Bag Filter

RoHS

Optimum for the large flow filtration

The bag-stated element (made of non-woven cloth) makes it possible to filtrate the large flow with lower pressure drop.
[FGF□1 Series (one element included): Up to 400 l/min]

Easy maintenance

Replacement operations are easy thanks to a built-in basket mechanism allowing element replacement outside the vessel.

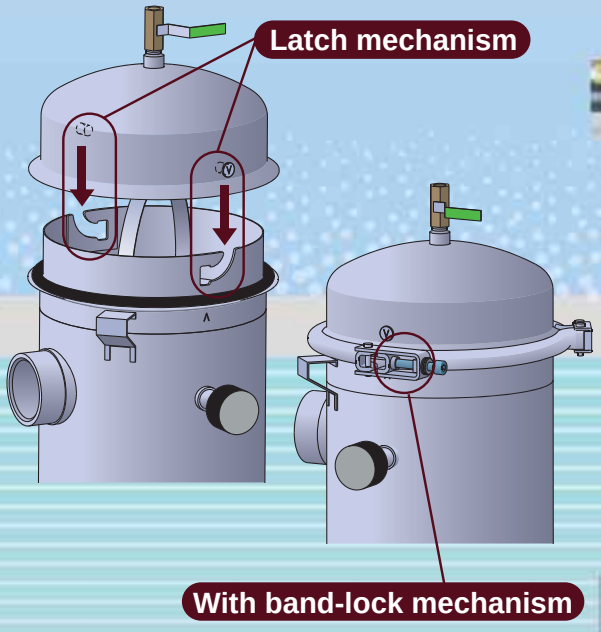
Main operating fluids

- Coolant (oil-based, water-soluble)
- Weak alkali-based cleaning fluid
- Cutting fluid
- Industrial water

∗ For other kinds of fluids, please contact SMC.

With safety mechanism

Employs proprietary SMC latch mechanism and band lock mechanism.
Safe even in the event of erroneous operation.



Bag-stated element

With a bag configuration, the aperture is wide and foreign matter is captured inside the element for easy removal. Furthermore, foreign matter captured inside the element will not spill over into the case interior or the surrounding area.

Select from a wide range of filtration accuracy.

Nominal filtration accuracy

5, 10, 25, 50, 100 μm

Improved functionality and operability Renewed for easier use!

[*FGF □1 Series* (one element included)]

- Leg format changed to removable type, improved piping workability on bottom side.
- Easier handling thanks to lightweight band and hinge mechanism.
- Basket features hole for fluid release. Release of foreign matter to the outlet side is prevented.
- Weight: **13** kg (Current model: 19 kg)
  32 % lighter than the current model

  ∗ Applies to FGF□1A

Series	Number of elements	Element size	Port size	Maximum flow (Water, at ΔP = 7 kPa)
FGF□1	1	Ø 190 x L440 Ø 190 x L770	Rc2	Approx. 400 l/min

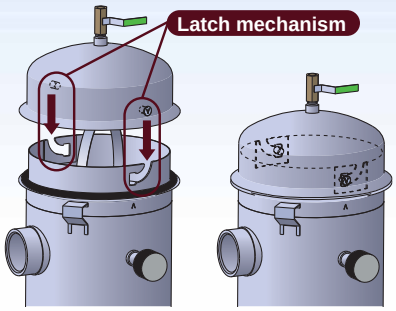
FGF Series

SMC

Bag filter offers excellent safety performance and ease of maintenance.

With safety mechanism

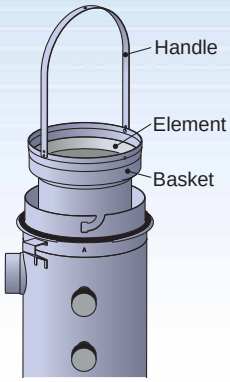
Employs SMC proprietary latch mechanism – Prevents cover blowout in cases of erroneous operation.



When cover is mounted

Element can be replaced outside the vessel.

Use of a built-in basket mechanism makes it possible to replace the element outside the vessel.



Band system

Makes the work of tightening easy.

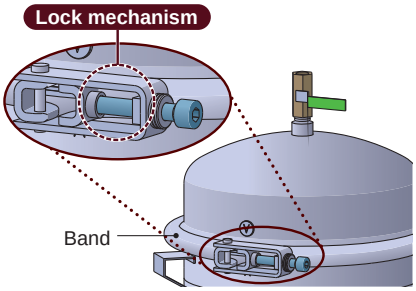
Compared to a bolt tightening system with many places (between 4 and 6) that need to be tightened, this system is easy to use with only one place to tighten.

