

In-line Air Filter

Series ZFC

For tubing sizes $\phi 2$ and $\phi 3.2$, refer to Air Suction Filter/Series ZFC on SMC website.

RoHS

Operating pressure range **-100 kPa to 1.0 MPa**

Both positive pressure and vacuum pressure can be used with one unit! Filtration **5 μm**

Positive pressure 1.0 MPa

Positive pressure 0 to 1 MPa


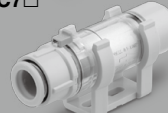
e.g.) Protection of solenoid valves

Vacuum pressure -100 kPa

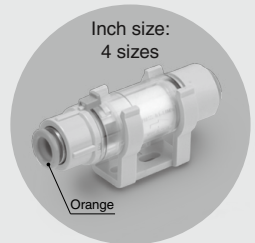
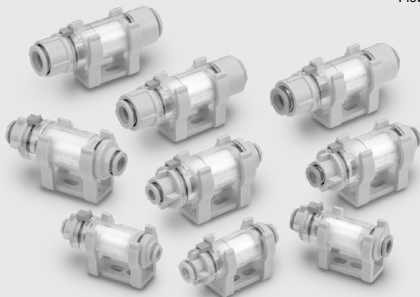
Vacuum pressure -100 to 0 kPa

Protection of equipment under dust environment

Series Variations

Series	Applicable tubing O.D.		Maximum flow rate under positive pressure [L/min (ANR)]		
	Metric size	Inch size	100	200	300
ZFC5 	$\phi 4$	$\phi 5/32"$	45		
	$\phi 6$	$\phi 1/4"$	100		
ZFC7 	$\phi 6$	$\phi 1/4"$	120		
	$\phi 8$	$\phi 5/16"$	250		
	$\phi 10$	$\phi 3/8"$	300		
	$\phi 12$	—	350		

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



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2 types of transparent case materials are available.

- Polycarbonate (Standard)
Possible to degrease with alcohol.



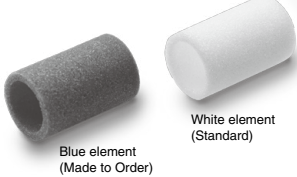
- Nylon (Made to Order)
Resistant to coolant oil

With lock mechanism

During positive pressure, prevents components from being scattered when they are loosened.

2 element colors are available.

No adhesion of foreign matter



Blue element
(Made to Order)

White element
(Standard)

Adhesion of foreign matter



Easy to visually check white foreign matter

2 levels of filtration rating are available.

- 5 μm
- 10 μm/Made to Order

With One-touch fitting

Metric size: $\phi 4$ to $\phi 12$
Inch size: $\phi 5/32''$ to $\phi 3/8''$

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

IN side < OUT side

Applicable tubing O.D.

IN port size	OUT port size
$\phi 4$	$\phi 6$



IN side > OUT side

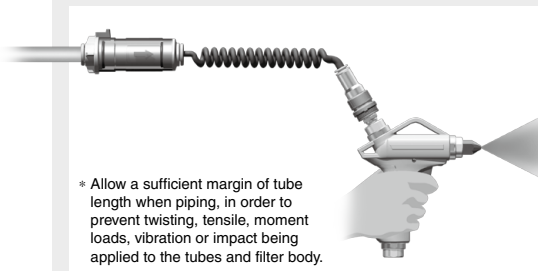
Applicable tubing O.D.

IN port size	OUT port size
$\phi 8$	$\phi 6$
$\phi 10$	$\phi 8$
$\phi 12$	$\phi 10$



