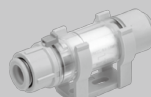


Air Suction Filter

Series ZF

Prevent from occurring vacuum equipment trouble due to solid foreign objects.

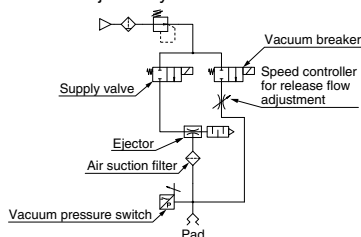
Series	Features	Port size			Air flow ^{Note)} [L/min(ANR)]	Filtration (μm)	Page
		Model	Screw-in	Applicable tubing O.D. for One-touch fittings			
ZFA 	<ul style="list-style-type: none">● Solid foreign objects are collected in the element and do not remain in the case.● Large filter element surface● Adaptable for a manifold application● Cartridge type allows element replacement	ZFA10	1/8	—	50	30	P.1102
		ZFA20	1/4		200		
ZFB Universal joint type 	<ul style="list-style-type: none">● Unrestricted 360° piping tube mounting on the IN side● Easy installation and removal with One-touch fittings● Light and compact molded resin parts● Cartridge type allows element replacement● Easily replaced filter element	ZFB10	—	ø4	10	30	P.1105
		ZFB20		ø6, ø3/16", ø1/4"	20		
				ø6, ø1/4"	30		
				ø8	50		
		ZFB30		ø8, ø10, ø3/8"	75		
		ZFB40	ø1/2"	100			
ZFC In-line type 	<ul style="list-style-type: none">● IN/OUT straight piping● Easy installation and removal with One-touch fittings● Light and compact molded resin parts● Easily replaced filter element	ZFC5	—	ø4, ø5/32"	10	5	P.1107
		ZFC7		ø6, ø1/4"	20		
				ø8, ø5/16"	30		
				ø8, ø5/16"	70		
				ø10, ø3/8"	80		
				ø12	100		

ZFA
ZFB
ZFC

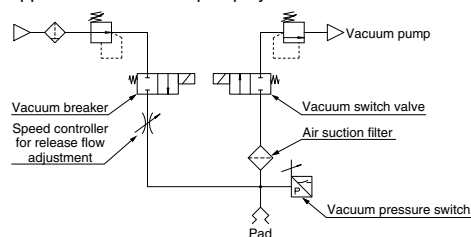
Note) Flow rate when initial pressure drop is 3 kPa or less.

Application Example

Application to ejector system



Application to vacuum pump system



Air Suction Filter

Series ZFA

RoHS

Prevents vacuum equipment trouble due to solid foreign objects

Solid foreign objects are collected in the element and do not remain in the case.

Max. 10 station manifold is possible.

Large filter element surface

Mountable in any direction

Cartridge type allows element replacement

Model

Model	Port size	Recommended air flow (L/min (ANR)) ^{Note 1)}	Weight (kg)	Internal capacity (cm ³)
ZFA100	1/8	50	0.14	30
ZFA200	1/4	200	0.19	49

Note 1) Flow rate when initial pressure drop is 3 kPa or less.

Specifications

Fluid ^{Note 1)}	Air, Nitrogen
Operating pressure range	-100 to 0 kPa
Vacuum release pressure	Max. 0.5 MPa (Unable to hold when pressurized)
Operating and ambient temperature range	5 to 60°C
Filtration accuracy	30 μm (Filtration efficiency 95%)
Element replacement differential pressure	20 kPa

Note 1) Do not use the product in an atmosphere and place where there is direct contact with chemicals. It may cause damage to the body. (Alcohol, acetone, etc. also cause damage, so be sure for the product not to be close to them.)

Note 2) Do not use it in a line that is kept pressurized because it could cause the body to break.

Bracket Part No.

Application	ZFA100	ZFA200	Note
For single unit	BP-1H-1A	BP-1H-2A	With Bolt, Nut, Washer
Both sides	ZZFA1-01	ZZFA2-01	
For manifold (2 to 10 stations) (Both sides)	ZZFA1-[Stations] ^{Note 1)}	ZZFA2-[Stations] ^{Note 1)}	

Note 1) Enter a 2-digit number in the stations portion while referring to the example below.

(Example) For 6 stations → 06

How to Order (Single unit)

ZFA 100 - 01

Air suction filter

Body type

Symbol	Filtration area (mm ²)
100	2110
200	4210

Thread type

Symbol	Thread type
Nil	Rc
T	NPTF
F	G

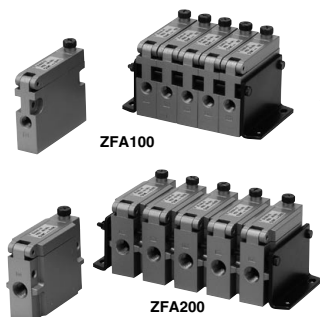
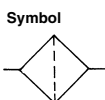
Bracket

Symbol	Bracket
Nil	None
L	With bracket (1 pc. on the left)
R	With bracket (1 pc. on the right)
LR	With bracket on both left and right

* L or R shows the left or right of the filter IN when viewed from front.

Port size

Symbol	Port size	Applicable model
01	1/8 ^B	ZFA100
02	1/4 ^B	ZFA200



How to Order Manifold (2 to 10 stations)

Indicate both the symbols for air suction filter and bracket part no.

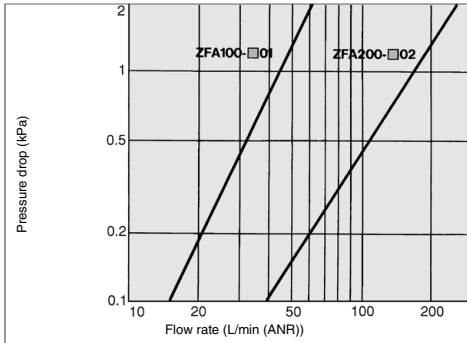
Example: In case of 6 stations of air suction filter ZFA100-01

ZZFA1-06 1 pc. (Brackets for 6 stations)

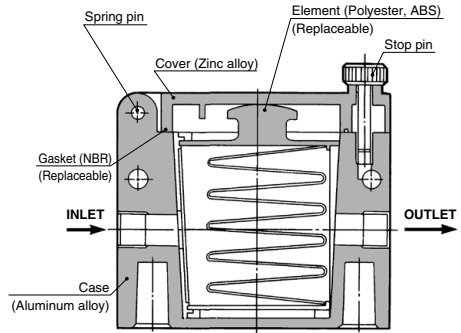
***ZFA100-01 6 pcs. (Air suction filter)**

Flow Characteristics

Fluid: Air
Filtration accuracy: 30 µm
Pressure: Downstream side atmospheric release (pressurized)
Temperature: Room temperature



Construction

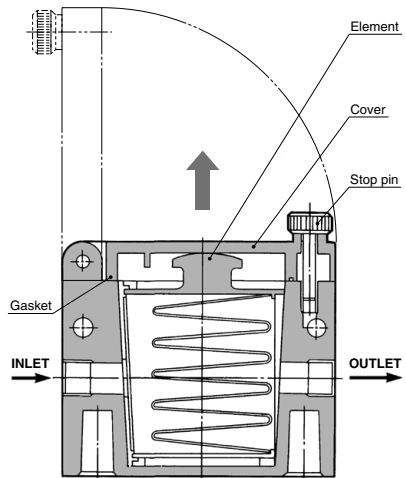


Replacement Element/Gasket Part No.

Description	Part no.	
	ZFA100	ZFA200
Gasket	AL-204H	AL-205H
Element	EJ001H-030N	EJ101H-030N
Element size		
Element size (mm)	43 x 42 x 12	43 x 40 x 22

Element Replacement

- 1) Stop operation and reduce the filter's internal pressure to atmosphere.
- 2) Loosen the stop pin and open the cover.
- 3) Hold the knob on the top of the element and take it out.
- 4) Check the gasket for damage, deformation, or swelling. If any fault is found, replace the gasket with a new one.
- 5) Replace the element with a new one in the reverse order. Note that the cover cannot be closed if the element is inserted into the case in incorrect orientation.
- 6) Close the cover and tighten the stop pin firmly.
- 7) After checking that no leakage is found from each part, start the actual operation.

