 |
| -J | 80 W | 150 L/min | 600 Hz | 0.6 | 0.75 |
| -K | 40 W | 150 L/min | 500 Hz | 0.8 | 0.75 |

* Current needs to be limited.

High speed response required for OFF only without use of special control circuit

Select the 10 W type.

| Model | Power consumption | Flow rate | Max. operating frequency | Response time [ms] | |
|-----------------|-------------------|-----------|--------------------------|--------------------|------|
| | | | | ON | OFF |
| SX1 □ -C | 10 W | 50 L/min | 550 Hz | 0.9 | 0.4 |
| -G | 10 W | 100 L/min | 300 Hz | 1.1 | 0.55 |
| -L | 10 W | 150 L/min | 250 Hz | 1.35 | 0.75 |

* Please consult with SMC for continuous energisation.

Saving energy and continuous energisation required

Select the 4 W type.

| Model | Power consumption | Flow rate | Max. operating frequency | Response time [ms] | |
|-----------------|-------------------|-----------|--------------------------|--------------------|------|
| | | | | ON | OFF |
| SX1 □ -D | 4 W | 50 L/min | 350 Hz | 1.25 | 0.4 |
| -H | 4 W | 100 L/min | 200 Hz | 1.7 | 0.55 |
| -M | 4 W | 150 L/min | 150 Hz | 2.75 | 0.75 |

* Continuous energisation is possible.

High Speed 2 Port Valve Series SX10



How to Order

SX1 2 F - A G

Valve mounting

| | |
|---|---------------------------------------|
| 1 | Screw mount type <small>Note)</small> |
| 2 | Quick disconnect type |

Note) Two mounting screws (M3 x 0.5) and a gasket are included. (packaged together)

Filter (IN port)

| | |
|---|----------------------------------|
| — | Without filter |
| F | With filter <small>Note)</small> |

Note) Flow reduction rate
50 L/min: 5% or less
100 L/min: 5 to 10%
150 L/min: 10 to 15%

Flow rate/Operating frequency (at 24 VDC, 0.25 MPa)

| Symbol | Flow rate [L/min] | Power consumption [W] | Max. operating frequency [Hz] |
|--------|-------------------|-----------------------|-------------------------------|
| A | 50 | 80 | 1200 |
| B | | 40 | 1000 |
| C | | 10 | 550 |
| D | | 4 | 350 |
| E | 100 | 80 | 650 |
| F | | 40 | 550 |
| G | | 10 | 300 |
| H | | 4 | 200 |
| J | 150 | 80 | 600 |
| K | | 40 | 500 |
| L | | 10 | 250 |
| M | | 4 | 150 |

Lead wire (grommet) length

| Symbol | Length |
|--------|---------|
| G | 300 mm |
| H | 500 mm |
| J | 1000 mm |

Specifications

| Flow rate [L/min] [at 0.25 MPa] | 50 | | | | 100 | | | | 150 | | | |
|--|------------------------------------|------|-----|-----|-----|------|-----|-----|-----|------|-----|------|
| | 80 | 40 | 10 | 4 | 80 | 40 | 10 | 4 | 80 | 40 | 10 | 4 |
| Power consumption [W] | 80 | 40 | 10 | 4 | 80 | 40 | 10 | 4 | 80 | 40 | 10 | 4 |
| Type of actuation | 2-position 2 port N.C., Air return | | | | | | | | | | | |
| Seal type | Metal poppet seal | | | | | | | | | | | |
| Valve width [mm] | 9 | | | | | | | | | | | |
| Fluid | Air | | | | | | | | | | | |
| Min. operating pressure [MPa] | 0.15 | | | | | | | | | | | |
| Coil resistance value [Ω] | 7.2 | 14.4 | 58 | 144 | 7.2 | 14.4 | 58 | 144 | 7.2 | 14.4 | 58 | 144 |
| Max. operating pressure [MPa] [at 24 VDC] | 0.7 | 0.7 | 0.7 | 0.6 | 0.7 | 0.7 | 0.6 | 0.4 | 0.7 | 0.7 | 0.4 | 0.25 |
| Ambient and fluid temperature [$^{\circ}\text{C}$] | -10 to 50 (No freezing) | | | | | | | | | | | |
| Lubrication | Not required | | | | | | | | | | | |
| Mounting orientation | Unrestricted | | | | | | | | | | | |
| Impact/Vibration resistance [m/s^2] | 300/50 | | | | | | | | | | | |
| Enclosure | Dustproof | | | | | | | | | | | |
| Electrical entry | Grommet | | | | | | | | | | | |
| Weight [g] | Screw mount type | | | | | | | | | | | |
| | Quick disconnect type | | | | | | | | | | | |
| | 27 | | | | | | | | | | | |
| | 29 | | | | | | | | | | | |

