Clean Air Filter

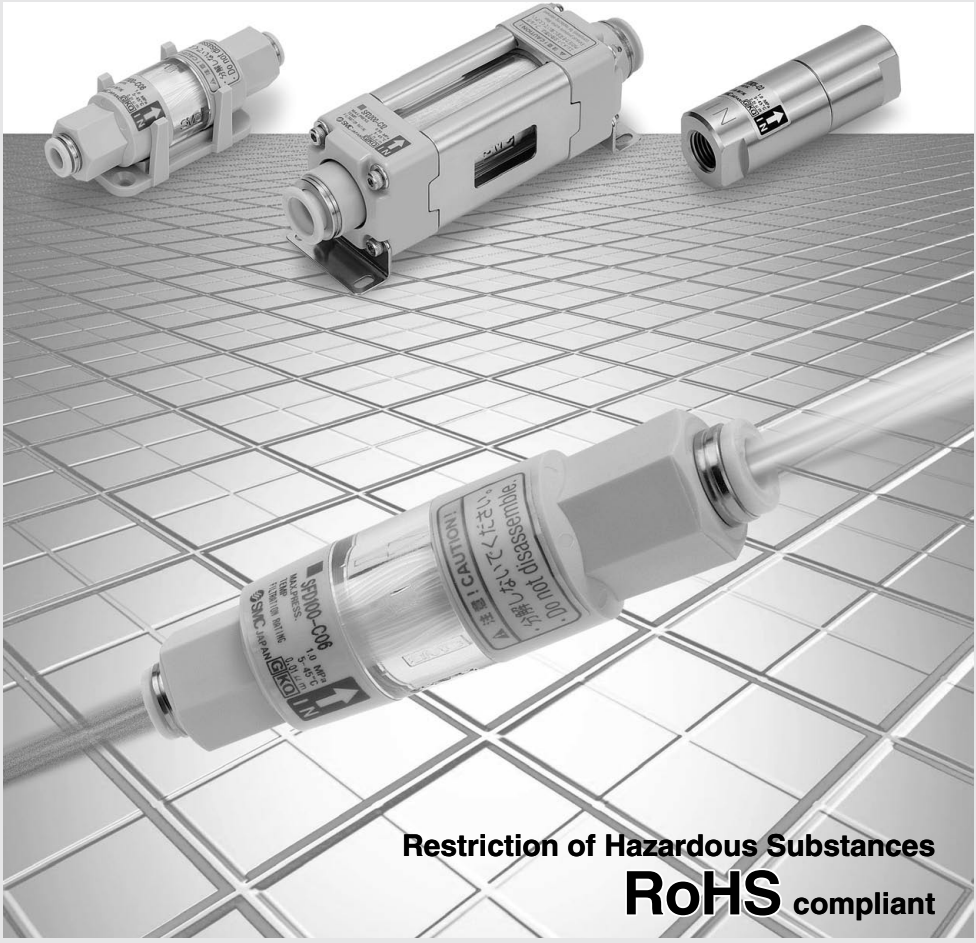
SFD Series

RoHS

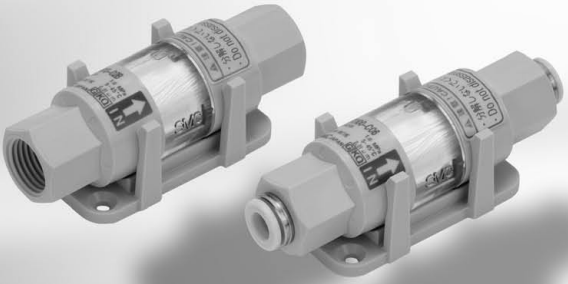
Hollow Fiber Element

- **Nominal filtration rating: 0.01** μm (filtration efficiency 99.99%)
- **Initial pressure drop: 0.03** MPa (at inlet pressure 0.7 MPa, maximum flow)
- **Maximum operating pressure: 1.0** MPa (at 20°C)

SFD100	SFD200	SFD101/102 Made to Order
Up to **100** L/min(ANR)	Up to **500** L/min(ANR)	Up to **100** L/min(ANR)

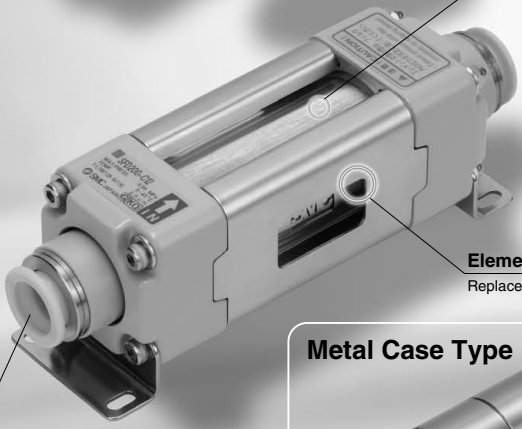


Restriction of Hazardous Substances
RoHS compliant



Clear resin case

- Easy to confirm a dirty element.
- Polycarbonated material is resistant to alcohol-based cleaning solutions.