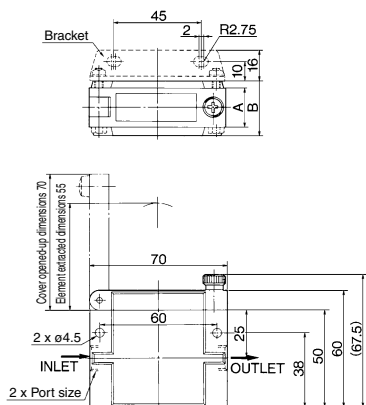
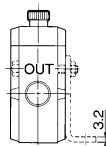


ZFA
ZFB
ZFC



Dimensions: ZFA ¹⁰⁰/₂₀₀ -

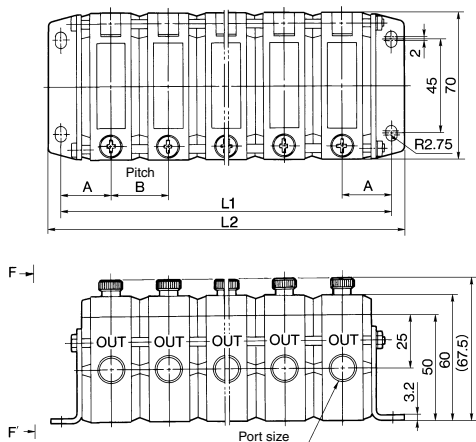
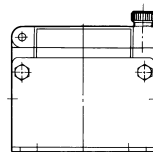
Single unit



Note) The above diagram is for ZFA200.
The bracket location shows L side.

Model	Symbol	Port size	A	B
ZFA100		1/8	—	18
ZFA200		1/4	20	28

Manifold



(Section F-F')

(The above diagram is for ZFA200)

Model \ Symbol	Port size	A	B
ZFA100	1/8	19	18
ZFA200	1/4	24	28

Model	Symbol	Single unit tests	Number of manifold stations								
			2	3	4	5	6	7	8	9	10
ZFA100	L1	38	56	74	92	110	128	148	164	182	200
	L2	50	68	86	104	122	140	158	176	194	212
ZFA200	L1	48	76	104	132	160	188	216	244	272	300
	L2	60	88	116	144	172	200	228	256	284	312

Note) The left and right brackets are mounted on the air suction filter single unit.

Air Suction Filter With One-touch Fittings Series ZFB

RoHS

Prevents vacuum equipment trouble
due to solid foreign objects

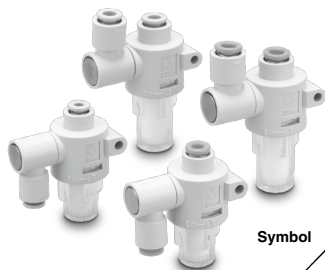
Unrestricted 360° piping tube
mounting on the IN side

Easily replaced filter element

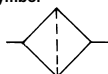
Easy installation and removal
with One-touch fittings

Light and compact molded resin parts

Cartridge type allows element
replacement



Symbol



Model

Tubing size	Model	Port size (Applicable tubing O.D.)		Recommended air flow (L/min (ANR)) ⁽¹⁾	Weight (g)	Internal capacity (cm ³)
		IN side, OUT side				
Metric size	ZFB100-04	ø4		10	22	7
	ZFB100-06	ø6		20	22	7
	ZFB200-06	ø6		30	30	12
	ZFB200-08	ø8		50	30	12
	ZFB300-08	ø8		75	39	16
	ZFB300-10	ø10		75	39	16
Inch size ⁽²⁾	ZFB101-05	ø 3/16"		20	22	7
	ZFB101-07	ø 1/4"		20	22	7
	ZFB201-07	ø 1/4"		30	30	12
	ZFB301-11	ø 3/8"		75	40	16
	ZFB401-13	ø 1/2"		100	62	19

Note 1) Flow rate when initial pressure drop is 3 kPa or less.

Note 2) Will be manufactured upon receipt of order.

Specifications

Fluid ^{Note 1)}	Air, Nitrogen
Operating pressure range ^{Note 2)}	-100 to 0 kPa
Vacuum release pressure	Max. 0.5 MPa (Unable to hold when pressurized)
Operating and ambient temperature range	0 to 60°C (No freezing)
Filtration accuracy	30 µm (Filtration efficiency 95%)
Element replacement differential pressure	20 kPa
Applicable tubing material	Nylon/Soft Nylon/Polyurethane

Note 1) Do not use the product in an atmosphere and place where there is direct contact with chemicals. It may cause damage to the body. (Alcohol, acetone, etc. also cause damage, so be sure for the product not to be close to them.)

Note 2) Do not use it in a line that is kept pressurized because it could cause the body to break.

ZFA

ZFB

ZFC

How to Order

Metric size
(Release button: Light gray)

Metric size ZFB **10** **0** - **04**

Inch size ZFB **10** **1** - **05**

Body type

Symbol	Filtration area (mm ²)
10	1037
20	1584
30	1980
40	3016

Inch size
(Release button: Orange)

Applicable tubing size
Metric size

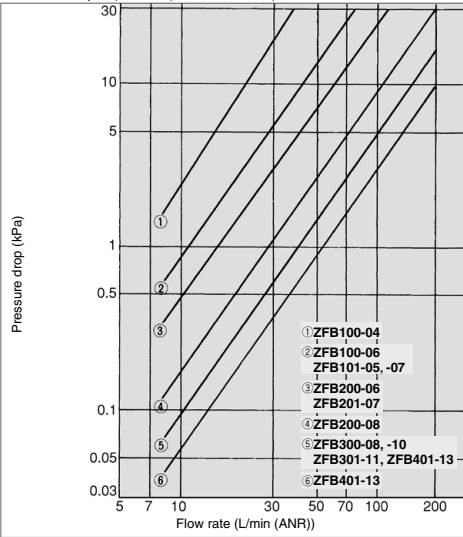
Symbol	Bore size	Applicable model			
		ZFB10	ZFB20	ZFB30	ZFB30
04	ø4	●	●	—	—
06	ø6	●	●	—	—
08	ø8	—	●	●	—
10	ø10	—	—	●	—

Inch size

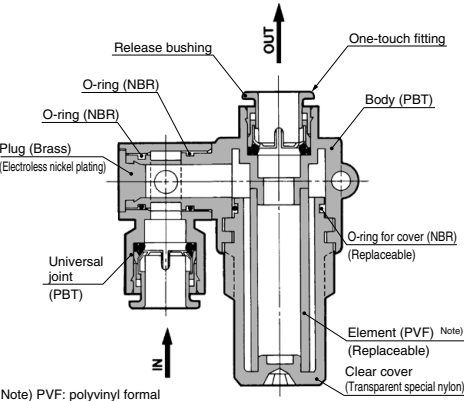
Symbol	Bore size	Applicable model			
		ZFB10	ZFB20	ZFB30	ZFB40
05	ø 3/16"	●	—	—	—
07	ø 1/4"	●	●	—	—
11	ø 3/8"	—	—	●	—
13	ø 1/2"	—	—	—	●

Flow Characteristics

Fluid: Air Measured pressure: Downstream side atmospheric release (pressurized)
Filtration accuracy: 30 μm Temperature: Room temperature



Construction

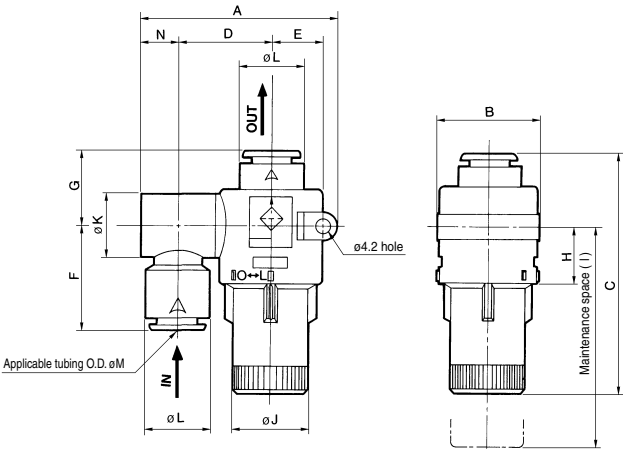


Replacement Element Part No.

