

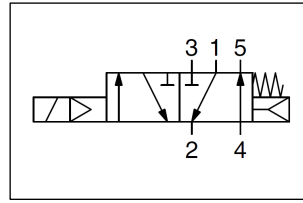
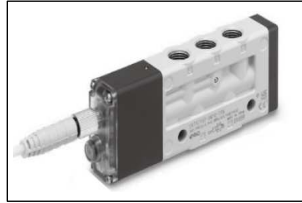


ORIGINAL INSTRUCTIONS

Instruction Manual

High Speed Pilot Operated 5 Port Solenoid Valve

Series DXT1215



The intended use of this valve is to control the movement of an actuator.

1 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<sup>\*)</sup>, and other safety regulations.

- <sup>\*)</sup> 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: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

<b>Caution</b>	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
<b>Warning</b>	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
<b>Danger</b>	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

**Warning**

- Always ensure compliance with relevant safety laws and standards.
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

**Caution**

- The product is provided for use in manufacturing industries only. This product must not be used in residential areas.

2 Specifications

2.1 Valve specifications

Valve type	Rubber seal
Fluid	Air
Internal pilot operating pressure range [MPa]	2 position single 0.3 to 0.6
Ambient and fluid temperature [°C] <sup>Note 1)</sup>	-10 to 60 (No freezing)
Minimum operating frequency	1 cycle / 30 days
Maximum operating frequency [Hz]	200
Duty cycle	Continuous (1.5W standard power saving type)
Flow rate	Refer to catalogue
Response time	Refer to catalogue
Manual override	Non-locking push type
Pilot exhaust type	Internal pilot
Lubrication	Common exhaust for main & pilot valve Not required
Mounting orientation	Unrestricted
Impact/vibration resistance <sup>Note 2)</sup>	150 / 30
Enclosure (based on IEC60529)	IP67
Weight	Refer to catalogue

Table 1.

2 Specifications - continued

Note 1) The upper limits of the ambient and fluid temperatures vary depending on the operating frequency. (Refer to figure1.) If a follow-up operation is performed at a duty ratio of 50% or higher, the upper limit value may change. Please contact SMC for further details.

Note 2) Impact resistance: No malfunction occurred when it was tested with a drop tester in the axial direction and at right angles to the main valve & armature; in both energized and de-energized states and for every time in each condition. (Values quoted are for a new valve).  
Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Tests are performed at both energized and de-energized states in the axial direction and at right angles to the main valve and armature. (Values quoted are for a new valve).

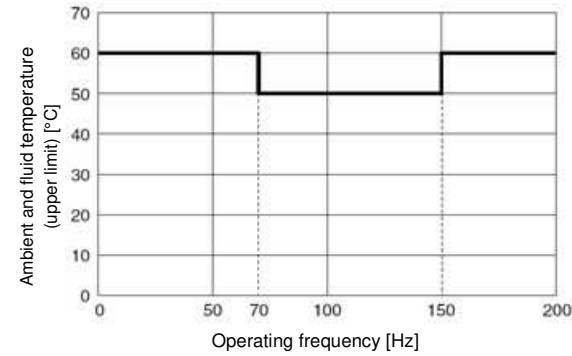


Figure 1. The upper limit of ambient and fluid temperature

2.2 Solenoid specifications

Coil rated voltage [VDC]	24
Electrical entry	M8 connector
Allowable voltage fluctuation [V] <sup>Note 1)</sup>	-5 to 10% of rated voltage
Power consumption [W] <sup>Note 2, 3)</sup>	1.5 (Inrush 6, Holding 1.5)
Surge voltage suppressor	Diode
Indicator light	LED

Table 2.

Note 1) Valve state is not defined if electrical input is outside of specified operating ranges.

Note 2) DXT1215 series available as power saving type only.  
Note 3) Refer to section 3.8 for details.

2.3 Indicator light

This valve has an indicator light and surge voltage suppressor. The light turns red when the solenoid is energized.

