Check Valve
Series AK

Large flow capacity
Low cracking pressure: 0.02 MPa
A wide variation of models

How to Order
AK 2 000 02

Standard size
2 1/8
4 1/2
6 1

Thread type
Nil Rc
N NPT
F G

Port size
01 1/8 AK2000
02 1/4 AK2000/4000
03 3/8 AK4000
04 1/2 AK4000
06 3/4 AK6000
10 1 AK6000

Model
<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>Effective area (mm²)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK2000-01</td>
<td>1/8</td>
<td>25</td>
<td>105</td>
</tr>
<tr>
<td>AK2000-02</td>
<td>1/4</td>
<td>27.5</td>
<td>100</td>
</tr>
<tr>
<td>AK4000-02</td>
<td>1/2</td>
<td>47</td>
<td>155</td>
</tr>
<tr>
<td>AK4000-03</td>
<td>3/8</td>
<td>85</td>
<td>150</td>
</tr>
<tr>
<td>AK4000-04</td>
<td>1/2</td>
<td>95</td>
<td>140</td>
</tr>
<tr>
<td>AK6000-06</td>
<td>3/4</td>
<td>200</td>
<td>345</td>
</tr>
<tr>
<td>AK6000-10</td>
<td>1</td>
<td>230</td>
<td>315</td>
</tr>
</tbody>
</table>

Specifications
- Fluid: Air
- Proof pressure: 1.5 MPa
- Maximum operating pressure: 1 MPa
- Minimum operating pressure: 0.02 MPa
- Ambient and fluid temperature: –5 to 60°C (No freezing)

Flow Characteristics

Flow rate (l/min (ANR))

Pressure drop (MPa)

Inlet pressure: 0.1 MPa

AK2000-01/-02

AK4000-02

AK4000-03/-04

AK6000-06/-10
Series AK

Construction

AK2000
AK4000/6000

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>AK2000</th>
<th>AK4000</th>
<th>AK6000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cover</td>
<td>Aluminum-die casted (Note)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Body</td>
<td>Aluminum-die casted (Note)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Replacement Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Valve</td>
<td>POM</td>
<td>19033</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stainless steel</td>
<td>19037</td>
</tr>
<tr>
<td>4</td>
<td>Spring</td>
<td>NBR</td>
<td>19014</td>
</tr>
<tr>
<td></td>
<td></td>
<td>20 x 17 x 1.5</td>
<td>19015</td>
</tr>
<tr>
<td>5</td>
<td>O-ring</td>
<td>NBR</td>
<td>19016</td>
</tr>
<tr>
<td>6</td>
<td>Ring</td>
<td>Brass, NBR</td>
<td>19013</td>
</tr>
<tr>
<td>7</td>
<td>Seat ring</td>
<td></td>
<td>19024</td>
</tr>
</tbody>
</table>

Dimensions

<table>
<thead>
<tr>
<th>Model</th>
<th>Port size</th>
<th>L1</th>
<th>B</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK2000-01/02</td>
<td>1/8, 1/4</td>
<td>50</td>
<td>25</td>
<td>22</td>
</tr>
<tr>
<td>AK4000-02/03/04</td>
<td>1/4, 3/8, 1/2</td>
<td>67</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>AK6000-06/10</td>
<td>3/4, 1</td>
<td>95</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

Caution

Be sure to read before handling.
Refer to pages 15-18-3 to 15-18-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 15-8-6 to 15-8-8 for Precautions on every series.
# Check Valve with One-touch Fitting

**Series AKH/AKB**

## How to Order

### Straight type

**Male connector type**

<table>
<thead>
<tr>
<th>AKH 04-00</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKH 04 A 01 S</td>
</tr>
</tbody>
</table>

- **Applicable tubing O.D.**
  - Metric size:
    - 04: ø4
    - 06: ø6
    - 08: ø8
    - 10: ø10
    - 12: ø12
  - Inch size:
    - 03: 3/32
    - 07: 1/16
    - 09: 3/32
    - 11: 1/8
    - 13: 1/4

- **Thread type**
  - Nil
  - Metric thread (M5)
  - Unified thread (10-32 UNF)

- **Port size**
  - M5: M5 x 0.8
  - U10/32: 10-32 UNF

- **Applicable tubing O.D./Port Size Combinations**
  - AKH04/L50132
  - AKH06/L50132
  - AKH08/L50132
  - AKH10/L50132
  - AKH12/L50132

