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Operation Manual

PRODUCT NAME

Pulse Blow Valve

MODEL / Series / Product Number

AXTS040□-2-X202

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

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, fuel 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

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
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.

1. Specifications

Table 1 Specifications

Model		AXTS040□-2-X202
Type of actuation		Internal pilot
Valve construction		Metal seal
Fluid		Air
Operating pressure range		0.2 to 1.0MPa
Frequency adjustment range		1 to 12Hz
Proof pressure		1.5MPa
Ambient and fluid temperature		-5 to 50℃ (No freezing)
Lubrication		No
Weight		About 1,400g
Flow characteristics (IN port ⇒ OUT port)	C[dm^3/(s・bar)	14
	b	0.18
	Cv	3.4

* The AXTS series is air operated. Ensure the air supply pressure does not fall below the lower limit of the operating pressure range (0.2 MPa) at the time of operation.

2. Outline Dimensions

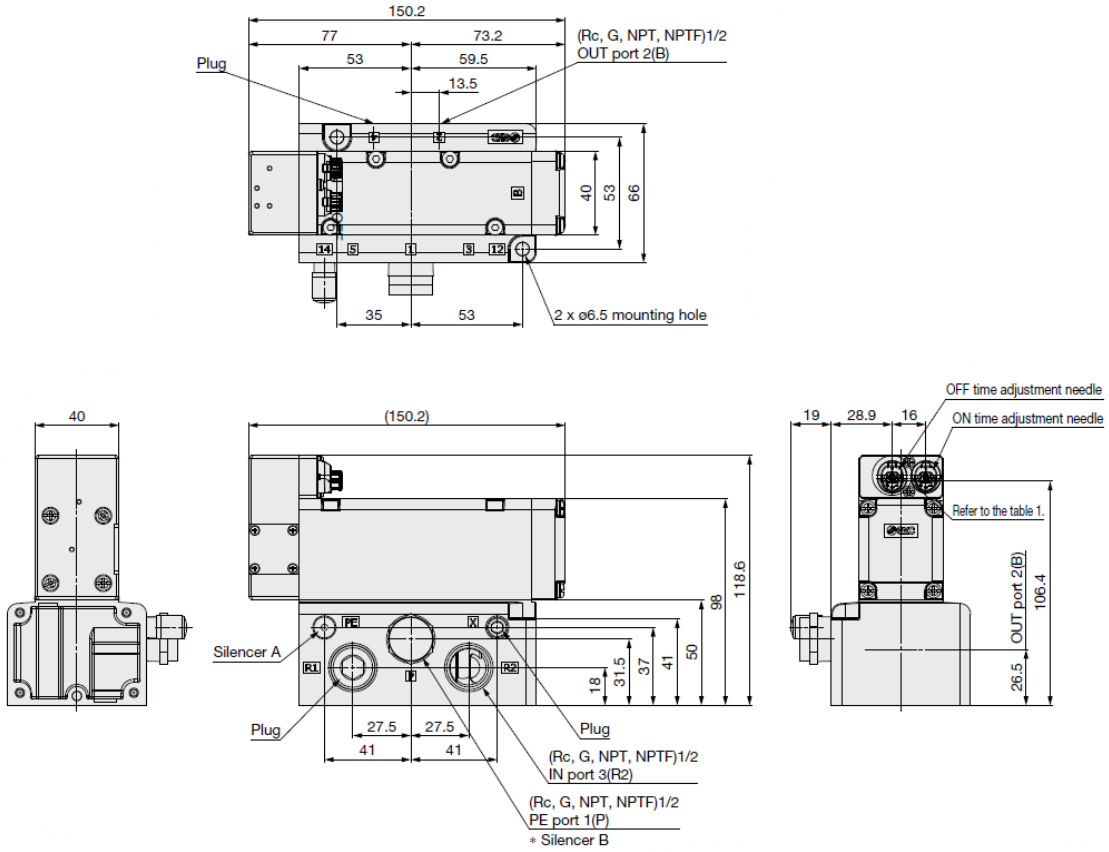


Fig.1 Outline Dimensions

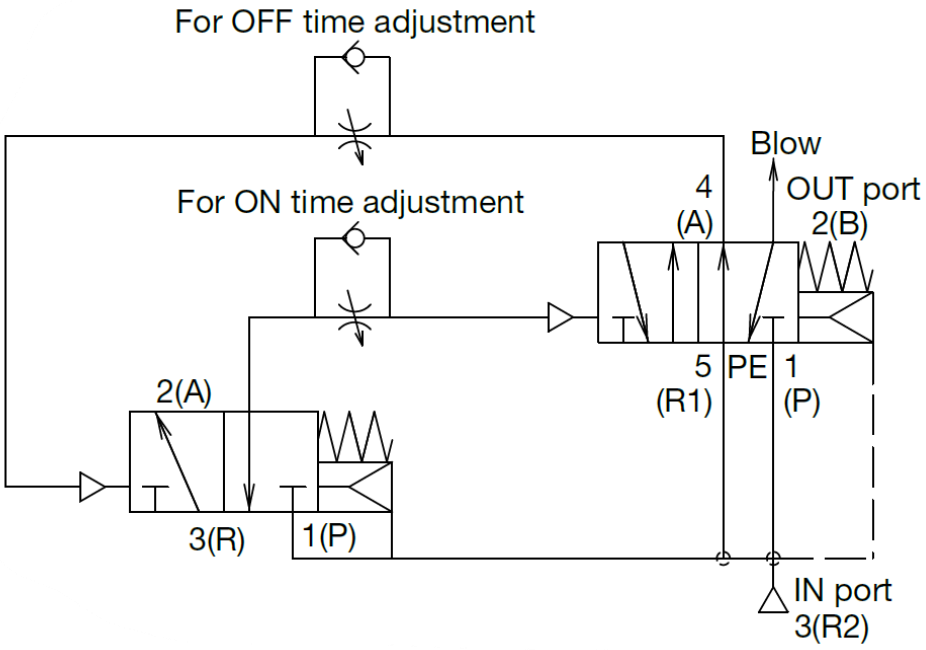


Fig.2 Pneumatic Symbols

3. Installation

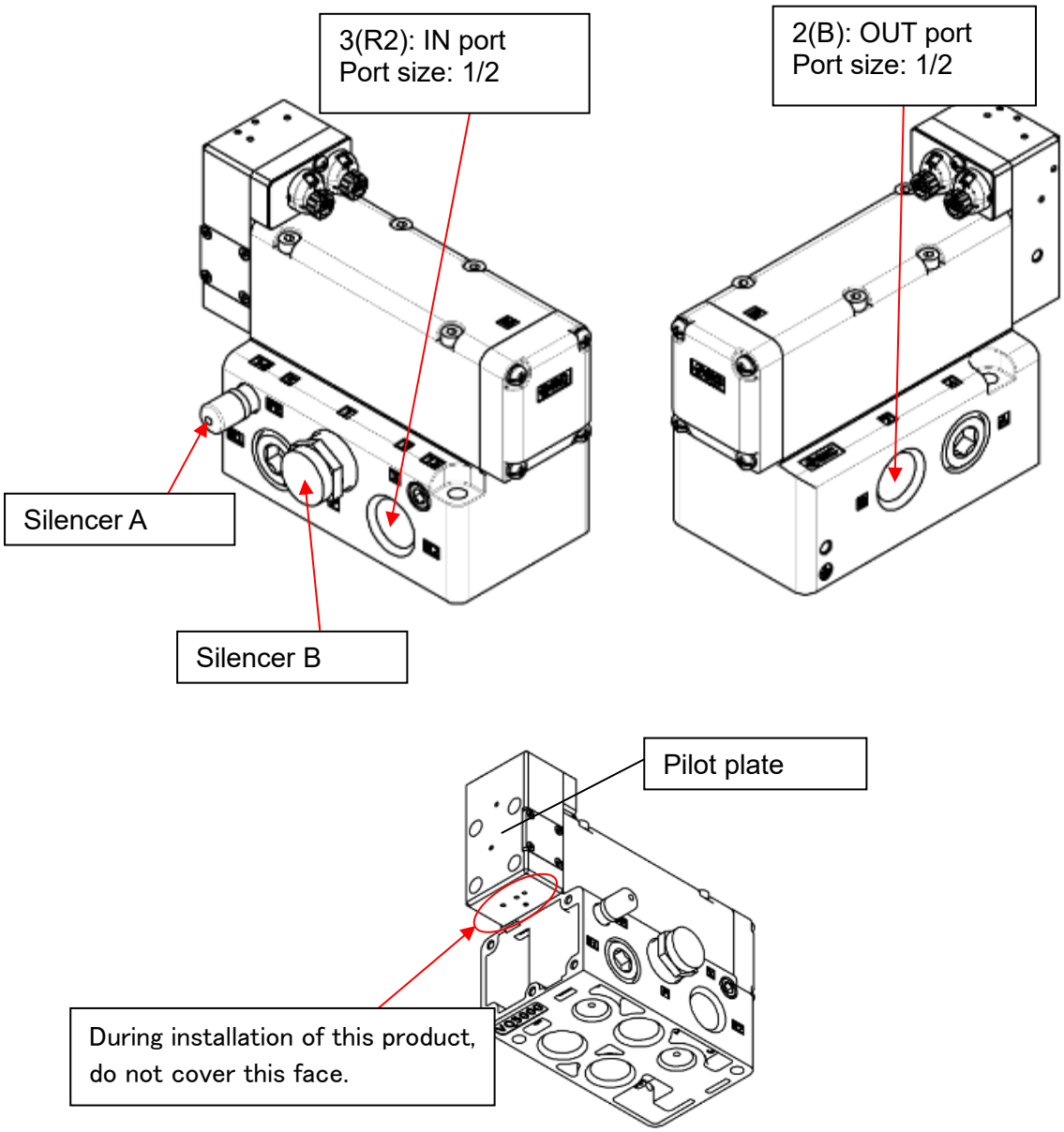


Fig. 3 Appearance and piping ports of pulse blow valve

When air is supplied to the IN port, pulse air is generated from the OUT port.

There are breathing holes and pilot exhausts at the bottom of the pilot plate. Therefore, ensure that the pilot plate face is not covered. To reduce the operation noise and prevent entry of foreign matter, use this product with the silencers A and B installed.

4. Setting

Continuous air blow can be changed to pulse blow without electrical wiring by installing this product between the continuous air blow valve and nozzle of existing equipment. By means of adjustment needle, it is possible to individually adjust the pulse blow ON and OFF times (frequency). Use Table 2 and Fig. 5 as a guide to adjust the value on the scale.

Fig. 2 Correlation between adjustment needle and operating frequency

Indicator	Small (− direction, clockwise)	⟷	Large (+ direction, counterclockwise)
Frequency	Low	⟷	High
ON time	Long	⟷	Short
OFF time	Long	⟷	Short

Refer to the scale as a guideline for setting. Note that the indication on the scale does not exactly indicate the frequency or length of ON and OFF time. The frequency and ON and OFF times vary depending on the piping conditions, supply pressure, and individual differences. Use the characteristics shown in Fig. 5 as reference values.

