

Operation Manual

Product name

Impact Blow Valve

Model / Series / Product No.

IBV1 Series

SMC Corporation

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2.How to order



Thread type

Symbol Type

Nil Rc

N NPT

F G

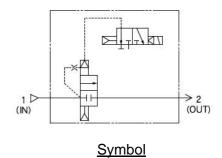
Symbol Rated voltag		Electrical entry	
5L	24 VDC	L plug connector, With lead wire (Length 300 mm)	
5LO	24 DCV	L plug connector, Without connector	
5WA	24 VDC	M8 connector, With connector cable (Length 300 mm)	
5WAO	24 VDC	M8 connector, Without connector	

Symbol	Angle	Electrical entry direction	Symbol	Angle	Electrical entry direction
Nil	0°	OUT	В	180°	OU
A	90°	ОИТ	С	270°	OU

3.Specifications

Valve mounted type

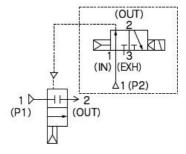
	Fluid	Air
	Operating pressure	0.454.07040
	range	0.15 to 0.7MPa
Valve	Ambient temperature	
specifications	Operating fluid	+5 to 50℃
	temperature	
	Vibration/ Impact	450/00 /-2
	resistance	150/30 m/s ²
	Rated voltage	DC24V
	Power consumption	0.35W
Coil	Allowable voltage	+/-10% of the rated
specifications	fluctuation	voltage
	Allowable leakage	3% of the rated
	voltage	voltage or less
,	Standards	CE / UKCA



3. Specifications

· Air operated type

	Fluid	Air
	Operating pressure	0.1 to 0.5 MPa
	range Pilot pressure range	Note1)
Valve	Ambient temperature	
specifications	Operating fluid	+5 to 50℃
	temperature	
	Vibration/ Impact	150/30 m/s²
	resistance	130/30 111/5-



*Pilot valve is not included.

Symbol

Note 1) Use with main pressure and pilot pressure at similar levels.

Note 2) As the pilot solenoid valve is not included, select it referring to the recommended example on page 6 and the relationship between pilot solenoid valve/piping conditions and peak pressure on page 11.

4.Discharge pressure adjustment

This product discharges high peak pressure by the outflow of the air in the upstream piping.

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 *Refer to the conceptual drawing below.

Upstream piping I.D.	Length(mm)	Peak pressure (Continuous blow ratio)
Ф 8	2000	2 times higher
Ф 1 0	1 3 0 0	2.5 times higher
Ф13	800	3 times higher

- In SMC test conditions.
- * The length in the table is the length in which the upstream side piping volume becomes 100 cc.
- * Refer to page 10 for the relationship between the upstream side piping and peak pressure.
- For the air-operated type, the peak pressure will be different according to the pilot solenoid valve and piping conditions. Refer to the relationship between the pilot solenoid valve/piping conditions and peak pressure on page 11.
- The peak pressure will be discharged once when energized. The normal continuous blow will be performed after discharging the peak pressure. Refer to the conceptual drawing next page.

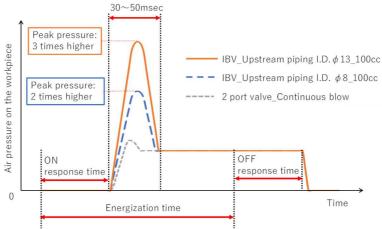
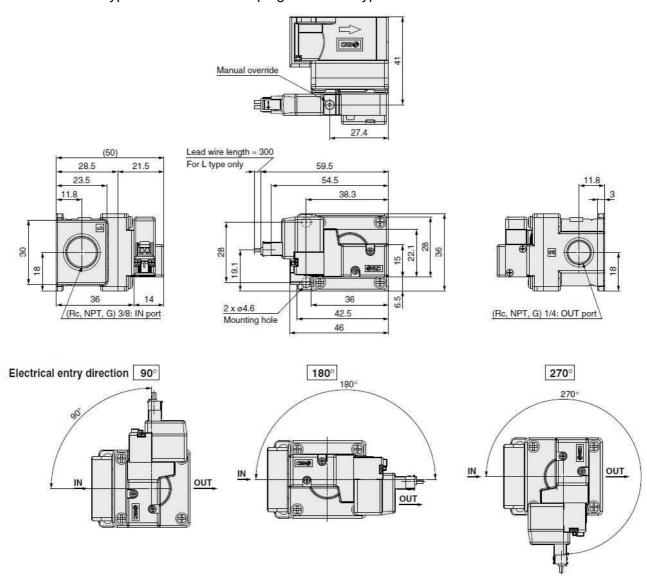