Element replaceable (Cartridge type)

Replaceable hollow fiber elements

Piping variation

- Clean One-touch fittings
- Female thread

Metal Case Type

Stainless steel or aluminum cases are available.

Metal case suitable for an atmosphere exposed to organic solvents and chemicals (Fluids: Air and (Nitrogen))

		SFD100			SFD200			SFD101	SFD102
								 Made to Order Pages 325 and 326	
Type		Disposable type (non-replaceable element)			Cartridge type (replaceable element)				
Flow rate L/min (ANR) (at inlet pressure 0.7 MPa)		Up to 60	Up to 80	Up to 100	Up to 300	Up to 400	Up to 500	Up to 100	
Port size	One-touch fitting	ø4	ø6	ø8	ø8	ø10	ø12	—	
	Female thread	—	—	Rc 1/4, G 1/4 NPT 1/4	—	—	Rc 1/4, G 1/4 NPT 1/4	Rc 1/4, G 1/4, NPT 1/4	
Case material		Resin			Resin			Aluminum	Stainless steel
Fluid		Air (Nitrogen)							
Nominal filtration rating		0.01 μm (filtration efficiency: 99.99%) Note)							
Initial pressure drop		0.03 MPa (at inlet pressure 0.7 MPa, maximum flow)							
Maximum operating pressure (at 20°C)		1.0 MPa (in case of nitrogen: 0.99 MPa)							
Operating temperature		5 to 45°C							

Note) The clean air filter is designed for the filtration of solid objects. It is not suitable for the separation of water and oil.

Integrated production in a clean environment

Under a clean environment, all components have undergone ultrasonic cleaning.
Assembly, inspection and antistatic double packaging processes are conducted in an integrated production system.

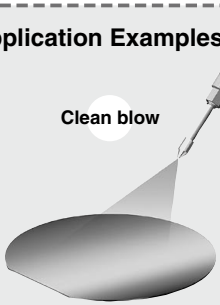
Assembly environment

- Clean room : Class **M5.5** (ISO class **7**)*
- Clean bench : Class **M3.5** (ISO class **5**)*

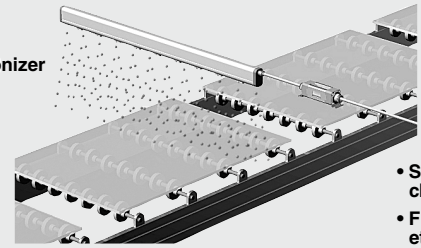
* Fed. Std. 209E ( ): based on ISO14644-1.

Application Examples

Clean blow



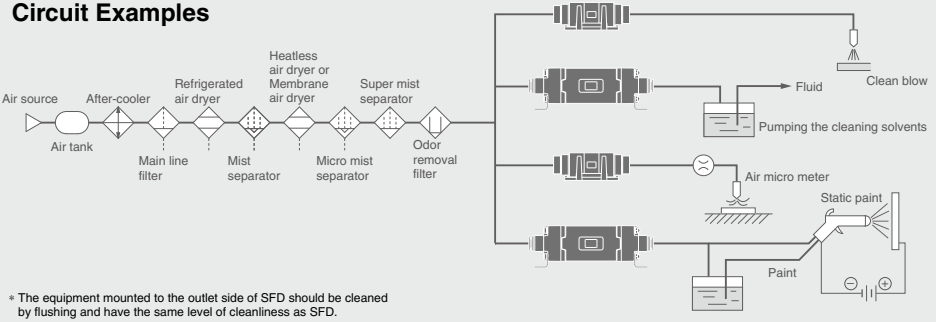
Blow of ionizer



- **Substitution of chamber**
- **Fluid pumping, etc.**

* When blowing, take care not to entrain ambient air which could contaminate the workpieces.

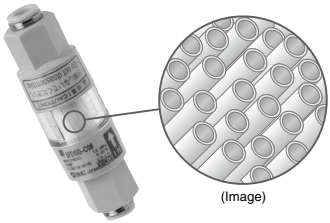
Circuit Examples



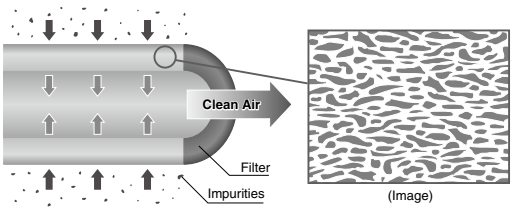
* The equipment mounted to the outlet side of SFD should be cleaned by flushing and have the same level of cleanliness as SFD.

Hollow fiber membrane

The hollow fiber membrane has a porous construction with numerous fine holes on a straw type fiber membrane wall.
The hollow fiber membrane filter traps and filtrates the impurities from the compressed air through the overlapping layered fine holes.



