XTO-SMV19EN

ORIGINAL INSTRUCTIONS

Instruction Manual

Pilot Check Valve

XTO-SERIES



XTO valve is a pilot-operated non-return valve with spring. Pilot pressure allows free flow in both directions.

Refer to the Validation Document for products used in safety related applications.

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) *1), and other safety regulations.

*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.

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- To ensure safety of personnel and equipment the safety instructions in this manual must be observed, along with other relevant safety practices.

⚠ 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.

⚠ 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.**

1 Safety Instructions - continued

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.

- **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, combustions 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 specification described in the product catalogue.
  3) An application which could have negative effects on people, property, or animals requiring special safety analysis outside the scope of the Validation Document.
  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.
- **Always ensure compliance with relevant safety laws and standards.**
  All electrical 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.**
  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.

2 Specifications

2.1 XTO Series

Model	XTO-2571	XTO-1239	XTO-1719
Fluid	Air		
Proof pressure	1.5MPa		
Max. operating pressure	1MPa		
Min. operating pressure	0.2MPa	0.1MPa	0.2MPa
Pilot check valve operating pressure	0.2 to 1MPa	0.1 to 1MPa	0.2 to 1MPa
Ambient and fluid temperature	-5 to 60°C (No freezing)		
Effective area mm^2	6	45	145
Air quality	5μ		
Frequency	2 cycles per second		
Port size	Rc1/4, 3/8	Rc1/4, 3/8,1/2	Rc3/4, Rc1
Impact resistance Note 1	1000 m/s^2		
Vibration resistance Note 2	50 m/s^2 (0.35mm)		

Note 1) No malfunction occurred when tested in the axial direction and rectangular to the valve.
Note 2) No malfunction occurred in a round sweep test between 10 to 150 Hz.
The test was performed in the axial direction and rectangular to the valve axis, 20 times for each condition (see installation details)

When installing the XTO-1239 and XTO-1719 with a bracket, please take measures to reduce vibration frequency so that the frequency does not exceed the value shown in the table below:

Product	Maximum vibration frequency
XTO-1239	80Hz
XTO-1719	40Hz

⚠ Caution

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

3 Installation

3.1 Installation

⚠ Warning

- As a main installation method mount the product directly to the cylinder.

The impact and vibration specification described in table 2.1 is applicable for this mounting method.

- Do not install the product unless the safety instructions have been read and understood.
- When mounting, please firmly align the tool with the hexagon width across flats of the pilot body. If the hexagon width across flats is damaged as a result of failure to properly align the tool, the pilot body will be deformed, and poor pilot operation may result.

3.2 Environment

⚠ Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in dusty locations or where water, oil, etc., splash on the equipment'
- 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 excessive vibration or impact exceeding tested value. Check the product specifications.
- Customer shall validate the XTO performance in the application.
- Do not mount in a location exposed to radiant heat.

3.3 Piping

⚠ Caution

- Before 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 1thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.
- If moisture enters the inside of the connecting piping, the cover may corrode, and it may lead to a pilot operation malfunction.

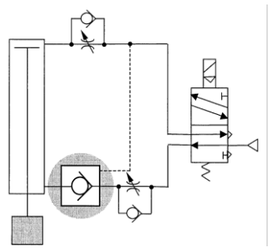
3.4 Lubrication

⚠ 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, use turbine oil Class 1 (no additive), ISO VG32. Once lubricant is used in the system, lubrication must be continued because the original lubricant applied during manufacturing will be washed away.

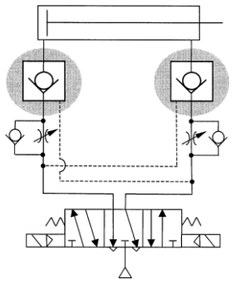
4 Settings

4.1 Cylinder Drop Prevention



4 Settings - continued

4.2 Cylinder Emergency stop



5 How to Order

XTO – 2571 – 02

Body size

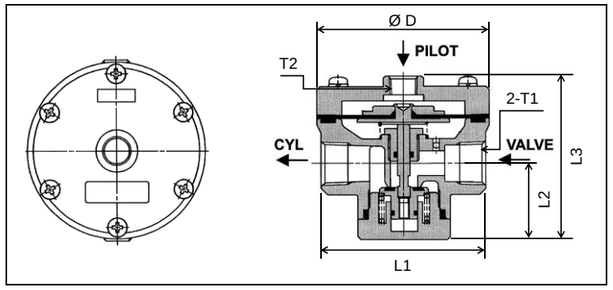
2571	Body O.D.:φ52
1239	Body O.D.:φ84
1719.	Body O.D.:φ98

Port size

Symbol	Cylinder side
02.	Rc1/4
03	Rc3/8
04.	Rc1/2
06	Rc3/4
10	Rc1

Model	Port size				
	Rc1/4	Rc3/8	Rc1/2	Rc3/4	Rc1
XTO-2571	●	●			
XTO-1239	●	●	●		
XTO-1719				●	●

6 Outline Dimensions (mm)



Model	T1	T2	φD	L1	L2	L3
XTO-2571-02	Rc1/4	Rc1/4	52	52	21	57
XTO-2571-03	Rc3/8					
XTO-1239-02	Rc1/4		84	80	37	79
XTO-1239-03	Rc3/8					
XTO-1239-04	Rc1/2					
XTO-1719-06	Rc3/4		98	98	40	90
XTO-1719-10	Rc1					

7 Maintenance

7.1 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.
- Perform periodic inspections to ensure proper operation of the product. Unexpected problems with a machine or equipment can be minimized by verifying the operation of the product on a regular basis.
- Wear safety glasses when conducting periodic inspections.
- Secure the space for maintenance. The maintenance cannot be done when there is no space.