Fig. Conceptual drawing of the peak pressure waveform

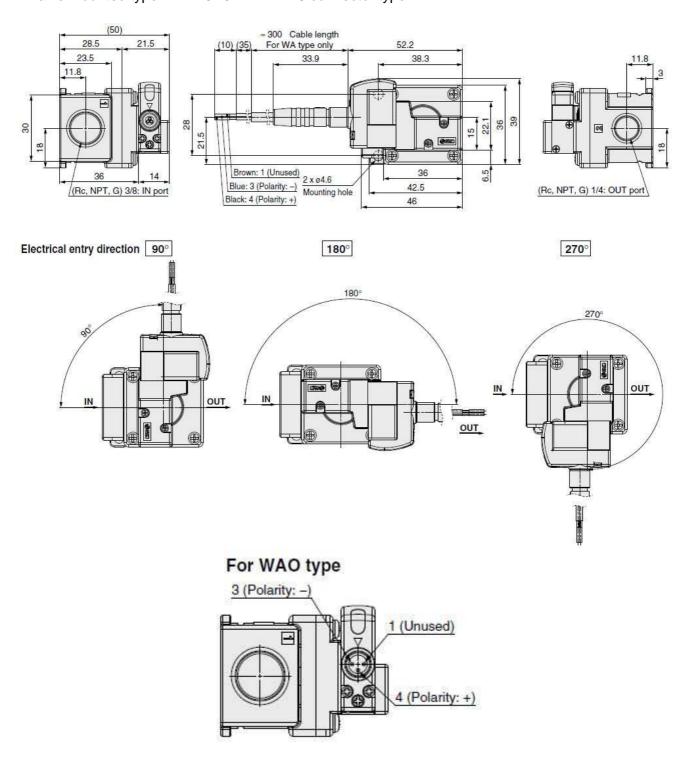
5.External dimensions drawing

Valve mounted type: IBV10*-5L*-* L plug connector type



5.External dimensions drawing

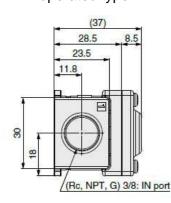
Valve mounted type: IBV10*-5WA*-* M8 connector type

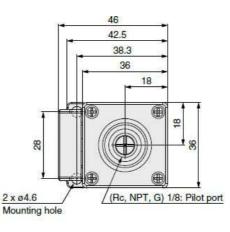


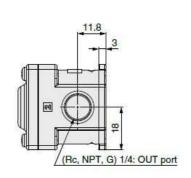
Please inquire separately for specifications including other wiring specifications, voltage, and electric specifications.

5.External dimensions drawing

Air operated type : IBV11*





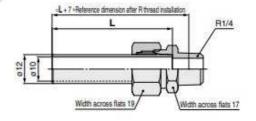


<Air operated type Notes>

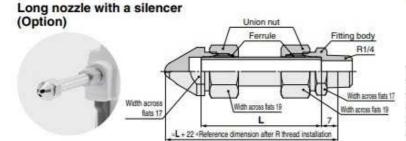
- Be careful not to allow the pilot pressure to drop below the main pressure when blowing.
- Be sure to pressurize the pilot port before pressurizing the main port.
- Air leakage from the main port when pressurizing the pilot port is normal.
- The following pilot valve and piping conditions are recommended.
 - Pilot valve : 3 port N.O. solenoid valve with flow characteristics C = 1.8 [dm3/(s · bar)] or more in flow path $2 \rightarrow 3(A \rightarrow R)$
 - Example) VQZ2(2,4)5, SYJ72(2,4), etc.
 - Pilot pipe inner diameter : Φ4 or Φ5 Example)TU0604 , TU0805 , etc.
 - Pilot pipe length: 1000mm or less Refer to page 11 for other conditions.