(Image)

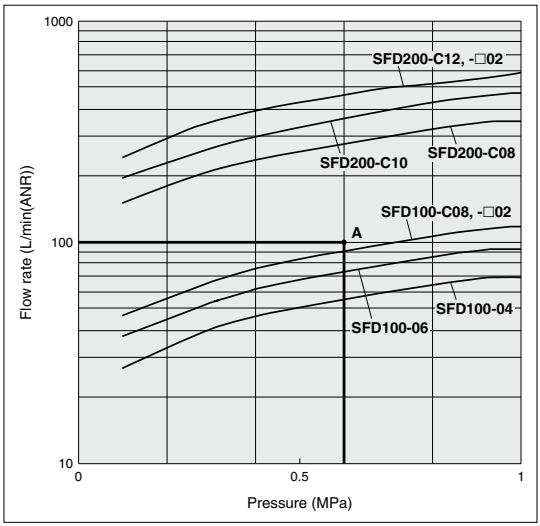


(Image)

SFD Series
Model Selection

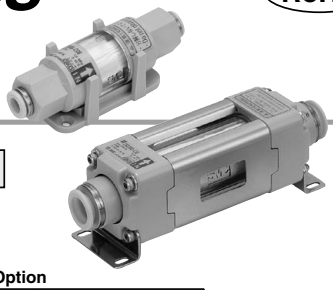
Select the model by using the following procedures involving the inlet pressure and the maximum flow rate.
[Example] Inlet pressure: 0.6 MPa
Maximum flow rate: 100 L/min (ANR)
1. Obtain the intersection A for the inlet pressure and the maximum flow rate by using the maximum flow rate chart.
2. If the obtained intersection A is above the maximum flow rate line, the SFD200-C12, -□02, -C10, or -C08 are selected.

Maximum Flow Rate



Clean Air Filter
SFD Series

RoHS



How to Order

SFD 1 0 0 – C08

Clean air filter

Size

Symbol	Max. flow rate
1	100 L/min (ANR)
2	500 L/min (ANR)

Case material

Symbol	Material
0	Resin
1	Aluminum
2	Stainless steel

Symbol 1 and 2 are made to order.
For details, refer to page 325.

Port size

Symbol	Connection size		Note
C04	ø4	Clean One-touch fittings (KP series)	SFD100 only
C06	ø6		
C08	ø8		SFD100/200
C10	ø10		SFD200 only
C12	ø12		
02	Rc 1/4		Female thread SFD100/200
N02	NPT 1/4		
F02	G 1/4		

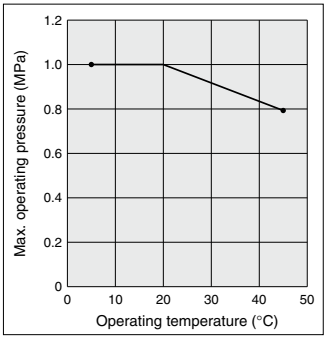
Made to Order Different diameters for IN and OUT ports are Made to Order.
For details, refer to page 326.

Option

Symbol	Option
Nil	None
B	Bracket (SFD100 only)

∗ The brackets are provided with the SFD200 series as a standard product. (Nil)

Relationship between Operating Temperature and Max. Operating Pressure



Specifications

Model	SFD10□	SFD20□
Port size	One-touch fittings ø4, ø6, ø8	One-touch fittings ø8, ø10, ø12
	Rc, NPT, G 1/4	Rc, NPT, G 1/4
Fluid	Air (Nitrogen)	Air (Nitrogen)
Air flow capacity	Up to 100 L/min (ANR)	Up to 500 L/min (ANR)
Nominal filtration rating Note 1)	0.01 μm (99.99%)	
Operating pressure range Note 2)	– 100 kPa to 1.0 MPa (in case of nitrogen: 0.99 MPa)	
Operating temperature	5 to 45°C	
Initial pressure drop	0.03 MPa (at inlet pressure 0.7 MPa, maximum flow)	
Element proof differential pressure Note 3)	0.5 MPa	
Proof pressure	1.5 MPa	
Element service life	1 year, or when the pressure drop reaches 0.1 MPa.	

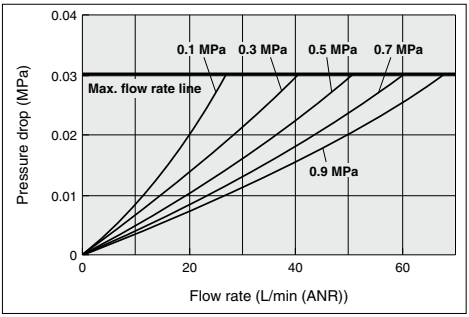
Note 1) Measured under SMC's specified conditions.
Note 2) The maximum operating pressure varies depending on temperature. Refer to the graph that shows the relationship between operating temperature and maximum operating pressure on the left.
Note 3) This means that the element does not break at 0.5 MPa. See "Specific Product Precautions".

