ORIGINAL INSTRUCTIONS

Instruction Manual
Bushing Type Check Valve
AKB Series



The intended use of this product is to control the direction of compressed air.

1 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 10218-1: Manipulating industrial robots -Safety. etc.

- Refer to product catalogue, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

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

- **Always ensure compliance with relevant safety laws and standards.**
- All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

Fluid	Air			
Proof pressure	1.5 MPa			
Operating pressure range	-100kPa to 1MPa			
Cracking pressure	0.005 MPa NOTE 1			
Ambient/fluid temperature	-5 to 60ºC (No freezing)			
Applicable tubing material NOTE 2	Nylon, Soft nylon, Polyurethane			
Air quality	5μm			
Maximum operating frequency	1 time per second			
Minimum operating frequency	Every 30 days			
Max Flow	AKB01	AKB02	AKB03	AKB04
[L/min(ANR)] (at 0.5MPa)	460	920	1,670	2,400
Impact resistance NOTE 3	1000 m/s^2			
Vibration resistance NOTE 4	50 m/s^2 (0.35mm)			

NOTE 1) The valve does not open fully at this pressure level. **The cracking pressure is the pressure at the point when the valve begins to open, not the pressure level when the valve is fully open.**

NOTE 2) Use caution regarding the max operating pressure when soft nylon or polyurethane tubing is used

NOTE 3) Two axes (horizontal and vertical) and two directions were tested 3 times and no malfunction of the valve occurred (pulse shape: sine shape)

2 Specifications - continued

NOTE 4) No malfunction occurred in a sweep cycle test between 10 to 150 Hz at vibration sweep 0.35mm. The test was performed in the two axes and two directions, 7 min per cycle (20 cycles).

3 Installation

3.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.
- Line up tools with width across flats on the body and tighten firmly.

3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact in excess of the product’s specifications.
- Do not mount in a location exposed to radiant heat that would result in temperatures in excess of the product’s specifications.

3.3 Piping

Caution

- Before connecting piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

3.4 Lubrication

Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is used in the system, refer to catalogue for details.

4 How to Order

Refer to catalogue for ‘How to Order’.

5 Outline Dimensions (mm)

Refer to catalogue for outline dimensions.

6 Maintenance

6.1 General Maintenance

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous.
- Maintenance of pneumatic systems should be performed only by qualified personnel.
- Before performing maintenance, turn off the power supply and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- **Take residual pressure into consideration.**
  The actuator may move during maintenance as a result of residual pressure.

7 Limitations of Use

7.1 Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

Warning

- **Even when used within the specification range, the check valve may oscillate and not fully open when the check valve inlet is restricted.**
- **The check valve is designed to close as a result of differential pressure created by the solenoid valve switching between primary (IN) and secondary (OUT) pressure. If primary pressure (IN) drops gently, and the differential pressure is smaller than minimum working pressure or cracking pressure; please be aware that outlet pressure may drop without the check valve closing.**
- A certain amount of leakage is allowed in the specifications of this product. It is not suitable for holding pressure over an extended period of time.

8 Contacts

Refer to Declaration of Conformity and www.smcworld.com for contacts.

SMC Corporation

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