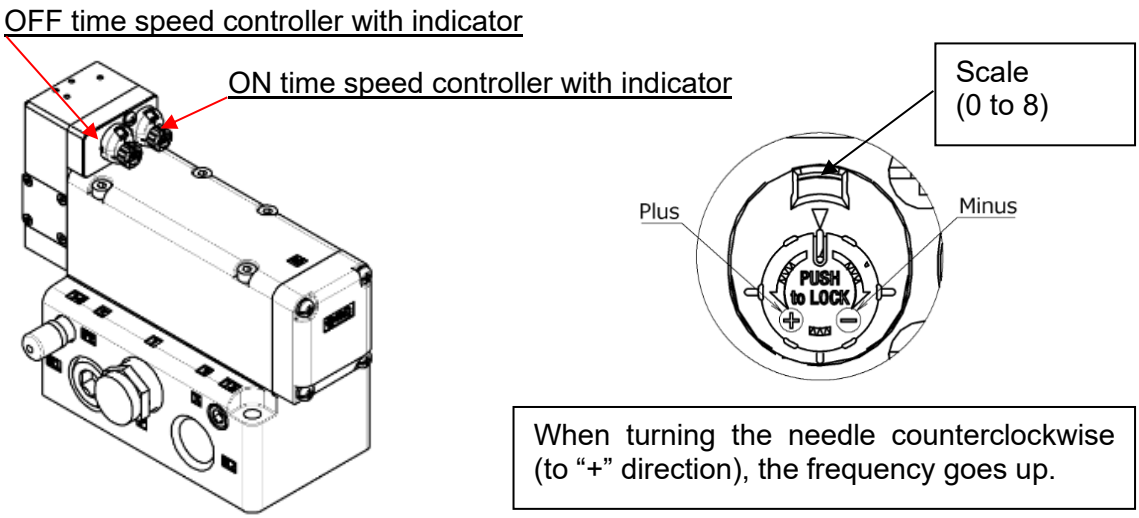


Fig.4 Positions of ON and OFF adjustment needles

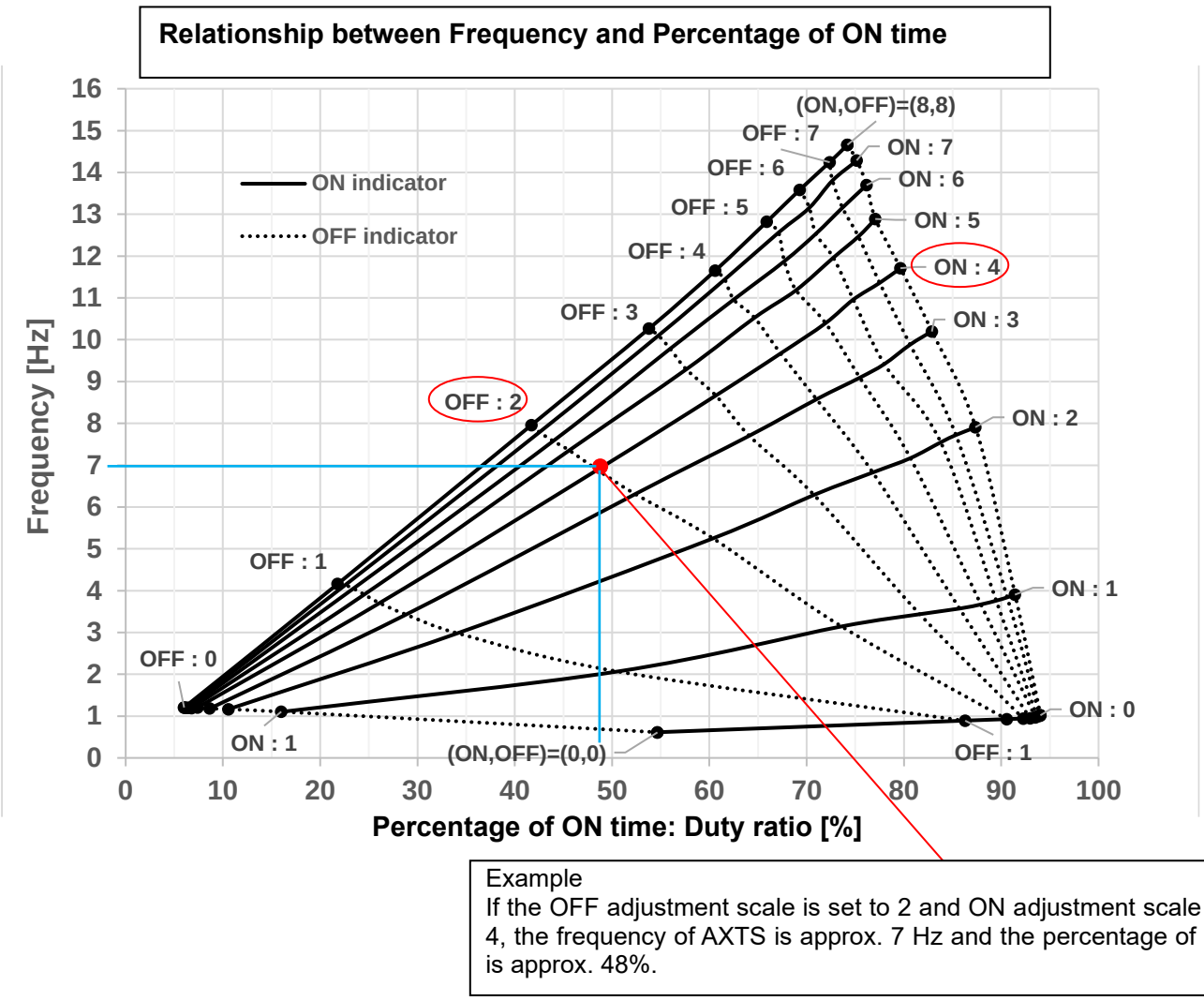


Fig.5 Relationship between adjustment needle, frequency, and ON time percentage

* Note that the characteristics shown in Fig. 5 are guidelines, not guaranteed values.