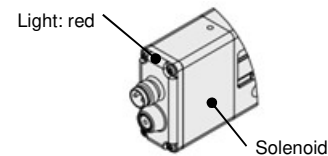


Figure 2. Light indication

2.4 Special products

**Warning**

Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

3 Installation

3.1 Installation

**Warning**

- Do not install the product unless the safety instructions have been read and understood.

3.2 Environment

**Warning**

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product's specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product's specifications.

3 Installation - continued

- Products with compliant with IP67 enclosures are protected against dust and water; however, these products cannot be used in water.
- Products compliant to IP67 satisfy the specifications by mounting the product appropriately. Be sure to read the Specific Product Precautions for each product.
- Do not use in high humidity environment where condensation can occur.
- If using in an atmosphere where there is possible contact with water drop-lets, oil, weld spatter, etc., take suitable preventive measures.
- Contact SMC for altitude limitations.

3.3 Piping

**Caution**

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- For internal pilot valves, even though the inlet pressure is within the operating pressure range, when the pipe 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.
- Tighten fittings to the specified tightening torque.

Connection thread size (R, NPT)	Tightening torque [N·m]
1/8	3 to 5

Table 3.

3.4 Lubrication

**Caution**

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, refer to catalogue for details.

3.5 Air supply

**Warning**

- Use clean air. If the compressed air supply includes chemicals, synthetic materials (including organic solvents), salinity, corrosive gas etc., it can lead to damage or malfunction.

**Caution**

- Install an air filter upstream of the valve. Select an air filter with a filtration size of 5µm or smaller.

3.6 Manual override

**Warning**

- Regardless of an electric signal for the valve, the manual override is used for switching the main valve. Since connected equipment will operate when the manual override is activated, confirm that conditions are safe prior to activation.
- Refer to the catalogue for details of manual override operation.

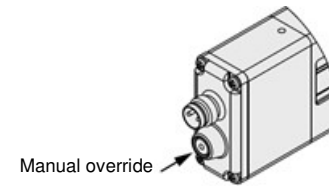


Figure 3.

3.7 One-touch fittings

3.7.1 Tube attachment and detachment

**Caution**

Refer to the Specific Precautions in the catalogue.

3.7.2 Precautions on other tube brands

**Caution**

When using non-SMC brand tubes, refer to the Specific Product Precautions in the fittings and tubing catalogue.

3.8 Electrical circuits

3.8.1 With power saving circuit (non-polar type)

- Power consumption is decreased by approximately 1/4 of the amount required at start up by reducing the wattage required to hold the valve in an energized state. (Effective energizing time is over 5 ms at 24 VDC).

3 Installation - continued

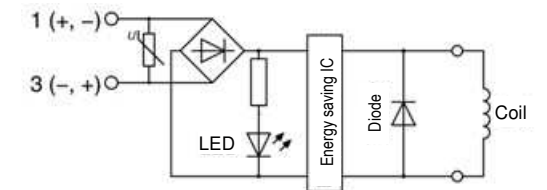


Figure 4. With power saving circuit.

- The above circuit reduces the power consumption for holding in order to save energy.
- Refer to the catalogue for additional information.

3.9 Wiring

**Caution**

- Do not use a tool to mount the connector as this may cause damage. Tighten the connector by hand (torque of 0.4 N·m to 0.6 N·m).
- Applying excessive force on the cable connector will result in it no longer being able to satisfy IP67 requirements. Please use caution and refrain from applying 30 N or more force on the connector.
- Refer to catalogue for additional information.

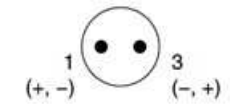


Figure 5. Solenoid valve side pin wiring diagram

Note: There is no grounding for this product.

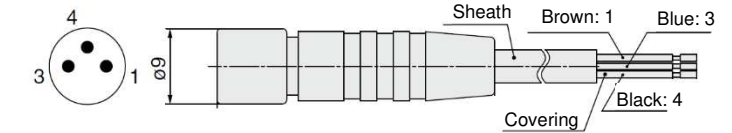


Figure 6. Connector cable

3.10 Residual voltage

**Caution**

- The suppressor arrests the back EMF voltage from the coil to a level in proportion to the rated voltage.
- Ensure the transient voltage is within the specification of the host controller.
- In the case of a diode, the residual voltage is approximately 1 V.

