



# Operation Manual

Product name

**Impact Blow Valve**

Model / Series / Product No.

**IBV1 Series**

**SMC Corporation**

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## 2. Specifications

Solenoid type

Valve specifications	Fluid	Air
	Operating pressure range	0.15 to 0.7 MPa
	Ambient temperature	+5~50°C
	Operating fluid temperature	
	Vibration/ Impact resistance	150/30 m/s <sup>2</sup>
Coil specifications	Rated voltage	24 VDC
	Power consumption	0.35W
	Allowable voltage fluctuation	+/-10% of the rated voltage
	Allowable leakage voltage	3% of the rated voltage or less

Ⓒ

## 3. Features

This product discharges high peak pressure by discharging the air in the upstream piping at once. The peak pressure is adjustable depending on the upstream piping condition. It is effective to increase the upstream piping diameter for higher peak pressure.

(Reference) Piping condition and peak pressure

Upstream piping I.D.	Length (mm)	Peak pressure (compared with existing product)
ø8	2000	2 times
ø10	1300	2.5 times
ø13	800	3 times

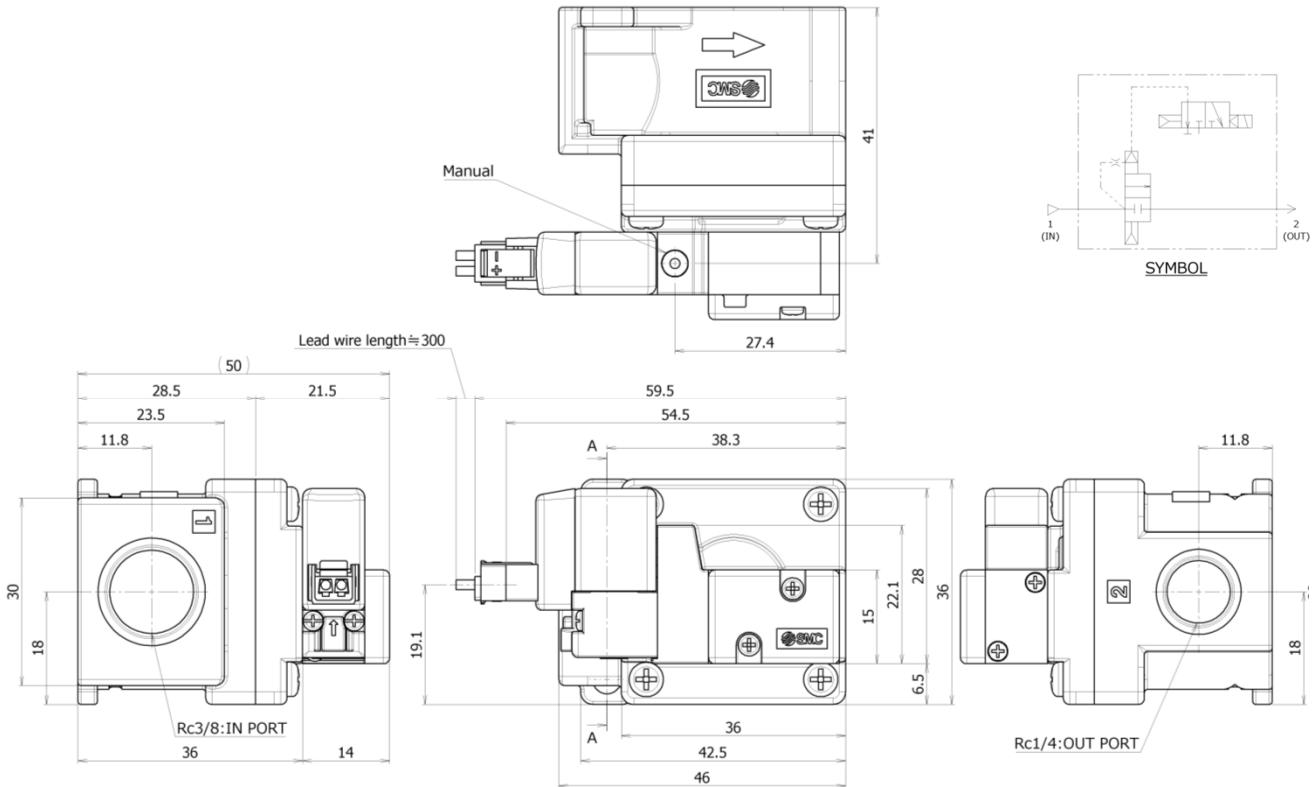
※ In SMC test conditions.

