



Operation Manual

PRODUCT NAME

Exhaust Flow Control Valve with Silencer
Push-lock Type / Compact Indicator Type

MODEL / Series / Product Number

ASN2 Series

SMC Corporation

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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
 etc.



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

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. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, combustion equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.



Safety Instructions

Caution

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.

Use in non-manufacturing industries is not allowed.

Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country.

The new Measurement Act prohibits use of any unit other than SI units in Japan.

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.

2. Precautions

Design/Selection

Warning

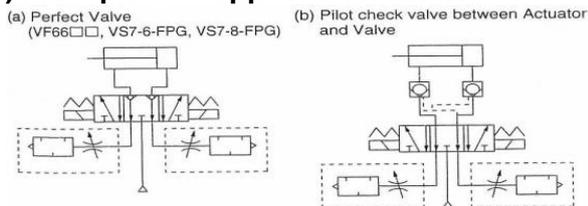
(1) Check the specifications.

Products represented in this manual are designed only for use in compressed air systems. If the product is used in an environment where the pressure or temperature is out of the specified range, damage and/or malfunction may result. (Refer to the specifications.) The product cannot be guaranteed if is used outside of the specification range.

(2) The product cannot be used as a stop valve to achieve zero leakage.

A certain amount of leakage is allowed in the products specifications. Tightening the handle needle to achieve zero leakage may result in equipment damage.

(3) Example of inapplicable circuits



Residual pressure behind the exhaust needle may cause check valve malfunction in the Perfect Valve.

Residual pressure behind the exhaust needle may cause pilot check valve malfunction.

Design/Selection

Caution

(1) The flow rate characteristics for each product are representative values.

The flow rate characteristics are characteristics of each individual product. Actual values may differ depending on the piping, circuitry, pressure conditions, etc.

(2) Sonic conductance and critical pressure ratio values for products are representative values.

Mounting

Caution

(1) Tighten threads with the proper tightening torque.

(2) Do not use tools, such as pliers, to rotate the knob.

This can cause the idle rotation of the knob or damage.

Mounting

Caution

(3) To adjust the speed, start with the knob in the fully-closed position, and then make adjustment by gradually turning it counterclockwise.

Depending on the opening adjustment condition of the knob (needle), the actuator may jump out. Adjustment of the knob (needle) in the clockwise direction decreases the flow rate (closes), and its adjustment in the counterclockwise direction increases the flow rate (opens).

The actuator speed decreases when an adjustment in the clockwise direction is made and increases when an adjustment in the counterclockwise direction is made.

(4) Do not apply excessive force or shock to the body of fittings with an impact tool.

It can cause damage or air leakage.

(5) Mounting and removal is conducted by holding with an appropriate wrench the width across flats of the body B and turning it.

Holding the parts other than the specified part to screw the product may cause damage to the product. For M5 size, grasp the position shown in the figure by hand and tighten.

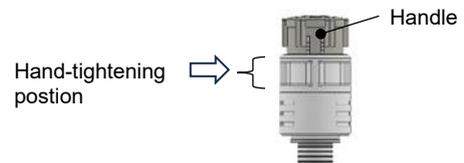


Fig Tightening position (M5, 10-32UNF)

(6) This product has a stopper for fully close in rotating direction. Excess torque may break the product. The table below shows the maximum allowable torque of the handle.

Body size	Maximum allowable torque [N·m]
M5	0.04
1/8	0.07
1/4	0.16
3/8	0.20
1/2	0.40

Mounting

Caution

(7) If installing flow controls to valve ports, interference may occur with the fittings. Please consult the catalog before installing.