### Bushing type

**Male connector type**

| AKB 01 A 01 S |

- **Applicable tubing O.D.**
  - Metric size:
    - 01: ø4
    - 02: ø6
    - 03: ø8
    - 04: ø10
    - 05: ø12
  - Inch size:
    - 01: 1/8
    - 02: 1/4
    - 03: 3/8
    - 04: 1/2

- **Thread type**
  - Nil
  - NPT

- **Port size**
  - M5: M5 x 0.8
  - U10/32: 10-32 UNF

- **Applicable tubing O.D./Port Size Combinations**
  - AKB01/L50132
  - AKB02/L50132
  - AKB03/L50132
  - AKB04/L50132

## Female/Male Threads Combinations

<table>
<thead>
<tr>
<th>R thread</th>
<th>NPT thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>Female thread</td>
</tr>
<tr>
<td>AKB01</td>
<td>1/8</td>
</tr>
<tr>
<td>AKB02</td>
<td>1/4</td>
</tr>
<tr>
<td>AKB03</td>
<td>3/8</td>
</tr>
<tr>
<td>AKB04</td>
<td>1/2</td>
</tr>
</tbody>
</table>

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15-14-4
Application Example for Check Valve with One-touch Fitting

Prevention of reverse flow to vacuum source *(Simple vacuum holding)*

Tank pressure reverse flow prevention

Drop prevention *

Specifications

<table>
<thead>
<tr>
<th></th>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proof pressure</td>
<td>1.5 MPa</td>
<td></td>
</tr>
<tr>
<td>Operating pressure range</td>
<td>~100 kPa to 1 MPa</td>
<td></td>
</tr>
<tr>
<td>Cracking pressure</td>
<td>0.005 MPa</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature and</td>
<td>~5 to 60°C (No freezing)</td>
<td></td>
</tr>
<tr>
<td>operating fluid temperature</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Applicable tubing material</td>
<td>Nylon, Soft nylon, Polyurethane</td>
<td></td>
</tr>
</tbody>
</table>

Note) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 15-6-3 to 15-6-5 for details.)

Caution

Be sure to read before handling. Refer to pages 15-18-3 to 15-18-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to pages 15-8-6 to 15-8-8 for Precautions on every series.

*A certain amount of leakage is allowed in the specifications of this product. Please note that it is not suitable for holding over an extended period of time.*
### Dimensions

#### Straight type: AKH

- **Connection thread size:**

- **Male connector type:** AKH

- **Inch Size**

- **Metric Size**

#### Male connector type: AKH

- **Series AKH/AKB**

#### Bushing type: AKB

- **Connection thread size:**

---

**Table Examples:**

<table>
<thead>
<tr>
<th>Metric Size</th>
<th>Connection thread size R</th>
<th>Model</th>
<th>Metric Size</th>
<th>Connection thread size NPT</th>
<th>Model</th>
<th>Effective area (mm²)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Ø1/2</td>
<td>AKB01R-01S</td>
<td>14.29</td>
<td>14 23.7</td>
<td>14 23.7</td>
<td>19.7</td>
<td>6.5 18</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AKB02R-02S</td>
<td>17.46</td>
<td>17 39.8</td>
<td>17 39.8</td>
<td>33.8</td>
<td>14 44</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AKB03R-03S</td>
<td>22.23</td>
<td>22 45.2</td>
<td>22 45.2</td>
<td>40.7</td>
<td>14 40</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AKB04R-04S</td>
<td>24.62</td>
<td>24 56.2</td>
<td>24 56.2</td>
<td>48.2</td>
<td>14 34</td>
</tr>
</tbody>
</table>

---

**Other Information:**

- Reference dimensions of R thread after installation.
- Reference dimensions of NPT thread after installation.
**Construction**

**Straight type: AKH**

<table>
<thead>
<tr>
<th>ø4, ø6</th>
<th>ø8, ø10, ø12</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø5/32, ø1/4</td>
<td>ø5/16, ø3/8, ø1/2</td>
</tr>
</tbody>
</table>

**Component Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Brass</td>
<td>Electroless nickel plated</td>
</tr>
<tr>
<td>2</td>
<td>Valve</td>
<td>NBR, Aluminum alloy</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Spacer</td>
<td>Brass</td>
<td>Electroless nickel plated</td>
</tr>
<tr>
<td>5</td>
<td>Stopper</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cassette</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Seal</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Gasket</td>
<td>Stainless steel + NBR</td>
<td></td>
</tr>
</tbody>
</table>