※ Refer to page 5 for the relation between the upstream piping and peak pressure.

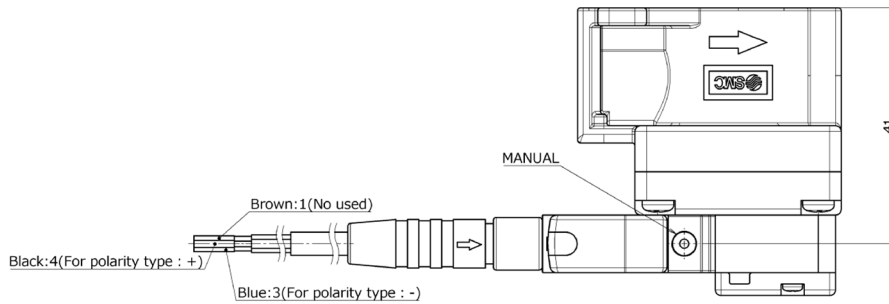
※ Oscillation may occur when supply air is insufficient. Upstream piping I.D. Must be larger than ø8.

Be careful that pressure drop does not occur.

# 4. Dimensions



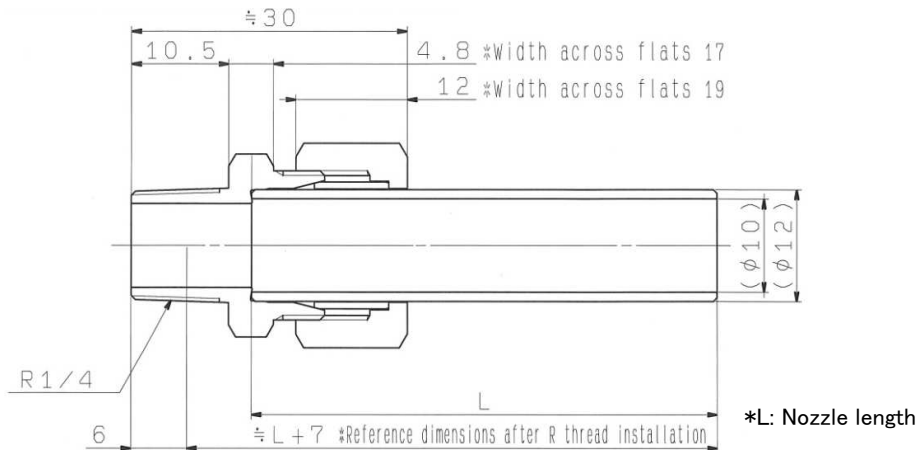
L plug connector



M8 connector **C**

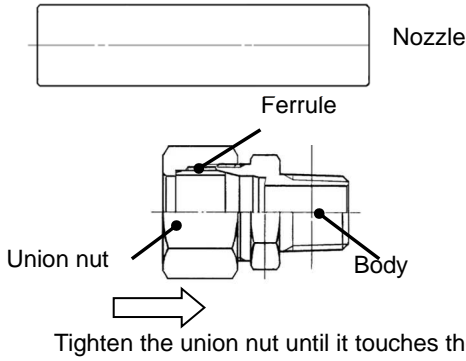
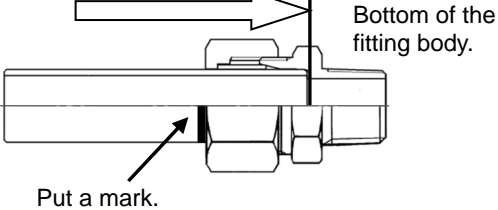
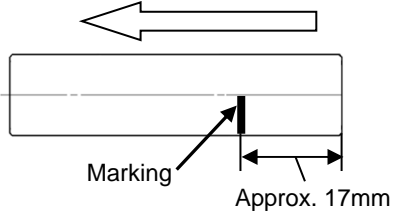
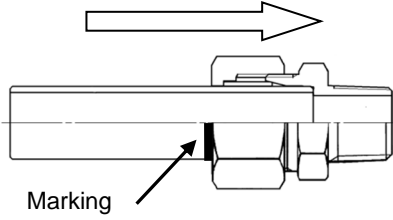
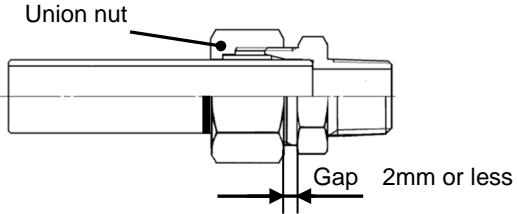
Contact us for the dimension for Grommet type, M plug connector type, and AC type.