Improved, easier handling thanks to lightweight band

Easier handling with more lightweight band (Band weight: 1 kg)

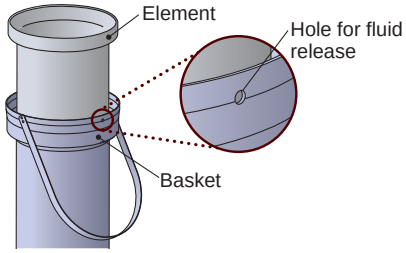
With lock mechanism <Patent pending>

Safe lock mechanism prevents band from coming off even in cases of erroneous operation under internal pressure.



No-fluid-buildup structure

Basket features hole for fluid release. Release of foreign matter to the outlet side during element replacement is prevented.
Since there is no leftover fluid, there is no need to perform drainage operations.
(The drain port of the current model has been eliminated.)



Lightweight

32 % lighter than the current model

Weight: **13** kg (Current model: 19 kg)

∗ Applies to FGF□1A

Piping operations are a breeze.

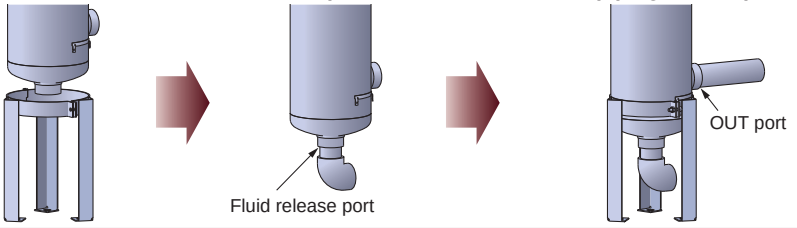
With a removable leg system, carrying out piping operations at the fluid release port is easier.

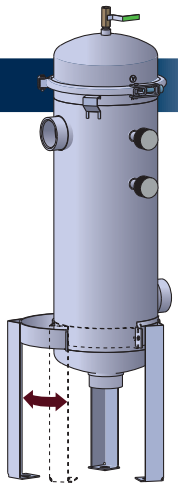
Example **When removing legs from the main unit before attaching piping**

❶ **Remove legs from the main unit.**

❷ **Attach piping to fluid release port.**

❸ **Replace legs on the main unit and attach piping to OUT port.**





SMC

Elements of Bag Filter

Available combination between an element and a vessel

Vessel

FGF□1
Vessel with one element
0.5 MPa type

Element		
Standard elements		P.4
Made to Order	Sub-element + Standard element	P.10
	Sub-element	
	HEPO element	P.11
	Long service life element	
	Branch type element	P.12
	PP (Polypropylene) bag element	
	Filter paper element	P.13

Types of Element

Standard element

Bag element

P.4

(For coarse filtration)

Made-to-Order elements

Sub-element + Standard element X46

P.10

Effective for extending the service life of a standard element

(For coarse filtration)

Sub-element X81

P.10

Eliminates large foreign matter.

(For coarse filtration)

HEPO element X49

P.11

High-performance filtration

(For precision filtration)

Made-to-Order elements

Long service life element X82

P.11

Long service life (Four to five times the filtration area compared with the standard elements)

(For coarse filtration)

Branch type element X292

P.12

More compact vessel is possible. (Longevity for L440 is same as L770.)

(For coarse filtration)

PP (Polypropylene) bag element X72

P.12

Applicable for strong alkali-based cleaning fluid

(For coarse filtration)

Filter paper element X142

P.13

Suitable for filtering cutting fluids

(For coarse filtration)

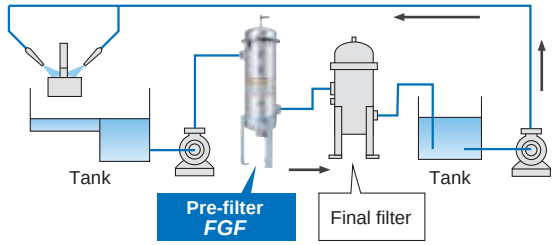
Note) Refer to pages 10 to 13 for details on Made-to-Order elements and vessels.

Stable quality and reuse of fluid is possible thanks to filtration!

