In-line Air Filter

Operating pressure range: −100 kPa to 1.0 MPa

Both positive pressure and vacuum pressure can be used with one unit!

Positive pressure 1.0 MPa

e.g.) Protection of solenoid valves

Positive pressure 0 to 1 MPa

Vacuum pressure −100 kPa

Vacuum pressure −100 to 0 kPa

Filtration
5 μm

Series Variations

<table>
<thead>
<tr>
<th>Series</th>
<th>Applicable tubing O.D.</th>
<th>Maximum flow rate under positive pressure [L/min (ANR)]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Metric size</td>
<td>Inch size</td>
</tr>
<tr>
<td>ZFC5</td>
<td>ø4</td>
<td>ø5/32&quot;</td>
</tr>
<tr>
<td></td>
<td>ø6</td>
<td>ø1/4&quot;</td>
</tr>
<tr>
<td>ZFC7</td>
<td>ø6</td>
<td>ø1/4&quot;</td>
</tr>
<tr>
<td></td>
<td>ø8</td>
<td>ø5/16&quot;</td>
</tr>
<tr>
<td></td>
<td>ø10</td>
<td>ø3/8&quot;</td>
</tr>
<tr>
<td></td>
<td>ø12</td>
<td>—</td>
</tr>
</tbody>
</table>

Flow rate (positive pressure) conditions: Supply pressure 0.1 MPa, Differential pressure 30 kPa

Series ZFC

Metric size: 5 sizes

Inch size: 4 sizes

Light grey

Orange

New

RoHS

CAT.EUS100-103A-UK
With lock mechanism
During positive pressure, prevents components from being scattered when they are loosened.

2 types of transparent case materials are available.
- Polycarbonate (Standard)
  Possible to degrease with alcohol.
- Nylon (Made to Order)
  Resistant to coolant oil

Available with different bores on IN and OUT sides
- Made to Order

2 element colours are available.
- Blue element (Made to Order)
- White element (Standard)

Adhesion of foreign matter
- No adhesion of foreign matter
- Made to Order

With One-touch fitting
- Metric size: ø4 to ø12
- Inch size: ø5/32” to ø3/8”

2 levels of filtration rating are available.
- 5 μm
- 10 μm/Made to Order

Application examples
- Improvement of air quality for air blow
- Flexible mounting orientation

- Allow a sufficient margin of tube length when piping, in order to prevent twisting, tensile, moment loads, vibration or impact being applied to the tubes and filter body.
Filter Variations

For positive pressure:
- Series AF
  - ZFC54: to 100 L/min (ANR)
  - ZFC77: to 100 L/min (ANR)
  - ZFB: to 200 L/min (ANR)

For vacuum pressure:
- ZFA

Flow rate (positive pressure) conditions: Supply pressure 0.1 MPa, Differential pressure 30 kPa

Flow rate under vacuum condition
Flow rate under positive pressure

Easy to install to the line
Flexible mounting orientation
Space-saving

Features 2
In-line Air Filter
Series ZFC

How to Order

ZFC 5 4 B

Body size

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Body size</th>
<th>Filtration area</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>20 L/min</td>
<td>750 mm²</td>
</tr>
<tr>
<td>7</td>
<td>100 L/min</td>
<td>1260 mm²</td>
</tr>
</tbody>
</table>

Applicable tubing O.D.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Applicable tubing O.D.</th>
<th>ZFC5</th>
<th>ZFC7</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>ø4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ø5/32”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>ø6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>ø8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>ø10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>ø12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Inch size

<table>
<thead>
<tr>
<th>Option</th>
<th>None</th>
<th>With bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specifications