Characteristics

| Flow rate [L/min] [at 0.25 MPa] | 50 | | | | 100 | | | | 150 | | | |
|---|---|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | 80 | 40 | 10 | 4 | 80 | 40 | 10 | 4 | 80 | 40 | 10 | 4 |
| Flow-rate characteristics | C [$\text{dm}^3/(\text{s}/\text{bar})$] | | | | | | | | | | | |
| | b | | | | | | | | | | | |
| | Cv | | | | | | | | | | | |
| Response time [ms] [at 0.25 MPa] | ON | | | | | | | | | | | |
| | OFF | | | | | | | | | | | |
| Max. operating frequency [Hz] [at 0.25 MPa] | 1,200 | 1,000 | 550 | 350 | 650 | 550 | 300 | 200 | 600 | 500 | 250 | 150 |

Note 1) 24 VDC, Duty ratio 1:1

80 W: Current needs to be limited by using an energy saving driver circuit.

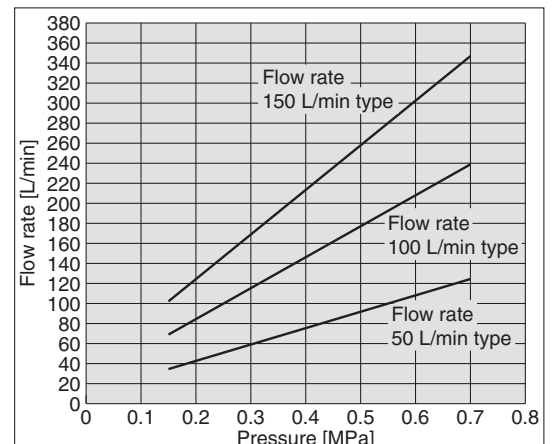
40 W: Current needs to be limited by using an energy saving driver circuit.

10 W: Energising time is one second at a maximum. Please consult with SMC for continuous energisation.

4 W: Continuous energisation is possible.

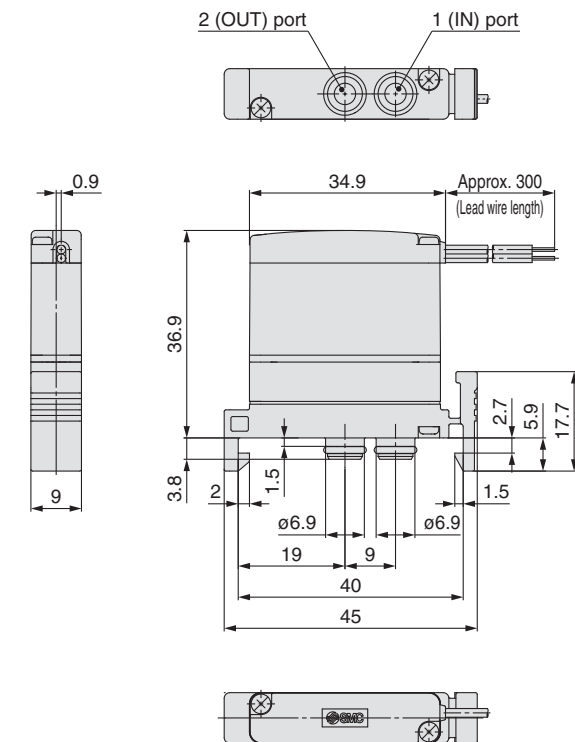
Note 2) The response time and maximum operating frequency are not guaranteed. (Actual values based on SMC test conditions)