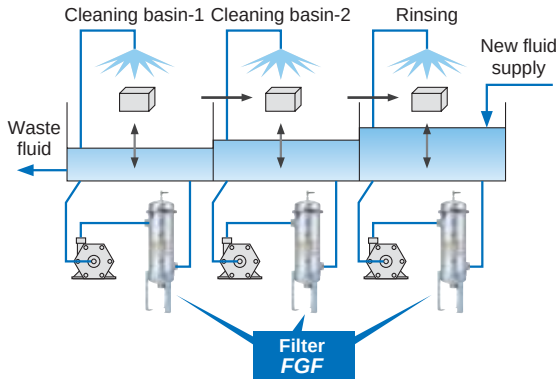
Contributes to… **Stable product quality** (Fewer defects, etc.) | **Prevention of problems in the line** (Prevention of nozzle blockage, etc.) | **Less waste fluid**

Application example

Washing line

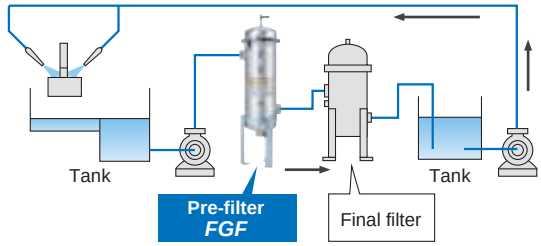


[Filtration of cleaning fluid]
The filter performs filtration of used cleaning fluid so it can be reused many times. (Thanks to cyclical filtration, the volume of waste fluid is reduced.)



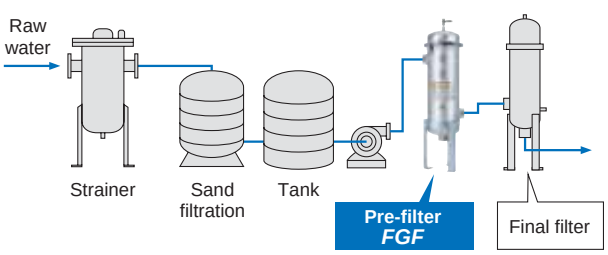
[Filtration of cleaning fluid]
The filter is used to maintain a constant level of cleaning fluid.

Processing line



[Filtration of coolant]
The filter performs filtration of used coolant so it can be reused many times.

Filtration of industrial water

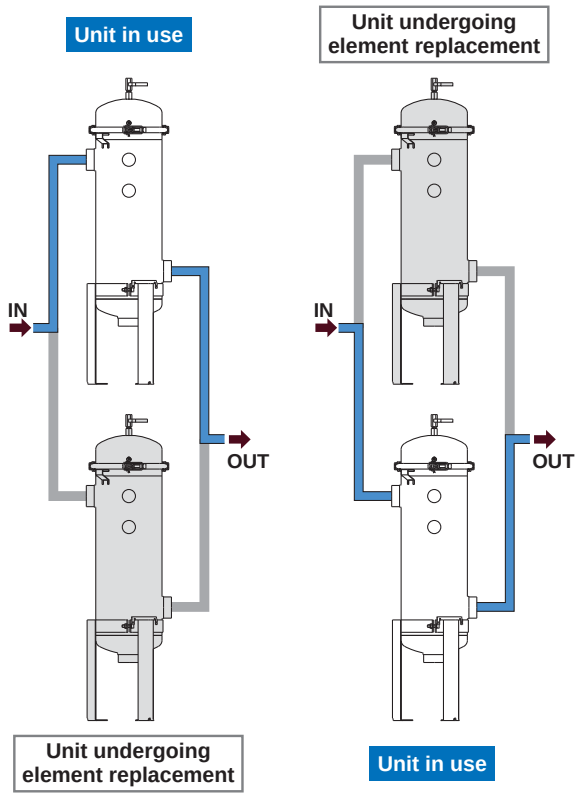


[Filtration of industrial water]
The filter removes foreign matter from raw water so it can be used for manufacturing.

Maintenance example

Two units used side by side

[Reduction in length of time line is stopped for element replacement]
Installing two bag filters means that one filter can always be used while the other is undergoing element replacement, meaning that the line does not have to be stopped for long periods of time for replacement of elements.



Bag Filter
FGF Series

RoHS

FGF□1

How to Order

One element included

FGF S 1 A – 20 – E 005 B – G

Bag filter

Material

Symbol	Vessel material	Seal material
S	Stainless steel	NBR
L	Stainless steel	FKM

Number of elements

Symbol	Number of elements
1	1 pc included (FGF□1)

Element size

Symbol	Element size
A	Ø 190 x L440
B	Ø 190 x L770

Element material (Polyester)

Port size

Symbol	Port size
20	Rc2

Option

Symbol	Option*
—	None
L	Foundation bolt (3 pcs)

∗ In the case of multiple options, indicate symbols in alphabetical order.