**Male connector type: AKH**

<table>
<thead>
<tr>
<th>M5 type</th>
<th>ø4, ø6</th>
<th>ø8, ø10, ø12</th>
</tr>
</thead>
<tbody>
<tr>
<td>U10/32</td>
<td>ø8 x R 1/8</td>
<td>ø5/16, ø3/8, ø1/2</td>
</tr>
<tr>
<td>Free flow</td>
<td>Male thread</td>
<td></td>
</tr>
<tr>
<td>One-touch fitting</td>
<td>Male thread</td>
<td></td>
</tr>
</tbody>
</table>

**Bushing type: AKB**

<table>
<thead>
<tr>
<th>R 1/8 NPT 1/8</th>
<th>R 1/4, 3/8, 1/2 NPT 1/4, 3/8, 1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free flow</td>
<td>Female thread</td>
</tr>
<tr>
<td>Female thread</td>
<td>Male thread</td>
</tr>
</tbody>
</table>

**Component Parts**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Brass</td>
<td>Electroless nickel plated</td>
</tr>
<tr>
<td>2</td>
<td>Valve</td>
<td>NBR, Aluminum alloy</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Spring</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Spacer</td>
<td>Brass</td>
<td>Electroless nickel plated</td>
</tr>
<tr>
<td>5</td>
<td>Stopper</td>
<td>Stainless steel</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>O-ring</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Cassette</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Seal</td>
<td>NBR</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Gasket</td>
<td>Stainless steel + NBR</td>
<td></td>
</tr>
</tbody>
</table>
Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠ Caution : Operator error could result in injury or equipment damage.
⚠ Warning : Operator error could result in serious injury or loss of life.
⚠ Danger : In extreme conditions, there is a possible result of serious injury or loss of life.

Note 1) ISO 4414: Pneumatic fluid power--General rules relating to systems.
Note 2) JIS B 8370: General Rules for Pneumatic Equipment

**Warning**

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications.
   Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements. The expected performance and safety assurance will be the responsibility of the person who has determined the compatibility of the system. This person should continuously review the suitability of all items specified, referring to the latest catalog information with a view to giving due consideration to any possibility of equipment failure when configuring a system.

2. Only trained personnel should operate pneumatically operated machinery and equipment.
   Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.
   1. Inspection and maintenance of machinery/equipment should only be performed once measures to prevent falling or runaway of the driver objects have been confirmed.
   2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
   3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc.

4. Contact SMC if the product is to be used in any of the following conditions:
   1. Conditions and environments beyond the given specifications, or if product is used outdoors.
   2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, clutch and brake circuits in press applications, or safety equipment.
   3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.
Common Precautions
Be sure to read before handling.
For detailed precautions on every series, refer to main text.

1. Confirm the specifications.
Products represented in this catalog are designed for use in compressed air applications only (including vacuum), unless otherwise indicated.
Do not use the product outside their design parameters.
Please contact SMC when using the products in applications other than compressed air (including vacuum).

4. Use clean air
If the compressed air supply is contaminated with chemicals, synthetic materials, corrosive gas, etc., it may lead to break down or malfunction.

Operating Environment

1. Do not use in environments where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
2. Do not expose the product to direct sunlight for an extended period of time.
3. Do not use in a place subject to heavy vibrations and/or shocks.
4. Do not mount the product in locations where it is exposed to radiant heat.

Warning

1. Instruction manual
Install the products and operate them only after reading the instruction manual carefully and understanding its contents.
Also keep the manual where it can be referred to as necessary.
2. Securing the space for maintenance
When installing the products, please allow access for maintenance.
3. Tightening torque
When installing the products, please follow the listed torque specifications.

Mounting

1. Before piping
Make sure that all debris, cutting oil, dust, etc. are removed from the piping.
2. Wrapping of pipe tape
When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not get inside the piping. Also, when the pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Caution

1. Operating fluid
Please consult with SMC when using the product in applications other than compressed air (including vacuum).
Regarding products for general fluid, please ask SMC about applicable fluids.
2. Install an air dryer, aftercooler, etc.
Excessive condensate in a compressed air system may cause valves and other pneumatic equipment to malfunction.
Installation of an air dryer, after cooler etc. is recommended.
3. Drain flushing
If condensate in the drain bowl is not emptied on a regular basis, the bowl will over flow and allow the condensate to enter the compressed air lines.
If the drain bowl is difficult to check and remove, it is recommended that a drain bowl with the auto-drain option be installed.
For compressed air quality, refer to “Air Preparation Equipment” catalog.

