



Operation Manual

PRODUCT NAME

Booster Regulator

MODEL / Series / Product Number

VBA10A-02-X3239

VBA11A-02-X3239

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 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: Manipulating industrial robots -Safety.

etc.



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

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. 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, combustion 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 specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

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.



Safety Instructions

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.

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 regulation 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

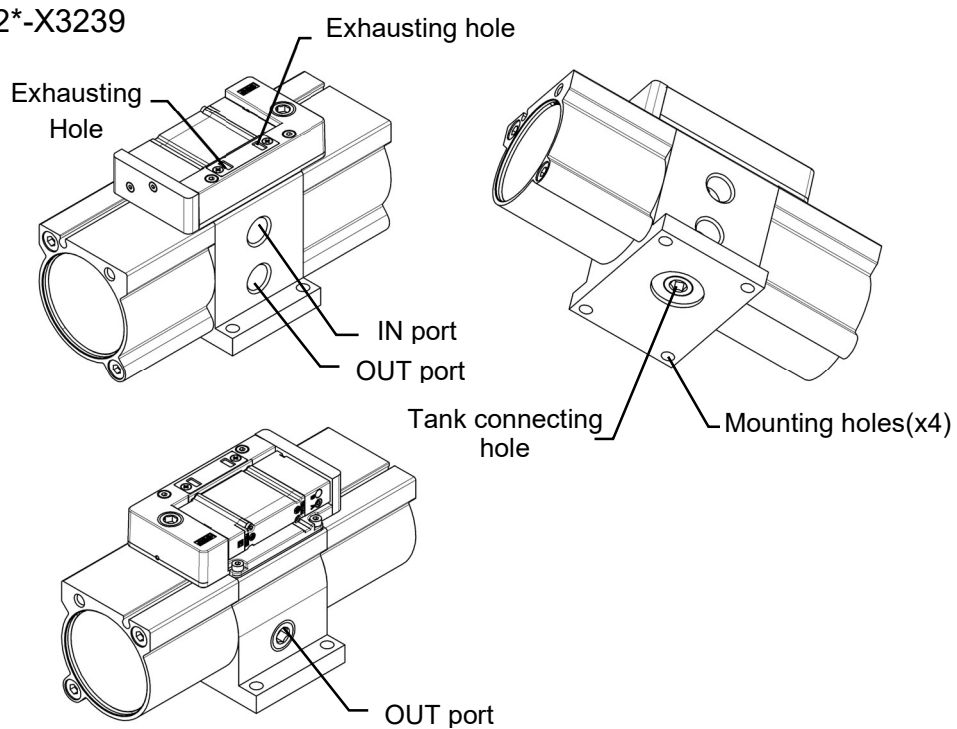
SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

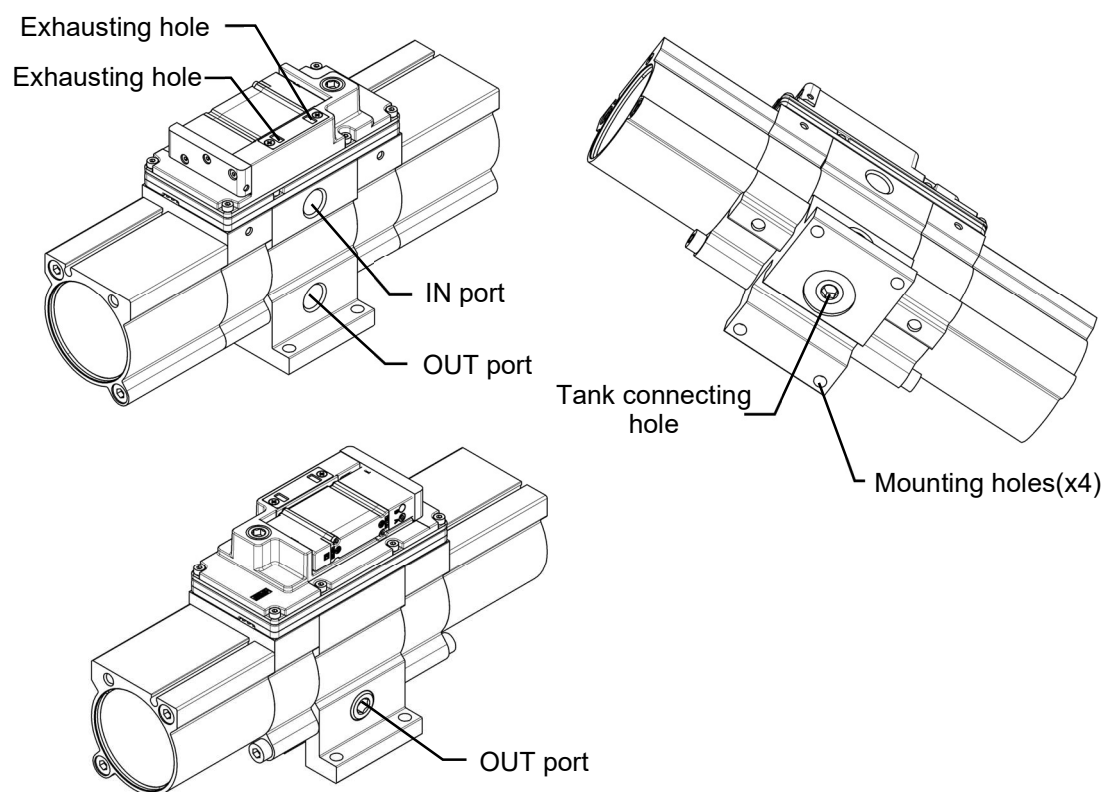
Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