Pressure/Flow-rate Characteristics (without filter)

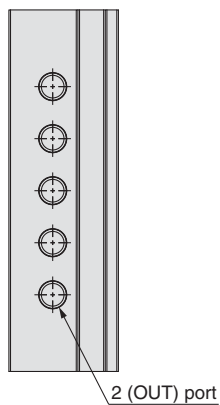
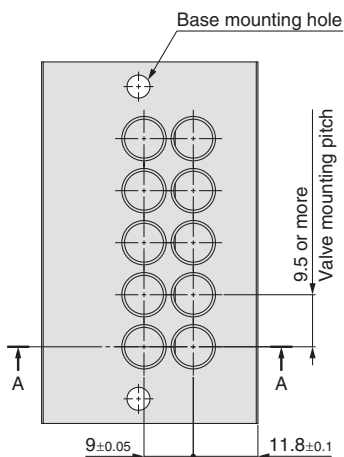
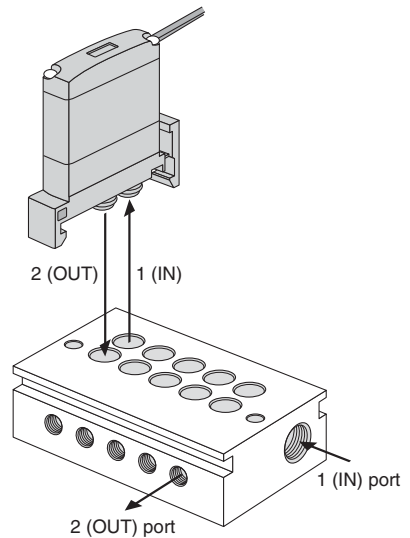
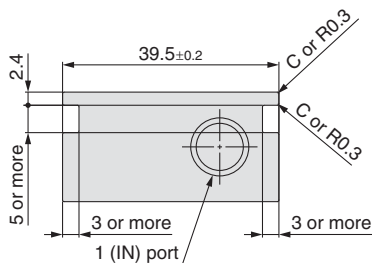


Dimensions

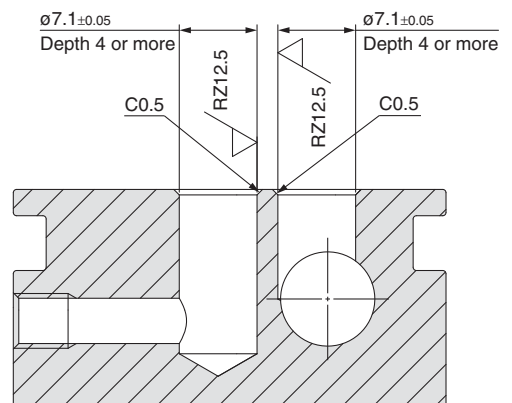
SX12-□G Quick disconnect type



Manifold base recommended dimensions



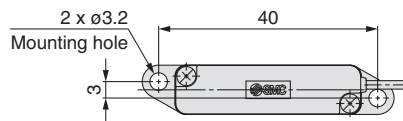
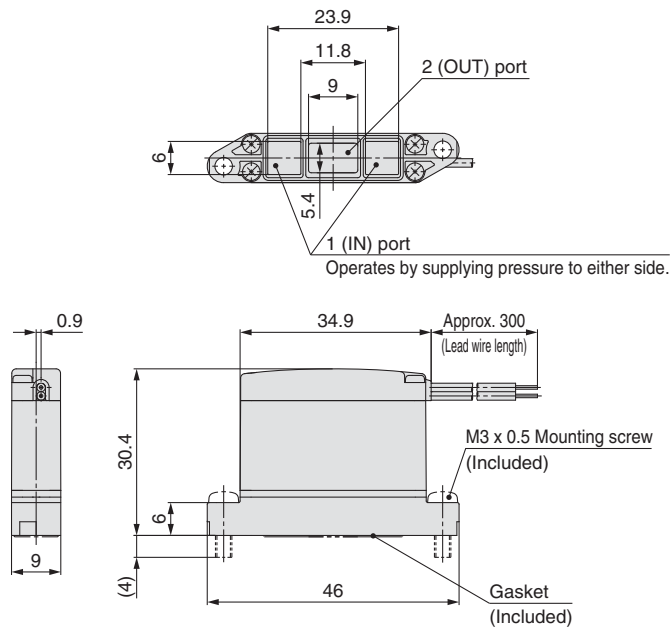
Sectional view A-A (2:1)