Model	Port size	Rated flow (L/min (ANR)) Note 1)	Weight
SFD100	ø4 (One-touch fittings)	60	35 g
	ø6 (One-touch fittings)	80	35 g
	ø8 (One-touch fittings)	100	35 g
	Rc, NPT, G 1/4	100	35 g
SFD101 Note 2)	Rc, NPT, G 1/4	100	60 g
SFD102 Note 2)	Rc, NPT, G 1/4	100	150 g
SFD200	ø8 (One-touch fittings)	300	190 g
	ø10 (One-touch fittings)	400	190 g
	ø12 (One-touch fittings)	500	190 g
	Rc, NPT, G 1/4	500	260 g

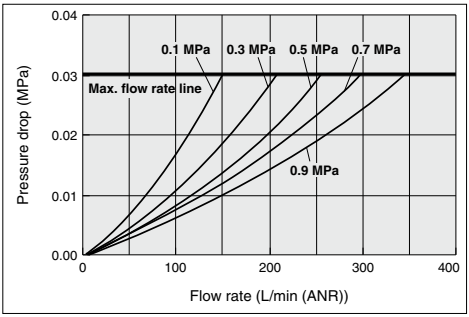
Note 1) The maximum flow rate when the inlet pressure is 0.7 MPa.
Note 2) SFD101 and SFD102 are produced upon receipt of order.

Flow Rate Characteristics

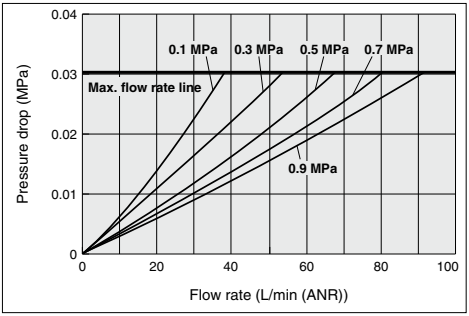
SFD100-C04



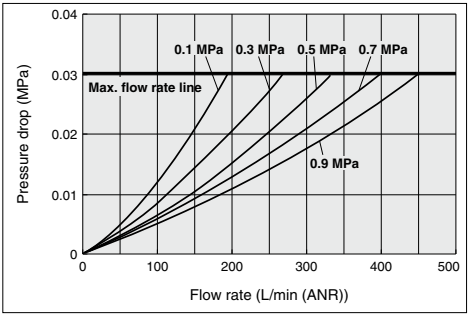
SFD200-C08



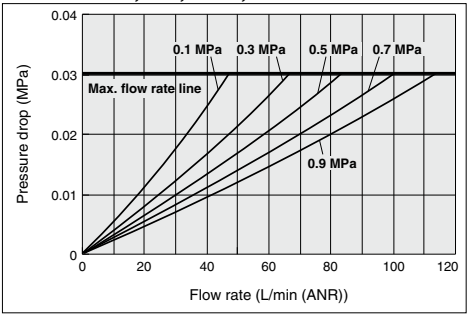
SFD100-C06



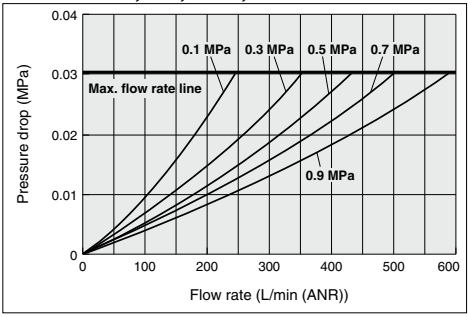
SFD200-C10



SFD100-C08, -02, -N02, -F02

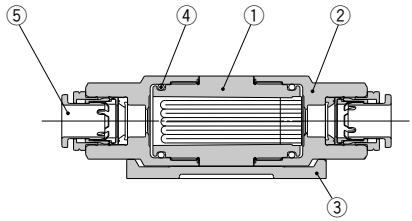


SFD200-C12, -02, -N02, -F02



Construction

SFD100-C□



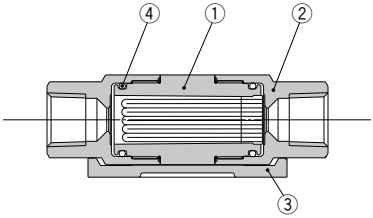
Component Parts

No.	Description	Material	Note
1	**Element**	PC, Polyolefin, PU, PET, ABS	
2	**Cover**	PBT	
3	**Bracket**	PBT	
4	**O-ring**	H-NBR	
5	**Cassette**	PP, EPDM, Stainless steel	

Replacement Parts

No.	Description	Material	Note
1	**Bracket set**	SFD-BR100	With 2 countersunk head screws (M3)

SFD100-□02



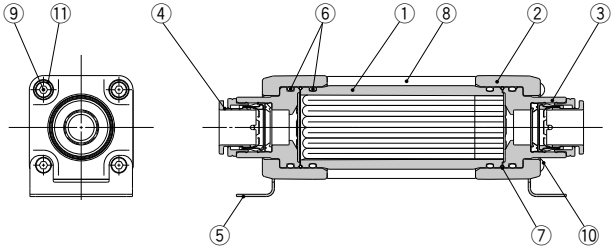
Component Parts

No.	Description	Material	Note
1	**Element**	PC, Polyolefin, PU, PET, ABS	
2	**Cover**	PBT	
3	**Bracket**	PBT	
4	**O-ring**	H-NBR	