Warning

1. Maintain the products
When installing the products, please allow access for maintenance.
2. Tightening torque
When installing the products, please follow the listed torque specifications.

Warning

1. Do not use in environments where the product is directly exposed to corrosive gases, chemicals, salt water, water or steam.
2. Do not expose the product to direct sunlight for an extended period of time.
3. Do not use in a place subject to heavy vibrations and/or shocks.
4. Do not mount the product in locations where it is exposed to radiant heat.

Maintenance

1. Maintenance procedures are outlined in the operation manual.
Not following proper procedures could cause the product to malfunction and could lead to damage to the equipment or machine.
2. Maintenance work
If handled improperly, compressed air can be dangerous.
Assembly, handling and repair of pneumatic systems should be performed by qualified personnel only.
3. Drain flushing
Remove drainage from air filters regularly. (Refer to the specifications.)
4. Shut-down before maintenance
Before attempting any kind of maintenance make sure the supply pressure is shut off and all residual air pressure is released from the system to be worked on.
5. Start-up after maintenance and inspection
Apply operating pressure and power to the equipment and check for proper operation and possible air leaks. If operation is abnormal, please verify product set-up parameters.
6. Do not make any modifications to the product.
Do not take the product apart.

Warning

1. Operating fluid
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For compressed air quality, refer to “Air Preparation Equipment” catalog.
Quality Assurance Information (ISO 9001, ISO 14001)

Reliable quality of products in the global market

To enable our customers throughout the world to use our products with even greater confidence, SMC has obtained certification for international standards “ISO 9001” and “ISO 14001”, and created a complete structure for quality assurance and environmental controls. SMC products pursue to meet its customers’ expectations while also considering company’s contribution in society.

Quality management system
ISO 9001

This is an international standard for quality control and quality assurance. SMC has obtained a large number of certifications in Japan and overseas, providing assurance to our customers throughout the world.

Environmental management system
ISO 14001

This is an international standard related to environmental management systems and environmental inspections. While promoting environmentally friendly automation technology, SMC is also making diligent efforts to preserve the environment.
SMC products complying with EN/ISO, CSA/UL standards are supporting CE marking. The CE mark indicates that machines and components meet essential requirements of all the EC Directives applied. It has been obligatory to apply CE marks indicating conformity with EC Directives when machines and components are exported to the member Nations of the EU. Once “A manufacturer himself” declares a product to be safe by means of CE marking (declaration of conformity by manufacturer), free distribution inside the member Nations of the EU is permissible.

**CE Mark**

SMC provides CE marking to products to which EMC and Low Voltage Directives have been applied, in accordance with CETOP (European hydraulics and pneumatics committee) guide lines.

**As of February 1998, the following 18 countries will be obliged to conform to CE mark legislation**

Iceland, Ireland, United Kingdom, Italy, Austria, Netherlands, Greece, Liechtenstein, Sweden, Spain, Denmark, Germany, Norway, Finland, France, Belgium, Portugal, Luxembourg

**EC Directives and Pneumatic Components**

- **Machinery Directive**
  The Machinery Directive contains essential health and safety requirements for machinery, as applied to industrial machines e.g. machine tools, injection molding machines and automatic machines. Pneumatic equipment is not specified in Machinery Directive. However, the use of SMC products that are certified as conforming to EN Standards, allows customers to simplify preparation work of the Technical Construction File required for a Declaration of Conformity.

- **Electromagnetic Compatibility (EMC) Directive**
  The EMC Directive specifies electromagnetic compatibility. Equipment which may generate electromagnetic interference or whose function may be compromised by electromagnetic interference is required to be immune to electromagnetic affects (EMS/immunity) without emitting excessive electromagnetic affects (EMI/emission).

- **Low Voltage Directive**
  This directive is applied to products, which operate above 50 VAC to 1000 VAC and 75 VDC to 1500 VDC operating voltage, and require electrical safety measures to be introduced.

- **Simple Pressure Vessels Directive**
  This directive is applied to welded vessels whose maximum operating pressure (PS) and volume of vessel (V) exceed 50 bar/L. Such vessels require EC type examination and then CE marking.
you to comply with EC directives and CSA/UL standards.