Nozzle



Note) The nozzle and flareless fitting are included in the same package unassembled. Refer to "How to mount to mount a nozzle" on the next page for the assembly instructions.

## 5. How to mount a Nozzle

<b>Preparation</b>	<p>1. Check that the ferrule is mounted inside the fitting as shown in figure on the right. Hand-tighten the union nut. Ensure ferrule is aligned properly.</p>	 <p>Labels: Nozzle, Ferrule, Union nut, Body</p> <p>Tighten the union nut until it touches the body.</p>
	<p>2. Insert the nozzle until it touches the fitting body. Then, mark a line on the nozzle at the edge of the union nut.</p>	<p>Insert the nozzle until it touches the bottom of the fitting body.</p>  <p>Labels: Bottom of the fitting body, Put a mark.</p>
	<p>3. Remove the nozzle once, and check the dimension from the end of the nozzle to the marking. If the dimension is different from the 17mm, verify the alignment of the nozzle and adjust.</p>	<p>Remove it once, and check the dimension.</p>  <p>Labels: Marking, Approx. 17mm</p>
<b>Tightening</b>	<p>4. After verifying the dimension, insert the nozzle into the fitting body again. Confirm that the nozzle is inserted down to the marking.</p>	<p>Insert to the marking.</p>  <p>Label: Marking</p>
	<p>5. Using the tightening tool, tighten the union nut so that the gap between the fitting body and the union nut becomes 2mm or less.</p> <p>6. Pull the nozzle by hand to ensure that the nozzle is secure.</p>	<p>Tighten the union nut so that the clearance is 2mm or less.</p>  <p>Labels: Union nut, Gap 2mm or less</p>