Replacement Parts

No.	Description	Material	Note
1	**Bracket set**	SFD-BR100	With 2 countersunk head screws (M3)

SFD200-C□



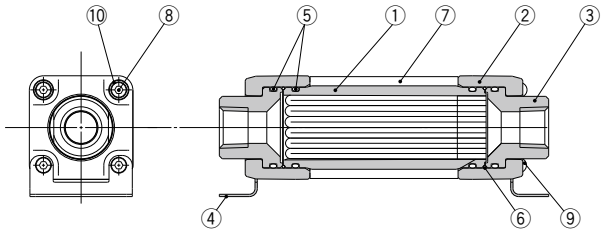
Component Parts

No.	Description	Material	Note
1	**Element**	PC, Polyolefin, PU	
2	**Cover**	Aluminum alloy	
3	**Fitting body**	PBT	
4	**Cassette**	PP, EPDM, Stainless steel	
5	**Bracket**	Stainless steel alloy	
6	**O-ring A**	H-NBR	
7	**O-ring B**	H-NBR	
8	**Rod cover**	Stainless steel alloy	
9	**Tie-rod**	Stainless steel alloy	
10	**Cap nut**	Stainless steel alloy	
11	**Plain washer**	Stainless steel alloy	

Replacement Parts

No.	Description	Material	Note
1	**Element set**	SFD-EL200	With 3 O-rings

SFD200-□02



Component Parts

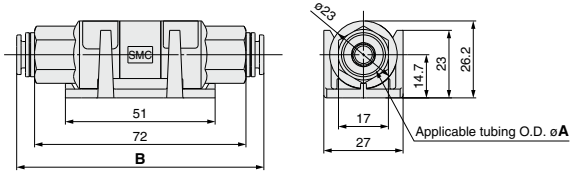
No.	Description	Material	Note
1	**Element**	PC, Polyolefin, PU	
2	**Cover**	Aluminum alloy	
3	**Fitting body**	Stainless steel alloy	
4	**Bracket**	Stainless steel alloy	
5	**O-ring A**	H-NBR	
6	**O-ring B**	H-NBR	
7	**Rod cover**	Stainless steel alloy	
8	**Tie-rod**	Stainless steel alloy	
9	**Cap nut**	Stainless steel alloy	
10	**Plain washer**	Stainless steel alloy	

Replacement Parts

No.	Description	Material	Note
1	**Element set**	SFD-EL200	With 3 O-rings

Dimensions

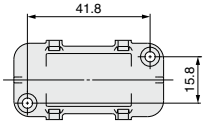
SFD100-C□



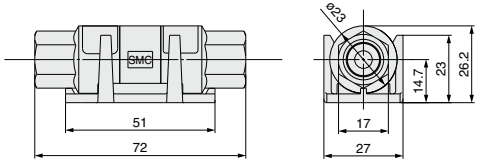
SFD100-C□ Dimensions

Model		A	B
SFD100-	C04	4	81
	C06	6	81
	C08	8	82

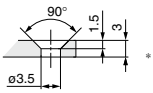
Bracket mounting dimensions



SFD100-□02

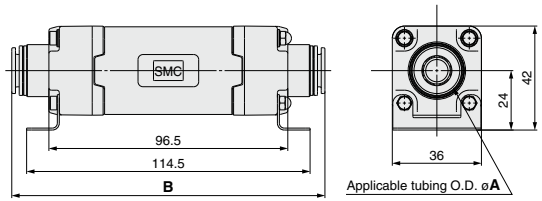


Hole shape for bracket mounting



∗ Use a countersunk head screw (M3) for bracket mounting.

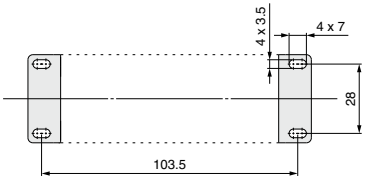
SFD200-C□



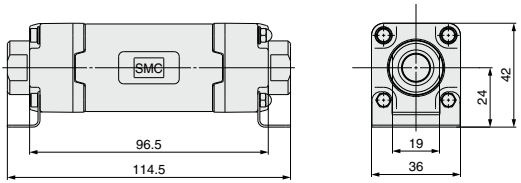
SFD200-C□ Dimensions

Model		A	B
SFD200-	C08	8	125
	C10	10	126
	C12	12	126

Bracket mounting dimensions



SFD200-□02



SFD Series
Made to Order Specifications 1

Please contact SMC for detailed specifications, delivery and prices.

Made to Order

1 Metal Case

SFD 1 0 1 – 02

Clean air filter

Size

Symbol	Max. flow rate
1	100 L/min (ANR)

∗ The SFD2 is not applicable.