Part no.	Applicable filter model	Element size mm	Set description	
			Element	O-ring for cover
I-34S-A	ZFB100, ZFB101	ø10 x ø6 x L33	10 pcs.	10 pcs.
I-35S-A	ZFB200, ZFB201	ø12 x ø8 x L42	10 pcs.	10 pcs.
I-36S-A	ZFB300, ZFB301	ø14 x ø10 x L45	10 pcs.	10 pcs.
I-39S-A	ZFB401	ø16 x ø14 x L60	10 pcs.	10 pcs.

Note) Elements and O-rings for the cover are sold in sets of 10 pieces each.

Dimensions

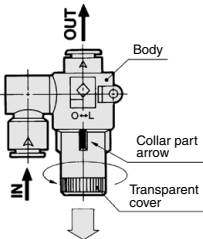


Size	Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Metric size	ZFB100-04	48	26	53	22.5	12.5	24	17.5	15	50	15.5	14.4	12.8	4	8.5
	ZFB100-06			54										6	
	ZFB200-06	52	28	65	24.5	13.5	27	19.5	16	61	17.5	16.6	15.2	6	9.5
	ZFB200-08													8	
	ZFB300-08	57	30	69.5	27	14.5	29.5	21	17	65	21.5	18	18.5	8	11
	ZFB300-10			70										10	
Inch size	ZFB101-05	48	26	53	22.5	12.5	24	17.5	15	50	15.5	14.4	12.8	3/16"	8.5
	ZFB101-07			54			24.2	17.7						1/4"	
	ZFB201-07	52	28	65	24.5	13.5	27.2	19.7	16	61	17.5	16.6	15.2	1/4"	9.5
	ZFB301-11	57	30	70	27	14.5	30.2	21.7	17	65	21.5	18	18.5	3/8"	11
	ZFB401-13	64.5	34	87.5	30.5	16.5	34	24	21.5	81	25.6	23	21.7	1/2"	13.5

Element Replacement

1. Stop the operation and reduce the internal pressure of the filter to atmospheric pressure.
2. Turn the transparent cover in counterclockwise direction and position the arrowhead of the collar in the transparent cover from the protruding in the "L" (LOCK) side to the protruding portion in the "O" (OPEN) side.
3. Pull the transparent cover downward to take out the element. Eliminate any dust in the transparent cover by blowing air. (Make sure there is no damage of the O-ring.)
4. Insert a new element into the body.
5. Set the arrowhead on the collar of the transparent cover to the protruding portion on the "O" side, push the transparent cover into the body and set the arrowhead from the protruding portion on the "O" side to the protruding portion on the "L" side to make the LOCK complete.
6. Restart operation.

Element Replacement Procedure

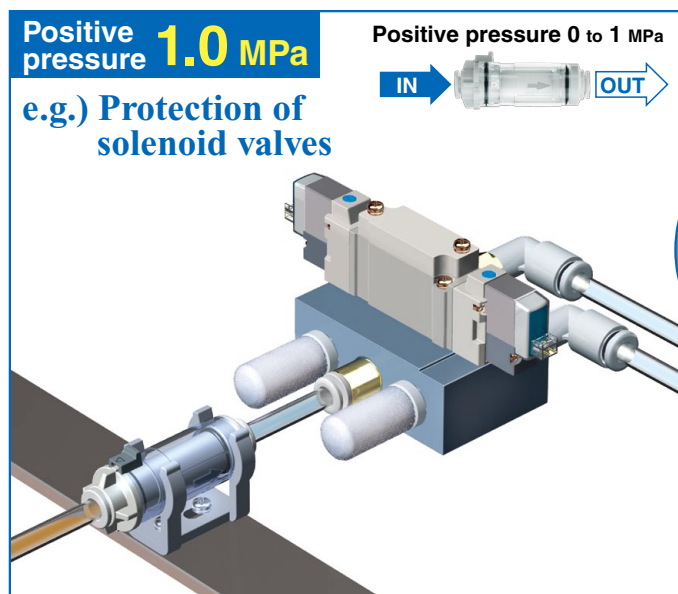
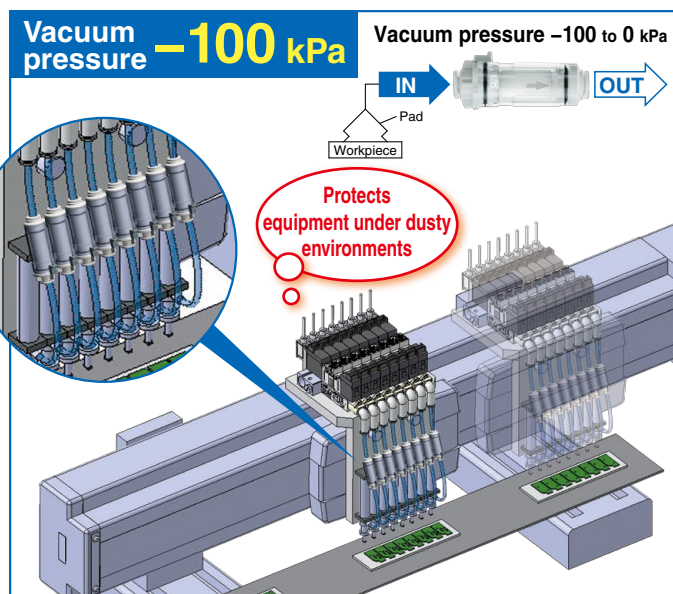


In-line Air Filter

RoHS

Operating pressure range **-100 kPa to 1.0 MPa (20°C)**

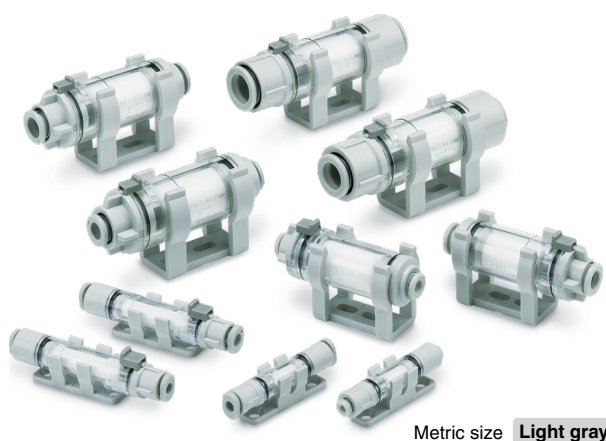
Both positive pressure and vacuum pressure can be used with one unit! **Filtration 5 μ m**



Variations 4 sizes 18 models

Series	Applicable tubing O.D.								Maximum flow rate under vacuum pressure [L/min (ANR)]	Maximum flow rate under positive pressure [L/min (ANR)]
	Metric Inch	ø2 —	ø3.2 ø1/8"	ø4 ø5/32"	ø6 ø1/4"	ø8 ø5/16"	ø10 ø3/8"	ø12 —		
New ZFC1□		●	●						5	45
New ZFC3□			●	●					10	80
ZFC5□				●	●				20	200
ZFC7□					●	●	●	●	100	650

At 0.7 MPa with a pressure drop of 30 kPa. The required flow rate may not be obtained due to piping resistance.



ZFC Series



CAT.ES100-103B

With lock mechanism

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

2 types of transparent case materials are available.

- Polycarbonate (Standard)
Possible to degrease with alcohol.