Pressure gauge

Symbol	Pressure gauge
G	With pressure gauge (1 MPa: Brass for wetted parts)
—	Without pressure gauge (with plug)

∗ Note that the differential pressure must be controlled strictly.

Nominal filtration accuracy Note)

Symbol	Nominal filtration accuracy [µm]
005	5
010	10
025	25
050	50
100	100

Note) Nominal filtration accuracy refers to the filtration accuracy according to SMC criteria, and serves as a guideline for the particulates that can be filtered out. It does not mean that 100 % of the particulates of the diameter shown can be filtered out.

Part number of element for replacement

EJ 501S – 005

Element symbol

Element size

Symbol	Element size	Applicable model
501S	Ø 190 x L440	For FGF□□A
601S	Ø 190 x L770	For FGF□□B

Made to Order

Made to Order
(For details, refer to pages 10 to 13.)

Specifications

Model			FGF□1A-20	FGF□1B-20
Common	Operating pressure		Max. 0.5 MPa	
	Operating temperature		Max. 80 °C (For with pressure gauge: 60 °C or less)	
	Maximum flow rate Note 1)		Approx. 400 l/min	
	Applicable fluid Note 2)		Water-soluble coolant, Weak alkali-based cleaning fluid, Industrial water (Vessel material: Stainless steel) Oil-based coolant, Cutting oil (Vessel material: Carbon steel)	
Vessel Note 3)	Material	Cover	Stainless steel 304	
		Case		
		Legs	Carbon steel	
		Seal	NBR or FKM Note 2)	
	Port size		Rc2	
	Internal volume		23 L	35 L
	Weight		13 kg	16 kg
	Accessories: Pressure gauge Note 4)		1 MPa: Brass for wetted parts	
	Accessories: Air release valve		1/4B Ball valve (Brass)	
	Accessories: Handle for picking elements		Basket integrated	
	Accessories: Davit for cover		None	
Element	Material		Polyestine	
	Nominal filtration accuracy		5, 10, 25, 50, 100 µm	
	Element relacement differential pressure		0.1 MPa Note 5)	
	Number of elements		1 element included	
	Size		Ø 190 x L440	Ø 190 x L770
	Filtration area		1800 cm^2	3400 cm^2

Note 1) Conditions: Fluid = Water, Pressure drop 7 kPa, Nominal filtration accuracy 100 µm
Note 2) Confirm the conformity of the fluid to be used.
Note 3) Surface treatment No. 2D* applies to the external surface of the vessel. (Scratches, scrapes, blotches and uneven colour may be present as long as they do not interfere with function or performance.)
∗ The symbol refers to surface finishing of JIS G 4305 cold rolled stainless steel sheet.
Note 4) For the FGF□1 series, this indicates cases where the "with pressure gauge" option has been selected.
Note 5) Control the element replacement so that the differential pressure does not exceed 0.1 MPa.
Note 6) Parts other than the wetted parts are made of carbon steel and painted (silver).

FGF Series
Model Selection

Step 1 Checking operating conditions ▶ **Step 2** Selecting a vessel ▶ **Step 3** Selecting the filter model ▶ **Step 4** Determining the model and number of units

Selection method	Selection flow chart	Selection example

Step 1 Checking operating conditions

• Fluid • Pressure • Temperature
• Flow rate • Filtration accuracy

Confirm that the specifications are within the appropriate range.

Check the compatibility of fluid with element material [polyester].

To check the compatibility with main fluids, refer to "Selection by Main Application" on page 7.

Check the compatibility of fluid with vessel material [stainless steel 304/ carbon steel].