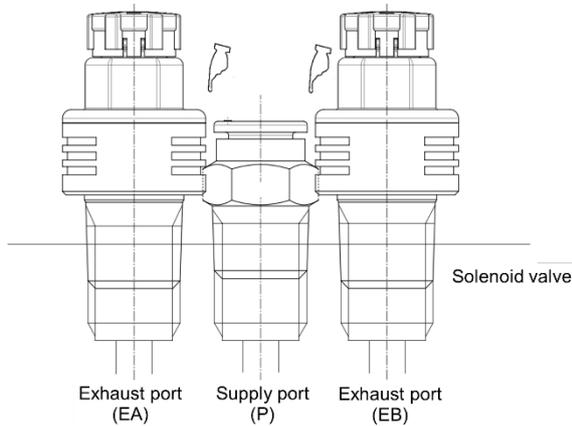


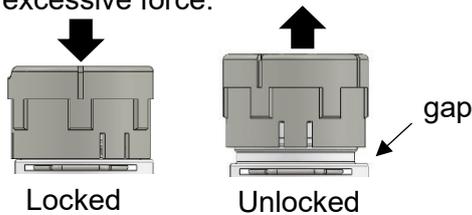
Fig. Example of the interference with fittings

(8) Keep the operation manual and check its contents.

Always keep the operation manual ready for use and install and use the product only after understanding its contents.

(9) 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.



(10) Connection thread Mount the

(10) -1 For M5, 10-32UNF

Tightening Method

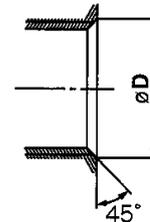
When installing the connection screw, screw it in securely by hand until it butts up against the end face, then hand-tighten it firmly. However, the tightening should be less than 30° (approximate tightening torque 0.1 N·m).
 (Note) Excessive tightening may damage the thread portion or deform the gasket and cause air leakage. If the screw is too shallowly screwed in, it may come loosen or air may leak.

Mounting

Caution

Chamfered area for female thread

In compliance with ISO 16030 (air pressure fluid dynamics—connection—ports and stud ends), the chamfered dimensions shown in the table below are recommended.



Connection thread size	Chamfered dimension φD (Recommended value)
M5	5.1 ~ 5.4
10-32UNF	5.0 ~ 5.3

(10)-2 For R, NPT

Tightening Method

Wrap sealing tape around the resin screw taper threads. It is recommended to tighten the seal tape using the number of turns and the number of tightening revolutions shown in the table below. The tightening torque should be less than the maximum allowable tightening torque shown in the table below. Be careful not to apply excessive torque, as this will result in damage. Please refer to the dimension table of each product for tooling.

Body size	Number of seal tape rolls [times]	Number of tightening revolutions* [times]	Maximum allowable tightening torque [N·m]
1/8	1.5	2.0 ~ 2.5	1.1
1/4	1.5	2.5 ~ 3.0	1.7
3/8	1.5	3.5 ~ 4.0	3.0
1/2	2.5	3.5 ~ 4.0	6.2

* Number of tightening revolutions:

Number of revolutions since the screw started to be applied.

When not wrapping the sealing tape, tighten the tape strongly by hand, and then tighten it an additional 0.5 turns.

Mounting

⚠ Caution

Winding of sealant tape

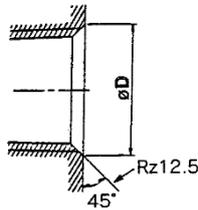
Leave the beginning of the screw cut and wrap the sealing tape around it. If the tape is wound in such a way that it covers the beginning of the screw, or if the tape is wound too many, the screw may tilt when screwed in, resulting in damage to the threads.



Beginning of thread cutting

Chamfered area for female thread

By chamfering as shown in the table below, machining of threads is easier and effective for burr prevention.



Connection thread size	Chamfered dimension øD (Recommended value)	
	Rc	NPT, NPTF
1/8	10.2 ~ 10.4	10.5 ~ 10.7
1/4	13.6 ~ 13.8	14.1 ~ 14.3
3/8	17.1 ~ 17.3	17.4 ~ 17.6
1/2	21.4 ~ 21.6	21.7 ~ 21.9

(11) Actuator speed check

Large variations in actuator speed can occur as a result of individual product differences due to tolerance of the components, individual actuator differences, operating conditions, temperature, etc. The final actuator speed should be checked each time the setting has been changed.