- Nylon (Made to order)
Resistant to coolant oil

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

With One-touch fitting

Metric size **Light gray** : $\phi 2$, $\phi 3.2$, $\phi 4$, $\phi 6$, $\phi 8$, $\phi 10$, $\phi 12$
Inch size **Orange** : $\phi 1/8$ ", $\phi 5/32$ ", $\phi 1/4$ ", $\phi 5/16$ ", $\phi 3/8$ "

2 levels of filtration rating are available.

- $\cdot 5 \mu m$
- $\cdot 10 \mu m$ (Made to order)

Selectable piping port sizes

Up to four types of piping port sizes can be selected with the same filtration area.

Series	Filtration area [mm ²]	Applicable tubing O.D. (Upper/Metric, Lower/Inch)						
		$\phi 2$	$\phi 3.2$	$\phi 4$	$\phi 6$	$\phi 8$	$\phi 10$	$\phi 12$
ZFC1□	140	●	●					
ZFC3□	470		●	●				
ZFC5□	750			●	●			
ZFC7□	1260				●	●	●	●

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

IN side < OUT side

Applicable tubing O.D. [mm]	
IN port size	OUT port size
$\phi 2$	$\phi 3.2$
$\phi 3.2$	$\phi 4$
$\phi 4$	$\phi 6$



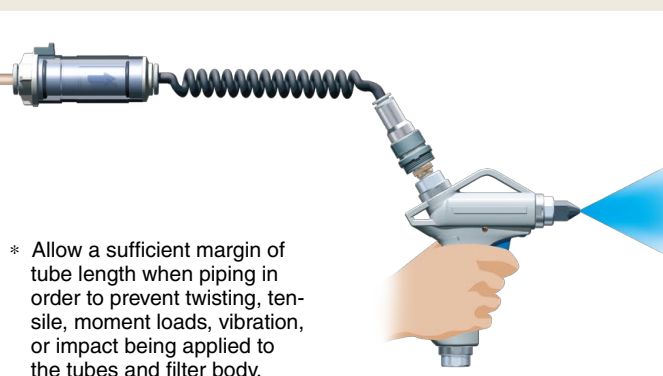
IN side > OUT side

Applicable tubing O.D. [mm]	
IN port size	OUT port size
$\phi 8$	$\phi 6$
$\phi 10$	$\phi 8$
$\phi 12$	$\phi 10$



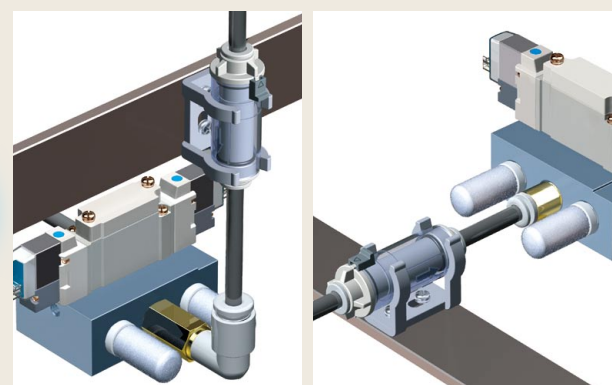
Application examples

Improvement in air quality of 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



Space-saving!



Long service life!

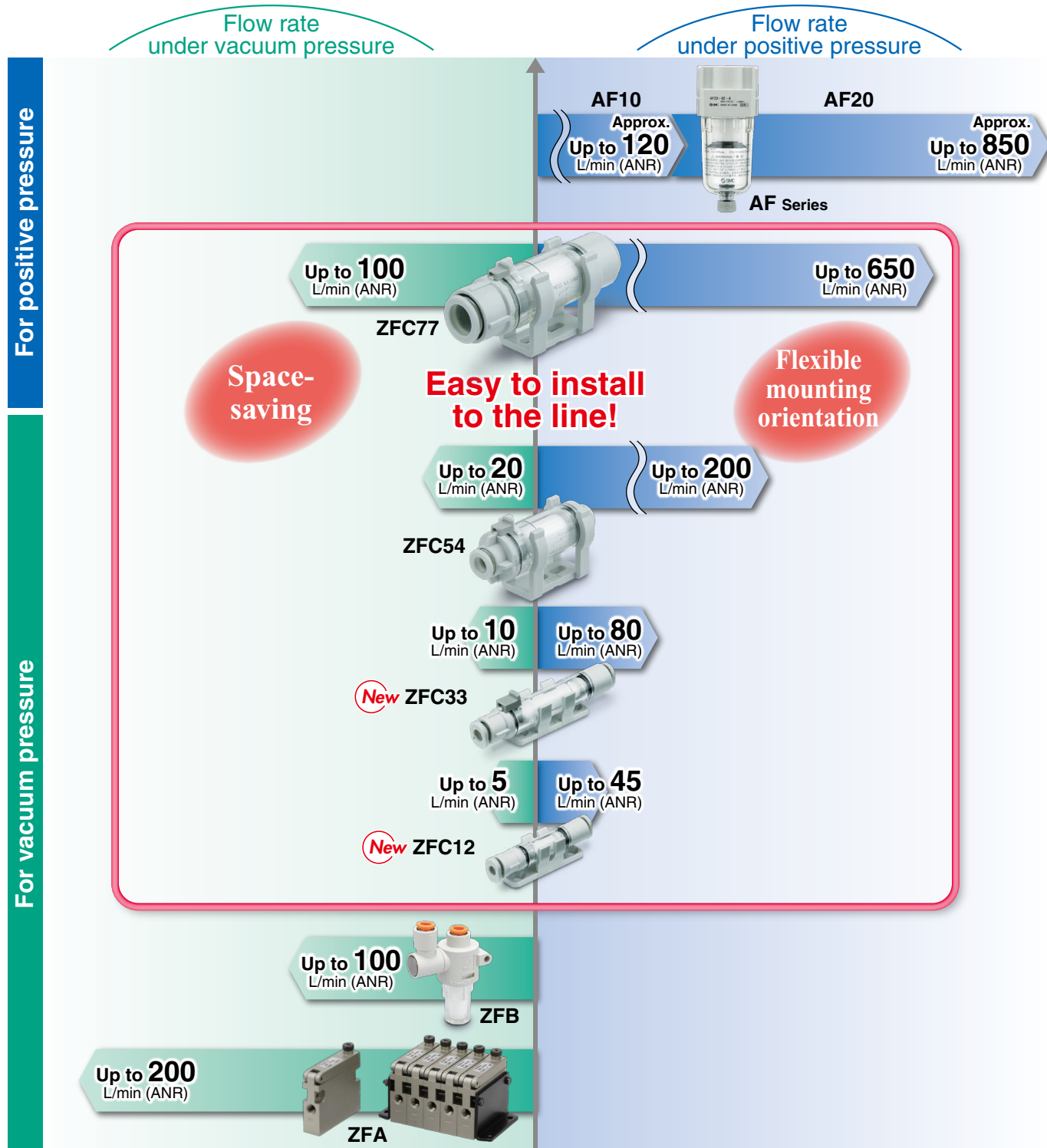
In-line Air Filter

Two types of bodies can be selected with the same piping size.

Applicable tubing O.D.		New ZFC1□		New ZFC3□		ZFC5□	ZFC7□
Metric	Inch						
ø3.2	ø1/8"	Space-saving		or	Long service life (Filtration area: 1.5 times or more)*1	—	—
ø4	ø5/32"	—		Space-saving	or	Long service life (Filtration area: 1.5 times or more)*1	—
ø6	ø1/4"	—		—	—	Space-saving	Long service life (Filtration area: 1.5 times or more)*1

*1 Compared with the same tubing O.D.

Filter Variations



Flow rate (positive pressure) conditions: Supply pressure of 0.7 MPa, Pressure drop of 30 kPa

In-line Air Filter ZFC Series

RoHS

How to Order

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

Body size

Symbol	Body size	Filtration area
1	5 L/min	140 mm ²
3	10 L/min	470 mm ²
5	20 L/min	750 mm ²
7	100 L/min	1260 mm ²

Applicable tubing O.D.