6. External dimensions drawing (Option)

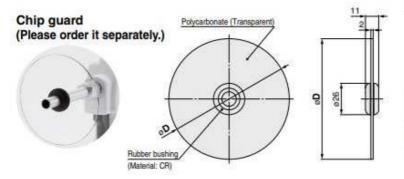




Part no.	Nozzle I.D.	Connection thread	L
IBG1-12-10-50		R1/4	50
IBG1-12-10-100 IBG1-12-10-150 IBG1-12-10-300 IBG1-12-10-600-X1 IBG1-12-10-1000-X1			100
	ø10		150
			300
		1	600
		1	1000



[mm]	
L	
50	
100	
150	
300	
600	
1000	

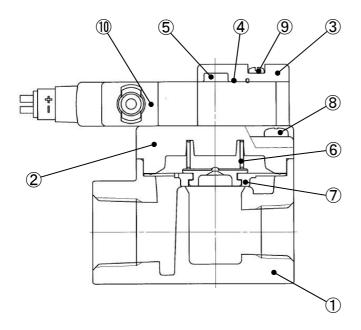


	[r
Part no.	σD
IBG1-12C	100

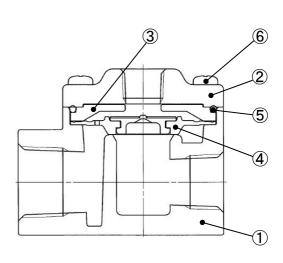
- * The rubber bushing is shipped together with the product.
- It is possible to use the guard with a silencer, but in that case, mount the guard before mounting the silencer.

7. Component drawing, component material

Valve mounted type



· Air operated type



Components parts

Number	Parts name	Material	
1	Body	ADC	
2	Bonnet	resin	
3	Plate	resin	
4	Gasket	HNBR	
5	Element	resin	
6	Spring	SUS	
7	Diaphragm Ass'y	HNBR, resin	
8	Screw	SUS	
9	Tapping screw	Carbon tool steel (Chromated)	
10	3 port valve	_	

Components parts

Number	Parts name	Material
1	Body	ADC
2	Bonnet	ADC
3	Guide bushing	resin
4	Diaphragm Ass'y	HNBR, resin
5	O-ring	FKM
6	Screw	SUS

8. How to mount a Nozzle

	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.	Union nut Tighten the union nut until it touches the body.
Preparation	2.	Insert the nozzle until it touches the fitting body. Then, mark a line on the nozzle at the edge of the union nut.	Insert the nozzle until it touches the bottom of the fitting body. Bottom of the fitting body. Put a mark.
	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.	Remove it once, and check the dimension. Marking Approx. 17mm
aning	4.	After verifying the dimension, insert the nozzle into the fitting body again. Confirm that the nozzle is inserted down to the marking.	Insert to the marking. Marking
Tightening	5.6.	Using the tightening tool, tighten the union nut so that the gap between the fitting body and the union nut becomes 2mm or less. Pull the nozzle by hand to ensure that the nozzle is secure.	Tighten the union nut so that the clearance is 2mm or less. Union nut Gap 2mm or less

8. How to mount a Nozzle *With a silencer

	Check that the ferrule and element is mounted inside the silent nozzle as shown in figure on the right. Hand-tighten the union nut. Ensure ferrule is aligned properly.	Element Ferrule Nozzle: IBG1-12-10-* *Refer to the attachment "Impact-Blowgun (Series IBG) nozzle mounting method"	
Preparation	2. Insert the silent nozzle until it touches the nozzle. Then, mark a line on the nozzle at the edge of the union nut.	I insert the silent nozzle until it touches	
	3. Remove the silent 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.	Remove the silent nozzle once, and check the dimension. Approx. 17mm Approx. 17mm	
ning	4. After verifying the dimension, insert the nozzle into the fitting body again. Confirm that the nozzle is inserted down to the marking.	Insert to the marking. Marking	
Tightening	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.6. Pull the nozzle by hand to ensure that the nozzle is secure.	Tighten the union nut so that the clearance is 2mm or less. Union nut Gap 2mm or less	

9. Relationship between Upstream Piping and Peak Pressure

Relationship between Upstream side Tube and Peak Pressure

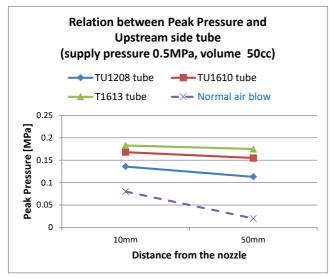
<Measurement conditions>

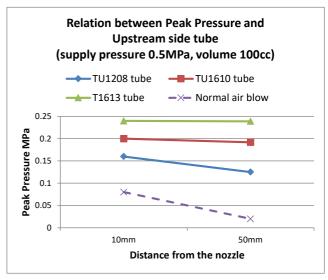
Upstream side: Tube T1613, TU1610, and TU1208. The length of the tube is cut so that the pipe volume is 100cc and 50cc.