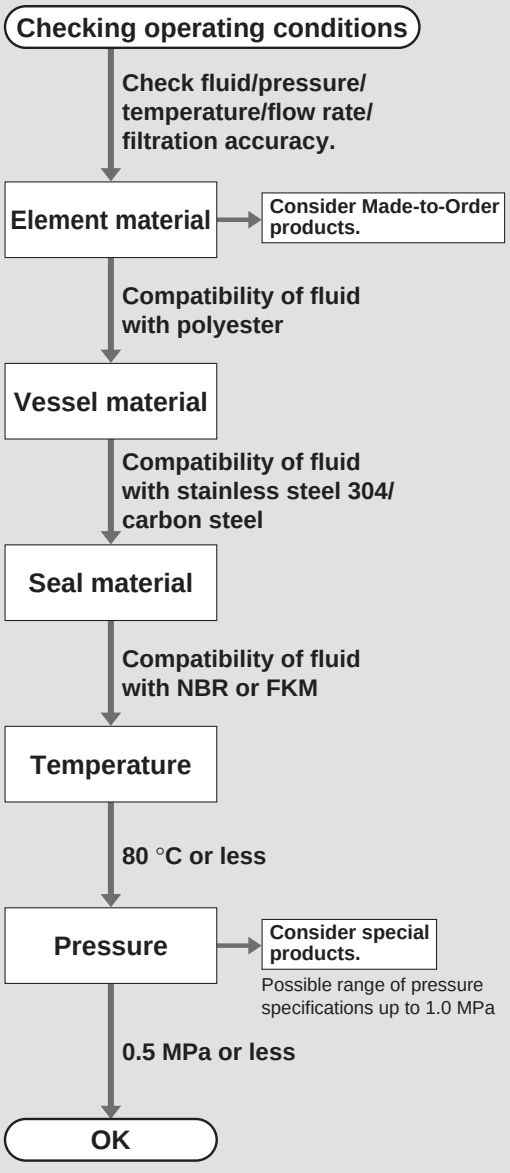
To check the compatibility with main fluids, refer to "Selection by Main Application" on page 7.

Check the compatibility of fluid with seal material [NBR] or [FKM].

To check the compatibility with main fluids, refer to "Selection by Main Application" on page 7.

Confirm that the temperature is 80 °C or less.

Confirm that the pressure is 0.5 MPa or less.



《**Operating conditions**》

- Fluid: Coolant (water-soluble) [Viscosity equivalent to water: 1 mm³/sec]
- Pressure: 0.3 MPa
- Temperature: 50 °C
- Flow rate: 700 l/min
- Filtration accuracy: 50 μm

Confirm that the specifications are within the appropriate range.

- Coolant (water-soluble)
  → Compatibility with polyester: OK
  → Compatibility with stainless steel 304: OK
  → Compatibility with NBR (FKM): OK
- 50 °C
  → 80 °C or less: OK
- 0.3 MPa
  → 0.5 MPa or less: OK

Selection method	Selection flow chart	Selection example

Step 2 Selecting a vessel

① Calculating the number of elements

Use the flow rate to calculate the number of elements.

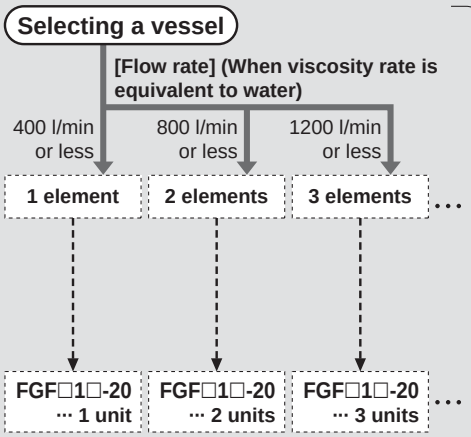
Required flow rate ÷ Recommended flow rate = Number of elements

[Recommended flow rate per one element]
400 l/min (Pressure drop 7 kPa to 8 kPa)
∗ When viscosity rate is equivalent to water. For other viscosities, perform viscosity conversion.

[Number of elements]
Round up: 1.75 elements ≈ 2 elements
∗ When flow rate = 50 l/min or less, the compact filters [FGD] [FQ] series are recommended.

② Vessel type and number of units

Choose a vessel that satisfies the number of elements obtained in step ①.



Calculate the number of elements.
Required flow rate ÷ Recommended flow rate
700 l/min ÷ 400 l/min
= 1.75 ≈ **2 elements**

Choose the vessel type and number of units.
2 elements
→ **FGF□1□-20 ··· 2 units**

Step 3 Selecting the filter model

① Selecting vessel material and seal material

Select vessel and seal materials from among those compatible with the fluid used.