CSA Standards & UL Standards
UL and CSA standards have been applied in North America (U.S.A. and Canada) symbolizing safety of electric products, and are defined to mainly prevent danger from electric shock or fire, resulting from trouble with electric products. Both UL and CSA standards are acknowledged in North America as the first class certifying body. They have a long experience and ability for issuing product safety certificate. Products approved by CSA or UL standards are accepted in most states and governments beyond question. Since CSA is a test certifying body as the National Recognized Testing Laboratory (NRTL) within the jurisdiction of Occupational Safety and Health Administration (OSHA), SMC was tested for compliance with CSA Standards and UL Standards at the same time and was approved for compliance with the two Standards. The above CSA NRTL/C logo is described on a product label in order to indicate that the product is approved by CSA and UL Standards.

TSSA (MCCR) Registration Products
TSSA is the regulation in Ontario State, Canada. The products that the operating pressure is more than 5 psi (0.03 MPa) and the piping size is bigger than 1 inch. fall into the scope of TSSA regulation.

Products conforming to CE Standard
With CE symbol for simple visual recognition
In this catalog each accredited product series is indicated with a CE mark symbol. However, in some cases, every available models may not meet CE compliance. Please visit our web site for the latest selection of available models with CE mark.

http://www.smcworld.com
Europe

FINLAND SMC Pneumatics Finland OY
PL72, Tisstinlierityle 4, SF-02231 Espoo, Finland
TEL: 09-8595-80 FAX: 09-8595-859

NORWAY SMC Pneumatics Norway A/S
Vøltsveien 13C, Granfoss Næringspark N-1366 LYSEKIL, Norway
TEL: 67-12-90-20 FAX: 67-12-90-21

BELGIUM (Distributor) SMC Pneumatics N.V./S.A.
Nijverheidsstraat 20 B-2160 Wommelgem Belgium
TEL: 03-355-1464 FAX: 03-355-1466

POLAND SMC Industrial Automation Polska Sp.z.o.o.
ul. Konstruktorstwa 11A, PL-02-673 Warszawa, Poland
TEL: 022-548-5085 FAX: 022-548-5087

TURKEY (Distributor) Entek Prüfistik San.ve Tic. Ltd. Sti
Perpa Tic. Merkezi Kat:11 No.1625 80270 Okmeydani İstanbul, Turkey
TEL: 0212-221-1512 FAX: 0212-221-1519

RUSSIA SMC Pneumatics LLC.
36/40 Sredny prospect V.O. St. Petersburg 199004, Russia
TEL: 812-118-5445 FAX: 812-118-5449

CZECH SMC Industrial Automation CZ s.r.o.
Hudcova 78a, CZ-61200 Brno, Czech Republic
TEL: 05-4121-8034 FAX: 05-4121-8034

HUNGARY SMC Hungary Ipari Automatizálási kft.
Budatők ut 107-113 1117 Budapest
TEL: 01-371-1343 FAX: 01-371-1344

ROMANIA SMC Romania S.r.l.
Str. Frunzei, Nr. 29, Sector 2, Bucharest, Romania
TEL: 01-3205111 FAX: 01-3261489

SLOVAKIA SMC Priemyselná automatizácia, s.r.o
Nová 3, SK-83103 Bratislava
TEL: 02-4445-6275 FAX: 02-4445-6028

SLOVENIA SMC Industrijska Avtomatika d.o.o.
Grajski trg 15, SLO-8360 Zuzemberk, Slovenia
TEL: 07388-5240 FAX: 07388-5249

LATVIA SMC Pneumatics Latvia SIA
Smeļu iel 1-705, Riga LV-1006
TEL: 777 94 74 FAX: 777 94 75

SOUTH AFRICA (Distributor) Hyflo Southern Africa (Pty.) Ltd.
P.O.Box 240 PaardenEiland 7420 South Africa
TEL: 021-511-7021 FAX: 021-511-4456

EGYPT (Distributor) Saadani Trading & Ind. Services
15 Sebaai Street, Miami 21411 Alexandria, Egypt
TEL: 3-548-50-34 FAX: 3-548-50-34

Oceania/Asia

AUSTRALIA SMC Pneumatics (Australia) Pty.Ltd.
14-18 Hudson Avenue Castle Hill NSW 2154, Australia
TEL: 02-9354-8222 FAX: 02-9894-5719