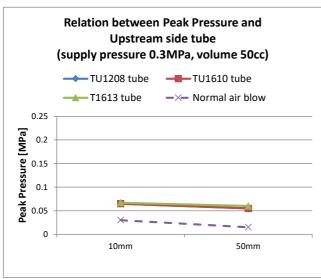
Downstream side: Standard nozzle (50mm)

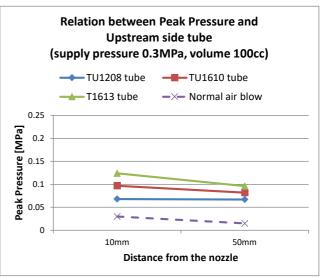
Supply pressure: 0.3 MPa, 0.5MPa

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









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

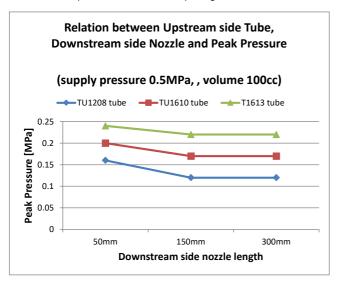
<Measurement conditions>

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.

10. Relationship of Pilot Valve/Piping Condition and Peak Pressure (Air Operated Type)

Peak pressure in different pilot valve/piping conditions and upstream side tubes

<Peak pressure measurement condition>

Upstream side: Tubes of T1613 and TU1208, equivalent length of piping volume 100 cc

Downstream side: Standard nozzle (length 50 mm)

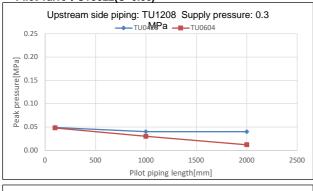
Supply pressure: 0.3MPa, 0.5MPa

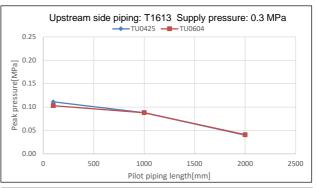
Measurement position: 10 mm from the nozzle opening

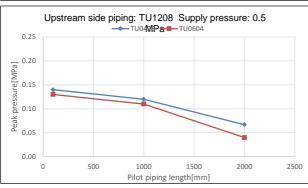
<Pilot valve condition>

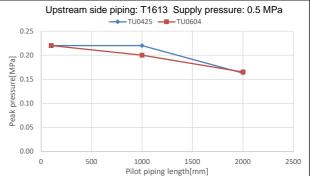
Solenoid valve: SYJ522 (C = 0.66), VQZ225 (C = 1.8) Pilot piping diameter: TU0425, TU0604, TU0805 Pilot piping length: 100, 500, 1000, 2000 mm

Pilot valve : SYJ522(C=0.66)

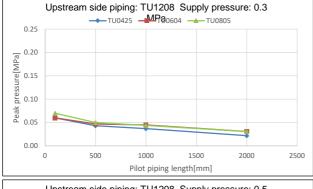


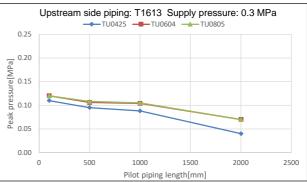


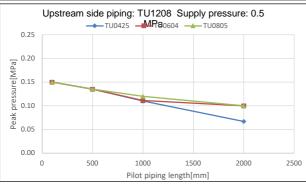




Pilot valve: VQZ225(C=1.8)







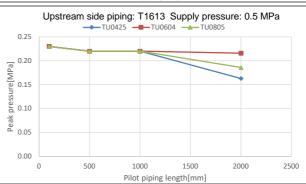


Image of peak pressure, response time, and pilot condition (reference)

Pea	Low	—	High	
Res	Slow		Fast	
Pilot valve flow	Small	—	Large	
Piping	I.D.	Small	-	Large
riping	Length	Long		Short



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)*1), and other safety regulations.