Case material

Symbol	Material
1	Aluminum
2	Stainless steel

Port size

Symbol	Connection size
02	Rc 1/4
N02	NPT 1/4
F02	G 1/4

∗ The metal case is not available with a clean One-touch fitting.
∗ The bracket is provided as a standard product.

Metal case suitable for an atmosphere exposed to organic solvents and chemicals

Specifications

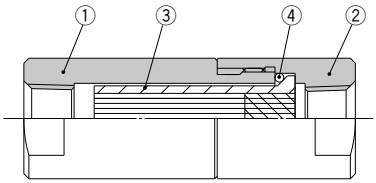
The specifications are the same as the standard product.
Refer to “Specifications” on page 321.

Flow Rate Characteristics

The flow rate characteristics are the same as the SFD100-02.
Refer to “Flow Rate Characteristics” on page 322.

Construction

SFD101-02



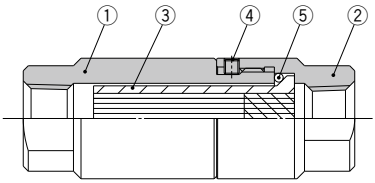
Component Parts

No.	Description	Material	Note
1	**Case**	Aluminum alloy	
2	**Cover**	Aluminum alloy	
3	**Element**	PC, Polyolefin, PU, PET, ABS	
4	**O-ring**	FKM	

Replacement Parts

No.	Description	Part no.	Note
1	**Element set**	SFD-EL101	With O-ring
2	**Bracket**	SFD-BR101	Material: Stainless steel 304

SFD102-02



Component Parts

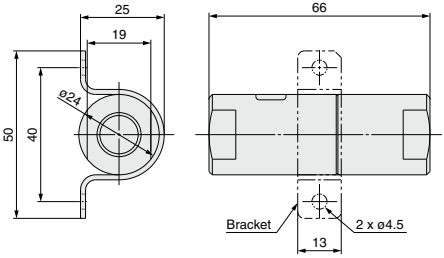
No.	Description	Material	Note
1	**Case**	Stainless steel alloy	
2	**Cover**	Stainless steel alloy	
3	**Element**	PC, Polyolefin, PU, PET, ABS	
4	**Hex. socket head set screw**	Stainless steel alloy	
5	**O-ring**	FKM	

Replacement Parts

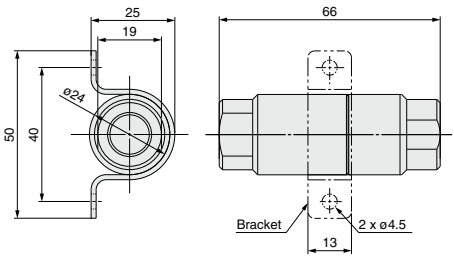
No.	Description	Part no.	Note
1	**Element set**	SFD-EL101	With O-ring
2	**Bracket**	SFD-BR101	Material: Stainless steel 304

Dimensions

SFD101-02



SFD102-02



SFD Series
Made to Order Specifications 2

Please contact SMC for detailed specifications, delivery and prices.

Made to Order

2 Different Diameters for IN and OUT Ports

SFD 1 00 – C04 C06 □

Clean air filter

Size

Symbol	Max. flow rate
1	100 L/min (ANR)
2	500 L/min (ANR)

Case material

Symbol	Material
0	Resin

Option

Symbol	Option
Nil	None
B	Bracket (SFD100 only)

∗ The brackets are provided with the SFD200 series as a standard product. (Nil)

IN side connection symbol

IN side connection symbol	Connection size	
C04	ø4	Clean One-touch fittings (KP series)
C06	ø6	
C08	ø8	
C10	ø10	
C12	ø12	
02	Rc 1/4	
N02	NPT 1/4	
F02	G 1/4	

OUT side connection symbol

OUT side connection symbol	Connection size	
C04	ø4	Clean One-touch fittings (KP series)
C06	ø6	
C08	ø8	
C10	ø10	
C12	ø12	
02	Rc 1/4	
N02	NPT 1/4	
F02	G 1/4	

∗ IN/OUT combination is the below table.

SFD100 Different Diameter Combinations

IN port size \ OUT port size	C04	C06	C08	02	N02	F02
C04		●	—	●	●	●
C06	●		●	●	●	●
C08	—	●		●	●	●
02	●	●	●		—	—
N02	●	●	●	—		—
F02	●	●	●	—	—	

∗ The symbol "—" stands for unavailable combination.

SFD200 Different Diameter Combinations

IN port size \ OUT port size	C08	C10	C12	02	N02	F02
C08		●	—	●	●	●
C10	●		●	●	●	●
C12	—	●		●	●	●
02	●	●	●		—	—
N02	●	●	●	—		—
F02	●	●	●	—	—	

∗ The symbol "—" stands for unavailable combination.

Specifications

The specifications are the same as the standard models.
Refer to "Specifications" on page 321.