# 6. Relationship between Upstream Piping and Peak Pressure

## Relationship between Upstream side Tube and Peak Pressure

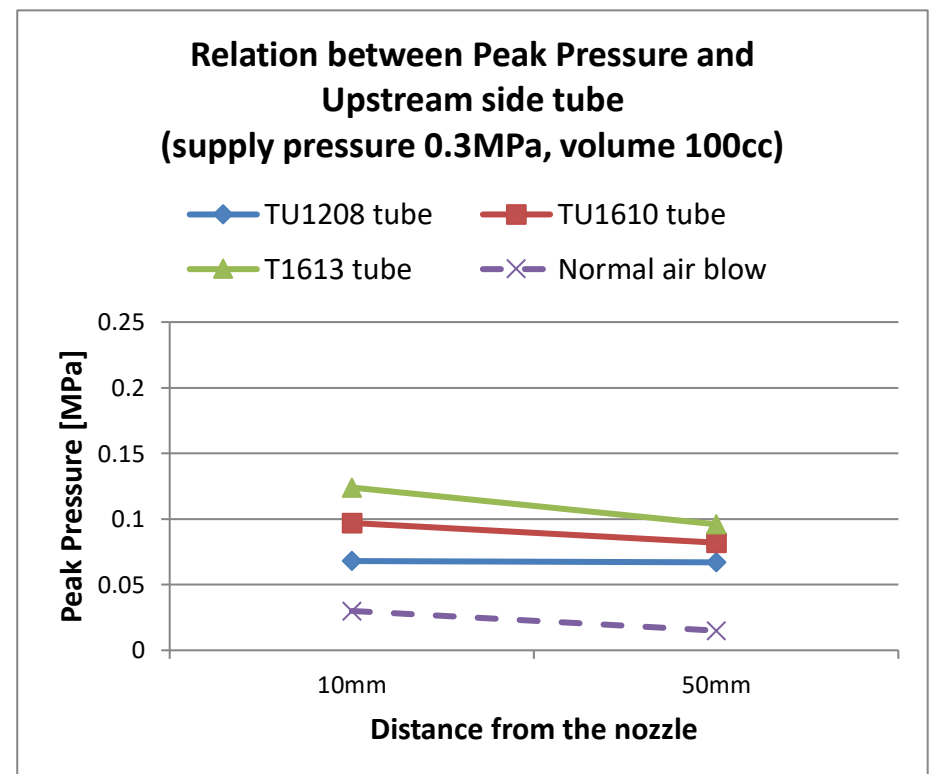