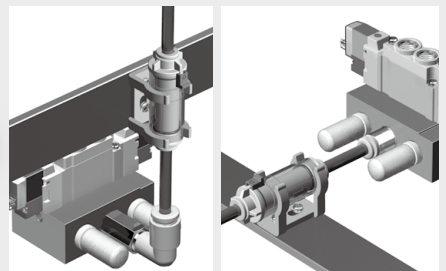
Application examples

Improvement of air quality for air blow

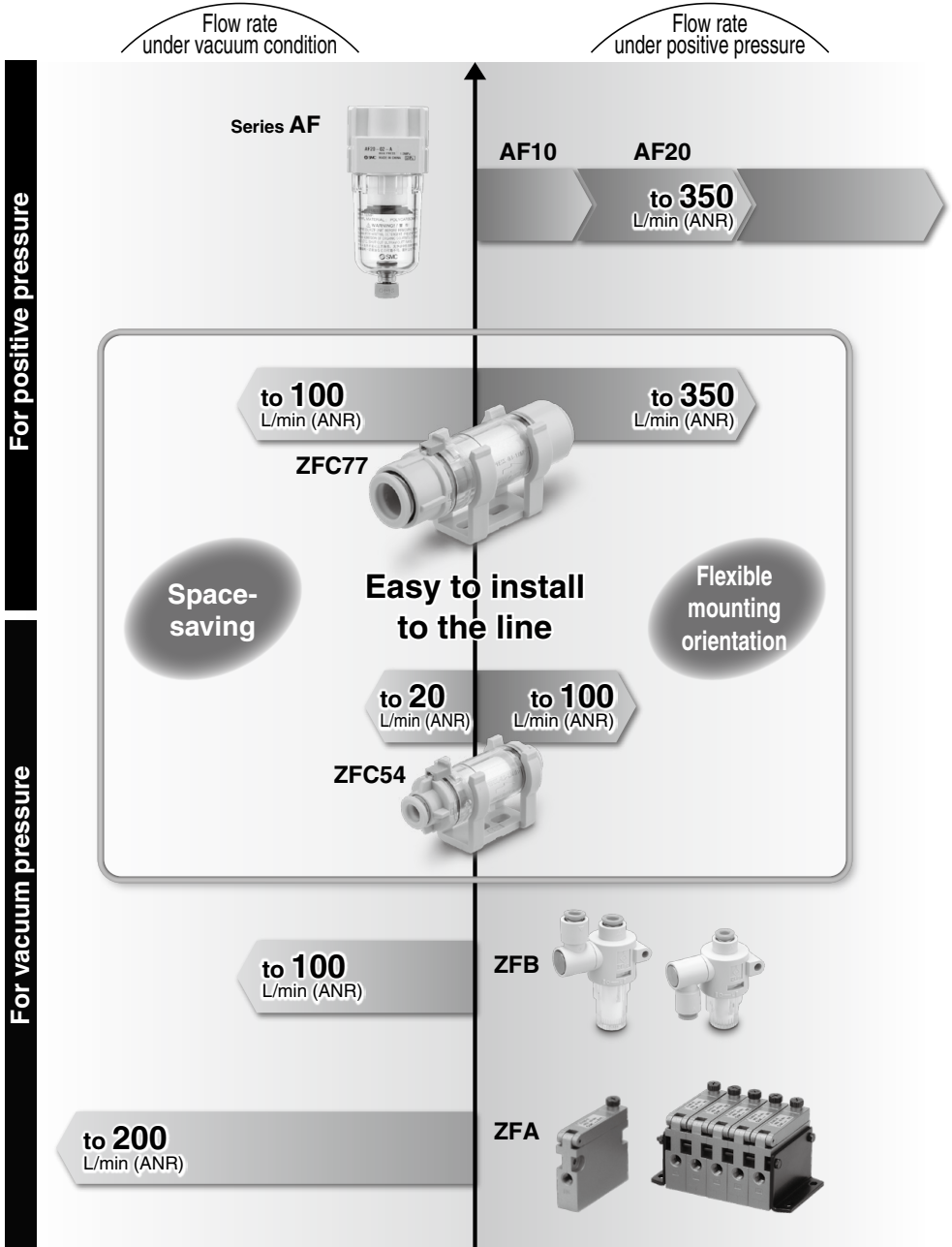


* Allow a sufficient margin of tube length when piping, in order to prevent twisting, tensile, moment loads, vibration or impact being applied to the tubes and filter body.

Flexible mounting orientation



Filter Variations



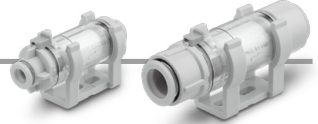
Flow rate (positive pressure) conditions: Supply pressure 0.1 MPa, Differential pressure 30 kPa

In-line Air Filter

Series ZFC

RoHS

How to Order



ZFC **5** **4** - **B** -

Body size

Symbol	Body size	Filtration area
5	20 L/min	750 mm ²
7	100 L/min	1260 mm ²

Applicable tubing O.D.