3.11 Countermeasure for surge voltage

**Caution**

- At times of sudden interruption of the power supply, the energy stored in a large inductive device may cause non-polar type valves in a de-energized state to switch.
- When installing a breaker circuit to isolate the power, consider to install a surge absorption diode across the output of the breaker.

3.12 Extended period of continuous energization

**Warning**

If a valve is continuously energized for an extended period of time or is mounted in a control panel, the temperature of the valve will increase due to the heat generated by the coil assembly. This will likely adversely affect the performance of the valve and any nearby peripheral equipment.

3.13 One-touch fittings

**Caution**

When fittings are used, they may interfere with one another depending on their types and sizes. Therefore, the dimensions of the fittings to be used should first be confirmed in their respective catalogues.

4 How to Order

Refer to catalogue for 'How to Order' or to product drawing for special products.

5 Outline Dimensions

Refer to catalogue for outline dimensions.

## 6 Maintenance

### 6.1 General maintenance

#### ⚠ Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- When the equipment is operated after remounting or replacement, first confirm that measures are in place to prevent lurching of actuators, etc. Then, confirm that the equipment is operating normally.
- Operate the valve at least once every 30 days.

## 7 Limitations of Use

### 7.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

#### ⚠ Warning

### 7.2 Effect of energy loss on valve switching

The use of 2-position single valves with air returned or air/spring returned spools has to be carefully considered.

Energy source status	Single solenoid
Air supply present, electrical supply cut	Spool returns to the OFF position by air and spring force
Electrical supply present, air supply cut	Spool stops moving after air pressure cut (Position cannot be defined)

Table 4.

Note) Applies to when the spool is at the end position and at an intermediate position.

### 7.3 Holding of pressure

Since valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a system.

### 7.4 Cannot be used as an emergency shut-off valve

This product is not designed for safety applications such as an emergency shut-off valve. If the valves are used in this type of system, other reliable safety assurance measures should be adopted.

### 7.5 Safety relays or PLC

If a safe output from a safety relay or PLC is used to operate this valve, please contact SMC.

#### ⚠ Caution

### 7.6 Leakage voltage

Ensure that any leakage voltage caused by the leakage current when the switching element is OFF causes  $\leq 3\%$  of the rated voltage across the valve.

### 7.7 Low temperature operation

Unless otherwise indicated in the specifications for each valve, operation is possible to  $-10^{\circ}\text{C}$ , but appropriate measures should be taken to avoid solidification or freezing of drainage and moisture, etc.

### 7.8 3 port specification (DXT1215T-5□U-01□-X1)

- The 3-port specification is a specification with the 2(B) port plugged and closed. The 3(EB) port should be kept open for pilot exhaust.
- When one of the cylinder ports 4(A) or 2(B) is closed with a plug and used as a 3-port valve, the surface temperature of the plug may rise due to adiabatic compression. Therefore, we recommend the use of a screw-in metal plug instead of a plastic plug with one-touch fittings.

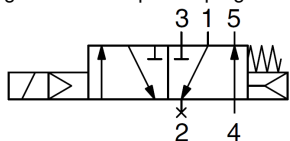


Figure 7.

## 7 Limitations of Use - continued

### 7.9 EMC restrictions

#### 7.9.1 Class and Group Description

- This product is group 1, class A equipment according to EN55011.
- Group 1 equipment does not intentionally generate radio-frequency energy in the range 9kHz to 400 GHz.
- Class A equipment is equipment suitable for use in all locations other than those allocated in residential environments and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.

#### ⚠ Caution

- This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

#### 7.9.2 Cable length to connect

The cable to connect the product shall be less than or equal to 30m.

#### 7.9.3 Connecting the power supply

This product is not intended to be directly connected to any DC Distribution network.

## 8 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose this product correctly, in order to reduce the impact on human health and the environment.

## 9 Contacts

Refer to [www.smcworld.com](https://www.smcworld.com) or [www.smc.eu](https://www.smc.eu) for your local distributor/importer.

## SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)  
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