NEW ZEALAND SMC Pneumatics (New Zealand) Ltd.
6C Sylvia Park Road Mt.Wellington Auckland, New Zealand
TEL: 09-573-7027 FAX: 09-573-7002

TAIWAIN SMC Pneumatics (Taiwan) Co., Ltd.
17, Lane 205, Nansan Rd., Sec.2, Luzhu-Hsiang, Taoyuan-Hsien, TAIWAN
TEL: 03-322-3443 FAX: 03-322-3387

HONG KONG SMC Pneumatics (Hong Kong) Ltd.
29/F, Clifford Centre, 778-784 Cheung, Sha Wan Road, Lai Chi Kok, Kowloon, Hong Kong
TEL: 2744-0121 FAX: 2785-1314

SINGAPORE SMC Pneumatics (S.E.A.) Pte. Ltd.
89 Tuas Avenue 1, Jurong Singapore 639520
TEL: 6861-0888 FAX: 6861-1889

PHILIPPINES SHOKETSU SMC Corporation
Unit 201 Common Goal Tower, Madrigal Business Park, Ayala Alabang Muntinlupa, Philippines
TEL: 02-8095066 FAX: 02-8095086

Lot 36 Jalan Delima1/1, Subang Hi-Tech Industrial Park, Batu 3 40000 Shah Alam Selangor, Malaysia
TEL: 03-56350590 FAX: 03-56350602

SOUTH KOREA SMC Pneumatics Korea Co., Ltd.
Woolim e-BIZ Center (Room 1008), 170-5, Guro-Dong, Guro-Gu, Seoul, 152-050, South Korea
TEL: 02-3219-0700 FAX: 02-3219-0702

CHINA SMC (China) Co., Ltd.
7 Wan Yuan St. Beijing Economic & Technological Development Zone 100176, China
TEL: 010-67882111 FAX: 010-67881837

THAILAND SMC Thailand Ltd.
134/6 Moo 5, Tiwanon Road, Bangkadi, Amphur Muang, Pathumthani 12000, Thailand
TEL: 02-963-7099 FAX: 02-501-2937

INDIA SMC Pneumatics (India) Pvt. Ltd.
D-107 to 112, Phase-2, Extension, Noida, Dist. Gautam Budh Nagar, U.P., 201 305, India
TEL: (0120)-4568730 FAX: 0120-4568933

INDONESIA (Distributor) P.T. Riyadi Putera Makmur
Jalan Hayam Wuruk Komplek Glodok Jaya No. 27-28 Jakarta 11180 Indonesia
TEL: 021-625-5548 FAX: 021-625-5888

PAKISTAN (Distributor) Jubilee Corporation
First Floor Mercantile Centre, Newton Road Near Bolton Market P.O. Box 6165 Karachi 74000 Pakistan
TEL: 021-243-1070/4849 FAX: 021-242-1589

ISRAEL (Distributor) Baccara Automation Control
Kuzvat Geva 18919 Israel
TEL: 04-653-5960 FAX: 04-653-1445

SAUDI ARABIA (Distributor) Assagaff Trading Est.
P.O. Box 3385 Al-Amir Majed Street, Jeddah-21471, Saudi Arabia
TEL: 02-6706174 FAX: 02-6708173
Flow Control Equipment Precautions

Be sure to read before handling. Refer to pages 15-18-3 to 15-18-4 for Safety Instructions and Common Precautions on the products mentioned in this catalog, and refer to main text for more detailed precautions on every series.

**Precautions**

**Warning**

1. Products mentioned in this catalog are not designed for the use as stop valve with zero air leakage. A certain amount of leakage is allowed in the product’s specifications.

**Warning**

1. Check that the lock nut is tightened. A loose lock nut may cause actuator speed changes.

2. Confirm the degree of rotation of the needle valve. Products mentioned in this catalog are retainer type so that the needle is not removed completely. Over rotation will cause damage.

3. Do not use tools such as pliers to rotate the handle. It can cause idle rotation of the handle or damage.

4. Confirm air flow direction. Mounting backwards is dangerous, because the speed adjustment needle will not work and the actuator may lurch suddenly.

5. Adjust needle by opening the needle slowly after having closed it completely. Loose needle valves may cause unexpected sudden actuator extension. When needle valve is turned clockwise, it is closed and cylinder speed decreases. When needle valve is turned counter clockwise, it is open and cylinder speed increases.

6. Do not apply excessive force or shock to the body or fittings with an impact tool. It can cause damage or air leakage.