⚠ Danger: Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Marning: 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.

=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

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

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing business.

Use in non-manufacturing business 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

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

- 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.

A Safety Instructions Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.

Prior to Use



As the pressure of the air blow is quite powerful, do not aim the product at another person during operation. It may cause danger to personnel. Additionally, the following precautions should be taken before use.

- 1.Before use, make sure that the blow pressure, or blow, will not cause surrounding objects to scatter and injure others or damage workpieces, equipment, etc., in the vicinity.
- 2. Wear protective eyewear when operating the product to protect your eyes from scattering debris.
- 3. This product is not a toy. Do not play with the product or use it as an air cannon for fun.
- 4.Air pressure may cause the nozzle to fly off during operation if it is not properly tightened. To prevent this, be sure to check the nozzle for loosening by pulling on it with your hands before use.



∖ Caution

1. Pay attention to the items below for the air-operated type.

Be careful not to allow the pilot pressure to drop below the main pressure when blowing.

Be sure to pressurize the pilot port before pressurizing the main port.

Air leakage from the main port when pressurizing the pilot port is normal.

Select the pilot solenoid valve and pilot piping diameter/length referring to page 3, 11.

Selection



Warning

1.Confirm the specifications.

Products represented in this catalog are designed only for use in compressed air systems. Do not operate at pressures, temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction.



Caution

1. This product enables high peak pressure blowing by instantly discharging air filled in the primary pipework when the main valve is opened, with a dedicated nozzle attached to the secondary side. This air-saving product is based on the concept of using the high peak pressure to perform work in a short time, thereby significantly reducing air consumption and working time.

If the secondary side nozzle has a small diameter, the filled air cannot be discharged all at once, so high peak pressure is not output and the blowing becomes normal continuous blowing. When using a small-diameter nozzle on the secondary side, it is recommended to select a general 2-port valve.

The high peak pressure is discharged immediately after the main valve opens (see p. 3), after which the product is in a continuous blowing state at low pressure. Continuous blowing with this product is ineffective and results in high air consumption, so it is recommended that the product is used by repeatedly switching the power on and off and that the continuous blowing time is kept as short as possible.

2. This product is based on the concept that the piping volume connected to the inlet side can be used in place of a tank, making a built-in tank unnecessary. It is recommended that the inside diameter of the inlet piping be as thick as possible.

Example) Inlet volume: 100 cc (piping volume equivalent to IBG1 series)

- Piping I.D.: Φ8
 Piping I.D.: Φ10
 Length: 2000mm
 Length: 1300mm
- Piping I.D. : Ф13 • • Length : 800mm
- * The blow pressure discharged can be adjusted by adjusting the inlet side piping conditions.
- * When not enough air is being supplied, the main valve will oscillate, which may result in a reduced product life. Therefore, use inlet piping with an inside diameter of Ø8 or more, and take measures to prevent the pressure from dropping as much as possible.

3.Use with the designated nozzle is recommended on the downstream side. If the nozzle on the downstream side is small, peak pressure will not be achieved. A silencing nozzle is available if the operation noise needs to be lower. Refer to page 6 for details.

Nozzle type	Product number	
Long nozzle	IBG1-12-10-□(-X1)	
A silencer	IBG1-12S	
Long nozzle with a silencer	IBG1-12-10-□S(-X1)	

- **Only the taper thread type is available for the designated nozzle. Consider using the one-touch fitting and tube when thread types of NPT and G are selected. In this case, a tube inside diameter of about
- Φ8 to 10 is recommended.

 4.Note that the discharging peak pressure will be lower than the first discharge when the operating frequency is fast and the second energization is performed without sufficient replenishment of air in the upstream side piping.
- 5. The impact resistance and vibration resistance of this product are 150 [m/s2] and 30 [m/s2], respectively. Be sure to prevent impact or vibration exceeding the allowable values from being applied to the product.
- 6.Do not apply the blow gun to flammable, explosive, or toxic substances such as gas, fuel gas, or refrigerant.

Mounting , Piping



Warning

1.Screw-in the pipe thread or the nozzle to the torque below.

As a guideline, it is equivalent to 2 to 3 additional turns with a tool after hand-tightening. Note that tightening with a torque exceeding the values in the table below may break the body.