Symbol	Applicable tubing O.D.	Metric size	
		ZFC5	ZFC7
3	ø4	●	—
4	ø6	●	●
5	ø8	—	●
6	ø10	—	●
7	ø12	—	●

Inch size

B	ø5/32"	●	—
D	ø1/4"	●	●
E	ø5/16"	—	●
F	ø3/8"	—	●

Made to Order

Refer to page 1114 for details.

Symbol	Specifications
X01	Different diameters (IN side < OUT side)
X02	Different diameters (IN side > OUT side)
X03	Blue element
X04	Filtration: 10 µm
X05	FKM/Oil free (Seal)
X06	Nylon

Option

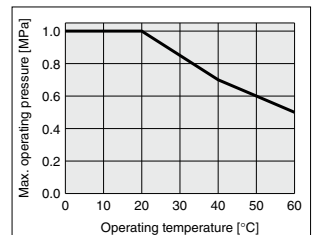
Nil	None
B	With bracket

Specifications

Model		ZFC5□		ZFC7□			
Port size (Applicable tubing O.D.)	Metric size	ø4	ø6	ø6	ø8	ø10	ø12
	Inch size	ø5/32"	ø1/4"	ø1/4"	ø5/16"	ø3/8"	—
Fluid	Air, Nitrogen						
Operating pressure	-100 kPa to 1.0 MPa						
Flow rate (Positive pressure) L/min ^{Note}	45	100	120	250	300	350	
Flow rate (Vacuum pressure) L/min	10	20	30	70	80	100	
Proof pressure MPa	1.5						
Operating and ambient temperature range °C	0 to 60						
Filtration µm	5 (Filtration efficiency 95%)						
Element replacement differential pressure MPa	0.1 (Vacuum pressure 20 kPa)						
Filtration area mm ²	750			1260			
Applicable tubing material	Nylon, Soft nylon, Polyurethane						
Weight g	10.5		20.0		25.0		
Internal capacity cm ³	4.5		6.0		7.0		
Total length mm	53.9		68.4		79.7		
Total width mm	19.0			23.6			
Bracket total length mm	23.0			27.3			
Case material	Polycarbonate						

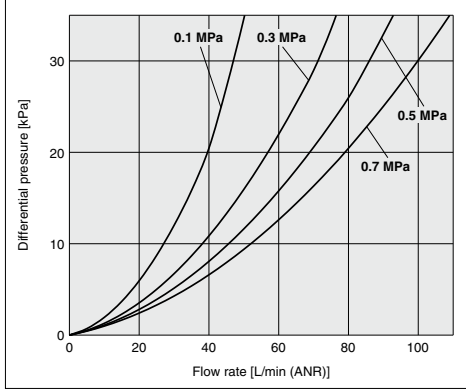
Note) Flow rate (positive pressure) conditions: Supply pressure 0.1 MPa, Differential pressure 30 kPa