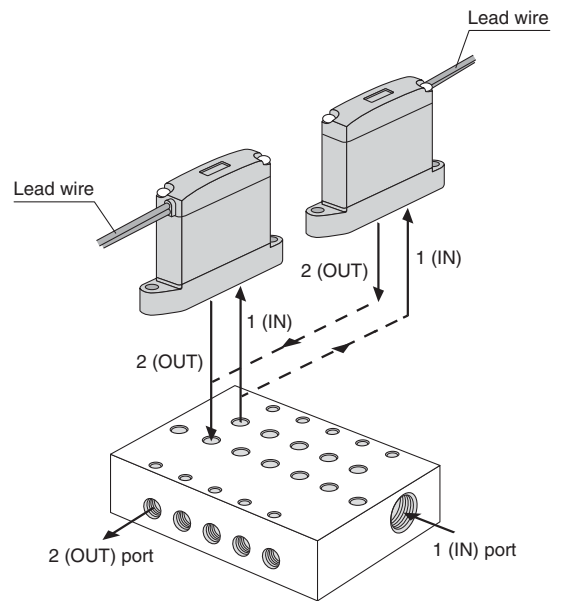
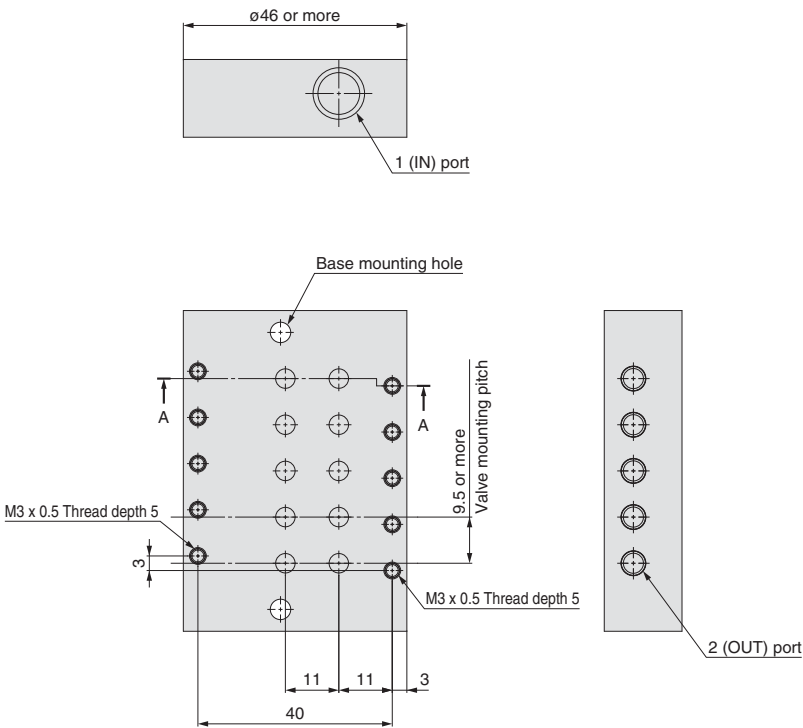
Series SX10