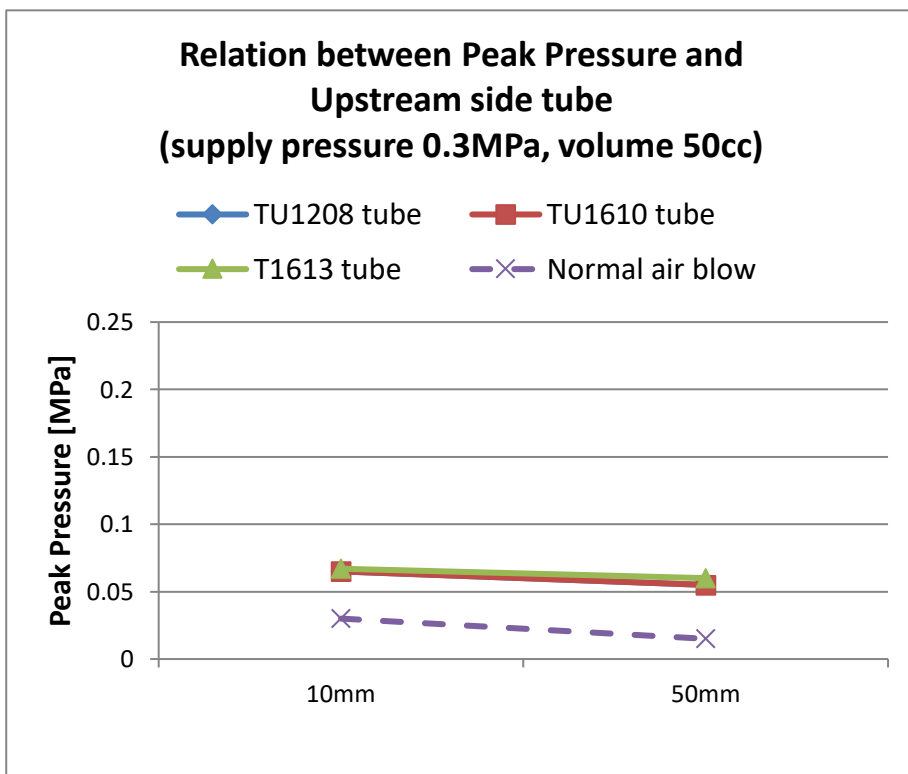
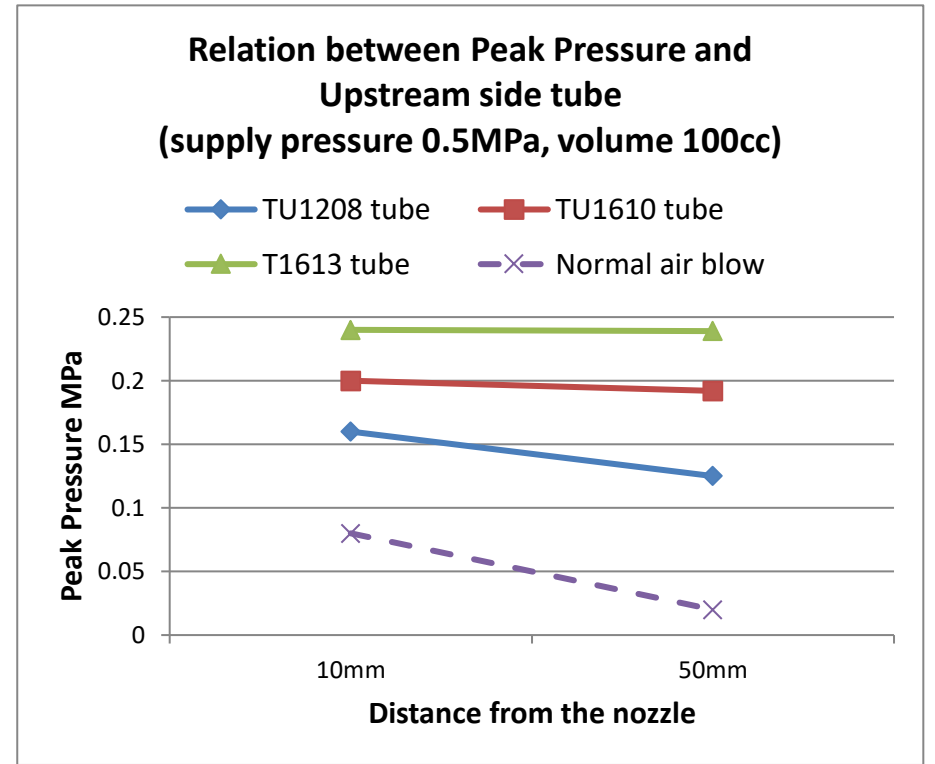
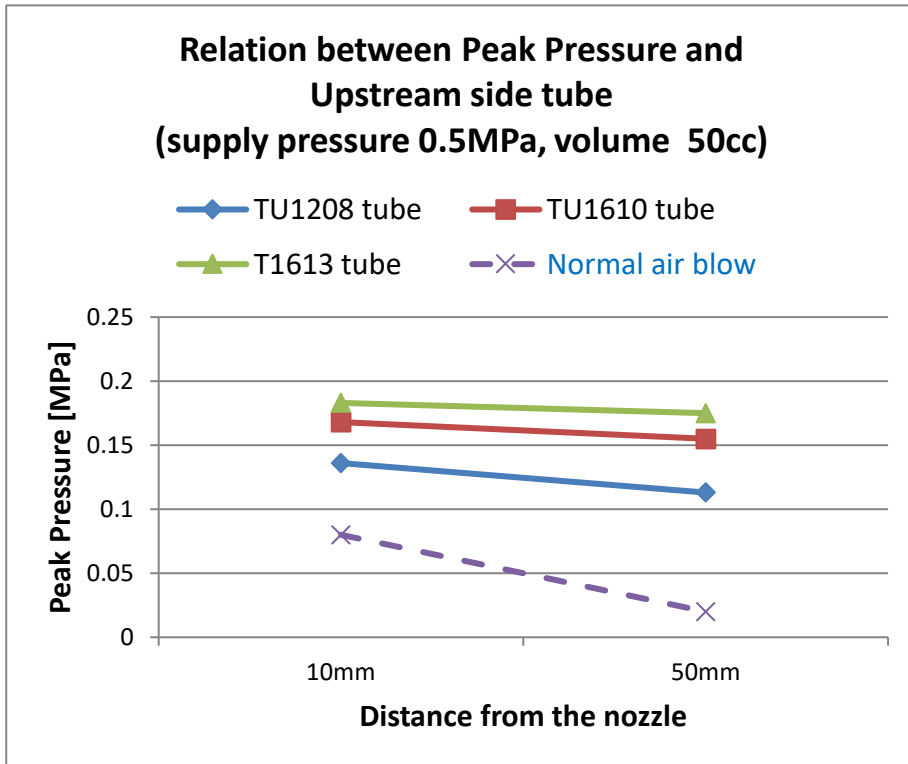
<Measurement conditions>