Max. Operating Pressure and Operating Temperature

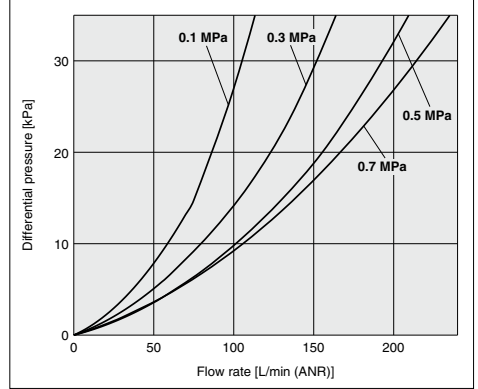


Flow Characteristics

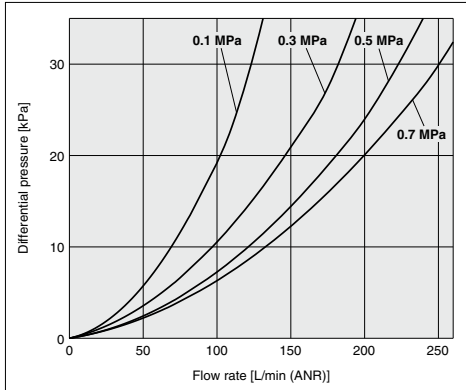
ZFC53 $\phi 4$



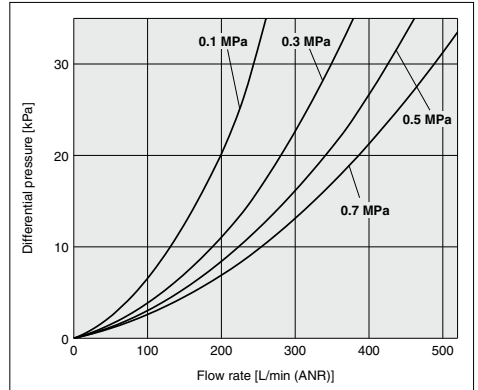
ZFC54 $\phi 6$



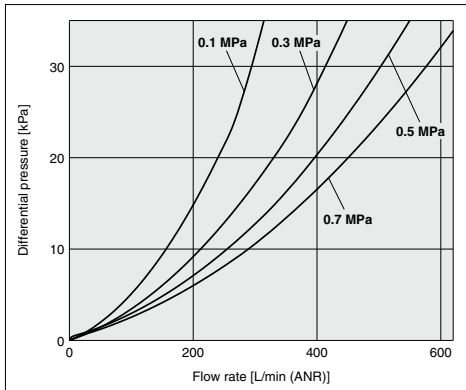
ZFC74 $\phi 6$



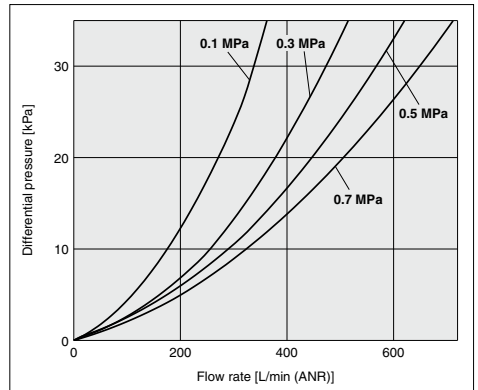
ZFC75 $\phi 8$



ZFC76 $\phi 10$



ZFC77 $\phi 12$



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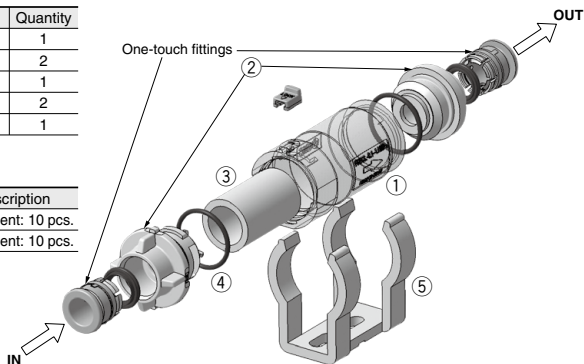
Construction

Component Parts

No.	Description	Material	Quantity
1	Case	PC	1
2	Cover	Resin PBT	2
3	Element	Sintered resin	1
4	Seal	HNBR	2
5	Bracket	Resin PBT	1

Replacement Element Part No.

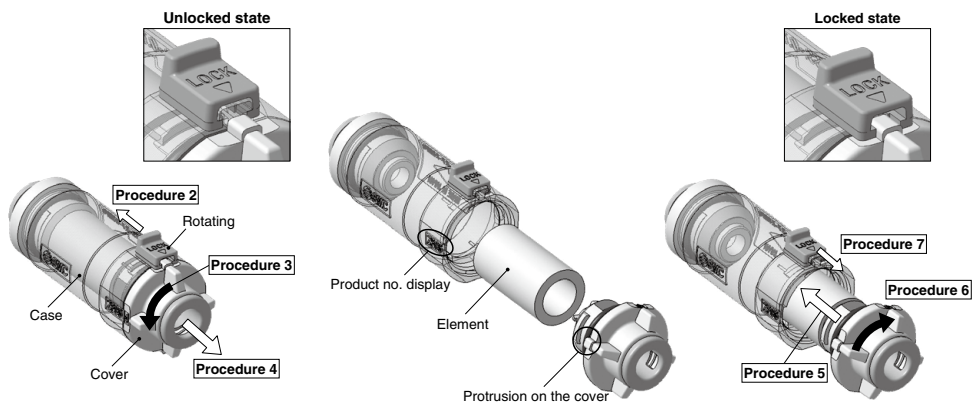
Part no.	Applicable filter model	Element size	Set description
ZFC-EL-3	ZFC5	ø12 x ø8 x L20	Spare element: 10 pcs.
ZFC-EL-4	ZFC7	ø16 x ø12 x L25	Spare element: 10 pcs.