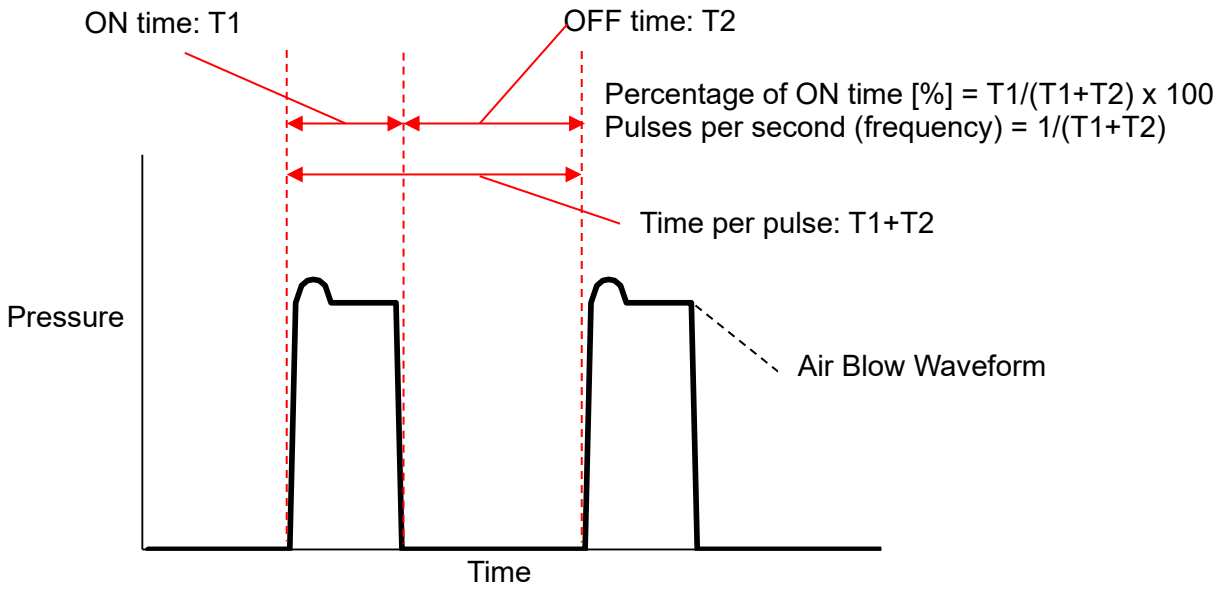


Fig.6 Diagram of waveforms at time of pulse blow

5. Precautions of pulse blow valve

This pulse blow valve has a large effective area and is capable of achieving high flow rates. To effectively use the pulse blow valve, it is recommended that a nozzle with a diameter of φ4 or more is installed downstream or ensure an effective area equivalent to or larger than a φ4 nozzle by using multiple nozzles.

To reduce the air consumption, it is effective to set the scale so that the percentage of ON time shown in Fig. 5 is low. (Set the OFF scale to a low value and the ON scale to a high value.)

Note that as leakage in extremely small amount can occur even when the adjustment needle is fully closed, the adjustment needle cannot be used for the purpose of stopping operation. The scale adjustment range of this product is 0 to 8. Note that damage may occur when the adjustment needle is rotated beyond this range.

Depending on the piping conditions of the valve piping on the downstream side, it may not be possible to conduct pulse blow. In this case, take measures such as reducing the secondary side volume and increasing the nozzle size.

(Approximate for piping length on secondary side: 3 m)

This product is air-operated and it starts intermittent operation once air is supplied to the upstream side. Even if the downstream side is blocked with a plug or valve, this product continues the intermittent operation as long as air is supplied to the upstream side. Therefore, air is discharged from the exhaust port (PE port).

For this reason, install a valve or similar for shutting off air supply on the upstream side of this product.

If clogging of the nozzle or filter occurs during use, the air blowing pressure drops, which reduces effective pulse blow. Perform maintenance regularly.

6. Limitations of Use

Environment

Do not use the product in locations such as those described below, as this may result in malfunction or breakage.

1) Locations with atmospheres in which water vapor is present or locations in which corrosive fluids (chemicals), sea water, or water may come into contact with the product.
2) Locations with explosive atmospheres.
3) Locations exposed to direct sunlight.