Flow Rate Characteristics

When the IN and OUT ports have different diameters, the flow rate characteristics will be those of the port with the smaller diameter.
Refer to "Flow Rate Characteristics" for the smaller diameter from the chart of standard product on page 322.

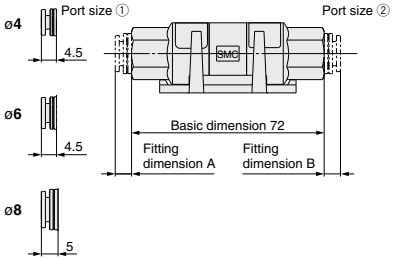
Construction

The construction and materials are the same as the standard product.
Refer to "Construction" on page 323.

Dimensions

SFD100 different diameters

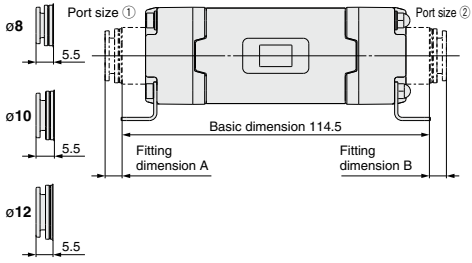
One-touch fitting dimensions(A, B)



Model	Port size ①	Port size ②	Total length
SFD100-	C04 (C06)	C06 (C04)	81 (A + 72 + B)
	C04 (□02)	□02 (C04)	76.5 (72 + A)
	C06 (C08)	C08 (C06)	81.5 (A + 72 + B)
	C06 (□02)	□02 (C06)	76.5 (72 + A)
	C08 (□02)	□02 (C08)	77 (72 + A)

SFD200 different diameters

One-touch fitting dimensions(A, B)



Model	Port size ①	Port size ②	Total length
SFD200-	C08 (C10)	C10 (C08)	125.5 (A + 114.5 + B)
	C08 (□02)	□02 (C08)	120 (114.5 + A)
	C10 (C12)	C12 (C10)	125.5 (A + 114.5 + B)
	C10 (□02)	□02 (C10)	120 (114.5 + A)
	C12 (□02)	□02 (C12)	120 (114.5 + A)

SMC

Related Products
<Pre-filters for *SFD Series*>

Mist Separator *AM Series*

Refer to pages 223 to 230 for details.

AM Series

Model	AM150C	AM250C
Rated flow (L/min (ANR))	300	750
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure Note)	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.3 μm (Filtering efficiency 99.9%)

Note) With auto drain: 0.1 MPa (N.O. type), 0.15 MPa (N.C. type)

Micro Mist Separator *AMD Series*

Refer to pages 231 to 239 for details.

AMD Series

Model	AMD150C	AMD250C
Rated flow (L/min (ANR))	200	500
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure Note)	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.01 μm (Filtering efficiency 99.9%)

Note) With auto drain: 0.1 MPa (N.O. type), 0.15 MPa (N.C. type)

Super Mist Separator *AME Series*

Refer to pages 249 to 256 for details.

AME Series

Model	AME150C	AME250C
Rated flow (L/min (ANR))	200	500
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.01 μm (Filtering efficiency 99.9%)

Odor Removal Filter *AMF Series*

Refer to pages 257 to 264 for details.

AMF Series

Model	AMF150C	AMF250C
Rated flow (L/min (ANR))	200	500
Port size (Nominal size B)	1/8, 1/4	1/4, 3/8

Specifications

Fluid	Compressed air
Max. operating pressure	1.0 MPa
Min. operating pressure	0.05 MPa
Proof pressure	1.5 MPa
Ambient temperature	5 to 60°C
Nominal filtration rating	0.01 μm (Filtering efficiency 99.9%)

SFD Series
Specific Product Precautions 1

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 6 to 8 for Air Preparation Equipment Precautions.

Selection

⚠Warning

1. Thoroughly and carefully confirm the purpose of use, required specifications and operating conditions (fluid, pressure, flow rate, nominal filtration rating and environment) then select a model within the specifications.

2. The product is not certified under the High Pressure Gas Safety law, so for nitrogen, its maximum operating pressure will be 0.99 MPa (gauge pressure).

3. Contact us beforehand if the product will be used in an application such as a caisson shield, breathing, food and/or medical treatment that affects the human body directly or indirectly.

4. If the compressed air includes ozone, do not use it since it may damage the product or cause malfunction. When it includes ozone, use a clean gas filter (SFA/B/C).

Mounting

⚠Warning

1. Operation manual

Mount the product after reading and understanding the operation manual. Keep it in a location where it can easily be found.

2. Flushing

Flush the piping line when the filter is used for the first time or has been replaced. In the event of connecting such as piping, flush (air blow) when using this product for the first time or replacing its elements in order to reduce the affect of the dust generated from the connection, etc. Flushing the line is also required to eliminate contamination resulting from the piping line installation. Therefore, be sure to flush the line before actually running the system. Fix all mounting parts for use.

3. Use fittings with resin threads for the connection of fittings to the IN and OUT ports.

Using fittings with metal threads could damage the IN and OUT ports (SFD100 only).