Element Replacement

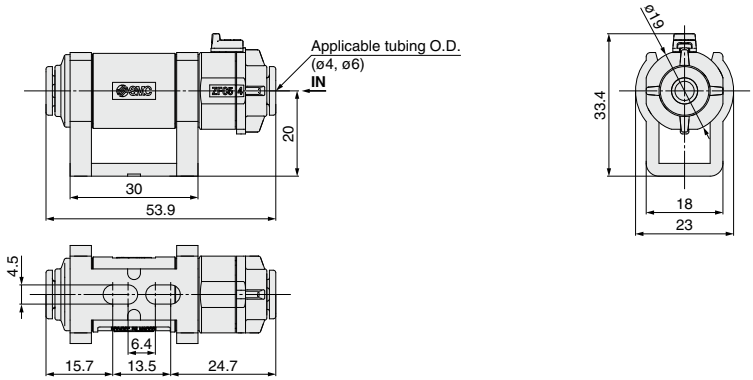
Procedure

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.

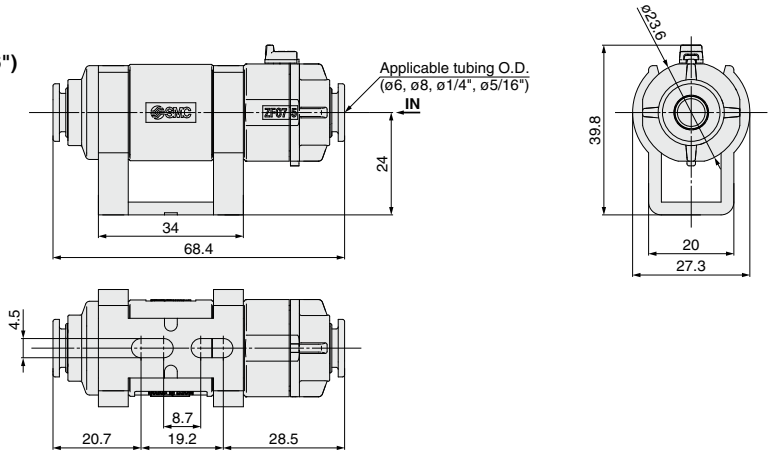


Dimensions

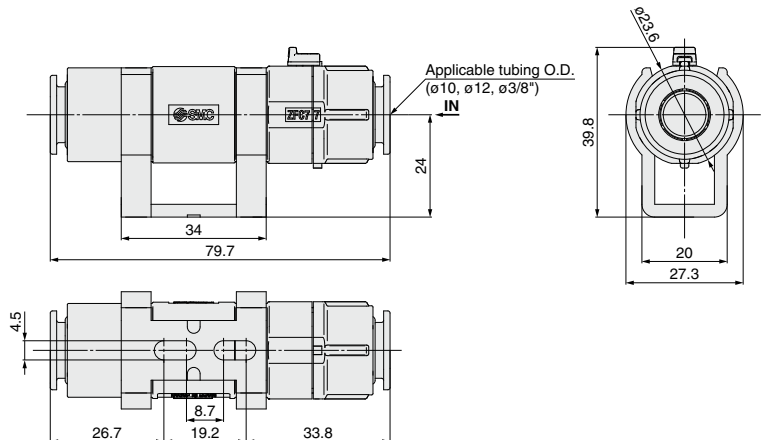
ZFC5
($\phi 4$, $\phi 6$)



ZFC7
($\phi 6$, $\phi 8$, $\phi 1/4$ ", $\phi 5/16$ ")



ZFC7
($\phi 10$, $\phi 12$, $\phi 3/8$ ")



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- ZFC**

Series ZFC

Made to Order

Please contact SMC for detailed specifications, dimensions and delivery.