<table>
<thead>
<tr>
<th>Port size (Applicable tubing O.D.)</th>
<th>Metric size</th>
<th>ZFC5</th>
<th>ZFC7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inch size</td>
<td>ø4</td>
<td>ø6</td>
<td>ø6</td>
</tr>
<tr>
<td></td>
<td>ø5/32”</td>
<td>ø1/4”</td>
<td>ø1/4”</td>
</tr>
<tr>
<td></td>
<td>ø6</td>
<td>ø8</td>
<td>ø5/16”</td>
</tr>
<tr>
<td></td>
<td>ø8</td>
<td>ø10</td>
<td>ø3/8”</td>
</tr>
<tr>
<td>Fluid</td>
<td>Air, Nitrogen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating pressure</td>
<td>-100 kPa to 1.0 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow rate (Positive pressure) [L/min]</td>
<td>45</td>
<td>120</td>
<td>250</td>
</tr>
<tr>
<td>Flow rate (Vacuum pressure) [L/min]</td>
<td>10</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Proof pressure [MPa]</td>
<td>1.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating and ambient temperature range [°C]</td>
<td>0 to 60</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filtration [μm]</td>
<td>5 (Filtration efficiency 95%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element replacement differential pressure [MPa]</td>
<td>0.1 (Vacuum pressure 20 kPa)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filtration area [mm²]</td>
<td>750</td>
<td>1260</td>
<td></td>
</tr>
<tr>
<td>Applicable tubing material</td>
<td>Nylon, Soft nylon, Polyurethane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight [g]</td>
<td>10.5</td>
<td>20.0</td>
<td>25.0</td>
</tr>
<tr>
<td>Internal capacity [cm³]</td>
<td>4.5</td>
<td>6.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Total length [mm]</td>
<td>53.9</td>
<td>68.4</td>
<td>79.7</td>
</tr>
<tr>
<td>Total width [mm]</td>
<td>19.0</td>
<td>23.6</td>
<td></td>
</tr>
<tr>
<td>Bracket total length [mm]</td>
<td>23.0</td>
<td>27.3</td>
<td></td>
</tr>
<tr>
<td>Case material</td>
<td>Polycarbonate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note) Flow rate (positive pressure) conditions: Supply pressure 0.1 MPa, Differential pressure 30 kPa

Max. Operating Pressure and Operating Temperature
Flow Characteristics

ZFC53 ø4

ZFC54 ø6

ZFC74 ø6

ZFC75 ø8

ZFC76 ø10

ZFC77 ø12
**Series ZFC**

### Construction

#### Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Case</td>
<td>PC</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Cover</td>
<td>Resin PBT</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Element</td>
<td>Sintered resin</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Seal</td>
<td>HNBR</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Bracket</td>
<td>Resin PBT</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Replacement Element Part No.

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Applicable filter model</th>
<th>Element size</th>
<th>Set description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZFC-EL-3</td>
<td>ZFC5</td>
<td>ø12 x ø8 x L20</td>
<td>Spare element: 10 pcs.</td>
</tr>
<tr>
<td>ZFC-EL-4</td>
<td>ZFC7</td>
<td>ø16 x ø12 x L25</td>
<td>Spare element: 10 pcs.</td>
</tr>
</tbody>
</table>

### Element Replacement

**Procedure**

1. Stop operation and reduce the filter’s internal pressure to atmosphere.
2. Slide the lock mechanism in the direction of the arrow to release the lock.
3. Rotate the cover counterclockwise at least 90 degrees.
4. Pull the cover out of the case to remove the element. Remove dust and other debris remaining inside the case by blowing it out with air, etc. (Also, confirm that the O-ring is not damaged.)
5. Install a new element on cover and insert it into the case.
6. Align the raised part of the cover with the model no. display of the body, and push the cover to the end of the body and rotate it clockwise until it stops.
7. Set the lock mechanism and check that the cover is locked completely.
Dimensions

ZFC5
(ø4, ø6)

ZFC7
(ø6, ø8, ø1/4", ø5/16")

ZFC7
(ø10, ø12, ø3/8")

Applicable tubing O.D.
(ø4, ø6)

Applicable tubing O.D.
(ø6, ø8, ø1/4", ø5/16")

Applicable tubing O.D.
(ø10, ø12, ø3/8")

In-line Air Filter Series ZFC
Series ZFC
Made to Order
Please contact SMC for detailed specifications, dimensions and delivery.