Upstream side: Tube T1613, TU1610, and TU1208. The length of the tube is cut so that the pipe volume is 100cc and 50cc.

Downstream side: Standard nozzle (50mm)

Supply pressure: 0.3 MPa, 0.5MPa

Measurement point: 10mm and 50mm from the opening of the nozzle.



## Relationship between Upstream side Tube, Downstream side nozzle and Peak Pressure

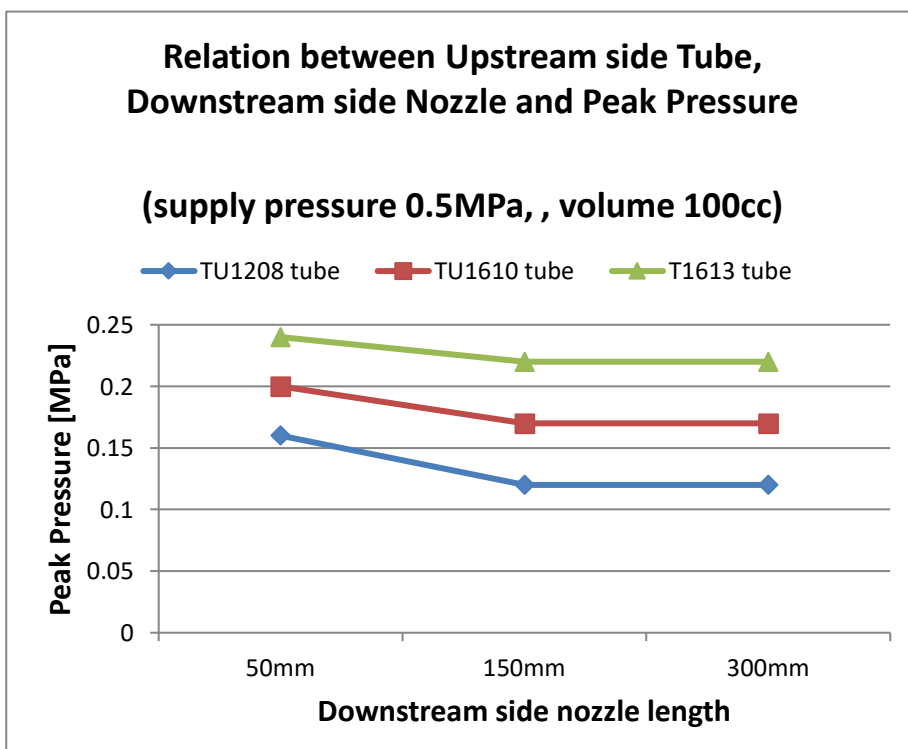
<Measurement conditions>

Upstream side: Tube T1613, TU1610, and TU1208. The length of the tube is cut so that the pipe volume is 100cc.

Downstream side: Standard nozzle (50,150,300mm)

Supply pressure: 0.5 MPa

Measurement point: 10mm from the opening of the nozzle.



\* In SMC test conditions.



# Impact Blow Valve 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)\*<sup>1)</sup> 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) General requirements) General requirements)

ISO 10218-1992: Manipulating industrial robots-Safety



## 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, could 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. Inspect the product periodically to confirm proper operation.



# Impact Blow Valve 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 the product is being considered for use 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. \*3)**

**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 for which we are responsible, 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.**

**\*3) Suction cups are excluded from this 1 year warranty.**

**A suction cup 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.



## Selection

### Warning

#### 1. Review 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 pressure or temperature is out of the specified range, damage and/or malfunction may result.

### Caution

#### 1. Do not use the product with flammable, explosive, or toxic fluid such as gas, gas fuel, and refrigerants.

#### 2. This product does not have a tank inside. The upstream piping volume acts as a tank. It is recommended to keep the upstream piping I.D. as large as possible.

Example) Upstream side volume: 100cc (piping volume equivalent to IBG series)

- Piping I.D.:  $\varnothing 8$  --- Length 2000mm
- Piping I.D.:  $\varnothing 10$  --- Length 1300mm
- Piping I.D.:  $\varnothing 13$  --- Length 800mm

※ Discharged blow pressure is adjustable by adjusting the upstream piping conditions.

※ Oscillation may occur when supply air is insufficient. Upstream piping I.D. must be larger than  $\varnothing 8$ . Be careful that pressure drop does not occur.

#### 3. It is recommended to use the designated nozzle for the downstream side. Silencing nozzle is available.

- Designated nozzle: IBG1-12-10-□ □: Nozzle length (50, 100, 150, 300)
- Silencing nozzle: IBG1-12S
- Set including the designated nozzle and silencing nozzle: IBG1-12-10-□S  
□: Nozzle length (50, 100, 150, 300)

#### 4. Impact resistance of the product is 150[m/s<sup>2</sup>]. Vibration resistance is 30[m/s<sup>2</sup>]. Avoid applying vibration exceeding the allowable value to the product.