Mounting

⚠ Caution

(12) Lifting force for the knob

The lifting force for the knob is specified as shown in the table below. Lifting a knob with a lifting force larger than that specified in the table below will cause the knob to come off, make the actuator setting speed or scale incorrect, or cause damage to the product.

Connection thread size	Lifting force [N]
M5	1 ~ 1.5
1/8, 1/4, 3/8, 1/2	3 ~ 4

Adjustment of indicator

⚠ Caution

(1) Turn the knob slowly in the open or closed direction during operation.

(Guide for rotation speed: 1 [rev/sec] or below)

Connection thread size	Guid for rotation speed [rev/sec]
M5	1 or below
1/8	1 or below
1/4	0.9 or below
3/8	0.7 or below
1/2	0.7 or below

Scale malfunction may occur if quick adjustment is made between two graduations (for example, 0→1→0).

(2) Do not force the knob to turn outside the specified range indicated to the scale.

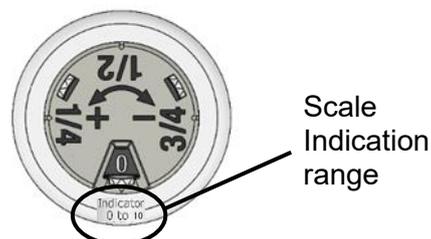
The scale may indicate a wrong value, possibly leading to a wrong setting.

[Example of wrong use]:

While the scale indication range is 0 to 8, turning the scale in the open direction from graduation 8 caused the scale to indicate 0.

Connection thread size	Scale indication range
M5	0 ~ 8
1/8	0 ~ 10
1/4	0 ~ 10
3/8	0 ~ 10
1/2	0 ~ 10

The scale indication range is also printed on the product.



Piping

Caution

(1) Prior to piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

(2) If the fitting is tightened with excessive torque, a large amount of sealant will seep out. Remove the excess sealant.

(3) Insufficient tightening may loosen the threads, or cause air leakage.

(4) Use R external threads with Rc internal threads and NPT external threads with NPT internal threads.

(5) This product taper threads are made of resin, minute leakage may gradually occur due to stress relaxation. Perform periodic inspections, and if leakage is detected correct the problem by further tightening. If additional tightening becomes ineffective, replace the fitting with a new product.

(6) Reuse (re-piping)

This product threads are made of resin, The threads may be deformed and leakage may occur when installing or removing the product from the piping. If the threads are deformed and leakage occurs, replace the product with a new one.

Air Supply

Warning

(1) Type of fluids

Use compressed air as the fluid used.

(2) When there is a large amount of drainage

Compressed air containing a large amount of drainage can cause the malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.

(3) Drain flushing

If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. This causes the malfunction of pneumatic equipment. If the drain bowl is difficult to check and remove, the installation of a drain bowl with an auto drain option is recommended. For compressed air quality, refer to SMC catalog "Compressed Air Purification System".

(4) Use clean air

Do not use compressed air that contains chemicals, synthetic oils that include organic solvents, salt, corrosive gases, etc., as it can cause damage or malfunction.

Air Supply

Caution

(1) Install an air filter.

Install an air filter at the upstream side of valve. Select a filtration rating of 5 µm or below, or that equivalent to or lower than ISO 8573-1:2010 [6:4:4]

* This rating is equivalent to the rating produced when an air filter is installed for the purity class [7:4:4] of the inlet side compressed air.

(2) Ensure that the fluid and ambient temperatures are within the specified range.

If the fluid temperature is 5 °C or less, the moisture in the circuit could freeze, causing damage to the seals or leading to equipment malfunction. Therefore, take appropriate measures to prevent freezing. For compressed air quality, refer to SMC catalog "Compressed Air Purification System".