Dimensions

SX11-□G Screw mount type

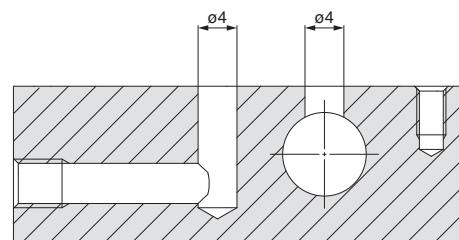


Manifold base recommended dimensions



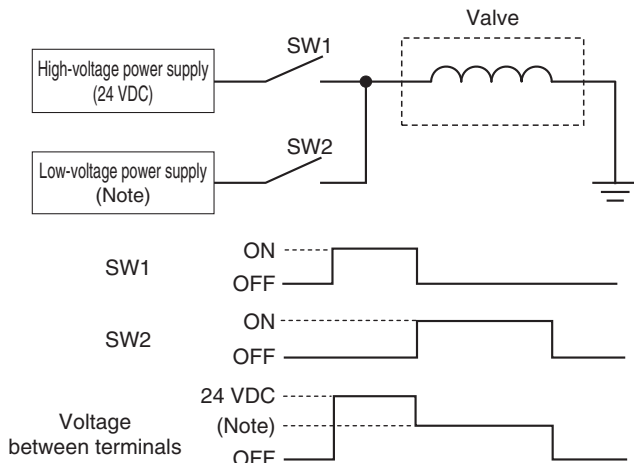
Electrical entry can be on the either side, right or left.

Sectional view A-A (2:1)



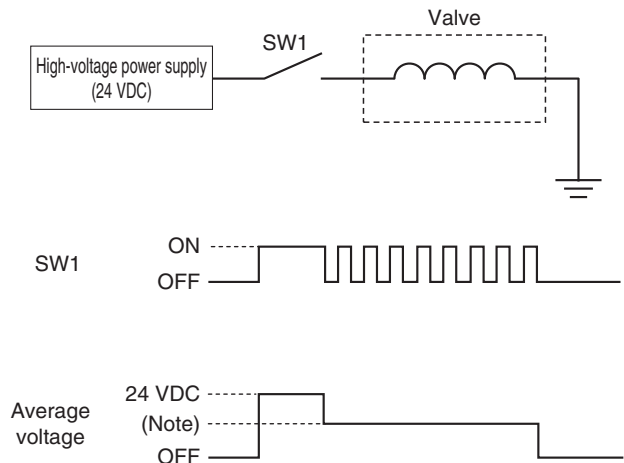
Control Method (Operation example with an energy saving driver circuit)

- 1. Control with 2 power supplies, starting power supply and holding power supply.
Switching system from high voltage to low voltage**



(Note) 80 W type: 3 to 6 VDC
40 W type: 4 to 8 VDC
10 W type: 8 to 16 VDC

- 2. High speed switching control of high voltage by PWM control*.** (*: PWM control circuit not currently available.)



⚠ Specific Product Precautions

Be sure to read before handling. Refer to back cover for Safety Instructions. For 2 Port Solenoid Valves for Fluid Control Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smcworld.com>

Continuous Energisation (at 24 VDC)

⚠ Caution

- Power consumption 80 W type: Not available**
When operating with an energy saving driver, continuous energisation with the holding voltage of 3 to 6 VDC is possible.
- Power consumption 40 W type: Not available**
When operating with an energy saving driver, continuous energisation with the holding voltage of 4 to 8 VDC is possible.
- Power consumption 10 W type: Please consult with SMC.**
When operating with an energy saving driver, continuous energisation with the holding voltage of 8 to 16 VDC is possible.
- Power consumption 4 W type: Available**

Energised Time/Non-energised Time (When not using power saving driver)

⚠ Caution

- Non-energised time (OFF) must be set longer than the energised time (ON).**
- For use with voltages other than 24 VDC, please consult with SMC with the operating condition information of pressure, voltage, energised time and non-energised time.**




Others

⚠ Caution

- If the valve is energised without air supply, the coil may be burned. Make sure to supply pressure to the valve when energising.**
- Please contact SMC for the product usage with a voltage at 75 VDC or more. Standard required by CE mark is different.**

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

- 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 catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- 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.
- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 - 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.
 - 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.
 - Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 - Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 - 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 catalogue.
 - An application which could have negative effects on people, property, or animals requiring special safety analysis.
 - 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.

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

- 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.
- 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.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue 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.

Caution

- 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.

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.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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