4) Locations subject to vibration or impact.

5) Locations where radiated heat will be received from nearby heat sources.

Air Supply

1) Install a filter to use clean fluid. (Recommended filtration rating: 5 μm or less.)
   If you use fluid mixed with foreign matter, issues such as operation failure may occur due to adhesion of the foreign matter on the sliding part.
2) Do not use compressed air that contains chemicals, synthetic oils that include organic solvents, salt, corrosive gases, etc., as it can cause malfunction or damage.
3) Compressed air that contains excessive drainage may cause the malfunction of valves and other pneumatic equipment. Install an aftercooler or an air dryer on the inlet side of the valve as a countermeasure against drainage.
4) If excessive carbon powder is generated by the compressor, it may adhere to the inside of the valves and cause malfunction. Install a mist separator on the inlet side of the valve as a countermeasure to remove any carbon powder.
5) For compressed air quality, refer to the Web Catalog.

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.

When connecting piping to the valve, tighten with the proper tightening torque shown below.

Fig.3 Tightening Torque for Piping

Port size (R,NPT)	Proper tightening torque [N·m]
1/2	28 to 30

For piping ports, refer to Fig. 3. If the silencer is being replaced due to any damage, etc., refer to the table below.

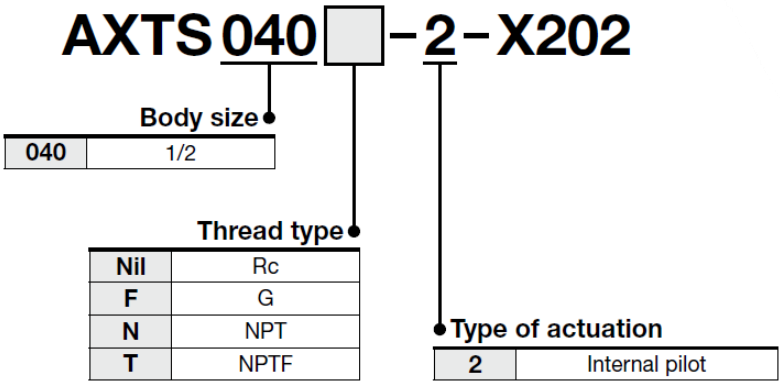
Table 4 Silencer part no.

Product part no.	Thread type	Silencer part no.	
		Silencer A	Silencer B
AXTS040-2-X202	Rc	AN10-01	EBKX-L7007-120
AXTS040F-2-X202	G		EBKX-L7007F-120
AXTS040N-2-X202	NPT	AN10-N01	EBKX-L7007N-120
AXTS040T-2-X202	NPTF		

Lubrication

1) The sliding parts of this product are lubricated. Be aware that due to the construction, some lubricant may flow out to the outlet side with the blow air.
2) These valves can be used without lubrication.
3) If a lubricant is used in the system, use class 1 turbine oil (no additives) ISO VG32 or class 2 turbine oil (with additives) ISO VG32. For details about lubricant manufacturers' brands, refer to the SMC website.

7. How to Order



8. Maintenance

1) When removing the product, shut off the fluid supply source and relieve the fluid pressure in the system.
2) Replace or clean filters periodically. Replace filters after one year of use, or earlier if the pressure drop reaches 0.1 MPa.
3) Exhaust the drainage from air filters periodically. 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.
4) Regularly perform maintenance and inspections. Regularly conduct appropriate inspections to confirm the product is correctly installed. If the product does not operate properly, do not use it.

9. Troubleshooting

1) Operation frequency is slow, or air blow pressure has reduced.

Check whether use of this pulse blow valve or other pneumatic equipment has caused the pressure to drop in the air pressure line. Also confirm that the pressure at the time of opening of the valve is equal to or greater than the lower limit of the operating pressure range of the product (0.2 MPa).

2) The pulse blow valve is always ON (constant air blow).

Check whether the ON adjustment needle has been fully turned to 0 .

Set the scale of the ON adjustment needle to 1 or higher and check whether pulse air is generated.

By taking measures of decreasing of the downstream side volume and increase of the nozzle size, check whether the condition improves.

3) The pulse blow valve is always OFF (no air blow).

Check whether the OFF adjustment needle has been fully turned to 0.

Set the scale of the OFF adjustment needle to 1 or higher and check whether pulse air is generated.

Revision history

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