Operating environment

Warning

(1) Do not use in an atmosphere containing corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.

(2) Do not expose the product to direct sunlight for an extended period of time.

(3) Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

Warning

(1) Do not disassemble the product or make any modifications.

Do not disassemble the product or make any modifications, including additional machining. Doing so may cause human injury and / or an accident.

(2) Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

(3) Perform maintenance and inspection according to the procedures indicated in the operation manual.

If handled improperly, malfunction or damage of machinery and equipment may occur.

Maintenance

Warning

(4) Maintenance work

If handled improperly, compressed air can be dangerous. Assembly, handling, repair, and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

(5) Drain flushing

Remove drainage from air filters regularly.

(6) Removal of equipment, and supply/exhaust of compressed air.

Before components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, Cut the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function. When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent sudden movement.

3. Application

This product is intended to be attached to the exhaust port of a directional control valve to control the speed of a pneumatic actuator.

4. Specifications

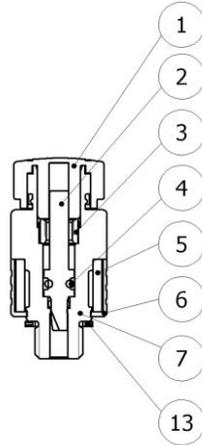
Fluid	Air
Pressure range	0 ~ 1 MPa
Proof pressure	1.5 MPa
Ambient and fluid temperature	-5 ~ 60°C (No freezing)

5. Troubleshooting

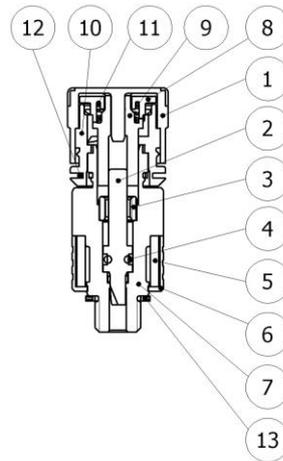
Trouble	Possible causes	Countermeasure
Speed(flow) cannot be adjusted.	Dust inside.	Fully open the needle (or knob) and apply air blow from the free flow side. If the problem is not solved even after air blow, install an air filter to the piping, and replace the product with a new one.

6. Construction

Seal method/Gasket seal
For M5, 10-32UNF

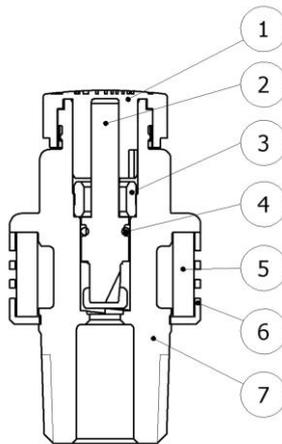


Push-lock Type

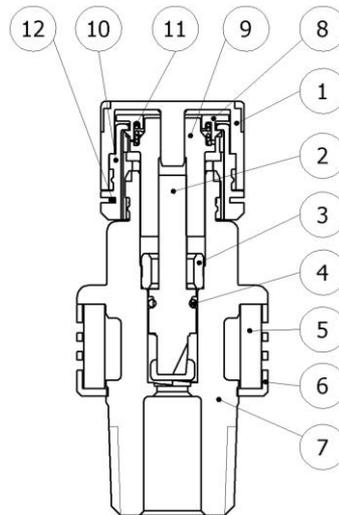


Compact Indicator Type

For R, NPT



Push-lock Type



Compact Indicator Type

No	Description	Material	Note
1	Handle	POM	
2	Needle	PBT	
3	Needle guide	Brass	Electroless nickel plating
4	O ring	NBR	
5	Sponge	PVA Sponge	
6	Cover	PE	
7	Body B	PBT	
8	Indicator guide	POM	
9	Shaft	POM	
10	Spacer	PBT	
11	Spring	Stainless	
12	Clip	Stainless	
13	Gasket	NBR/Stainless	

Revision history

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
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