1. Different diameters (IN side < OUT side)
   - Symbol: X01
   - ZFC5
   - IN side applicable tubing O.D. (Metric size): ø4
   - OUT side applicable tubing O.D. (Metric size): ø6
   - Applicable tubing O.D.
   - Option
   - IN side < OUT side
   - Option
   - None
   - With bracket

2. Different diameters (IN side > OUT side)
   - Symbol: X02
   - ZFC7
   - IN side applicable tubing O.D. (Metric size): ø8 to ø12
   - OUT side applicable tubing O.D. (Metric size): ø6 to ø10
   - Applicable tubing O.D.
   - Option
   - None
   - With bracket

3. Blue element
   - Symbol: X03
   - Easy to recognize white foreign matter on the element by colouring the element.
   - Standard product
   - Filteration: 10 μm

4. Filtration: 10 μm
   - Symbol: X04
   - Standard product
   - Blue element

5. Seal material: FKM
   - Oil free: Seal
   - Symbol: X05
   - Standard product

6. Case material: Nylon
   - Symbol: X06
   - Case material: Nylon
Series ZFC
Specific Product Precautions 1
Be sure to read before handling. Refer to back cover for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) and Operation Manual for Vacuum Equipment Precautions. Please download it via our website, http://www.smc.eu

Mounting

⚠️ Warning

1. Operation manual
   Install the products and operate them only after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

2. Maintenance space
   Allow sufficient space for maintenance and inspection.

3. Observe the tightening torque for screws.
   Tighten the screws to the recommended torque for mounting the product.

4. Connect tubing to the IN and OUT One-touch fittings in accordance with the precautions for One-touch fittings.

⚠️ Caution

1. Connect the piping after checking the arrow indication showing the flow direction on the body. If the piping is connected the other way around, it is not possible to seal the element.

2. Positive and negative pressures cannot be used together in the same circuit.

3. Allow a sufficient margin of tube length when piping, in order to prevent twisting, tensile, moment loads, vibration or impact being applied to the tubes and filter body.

Maintenance

⚠️ Warning

5. The performance of an ejector will deteriorate due to clogged suction filters and silencers.
   High flow filters should be used, especially in dusty locations.

   ![Diagram of vacuum system]

If a filter is required on the release pressure side, a different filter should be prepared.

> Not possible to use vacuum pressure and positive pressure together in the same line.

6. When the element becomes clogged, stop operation and adjust the internal pressure of the filter to atmospheric pressure before replacing the element.

⚠️ Caution

1. Element should be replaced in either of the two cases below.
   1) When pressure drop reaches 0.1 MPa in a positive pressure or 20 kPa in a vacuum pressure.
   2) When the set values (flow rate, vacuum reaching time) change.

2. During disassembly and assembly, confirm that there are no scratches or damage, etc, on the O-ring.

3. Before using, confirm there is no leakage after replacing elements.
Recommended Piping Conditions

1. When connecting piping to the One-touch fitting, use pipe length with sufficient margin, in accordance with the piping conditions shown in Figure 1.
   Also, when using a tying band, etc., to bind the piping together, make sure that external force does not come to bear on the fitting. (see Figure 2)

<table>
<thead>
<tr>
<th>Tubing size</th>
<th>Mounting pitch A</th>
<th>Straight-line pipe length</th>
</tr>
</thead>
<tbody>
<tr>
<td>ø4, 5/32&quot;</td>
<td>56 or more</td>
<td>20 or more</td>
</tr>
<tr>
<td>ø6</td>
<td>84 or more</td>
<td>39 or more</td>
</tr>
<tr>
<td>ø1/4&quot;</td>
<td>89 or more</td>
<td>56 or more</td>
</tr>
<tr>
<td>ø8, 5/16&quot;</td>
<td>112 or more</td>
<td>58 or more</td>
</tr>
<tr>
<td>ø10</td>
<td>140 or more</td>
<td>70 or more</td>
</tr>
<tr>
<td>ø3/8&quot;</td>
<td>134 or more</td>
<td>76 or more</td>
</tr>
<tr>
<td>ø12</td>
<td>168 or more</td>
<td>82 or more</td>
</tr>
</tbody>
</table>