Metric size

Symbol	Applicable tubing O.D.	ZFC1	ZFC3	ZFC5	ZFC7
1	ø2	●	—	—	—
2	ø3.2	●	●	—	—
3	ø4	—	●	●	—
4	ø6	—	—	●	●
5	ø8	—	—	—	●
6	ø10	—	—	—	●
7	ø12	—	—	—	●

Inch size

Symbol	Applicable tubing O.D.	ZFC1	ZFC3	ZFC5	ZFC7
A	ø1/8"	●	●	—	—
B	ø5/32"	—	●	●	—
D	ø1/4"	—	—	●	●
E	ø5/16"	—	—	—	●
F	ø3/8"	—	—	—	●

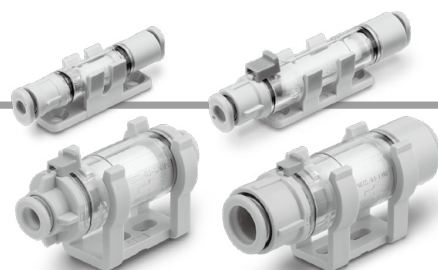
Made to order

Refer to page 8 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

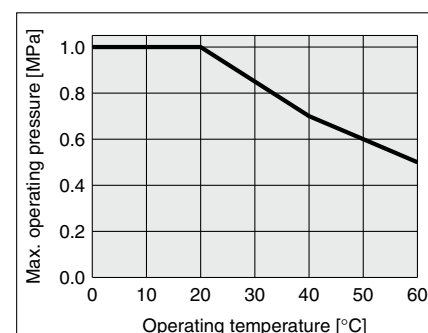


Specifications

Model		ZFC1□		ZFC3□		ZFC5□		ZFC7□		
Port size (Applicable tubing O.D.)	Metric size	ø2	ø3.2	ø3.2	ø4	ø4	ø6	ø6	ø8	ø10
	Inch size	—	ø1/8"	ø1/8"	ø5/32"	ø5/32"	ø1/4"	ø1/4"	ø5/16"	ø3/8"
Fluid		Air, Nitrogen								
Operating pressure		-100 kPa to 1.0 MPa (at 20°C)								
Flow rate (Positive pressure) [L/min] *1		15	45	50	80	100	200	250	450	650
Flow rate (Vacuum pressure) [L/min]		2	5	7	10	10	20	30	70	100
Proof pressure [MPa]		1.5 (at 20°C)								
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]		140		470		750		1260		
Applicable tubing material		Nylon, Soft nylon, Polyurethane								
Weight [g]		2.5		4.5		10.5		20.0		25.0
Internal capacity [cm ³]		0.5		1.7		4.5		6.0		7.0
Total length [mm]		45.0		60.5		53.9		68.3		79.6
Total width [mm]		8.5		11.2		19.0		23.6		
Bracket total length [mm]		10.0		11.5		23.0		27.3		
Case material		Polycarbonate								

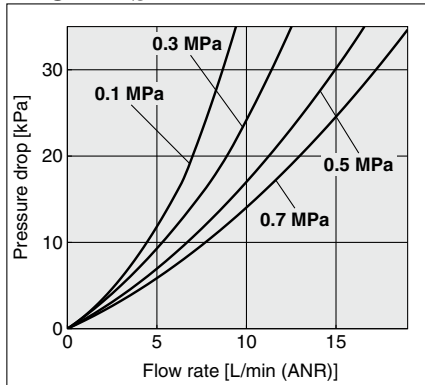
*1 Flow rate (positive pressure) conditions: Supply pressure of 0.7 MPa, Pressure drop of 30 kPa

Max. Operating Pressure and Operating Temperature

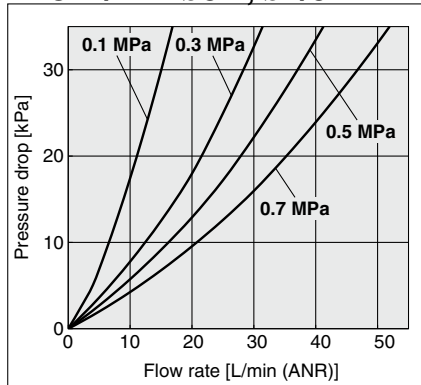


Flow Rate Characteristics

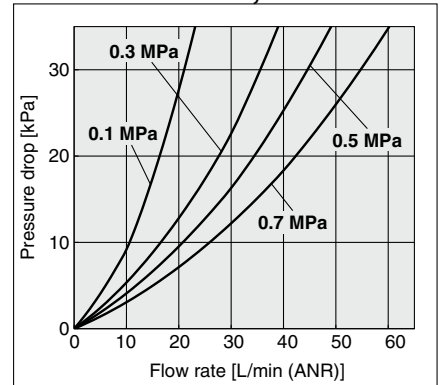
ZFC11 $\varnothing 2$



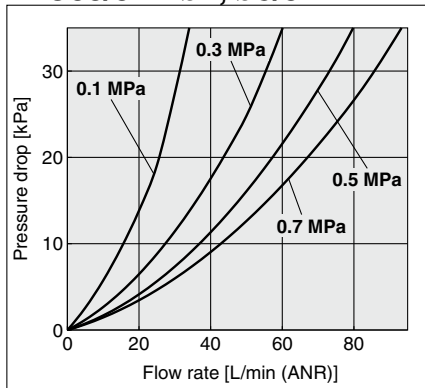
ZFC12/1A $\varnothing 3.2, \varnothing 1/8"$



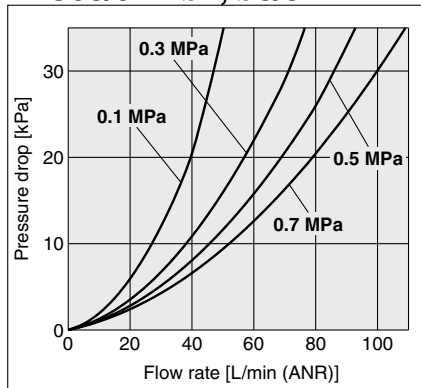
ZFC32/3A $\varnothing 3.2, \varnothing 1/8"$



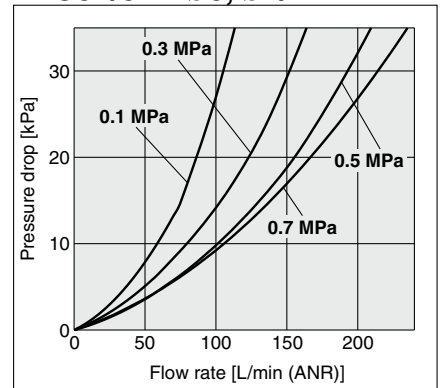
ZFC33/3B $\varnothing 4, \varnothing 5/32"$



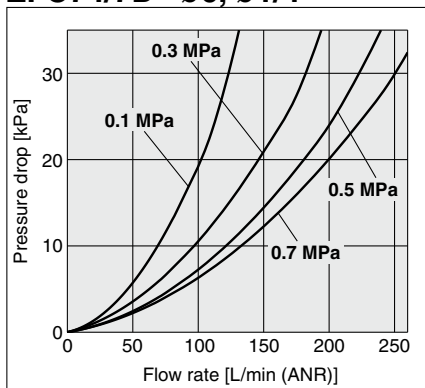
ZFC53/5B $\varnothing 4, \varnothing 5/32"$



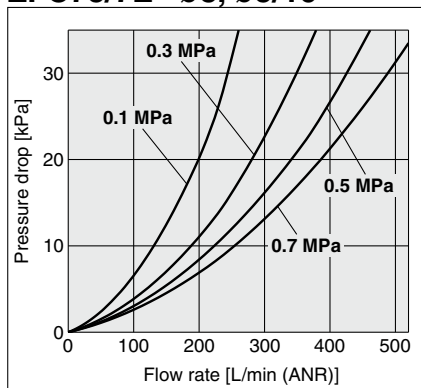
ZFC54/5D $\varnothing 6, \varnothing 1/4"$