8 Limitations of Use

8.1 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[(1)]. 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 catalogue for the particular products.

  [(1)] 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.

8 Limitations of Use - continued

⚠ Warning

- **If the pilot air pressure drops below the specified minimum operating pressure, the valve will close**
- Do not exceed any of the specifications laid out in section 2 of this document or the specific product catalogue.
- **This product cannot be used for accurate and precise intermediate stops of the actuator.**

  Due to the compressibility of air as a fluid, the actuator will continue to move until it reaches a position of pressure balance, even though the pilot check valve closes with an intermediate stop signal.
- **The product cannot be used to hold a stop position for an extended period of time.**

  Pilot check valve and actuators are not guaranteed for zero air leakage. Therefore, it is sometimes not possible to hold a stop position for extended period of time. In the event that holding for an extended time is necessary, a mechanical means for holding should be devised.
- **Consider the release of residual pressure.**

  Actuators may move suddenly due to residual pressure, which can be dangerous during maintenance procedures.
- System reaction time is to be determined by the machine builder
- After the release of pilot pressure, the pilot check valve closes the air exhaust of the cylinder and stops the operation of the cylinder. This results in air trapped in cylinder

9 Troubleshooting

The system designer should determine the effect of the possible failure states on the system.

Failure	Cause	Countermeasure
Cylinder does not stop in an intermediate position.	Sealing in cylinder has leakage.	Replace cylinder.
	Air leaks from piping.	Stop air leakage.
	Check valve in the pilot contaminated with dusts.	Replace the valve.

10 Contacts

AUSTRIA	SMC Pneumatik GmbH,Girakstrasse 8, AT-2100 Korneuburg
BELGIUM	SMC Pneumatics N.V./S.A. Nijverheidsstraat 20, B-2160 Wommelgem
BULGARIA	SMC Industrial Automation Bulgaria EOOD, Business Park Sofia, Building 8-6th floor, BG-1715 Sofia
CROATIA	SMC IndustrijskaAutomatikad.o.o. ZagrebačkaAvenija 104,10 000 Zagreb
CZECH REP.	SMC Industrial Automation CZ s.r.o. Hudcova 78a, CZ-61200 Brno
DENMARK	SMC Pneumatik A/S,Egeskovvej 1, DK-8700 Horsens
ESTONIA	SMC Pneumatics Estonia Oü,Laki 12, EE-10621 Tallinn
FINLAND	SMC Automation Oy, PL72, Tiistinniityntie 4, SF-02031 Espoo
FRANCE	SMC France, 1, Boulevard de Strasbourg, Parc Gustave Eiffel, Bussy Saint Georges, F-77607 Marne La ValleeCedex 3
GERMANY	SMC Deutschland GmbH, Boschring 13-15, 63329 Egelsbach
GREECE	SMC Italia Hellas Branch, Anagenniseos 7-9-P.C. 14342 N.Philadelphia, Athens
HUNGARY	SMC Hungary IpariAutomatizálásiKft.Torbágy u. 19, HU-2045 Törökbálint
IRELAND	SMC Pneumatics (Ireland) Ltd.2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin
ITALY	SMC Italia S.p.A.Via Garibaldi 62, I-20061Carugate, (Milano)
LATVIA	SMC Pneumatics Latvia SIA, Dzelzavas str. 120g, Riga, LV-1021,
LITHUANIA	UAB "SMC Pneumatics", Oslo g. 1, LT-04123 Vilnius
NETHERLANDS	SMC Pneumatics B.V.De Ruyterkade 120, NL-1011 AB Amsterdam
NORWAY	SMC Pneumatics Norway AS, Vollsveien 13 C, GranfosNæringspark, N-1366 Lysaker
POLAND	SMC Industrial Automation, Polska Sp z o.o. 02-826 Warszawa, ul. Poloneza 89
PORTUGAL	SMC Sucursal Portugal, S.A.Rua De Eng Ferrerira Dias 452 4100-246, Porto
ROMANIA	SMC Romania S.r.l. StrFrunzei 29, Sector 2, Bucharest
RUSSIA	SMC Pneumatik LLC. Business centre, building 3, 15 Kondratjevskij prospect, St.Petersburg, 195197
SLOVAKIA	SMC PriemyselnáAutomatizáciaSpols.r.o. Fantranská 1223, Teplickanadvahom, 01301
SLOVENIA	SMC IndustrijskaAvtomatikad.o.o. Mirnskacesta 7, SLO-8210 Trebnje
SPAIN	SMC España S.A. Zuazobidea 14, 01015 Vitoria
SWEDEN	SMC Pneumatics Sweden AB,Ekhagsvägen 29-31, SE-141 71 Segeltorp
SWITZERLAND	SMC Schweiz AG,Dorfstrasse 7, Postfach, 8484 Weisslingen,
TURKEY	SMC PnömatikSanayiTicaretveServis A.Ş. GülbaharCaddesi, Aydın Plaza, No: 9/4 Güneşli – 34212 , Istanbul
UK	SMC Pneumatics (U.K.) Ltd. Vincent Avenue, Crownhill, Milton Keynes, Buckinghamshire MK8 0AN

SMC Corporation

URL : http// www.smcworld.com (Global) http// www.smceu.com (Europe)
'SMC Corporation, Akihabara UDX15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101 0021
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