Handling of One-touch Fittings

**Caution**

1. Tubing attachment/detachment for One-touch fittings
   1) Installing of tubing
      (1) Use tubing with no flaws on its periphery and cut it off at a right angle. When cutting the tubing, use a tube cutter, TK-1, 2 or 3. Do not use pinchers, nippers or scissors, etc. If cutting is done with tools other than tube cutters, the tubing may be cut diagonally or become flattened, etc. This can make a secure installation impossible, and cause problems such as the tubing pulling out after installation or air leakage. Allow some extra length in the tubing.
      (2) The outside diameter of the polyurethane tubing swells when internal pressure is applied to it. Therefore, it may not be possible that the tubing can be re-inserted into the One-touch fitting. Confirm the tubing outside diameter, and when the accuracy of the outside diameter is +0.15 or larger, re-insert the tubing into the One-touch fitting without cutting it. When the tubing is re-inserted into the One-touch fitting, confirm that the tubing goes through the release button smoothly.
      (3) Grasp the tubing and push it in slowly, inserting it securely all the way into the fitting.
      (4) After inserting the tubing, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tubing pulling out.
   2) Removal of tubing
      (1) Push in the release button sufficiently. When doing this, push the collar evenly.
      (2) Pull out the tubing while holding down the release button so that it does not come out. If the release button is not pressed down sufficiently, there will be increased bite on the tubing and it will become more difficult to pull it out.
      (3) When the removed tubing is to be used again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tubing is used as it is, this can cause trouble such as air leakage or difficulty in removing the tubing.
2. Do not install the SMC’s KQ One-touch fitting series with a metal rod into the ZFC5 series fittings. The metal rod will not be held and the fitting will shoot out.
### Operating Environment

**Warning**

1. Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.

2. Do not use in a place subject to heavy vibration and/or shock.

3. Do not use in an environment where flammable gas or explosive gas exists. Usage may cause a fire or explosion. The products do not have an explosion proof construction.

4. The valve should not be exposed to prolonged sunlight. Use a protective cover.

5. Remove any sources of excessive heat.

6. In locations where there is contact with spatter from water, oil, solder, etc., take suitable protective measures.

### Air Supply

**Warning**

1. **Type of fluids**
   
   Please consult with SMC when using the product in applications other than compressed air.

2. **When there is a large amount of drainage.**
   
   Compressed air containing a large amount of drainage can cause malfunction of pneumatic equipment. An air dryer or water droplet separator should be installed upstream from filters.

3. **Drain flushing**
   
   If condensate in the drain bowl is not emptied on a regular basis, the condensate will overflow and allow it to enter the compressed air lines. This will cause a malfunction of pneumatic equipment. If the drain bowl is difficult to check and remove, installation of a drain bowl with an auto drain option is recommended.

   Refer to “SMC Air Preparation System” for further details on compressed air quality.

4. **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.

### Design

**Warning**

1. **Confirm the specifications.**

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

   Please contact SMC when using a fluid other than compressed air (including vacuum).

   We do not guarantee against any damage if the product is used outside of the specification range.

2. **Modification prohibited**

   Do not make any modifications, including additional machining. It may cause human injury and/or an accident and will void the warranty.

### Other Tube Brands

**Caution**

1. **When tubing of brands other than SMC’s are used, verify that the tubing O.D. satisfies the following accuracy;**

   1) Nylon tubing  : Within ±0.1 mm
   2) Soft nylon tubing  : Within ±0.1 mm
   3) Polyurethane tubing  : Within +0.15 mm, Within –0.2 mm

   Do not use tubing which does not meet these outside diameter tolerances. It may not be possible to connect them, or they may cause other trouble, such as air leakage or the tube pulling out after connection.

2. **Connecting products with metal rods**

   After connecting the products with metal rods (Series KC, etc.) to the One-touch fittings, do not use tubes, resin plugs or reducers, etc. These may come off the fittings.
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.

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.

1. The compatibility of the product is the responsibility of the person who designs the product 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 catalogue 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.

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 environments other than those specified in the product catalogue.

   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.

5. Use in an interlock circuit, which requires the provision of double interlock for measures if the product is to be used in any of the following conditions.

6. 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.

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 catalogue for the particular products.

Compliance Requirements

1. The product herein described is basically provided for peaceful use in manufacturing industries.

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.

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Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.