② Selecting element size

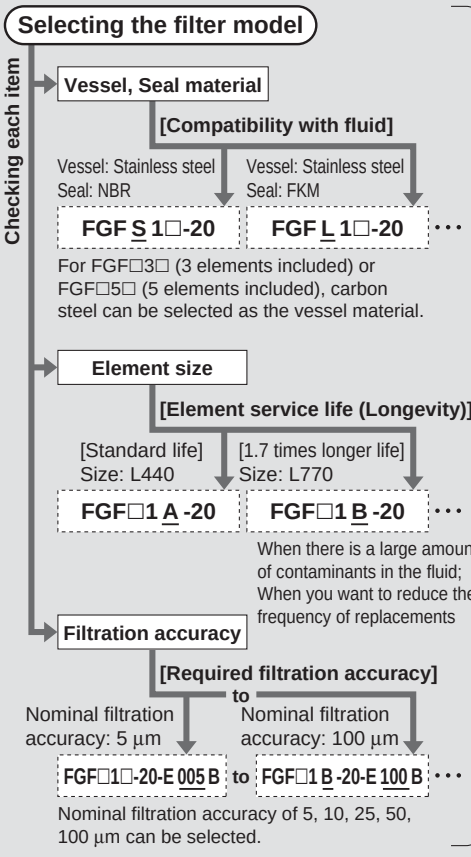
Select the element size when there is a large amount of contamination or frequent replacements.

Flow rate does not change depending on element size.

③ Selecting filtration accuracy

Select the required filtration accuracy depending on conditions.

Filtration accuracy = Nominal filtration accuracy



Select vessel and seal materials based on compatibility with the fluid.
Coolant (water-soluble)
→ Stainless steel / NBR: OK
The model selected is the **FGF S 1□-20**.

∗ In this case, the FGFL1□ with FKM seal material can also be selected.

Select the element size.
With standard life, the model selected is the **FGFS1 A -20**.

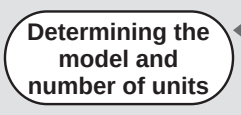
∗ When there is a large volume of contaminants in the fluid or when you want to reduce the frequency of replacements, select the FGFS1B with the L770 size element with 1.7 times longer life.

Select the filtration accuracy.
With a nominal filtration accuracy of 50 μm, the model selected is the **FGFS1A-20-E 050 B**.

Step 4 Determining the model and number of units

Determine the filter model and number units based on the results of **Step 2** and **Step 3**.

∗ Select pressure gauge or other options as needed.



Based on the results of **Step 2** and **Step 3**, **2 units** of the **FGFS1A-20-E050B** are selected.

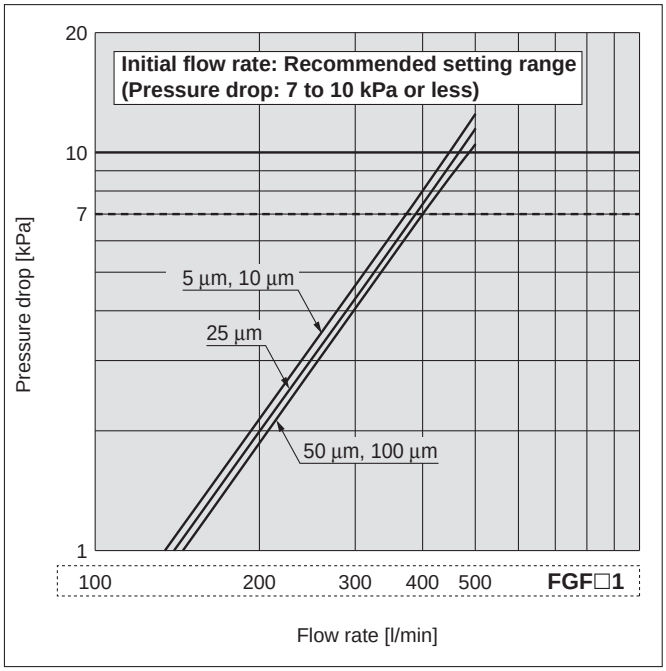
Selection by Main Application

Field	Fluid	Element		Vessel			
				Material		Compact filter [Other series]	FGF□1 1 element included
		Material	Filtration accuracy	Vessel	Seal		
						Up to 50 l/min	Up to 400 l/min
Machine tools	Coolant (water-soluble)	Polyester	10 to 50 µm	Stainless steel	NBR	Compact filter (FGD, FQ)	FGFS1□
	Coolant (oil-based)			Stainless steel or Carbon steel	NBR		
Washing equipment	Water-based cleaning fluid	Polyester	5 to 25 µm	Stainless steel	NBR	Compact filter (FGD, FQ)	FGFS1□
	Weak alkali-based cleaning fluid						
	Alcohol-based cleaning fluid						
	Oil-based cleaning fluid						
	Chlorine- / Fluorine-based cleaning fluid			Stainless steel	FKM		FGFL1□
	Strong alkali-based cleaning fluid	Polypropylene (See "Made to Order" on P.12.)		Stainless steel	FKM		FGFL1□··· X72
Others	Industrial water	Polyester	10 to 100 µm	Stainless steel	NBR	Compact filter (FGD, FQ)	FGFS1□
	Cooling water						

Select the element size □ (A: Ø 190 x L440; B: Ø 190 x L770) based on the amount of contaminants.
The above is for guideline purpose only. Check the compatibility of fluid with product, seal and element material before operation.
The flow rate is the appropriate flow rate at a viscosity equivalent to water.

