

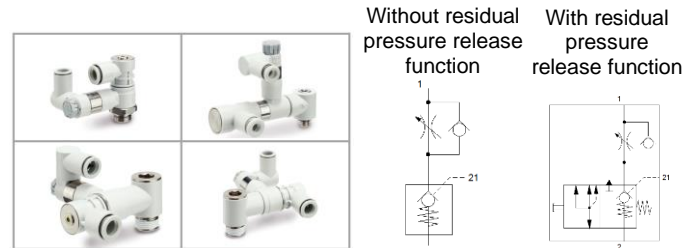


ORIGINAL INSTRUCTIONS

Instruction Manual

Compact Speed Control Valve with Pilot check valve

ASP Series (including ASP-G)



The intended use of this product is for a temporary stop of an actuator. If there is no pilot signal applied, the check valve will close, preventing the flow from 2 to 1, and the actuator will not move. When the pilot signal is applied, the check valve will open, allowing the air to flow from 2 to 1 and the actuator to move. The manual override button opens all flow paths (2 → 1, 21 and exhaust port).

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 and safety requirements for systems and their components.

ISO 4413: Hydraulic fluid power — General rules and safety requirements for systems and their components

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.

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

2 Specifications

2.1 General specifications

Model	ASP
Fluid	Air
Proof pressure [MPa]	1.05
Max. operating pressure [MPa]	0.7
Min. operating pressure [MPa]	0.1
Min. air quality [μm]	5 filtration or smaller
Ambient and fluid temperature [C°]	-5 to +60 (No freezing)
Pilot check valve operating pressure [MPa] ^{Note 1)}	More than 50% of operating pressure (0.1 or more)
Applicable tubing material ^{Note 2)}	Nylon, Soft nylon, Polyurethane
Min. operating frequency	Every 30 days
Max. operating frequency [Hz]	2
Impact resistance [m/s^2] ^{Note 3)}	1000, half sine 6 ms
Vibration resistance [mm] ^{Note 4)}	0.35, 10 to 150 Hz

Table 1.

Note 1) For ASP-*-M5/U10, pilot check valve, pressure must be more than 50% of operating pressure and 0.15 MPa or more.

Note 2) Use caution about the maximum operating pressure when soft nylon and polyurethane is used.

2 Specifications - continued

Note 3) No malfunction of the valve occurred when two axes (horizontal and vertical) and two directions were tested and (pulse shape: sinusoidal), 3 times (test sample mounted with bracket). (IEC 60068-2-27:2009)

Note 4) No malfunction occurred in a sweep cycle test from 10 to 150 Hz at a vibration sweep 0.35mm. The test was performed in two axes (horizontal and vertical) and two directions, 7 min per cycle (20 cycles). (IEC 60068-2-6:2007)

2.2 Design/Selection

Warning

- To exhaust air manually, press the black button on body. If the valve connected to port 1 is not open, the pressure in the cylinder will not be able to exhaust.
- When used in a balance control circuit, there are instances in which the check valve cannot release, even though the pilot pressure is 50% of the operating pressure. In these cases the pilot pressure should be the same as the operating pressure.
- The check valve, by design is closed by the differential pressure generated. If the differential pressure between the inlet (port 1) and outlet (port 2) is less than the minimum operating pressure, the check valve will not close completely, causing a leakage.
- In the following cases, abnormal noise may occur due to poor exhaust or oscillation.
 - When there is residual pressure or back pressure on port 1 (IN) side.
 - When the differential pressure between port 1 and port 2 side is smaller than the minimum working pressure.
 - When the effective cross-sectional area of the IN side piping / on-off valve (ASP) of the product is smaller than the effective cross-sectional area of the product.
 - When the pressure loss on port 1 side during product (ASP) operation is slower than the pressure loss on port 2 side.
 - When the supply pressure of the PIL port is throttled.
 - When port 1 (IN) side piping (tube) is bent or crushed.
- Do not allow the product to constantly rotate when using. Do not allow a moment load to be applied when using the product.
- Please note that the valve may open if the pressure difference between the inlet pressure and the outlet pressure becomes small due to internal leakage.

2.3 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.

3.3 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.
- Tighten fittings to the specified tightening torque.
- Ensure to screw into correct threads: R screws into Rc threads, NPT screws into NPT threads and G screws into G thread.
- Check piping directions before mounting. Connect the inlet to the directional control valve and the outlet to the actuator.

3 Installation - continued

- Do not apply excessive force or impact by a tool to the cover (pilot port), fittings and other parts of the product. Do not apply an external force such as moment, torsion, or tensile, to the fittings of the cover during and after mounting the cover (pilot port).
- Depending on the piping orientation, products will either have a hexagonal hole or flats to screw the product in. To install and remove the product with hexagonal hole, use an appropriate hex key and push it into the hexagon hole of the stud.