1.Description of the components

VBA10A-02*-X3239



VBA11A-02*-X3239



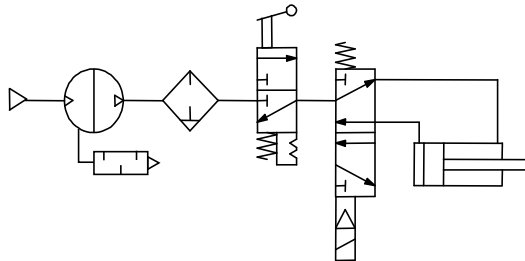
Warning

1. Warning concerning abnormal outlet pressure

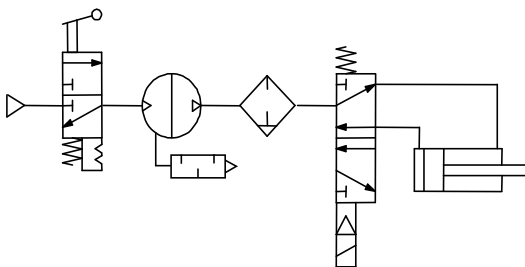
- If there is a likelihood of causing an outlet pressure drop due to unforeseen circumstances such as equipment malfunction, thus leading to a major problem, take safety measures on the system side.
- Because the outlet pressure could exceed its set range if there is a large fluctuation in the inlet pressure, leading to unexpected accidents, take safety measures against abnormal pressures.
- Operate the equipment within its maximum operating pressure and set pressure range.

2. Residual pressure measures

- To quickly exhaust residual pressure downstream of the booster regulator for maintenance, mount a 3-port valve to the outlet of the booster regulator (Refer to the figure below). Even though the 3-port valve is connected to the IN side for exhausting the residual pressure, the check valve in the booster regulator will operate, which interferes with exhausting the residual pressure on the outlet side.



- After exhausting the residual pressure on the outlet side, ensure that the supply pressure is also exhausted. Exhausting the supply pressure will stop the operation, which prevents unnecessary air consumption from occurring.





Caution

1. System configuration

- Ensure sufficient air charge capability of the minimum operating pressure (0.2 MPa) or more. The switching valve may not operate when the internal operating pressure is equal to the minimum operating pressure or less.
- The sliding parts in the booster regulator generate dust particles. Mount air purification equipment such as an air filter or a mist separator to the outlet side as necessary.
- Mount a lubricator to the outlet side. Accumulated oil in the booster regulator may cause operation failure.
- Pay attention to the maximum operating pressure range and operate within these specifications of peripheral equipment.

2. Maintenance space allowance

- When installing the product, allow access for maintenance.

3. Counting of operation cycles

- When counting the operating cycles using an auto switch, use an instrument with a counting speed of 1 kHz or more.

5.Selection



Caution

1. Check the specifications

- Consider the operating conditions and operate this product within the specification range that is described in this catalog.