## Mounting

### Warning

#### 1. Install a stop valve on the supply pressure side of the impact blow valve.

This will be an emergency stop in case of leakage or breakage.

#### 2. Refer to How to mount a Nozzle on page 4 for assembling the nozzle.

#### 3. After tightening the nozzle onto the impact blow valve by hand, add extra tightening by 2 to 3 turns. Tightening torque is 12 to 14N as a guide.

If tightened insufficiently, the thread of the product may become loose.

## Piping

### Caution

#### 1. Before piping, confirm the product number and bore size.

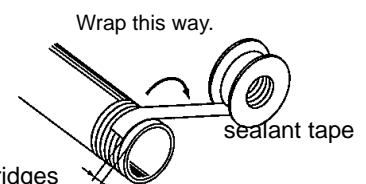
Also, check that there are no scratches, dents or cracks in the product.

#### 2. Preparation before 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.

#### 3. Sealant tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter into the impact blow valve. If sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



leave 1.5 to 2 thread ridges exposed at the end of the threads..

4. **Tighten the thread for the tube for primary side port by 2 to 3 turns after tightening by hand.**  
Tightening torque is 22 to 24N as a guide.
5. **When connecting a tube, consider factors such as changes in the tubing length due to pressure, and allow sufficient leeway.**
6. **Make sure that no twist, turn, tensile force or moment load is applied on the port or tube.**  
This may cause damage to the fitting or crushing, bursting or disconnection of tubing.
7. **Mount so that tubing is not damaged by becoming entangled or abrasion. This can cause crushing, bursting or disconnection of tubing, etc.**

## Lubrication

### **Warning**

1. **Do not refuel.**  
This can damage or contaminate the object to be blown.

## Air Supply

### **Warning**

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

### **Caution**

1. **Install air filters.**  
Install an air filter at the upstream side close to the impact blow valve. Select an air filter with a filtration degree of 5µm or finer.
2. **Take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.**  
Compressed air containing a lot of contaminants may cause operation failure of the impact blow valve or contamination/damage of the object to be blown. Therefore, take appropriate measures to ensure air quality, such as by providing an after cooler, water separator.

## Operating Environment

### **Warning**

1. **Do not use in an environment where corrosive gases, chemicals, sea water, water or steam are present.**
2. **If using in a location directly exposed to sunlight, shade the product from the sunlight.**
3. **Do not mount the product in locations where it is exposed to radiant heat.**

4. Do not use the product in a place where static electricity is a problem. It may result in the system failure and trouble.
5. Do not use the product in a place where spatter can splash or get inside the product. Spattering may result in a fire hazard.
6. Do not use in an environment where the product is directly exposed to cutting oil, lubricant oil or coolant liquid, etc.

Consult with SMC if using in such an environment.

## Maintenance

### Caution

1. Please check the following points in the regular maintenance, and replace the parts as necessary.
  - a) Scratches, damage, wear, or corrosion
  - b) Air leakage
  - c) Squeezing or twisting of the tubing that is connected
  - d) Hardening, deterioration or softening of the tubing that is connected
  - e) Loosening of the nozzle
2. Before removing the product, stop the supply pressure and exhaust compressed air in the piping.
3. Do not modify or reconstruct the product.

## Handling

### Warning

Air blow pressure is high. Pay attention to the following for use.

1. Make sure that the person and workpiece are safe from the objects scattered by the blowing pressure or by the air blow.
2. Be sure to wear safety goggles to protect the eyes from splashed substances.
3. Be careful with air blow sound.
4. Do not use this product to the human body. It may cause injury to personnel.
5. This product is not intended for amusement applications. Do not use the product as an air gun, etc.
6. To prevent lurching of the nozzle due to air pressure, confirm that the nozzle is not loosened or rattling by pulling on it by hand before operation.
7. Do not use the product to clean or remove toxic substances or chemicals.
8. Do not drop, step on or hit the product. This may cause damage.
9. If product is to be used in a public place, ensure product is not directed at people or used in a manner that could adversely affect the environment.
10. For other cautions, refer to the 2 Port Solenoid Valves for Fluid Control Precautions.
11. Pressurizing the air blow discharge port may result in the breakage of the product.

#### Revision history

A: Specification and Notes added

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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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