Connection thread	Hex key (Nominal)	
	Metric [mm]	Imperial [Inch]
M5, 10-32UNF	2.5	-
R1/8, G1/8	6	-
NPT1/8	-	7/32"
R1/4, G1/4	8	-
NPT1/4	-	5/16"
R3/8, G3/8	10	-
NPT3/8	-	3/8"
R1/2, G1/2	10	-
NPT1/2	-	3/8"

Table 2.

- Using the appropriate hex key, given in the table above, tighten the fitting to the proper tightening torque.

Connection thread	Tightening torque [N·m]
1/8	3 to 5
1/4	8 to 12
3/8	15 to 20
1/2	20 to 25

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 5 μm or smaller.

4 Settings

4.1 Speed controller

- The speed controller's controlled flow values are with the needle fully open (2 to 1) and free flow with the needle fully closed (1 to 2).
- The products in this manual are retainer type so that the needle is not removed completely. Over rotation will cause damage.
- Adjust the speed by opening the needle slowly from the fully closed state. Loose needle valves may cause unexpected sudden actuator lurching. When a needle valve is turned clockwise, it is closed and actuator speed decreases. When a needle valve is turned counterclockwise, it is open and actuator speed increases.
- This product has a stopper for when the knob reaches the fully closed position. Excess torque may break the stopper.

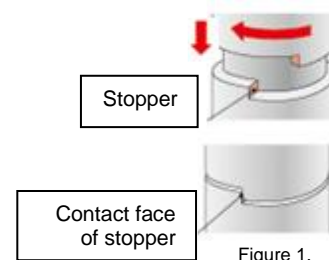


Figure 1.

- Table below shows the maximum allowable torque of the knob.

4 Settings - continued

Body Size	Maximum allowable torque [N·m]
M5	0.05
1/8	0.07
1/4	0.16
3/8	0.2
1/2	0.4

Table 4.

- Do not use tools such as pliers to rotate the knob. It can cause idle rotation or damage the knob.
- After pushing the knob down to lock, confirm that it is locked. It should not be possible to rotate the knob to the right or to the left. If the knob is pulled with force, it may break. Do not pull the knob with excessive force.



Locked

Unlocked

Figure 2.

4.1 Pressure release

- Use a tool to push the manual override button fully. See the table below for the depth and force to push the tool. The higher the residual pressure, the more force is needed to press the override button completely.

Part number	Operating force [N] (reference value)	Operating depth [mm]
ASP-*-M5/U10	5.3 to 8.2	3.5
ASP-*-01	5.1 to 11.9	3.9
ASP-*-02	6.7 to 19.5	3.8
ASP-*-03	10.6 to 34.4	4.7
ASP-*-04	17.1 to 54.4	5.8

Table 5.

- Ensure that the manual override button is back to its original position after pushing the button (at the end face of the product) before use.
- The check valve doesn't work properly unless the button is back to the original position. Replace the product if the button is unable to return to the original position.

5 How to Order

Refer to drawings or catalogue for 'How to Order'.

6 Outline Dimensions

Refer to drawings or catalogue for outline dimensions.

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.

7 Maintenance - Continued

- 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.

8 Limitations of Use

Warning

- The system designer should determine the effect of the possible failure modes of the product on the system.
- The machine builder should determine the reaction time of the system.

8.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

8.2 Effect of energy loss on valve switching

When the air pressure is cut, the valve closes.

8.3 Air supply

- For use with compressed air only. Do not use this product with a fluid other than compressed air (e.g. oxygen, hydrogen, inflammable gas, mixed gas, etc.).
- Use with air class [6:4:4] or higher as defined in ISO8573-1:2010 Compressed air – Part 1: Contaminants and purity classes. ASP may not operate properly, disturbing the operation of the system.

8.4 Intermediate stopping

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.

8.5 Holding of pressure

Pilot check valves and actuators are not guaranteed for zero air leakage; therefore, it is sometimes not possible to hold a stop position for an extended period. If holding for an extended time is necessary, a mechanical means for holding should be devised.

8.6 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.

8.7 Release of pressure

- Actuators may move suddenly due to residual pressure, which can be dangerous during maintenance procedures.
- When operating the residual pressure exhaust button or conducting maintenance or inspection, the actuator may start moving due to the residual pressure. Take appropriate measures in advance to prevent an actuator movement from posing a hazard.

Caution

8.8 Low temperature operation

The valve can be used in an ambient temperature down to -5°C. However, take measures to prevent freezing or solidification of impurities, etc.

9 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.

10 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor/importer.

SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
 SMC Corporation, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, Japan
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 Template DKP50047-F-085N