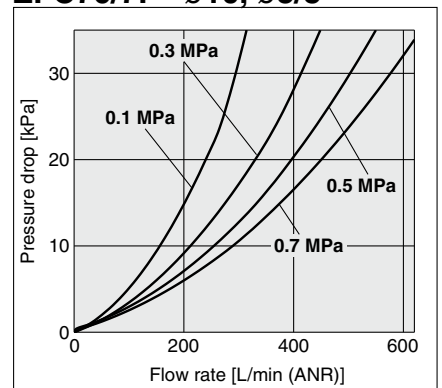
ZFC74/7D $\varnothing 6, \varnothing 1/4"$



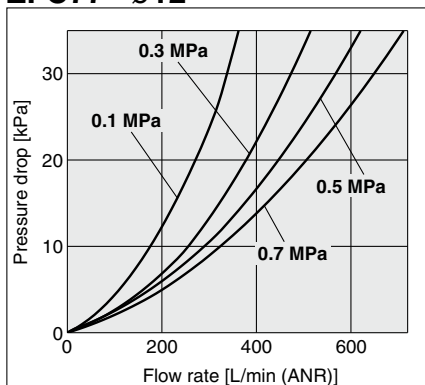
ZFC75/7E $\varnothing 8, \varnothing 5/16"$



ZFC76/7F $\varnothing 10, \varnothing 3/8"$



ZFC77 $\varnothing 12$



Construction

Component Parts

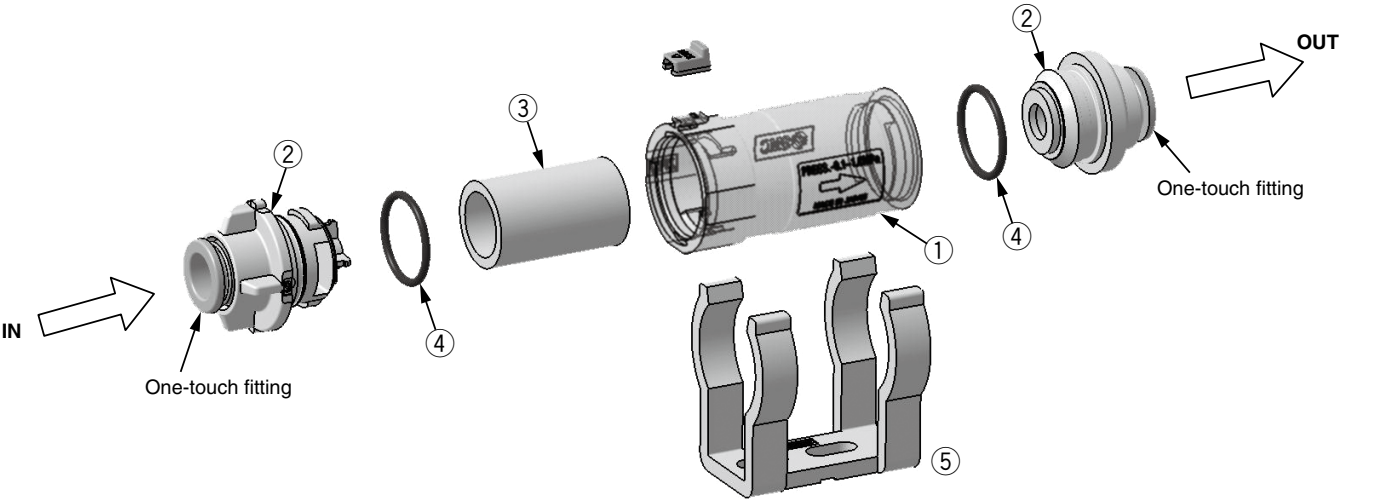
No.	Description	Material	Quantity
1	Case	PC	1
2	Cover	Resin PBT	2
3	Element	Sintered resin	1
4	O-ring	HNBR	2
5	Bracket	Resin PBT	1

Replacement Element Part No. (10 elements included)

Part no.	Applicable filter	Element size	Quantity
ZFC-EL-1	ZFC1	ø5 x ø3 x L11	10
ZFC-EL-2	ZFC3	ø6 x ø4 x L25	10
ZFC-EL-3	ZFC5	ø12 x ø8 x L20	10
ZFC-EL-4	ZFC7	ø16 x ø12 x L25	10

Replacement Bracket Part No.

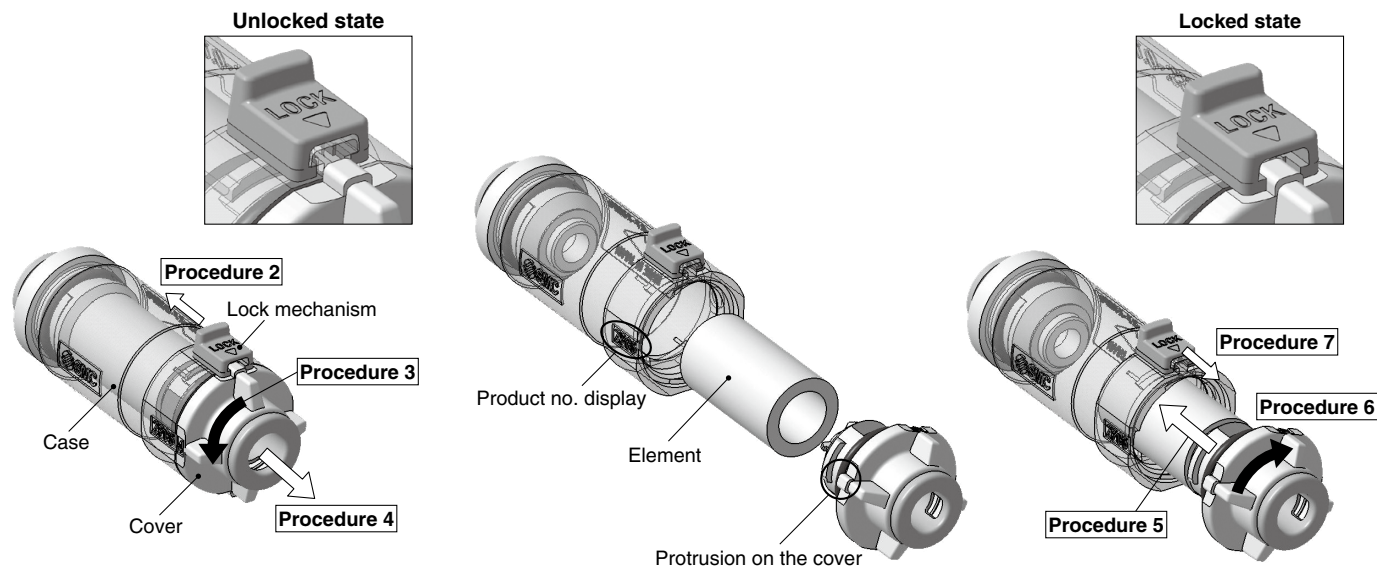
Part no.	Applicable filter	Quantity
ZFC-BR001	ZFC1	1
ZFC-BR002	ZFC3	1
ZFC-BR003	ZFC5	1
ZFC-BR004	ZFC7	1