1 Different diameters (IN side < OUT side) Symbol **-X01**

IN side applicable tubing O.D. (Metric size): $\phi 4$
 OUT side applicable tubing O.D. (Metric size): $\phi 6$

ZFC5 3 - - X01
 • IN side < OUT side

Applicable tubing O.D.

Symbol	IN port	OUT port
3	$\phi 4$	$\phi 6$

Option

Nil	None
B	With bracket



2 Different diameters (IN side > OUT side) Symbol **-X02**

IN side applicable tubing O.D. (Metric size): $\phi 8$ to $\phi 12$
 OUT side applicable tubing O.D. (Metric size): $\phi 6$ to $\phi 10$

ZFC7 5 - - X02
 • IN side > OUT side

Applicable tubing O.D.

Symbol	IN side	OUT side
5	$\phi 8$	$\phi 6$
6	$\phi 10$	$\phi 8$
7	$\phi 12$	$\phi 10$

Option

Nil	None
B	With bracket



3 Blue element Symbol **-X03**

Easy to recognize white foreign matter on the element by coloring the element.

Standard product - X03
 • Blue element

4 Filtration: 10 μm Symbol **-X04**

Standard product - X04
 • Filtration: 10 μm

5 Seal material: FKM Oil free: Seal Symbol **-X05**

Standard product - X05

6 Case material: Nylon Symbol **-X06**

Standard product - X06
 • Case material: Nylon



Series ZFC

Specific Product Precautions 1

Be sure to read before handling. Refer to front matter 35 for Safety Instructions.

For Vacuum Equipment Precautions, refer to pages 899 to 901 and the Operation Manual. Please download it via our website, <http://www.smcworld.com>

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

1. Perform maintenance inspection according to the procedures indicated in the operation manual.

If handled improperly, malfunction and damage of machinery or equipment may occur.

2. Maintenance work

If handled improperly, compressed air can be dangerous. Assembly, handling, repair and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

3. Drain flushing

Remove drainage regularly from the air filters, etc.

4. Removal of equipment, and supply/exhaust of compressed air

When components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function.

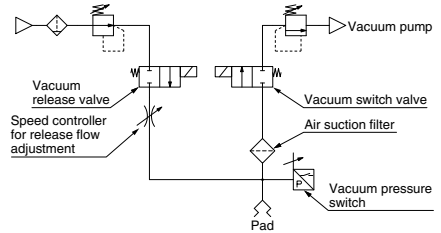
When machinery is restarted after remounting or replacement, confirm that the equipment is operating normally.

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.



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.

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Series ZFC

Specific Product Precautions 2

Be sure to read before handling. Refer to front matter 35 for Safety Instructions.

For Vacuum Equipment Precautions, refer to pages 899 to 901 and the Operation Manual. Please download it via our website, <http://www.smcworld.com>

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)

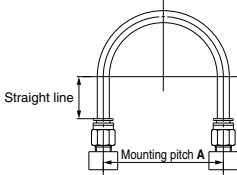


Figure 1 Recommended piping

Unit: mm

Tubing size	Mounting pitch A			Straight-line pipe length
	Nylon tube	Soft nylon tube	Polyurethane tube	
ø4, 5/32"	56 or more	30 or more	26 or more	20 or more
ø6	84 or more	39 or more	39 or more	30 or more
ø1/4"	89 or more	56 or more	57 or more	32 or more
ø8, 5/16"	112 or more	58 or more	52 or more	40 or more
ø10	140 or more	70 or more	69 or more	50 or more
ø3/8"	134 or more	76 or more	69 or more	48 or more
ø12	168 or more	82 or more	88 or more	60 or more

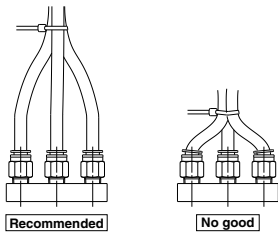


Figure 2 When using a tying band to bind the piping together

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.



Series ZFC

Specific Product Precautions 3

Be sure to read before handling. Refer to front matter 35 for Safety Instructions.

For Vacuum Equipment Precautions, refer to pages 899 to 901 and the Operation Manual. Please download it via our website, <http://www.smcworld.com>

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.

Design

Warning

1. Confirm the specifications.

Products represented in this catalog 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.

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.

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.

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