2. Selection

- Based on the conditions (such as pressure, flow rate, and cycle time) required for the outlet side of the booster regulator, check the selection procedures described in this catalog or model selection software for size selection of the booster regulator. Model selection can be done using the selection software on the SMC website. Go to Documents/Downloads → Model Selection Software → Booster Regulators
- Since the booster regulator is a compressor powered by the air, it consumes the air. The air consumption is approximately 0.9 times (VBA10A) or 3 times (VBA11A) larger than the outlet side volume. Therefore, the booster regulator requires a supply capacity of the inlet side volume that is approximately 1.9 times (VBA10A) or 4 times (VBA11A) larger than the

outlet side volume.

- When operating the booster regulator continuously for longer periods of time, particularly confirm its service life.
- The life expectancy of the booster regulator does not depend on the operating period but on the cycles of operation (piston sliding distance). The cycles of operation (piston sliding distance) are decided by the flow rate on the outlet side of the booster regulator, so if the flow rate on the outlet side of the booster regulator is large, the product reaches the life time in a short period of time.
- When two booster regulators are used, mount a pressure container such as an air tank between the booster regulators so that a stable pressure can be supplied to the product on the downstream side.

6.Mounting



Caution

1. Mounting

- Since the booster regulator vibrates due to the reciprocation of the internal piston, mount 4 bolts onto the mounting holes and tighten them completely.

Model	Bolt size	Tightening torque
VBA10A-X3239	M5	3N·m
VBA11A-X3239		

- If vibration of the booster regulator may cause problems, take countermeasures in your application to prevent vibration.
- Ensure there is enough space for maintenance.
- When connecting the booster regulator with the VBAT tank, be sure to read the operation manual and use the accessories provided with the tank.
- Tightening torque for mounting of pressure gauge is 7 to 9 N·m.

7.Piping



Caution

1. Flushing

- Use an air blower to flush the piping to thoroughly remove any cutting chips, cutting oil, or debris from the piping inside, before connecting them. If they enter the inside of the

booster regulator, they could cause the booster regulator to malfunction or its durability could be affected.

2. Piping size

- To bring the booster regulator's ability into full play, make sure to match the piping size to the port size. If the piping is too thin, the function will be reduced due to the pressure loss.

3. Piping

- Connect IN port with the air source, and OUT port with an actuator.
- Piping on each port should be tightened to the tightening torque specified below.

Model	VBA10A	VBA11A
Port size	1/4	
Tightening torque	12~14N·m	

4. Particle generation

- Lubrication (grease) from inside the booster regulator is contained in the exhaust air.

8.Air Supply



Caution

1. Quality of air source

- Install an air filter on the upstream side of the booster regulator. A filtration degree of 5 micron millimeter or less should be selected.
- If dry air (atmospheric pressure dew point:-23°C or less) is used, the life expectancy may be shortened because dry air will accelerate evaporation of grease inside.

2. Pressure fluctuation.

- Supply stable pressure to the inlet side.

9.Operating Environment



Caution

1. Installation location

- Do not install this product in an area that is exposed to rainwater or direct sunlight.
- Do not install in locations influenced by vibrations.

10.Handling

1. Draining

- If this product is used with a large amount of drainage accumulated in the filter, mist separator or tank, the drainage could flow out, leading to equipment malfunction. Therefore, drain the system once a day. If it is equipped with an auto drain, check its operation once a day.

2. Maintenance

- Life expectancy varies depending on the quality of air and the operating conditions. Signs that the unit is reaching the end of its service life include following.
 - ①Exhausting noise is heard every 10 to 20 seconds even when there is no air consumption on the outlet side.
(When the interval of air exhaust noise is less than 30 seconds, the seals are being worn out or damaged)
 - ②The silencer mounted on the exhaust turns back due to dirt.
(Seals are getting worn out, so particles get stuck in the silencer.)
- When maintenance is required, please contact SMC.

11.Troubleshooting

Trouble	Possible cause	Time of occurrence	Countermeasures
Pressure doesn't increase.	IN and OUT piping connected the wrong way round.	Beginning	•Reconnect the piping properly.
	Insufficient supply of inlet pressure and flow rate. Outlet flow rate (amount used) is too much.	Beginning Middle	•Decrease the operating pressure and flow rate. •Increase the number of the booster regulator (for parallel and series).
Doesn't operate.	The pressure was lower than the minimum operating pressure.	Beginning Middle	•If the inlet pressure fluctuation is large, stabilize it with a regulator.

Operation doesn't stop.	Air is leaking from the equipment or piping on the downstream side of the outlet.	Beginning	• Check where the air is leaking from and fix it.
	Sealing is worn out or broken due to intrusion of foreign matter or lubrication running out.	Middle Later	Change the seals.

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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