Element Replacement

Procedure

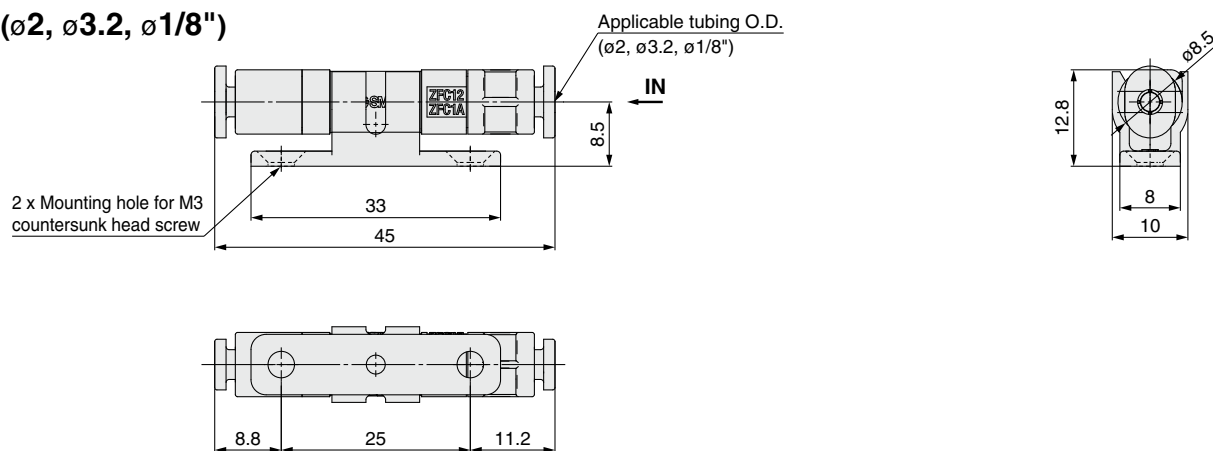
1. Stop operation and reduce the filter's internal pressure to atmosphere.
2. Slide the lock mechanism in the direction of the arrow to release the lock. (The ZFC1 series is not equipped with a lock mechanism.)
3. Rotate the cover counterclockwise at least 90 degrees.
4. Pull the cover out of the case 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. Attach the new element to the cover and insert it into the case.
6. Align the raised part of the cover with the product no. display of the body, and push the cover to the end of the body. Rotate it clockwise until it stops.
7. Set the lock mechanism and check that the cover is locked completely.



Dimensions

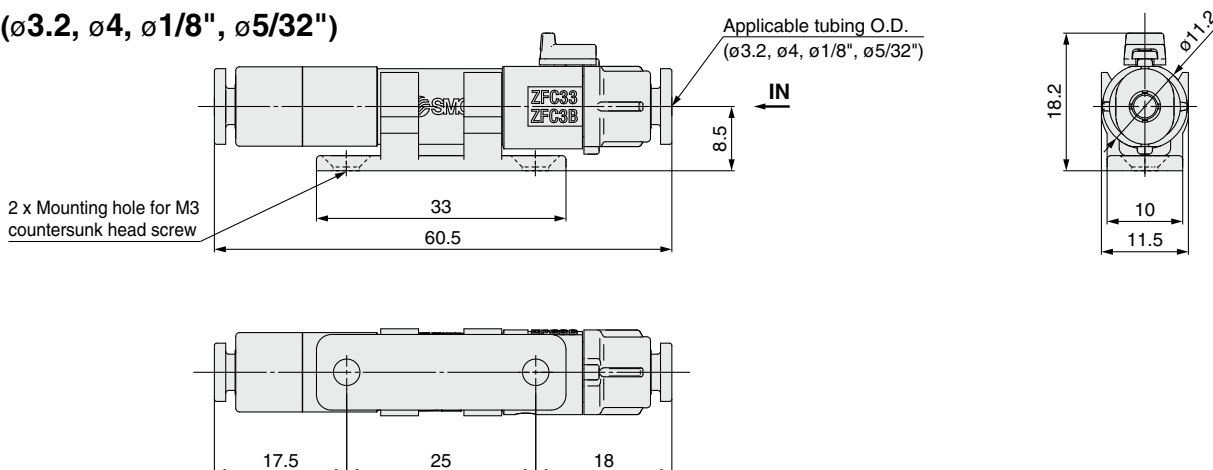
ZFC1

($\varnothing 2$, $\varnothing 3.2$, $\varnothing 1/8"$)



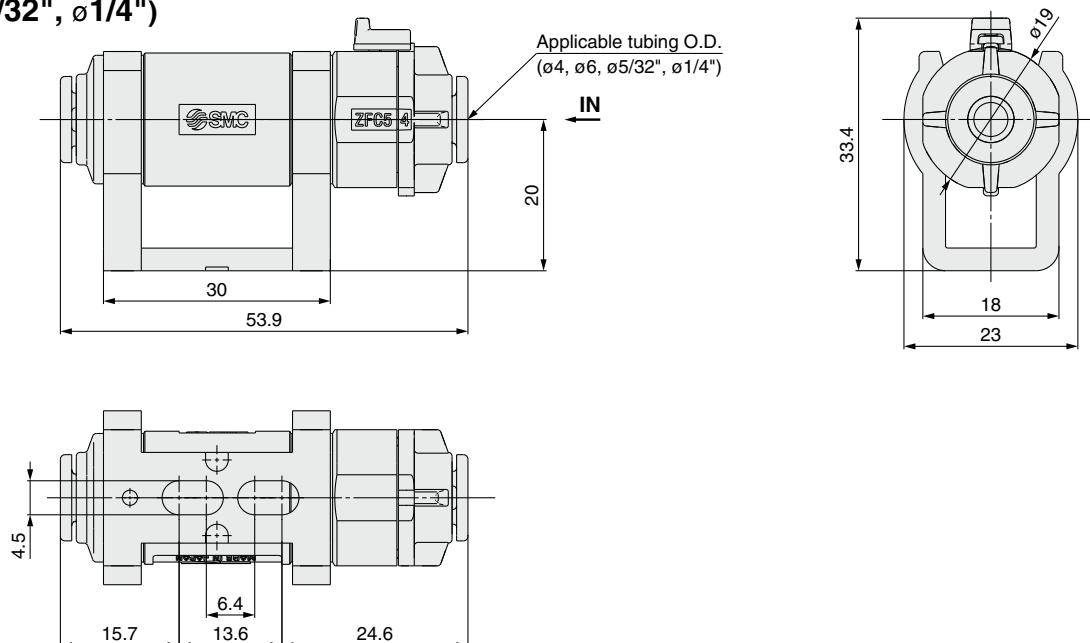
ZFC3

($\varnothing 3.2$, $\varnothing 4$, $\varnothing 1/8"$, $\varnothing 5/32"$)



ZFC5

($\varnothing 4$, $\varnothing 6$, $\varnothing 5/32"$, $\varnothing 1/4"$)

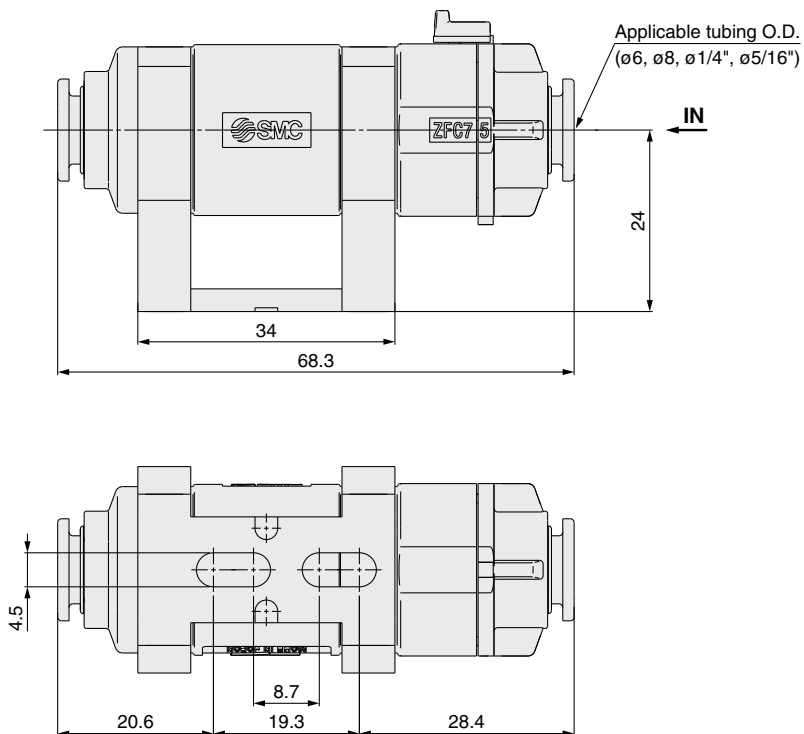
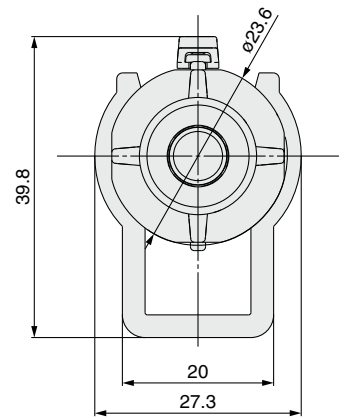