**Selection**

**Mounting**

**Warning**

1. To install/remove the Flow Control Equipment, tighten/loosen at wrench flat B as close to the thread as possible using the appropriate wrench. Do not apply torque at other points as the product may be damaged. Rotate Body A manually for positioning after installation.

2. Do not use universal type fittings for applications involving continuous rotation. The fitting section may be damaged.

**Tightening Torque**

1. The tightening torque for pipe fittings is as shown in the table. As a rule, they should be tightened 2 to 3 turns with a tool after first tightening by hand. Be careful not to cause damage by over-tightening.

<table>
<thead>
<tr>
<th>Male thread</th>
<th>Suitable screw torque (N·m)</th>
<th>Hexagon width across flats (mm)</th>
<th>Adjustable spanner nominal (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3</td>
<td>1/4</td>
<td>4.5</td>
<td>—</td>
</tr>
<tr>
<td>M5</td>
<td>1/6 turn after hand tightening</td>
<td>8</td>
<td>100</td>
</tr>
<tr>
<td>10/32-UNF</td>
<td>7 to 9</td>
<td>14</td>
<td>150</td>
</tr>
<tr>
<td>1/8</td>
<td>12 to 14</td>
<td>17</td>
<td>200</td>
</tr>
<tr>
<td>3/8</td>
<td>22 to 24</td>
<td>21</td>
<td>200</td>
</tr>
<tr>
<td>1/2</td>
<td>28 to 30</td>
<td>24</td>
<td>200</td>
</tr>
</tbody>
</table>

**Lock Nut Tightening Torque**

1. Suitable screw torque for a hexagon lock nut is shown in the table below. For standard installation, turn 15 to 30° using tool, after fastening by hand. Pay attention not to over torque the product.

<table>
<thead>
<tr>
<th>Body size</th>
<th>Suitable screw torque (N·m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M3</td>
<td>0.07</td>
</tr>
<tr>
<td>M5</td>
<td>0.3</td>
</tr>
<tr>
<td>1/8</td>
<td>1</td>
</tr>
<tr>
<td>1/4</td>
<td>1.5</td>
</tr>
<tr>
<td>3/8</td>
<td>4</td>
</tr>
<tr>
<td>1/2</td>
<td>10</td>
</tr>
</tbody>
</table>
**Precautions**

### Handling of One-touch Fittings

**Caution**
1. Refer to page 15-1-11 for One-touch Fitting.

### Series ASD

**Operation**

**Caution**
1. Single acting cylinder

When controlling a single acting cylinder, the cylinder’s return speed will differ depending on the operating conditions. Operate after confirming the maximum return speeds shown in the table below.

<table>
<thead>
<tr>
<th>Speed Controller</th>
<th>Cylinder</th>
<th>Solenoid valve</th>
<th>Tubing</th>
<th>Silencer</th>
<th>Maximum return speed (mm/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASD230F</td>
<td>CJ2</td>
<td>VJ500</td>
<td>TU604</td>
<td>AN110-01</td>
<td>100, 200, 300, 400</td>
</tr>
<tr>
<td>ASD330F</td>
<td>CM2</td>
<td>VZ500</td>
<td>TU604</td>
<td>AN110-01</td>
<td>100, 200, 300, 400</td>
</tr>
</tbody>
</table>

*<Operating conditions>*
- Cylinder extension speed: 100 mm/s
- Meter-out needle fully open

*Values at 0.5 MPa and 20°C.*

(Reference) Recommended circuit for high return speed

When low extension speed and high return speed are desired, the following circuit using 3-port is recommended.

**Series ASN2**

### Selection

**Warning**
1. Inappropriate Circuits
(a) “Perfect Valve” (VF866, VS7-6-FPG, VS7-8-FPG)
(b) Pilot check valve between Actuator and Valve

Residual pressure behind the exhaust needle may cause check valve malfunction in the “Perfect Valve”.

Residual pressure behind the exhaust needle may cause check valve to malfunction.

### Mounting

**Caution**
1. If installing flow controls to valve ports, interference may occur with the fittings. Please consult the catalog before installing.

**Series AK**

**Caution**
1. Vibrations may generate due to operating conditions, etc., even if the specifications are in the range mentioned in the catalog. Please consult with SMC.

2. Cracking pressure is a pressure at which the valve starts opening and not a pressure at which the valve is fully open.

Note) Use Series AS-F with -X214 for the throttle valve.