Flow Rate Characteristics (Initial Value)

● Test fluid: Water Liquid temperature: 17 °C to 20 °C (Room temperature)
● Test method: Per SMC test method



● **Flow rate conversion based on viscosity conversion (with viscosity other than that equivalent to water)**

Example) Fluid: Coolant (oil-based) Kinematic viscosity: 20 mm²/sec
Flow rate: 285 l/min

1) Calculation of flow coefficient
- Obtain the flow coefficient from the viscosity conversion table.
  Kinematic viscosity: 20 mm²/sec → Flow coefficient: 95 %

2) Flow rate conversion
- Convert the flow rate when viscosity is equivalent to water using the flow coefficient obtained in step 1).
  285 l/min ÷ flow coefficient 95 % = 300 l/min
  300 l/min flow rate is necessary when viscosity is equivalent to water.
- After this, make a selection using the selection method.
  * When making a selection, designate the flow rate as 300 l/min when viscosity is equivalent to water.

Reference) The recommended flow rate for one coolant (oil-based) element at a kinematic viscosity of 20 mm²/sec is the recommended flow rate when viscosity is equivalent to water (400 l/min) x flow coefficient (95 %) = recommended flow rate 380 l/min at a kinematic viscosity of 20 mm²/sec.

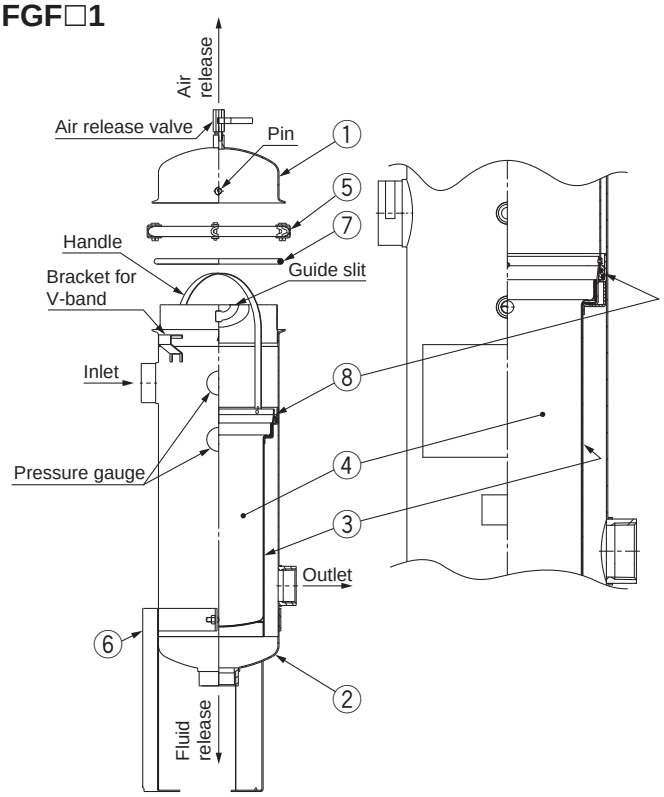
Viscosity Conversion Table

Kinematic viscosity (mm²/sec) (cSt)	400 High	200	100	50	20	1 Low
Fluid indicator	Equivalent to honey	—	—	Paint	Coolant (oil-based)	Water, Coolant (water-soluble), Cleaning fluid
Flow coefficient (%)	35	58	85	90	95	100

* These relationships between fluids and kinematic viscosity are for guideline purposes only. Check the actual kinematic viscosity of fluid before using. Fluid viscosities shown are at room temperature (17 °C to 20 °C).
* Flow coefficient: When 100 % of water flows at 1 mm²/sec, the flow coefficient indicates that 85 % flows at a kinematic viscosity of 100 mm²/sec.