ZFC Series

Dimensions

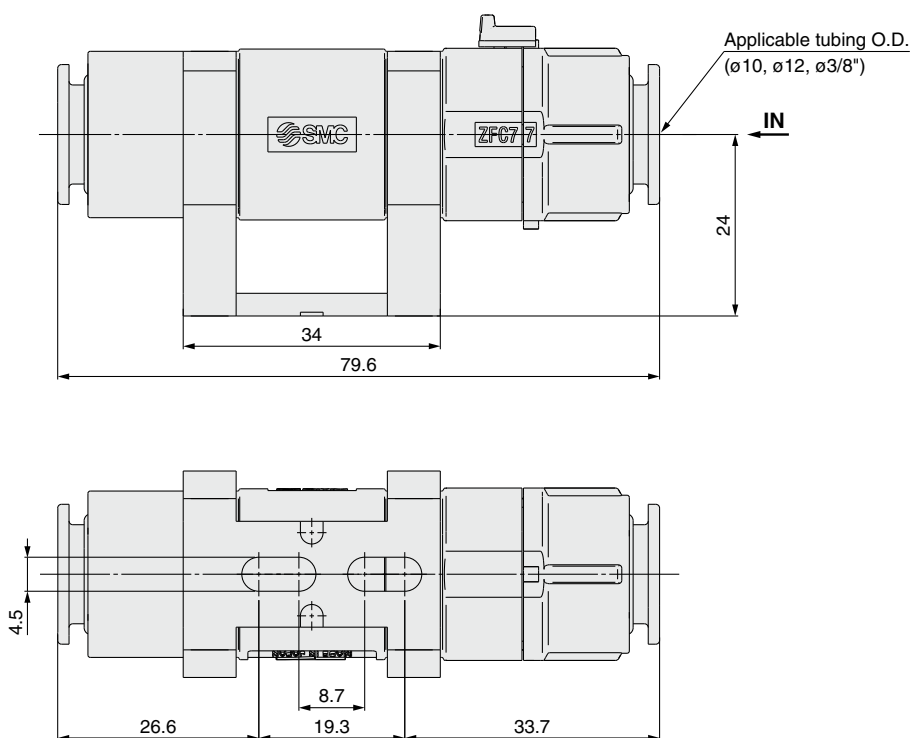
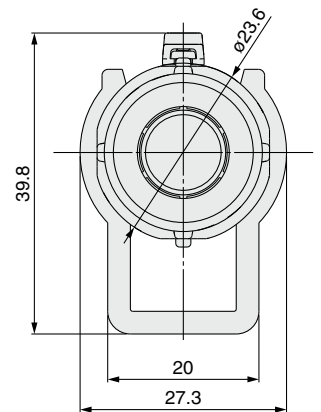
ZFC7

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



ZFC7

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



ZFC Series

Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.



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

IN side applicable tubing O.D. (Metric size): $\phi 2$ to $\phi 4$
OUT side applicable tubing O.D. (Metric size): $\phi 3.2$ to $\phi 6$

ZFC **53** - - **X01**

• IN side < OUT side

Applicable tubing O.D.

Symbol	IN port	OUT port
11	$\phi 2$	$\phi 3.2$
32	$\phi 3.2$	$\phi 4$
53	$\phi 4$	$\phi 6$

• 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

Replacement Element Part No.
(Element: 1 pc.)

Series	Part no.
ZFC1 - X03	ZFC-EL019
ZFC3 - X03	ZFC-EL020
ZFC5 - X03	ZFC-EL015
ZFC7 - X03	ZFC-EL016

4 Filtration: 10 μ m Symbol -X04

Standard product - **X04**

• Filtration: 10 μ m

Replacement Element Part No.
(Element: 1 pc.)

Series	Part no.
ZFC1 - X04	ZFC-EL021
ZFC3 - X04	ZFC-EL022
ZFC5 - X04	ZFC-EL017
ZFC7 - X04	ZFC-EL018

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

Standard product - **X05**

6 Case material: Nylon Symbol -X06

Standard product - **X06**

• Case material: Nylon



Specific Product Precautions 1

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <http://www.smcworld.com>

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, 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.

Caution

1. When vacuum adsorption and release are used on the same line, the dust trapped by the vacuum adsorption scatters again during vacuum release. Therefore, both vacuum pressure and positive pressure cannot be used together on the same line.

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. 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.

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 the malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.

3. Drain flushing

If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. This causes the malfunction of pneumatic equipment. If the drain bowl is difficult to check and remove, the 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 that include organic solvents, salt, corrosive gases, etc., as they can cause damage or malfunction.

Operating Environment

Warning

1. Do not use in an atmosphere where corrosive gases, chemicals, sea water, water, or water steam is present. Do not use in cases where there is direct contact with any of the above.
2. Do not use in a place subject to heavy vibration and/or impact.
3. Do not use in an environment where flammable gas or explosive gas is present. 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 if necessary.
5. Remove any sources of excessive heat.
6. In locations where there is contact with water, oil, weld spatter, etc., take suitable protective measures.



ZFC Series

Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For vacuum equipment precautions, refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <http://www.smcworld.com>

Handling Precautions

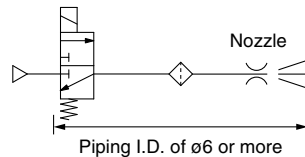
Warning

Use of intermittent air blow may increase piping temperatures. Therefore, observe the temperature for several hours during the trial operation. Also, pay attention to the product temperature during inspection.

The flow rate is throttled in the nozzle. If compressed air is supplied repeatedly, the air inside the piping may cause adiabatic compression. As a result, the temperature inside the piping increases. In this case, if the heat radiation to surroundings is not sufficient, the product temperature may exceed its operating temperature range. If compressed air is supplied under conditions where the product temperature exceeds its operating temperature range, this may cause the product to break. Take the preventive measures shown below.

- 1) Design to reduce piping capacity.
- 2) Build materials or mechanisms with high heat radiation ability into the areas around the nozzle.
- 3) Select a product with a wide operating temperature range.

Example of circuit when piping temperatures increase:
Pressure of 0.5 MPa or more, Ten times per minute



Maintenance

Warning

1. Perform maintenance inspections 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. The assembly, handling, repair, and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

3. Drain flushing

Remove drainage from air filters regularly.

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.

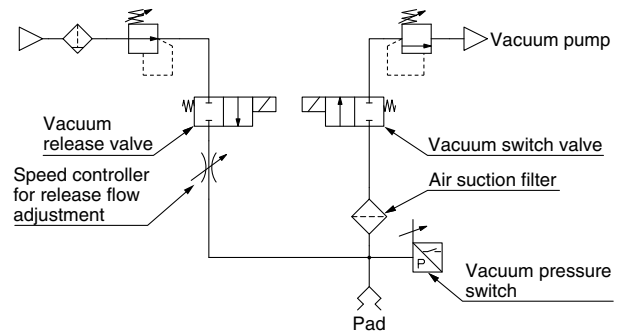
When the equipment is operated after remounting or replacement, confirm that the equipment is operating normally.

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.

* It is not possible to use vacuum pressure and positive pressure together on 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 of positive pressure or 20 kPa of vacuum pressure.
- 2) When the set values (flow rate, vacuum reaching time) change.

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

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

4. Be sure to check that the lock mechanism is locked securely before use.

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) 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.

Warning

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. 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 outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

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

1. 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.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Revision History

Edition B * Added ZFC1□/3□.
* Change in the maximum flow rate conditions.

UU

Safety Instructions

Be sure to read the “Handling Precautions for SMC Products” (M-E03-3) and “Operation Manual” before use.