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 in accordance with the flow direction marked on the case.

If connected in reverse, the element could break.

2. The mounting orientation does not affect the performance, but if excessive force is applied to the SFD100 series, the body may become disconnected from the bracket.

Therefore, take particular care about the mounting orientation.

Caution on Installation

⚠Warning

1. The material of the element is polycarbonate.

The material is resistant to wiping with alcohol, but is not suitable for atmospheres or places with organic solvents, chemicals, cutting oils, synthetic oils, ester base compressor oils, alkalis or thread locking agents.

⚠Caution

1. If the pressure difference (pressure drop) between the inlet and the outlet exceeds 0.1 MPa, it can cause damage to the product.

2. Do not install the product in a place where it can be affected by a pulsation (including surge pressure) of over 0.1 MPa.

3. Use caution regarding the particles that may be emitted from the outlet side of a pneumatic equipment.

Installation of a pneumatic equipment on the outlet side can deteriorate the cleanliness because a particle will be generated from the equipment.
The mounting position of the pneumatic equipment needs to be considered.

4. Set the air flow capacity with an initial pressure drop of 0.03 MPa or less. If the initial pressure drop is set to be high, its service life will be shorten due to clogging.

5. Determine the product by the maximum consumption flow rate.

When using compressed air for an air blow application, calculate the maximum volume of air that will be consumed before selecting the SFD series product size.

6.Generally, the following pollutant particles are contained in compressed air.

[Pollutant particle substances contained in the compressed air]

- Moisture (drainage)
- Dusts and particles which are in the surrounding air
- Deteriorated oil which is discharged from the compressor
- Solid foreign matter such as rust and/or oil in the piping

1) The SFD series is not compatible with compressed air which contains fluids such as water and/or oil.

2) Install a dryer (IDF, IDG, ID series), mist separator (AM series), micro mist separator (AMD series), super mist separator (AME series), or odor removal filter (AMF series), etc., for the source of the air for the SFD series.

7. Using with a flow-rate much higher than its specification could lead to exceeding the differential pressure the product can resist.

Use the product within its specifications. Also, take care about the replacement period of the product, taking into consideration that the differential pressure of the filter will increase over time.

SFD Series
Specific Product Precautions 2

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 6 to 8 for Air Preparation Equipment Precautions.

Piping

⚠ Caution

1. Unpacking the sealed package

Since the filter is sealed in an antistatic double bag, the inner package should be unpacked in a clean atmosphere (such as a clean room).

2. Apply a wrench to 2 chamfered flats or hexagon portion on the IN side or the OUT side to prevent the housing from rotating.

3. Always tighten threads with the proper tightening torque.

When attaching fittings to the product, tighten with the proper tightening torque shown below.

Material	Tightening torque (N·m)
Resin	2 to 3
Metal	12 to 14

4. Check the arrow mark on the case which shows the flow direction to connect the IN and OUT ports correctly.

If connected in reverse, the element could break.

Maintenance

⚠ Warning

1. Follow the maintenance procedures in the operation manual. If handled incorrectly equipment or device can be damaged or cause a malfunction.

2. When removing the product, exhaust the air and ensure the air is released to atmosphere before removing it.

3. When the element comes to the end of its life, immediately replace it with a new filter or replacement element.

Service life of element

The service life of the element ends when either of the following two conditions occurs.

1) After 1 year of usage has elapsed.
2) When the pressure drop reaches 0.1 MPa even though the operating period has been less than 1 year.

Operating Environment

⚠ Warning

1. Do not operate under the conditions listed below due to a risk of malfunction.

In locations having corrosive gases, organic solvents, and chemical solutions, or in locations in which these elements are likely to adhere to the equipment.
In locations in which salt water, water, or water vapor could come in contact with the equipment.
In locations that are exposed to direct sunlight. (Shield the equipment from sunlight to prevent its resin material from ultraviolet ray degradation or overheating.)
In locations that have a heat source and poor ventilation. (Shield the equipment from heat sources to protect it from softening degradation due to radiated heat.)
In locations that are exposed to shocks and vibrations.
In locations with high humidity or a large amounts of dust.

2. When the product is used for blowing, use caution to prevent the work from being damaged by entrained air from the surrounding area.

When the compressed air is used for air blow, the exhausted air from the blow nozzle may have taken in airborne foreign matter (such as solid particle, fluid particle) from the surround air. The foreign matter will be sprayed on the work, and the airborne foreign matter may adhere to it. Therefore, use caution for the surrounding environment.

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) Polyolefin tube: Within ±0.1 mm
2) Polyurethane tubing: Within +0.15 mm, within –0.2 mm
3) Nylon tubing: Within ±0.1 mm
4) Soft nylon tubing: Within ±0.1 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.
The recommended tube for the clean fitting is polyolefin tube. Other tubes can satisfy the performance in terms of leakage, tensile strength, etc., but impair the cleanliness. Note this point for use.