Screw-in	Screw size	Tightening torque N • m	Remarks
Pilot port	1/8	7~9	Only air operated type
OUT port	1/4	12~14	Note1)
IN port	3/8	22~24	

Note1) Insufficient tightening may cause loosening of the nozzle.

- 2.Install a stop valve on the supply pressure side of the blow valve.
 - It will be emergency shut off in case of unexpected leakage or damage.
- 3. Follow the instruction on "How to mount a nozzle" on pages 8 and 9 when assembling the nozzle.



Caution

1. Check the model, type, and size before installation.

Also, confirm that there are no scratches, gouges, or cracks on 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. Winding of sealant tape

When connecting pipes, fittings, etc., be sure that chips from the pipe threads and sealing material do not enter the blow valve. Furthermore, when 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...

Wrap this way

sealant tape

- 4.Allow extra length when connecting a tube to accommodate changes in tube length due to pressure.
- 5. Confirm that no twisting, turning, or tensile force or moment load is applied to the port or tube. This may cause fittings to fracture or tubes to be crushed, burst, or come loose.
- 6.Do not abrade, entangle, or scratch the tube. This may cause the tube to be crushed, burst, or come loose.

Lubrication



1.Do not lubricate the product.

It may contaminate or damage the target object.

Air supply



Warning

1.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.



Caution

1.Install an air filter.

Install an air filter upstream near the blow valve. Select an air filter with a filtration size of 5 µm or smaller.

2. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.

Compressed air that contains a large amount of drainage can cause the malfunction of the blow gun and contaminate or damage the target object. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

Operating Environment



Warning

- 1. Do not use in an atmosphere where corrosive gases, chemicals, sea water, water, or water steam are present. Do not use in cases where there is direct contact with any of the above.
- 2. Do not expose the product to direct sunlight for an extended period of time.
- 3. Do not use in locations where radiated heat will be received from nearby heat sources.
- 4. Do not use in an environment where static electricity is a problem. It may result in system failure or malfunction. Please contact SMC for use in such an environment.
- 5. Do not use in an environment where spatters are generated. Spattering may result in a fire hazard. Please contact SMC for use in such an environment.
- 6. Do not use in an environment where the product is exposed to cutting oil, lubricating oil, or coolant oil. Please contact SMC for use in such an environment.

Maintenance



Caution

- In periodical inspections, check the following items and replace the parts if necessary.
 - a) Scratches, gouges, abrasion, corrosion
 - b) Air leakage
 - c) Twisting, crushing, and turning of connected tubes
 - d) Hardening, deterioration, and softening of connected tubes
 - e) Loosening of nozzles
- 2. When removing the product, first stop the pressure supply, exhaust compressed air in the piping, and check the condition of atmospheric release.
- 3. Do not disassemble or remodel the body of the product.

Handling



As the pressure of the air blow is quite powerful, the following precautions should be taken before use.

- 1. When the blow gun is used or stored, confirm that no twisting, turning, or tensile force or moment load is applied to the port or tube. This may cause fittings to fracture or tubes to be crushed, burst, or come loose.
- 2.Before use, make sure that the blow pressure, or blow, will not cause surrounding objects to scatter and injure others or damage workpieces, equipment, etc., in the vicinity.
- 3.Be sure to wear protective eyewear when operating the product to protect your eyes from scattering debris.
- 4. Please be careful as the sound of the air blow is loud.
- 5. do not aim the product at another person during operation. It may cause danger to personnel.
- 6. This product is not a toy. Do not play with the product or use it as an air cannon for fun.
- 7.Air pressure may cause the nozzle to fly off during operation if it is not properly tightened. To prevent this, be sure to check the nozzle for loosening by pulling on it with your hands before use.
- 8.Do not use the product to clean or remove toxic substances or chemicals.
- 9.Do not drop, step on, or hit the product. It may cause damage to the product.
- 10.Do not use the product to disturb public order or public hygiene.
- 11. For other precautions, refer to the 2 Port Solenoid Valves for Fluid Control Precautions.

Caution

- 1. Pressurizing the air blow discharge port may result in the breakage of the product.
- 2. When blowing continuously for a long time, the main valve may close automatically due to its structure, but this is not abnormal. In that case, turn off the power and then turn it on again to operate normally.

Revision history
1. addition of notes

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