Construction

FGF□1



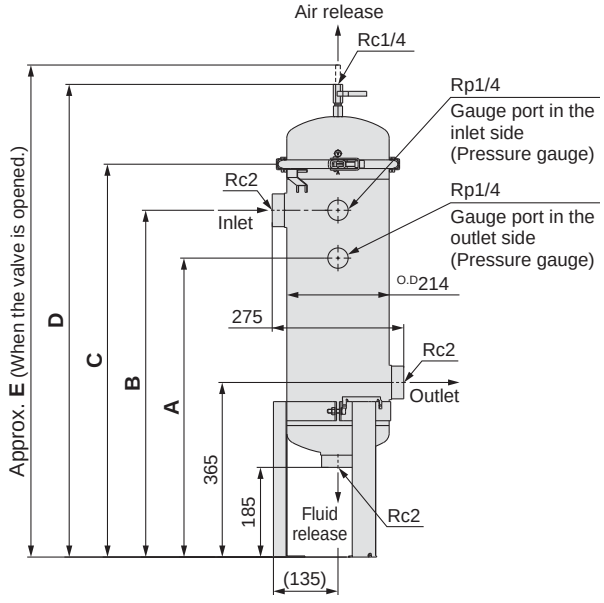
Component Parts/Replacement Parts

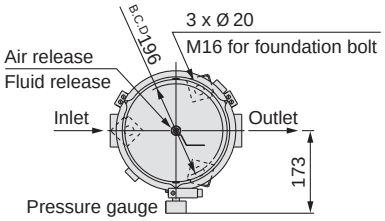
No.	Description	Part No.	Material	Qty.	Applicable model Note 1)
1	**Cover**	—	Stainless steel	1	FGF□1□
2	**Case**	—	Stainless steel	1	FGF□1□
3	**Basket**	FGF-BT01	Stainless steel	1	FGF□1A
		FGF-BT02		1	FGF□1B
4	**Element**	EJ501S-□	Polyester	1	FGF□1A
		EJ601S-□		1	FGF□1B
5	**V-band** Note 2)	FGF-BA01	Stainless steel	1	FGF□1□
6	**Legs (with bolt, nut, flat washer)**	FGF-OP01 (Set)	Carbon steel	1	FGF□1□
7	**O-ring**	FGF-KT01	NBR	1	FGFS1□
		FGF-KT02	FKM	1	FGFL1□
8	**Holder (with O-ring)**	FGF-KT03 (Set)	Polypropylene/ NBR	1	FGFS1□
		FGF-KT04 (Set)	Polypropylene/ FKM	1	FGFL1□

Note 1) Refer to “How to Order” on page 4 for the □ part of the model number.
Note 2) When replacing the ⑤ V-band, also replace the ⑦ O-ring at the same time.

Dimensions

FGF□1□-20





[mm]

Model	A	B	C	D	E
FGFS1A-20	625	725	820	985	1025
FGFL1A-20					
FGFS1B-20	955	1055	1150	1315	1355
FGFL1B-20					

Made to Order *FGF Series*

Elements

X46 Sub-element + Standard element

P.10

Effective for extending the service life of a standard element

(For coarse filtration)

X81 Sub-element

P.10

Eliminates large foreign matter.

(For coarse filtration)

X49 HEPO element

P.11

High-performance filtration

(For precision filtration)

X82 Long service life element

P.11

Long service life (Four to five times the filtration area compared with the standard elements)

(For coarse filtration)

X292 Branch type element

P.12

More compact vessel is possible. (Filtration area for L440 is same as L770.)

X72 PP (Polypropylene) bag element

P.12

Applicable for strong alkali-based cleaning fluid

(For coarse filtration)

X142 Filter paper element

P.13

Suitable for filtering cutting fluids

(For coarse filtration)

Leg Material: Stainless Steel

X47

P.13

FGF Series
Made to Order

Please consult with SMC for details.

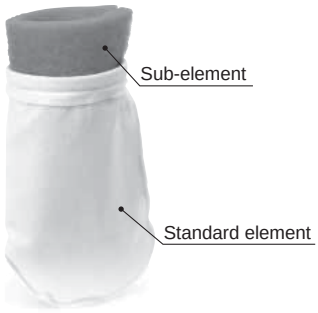
Made to Order

X46 "Sub-element and Standard element" equipped

Coarse filtration

- **Effective for extending the service life of a standard element**
- **Sub-elements eliminate large foreign matter.**

(For coarse filtration)



It has a structure such that the spongiform filtration material, which is made of Polyvinylidene Chlorides, is in the form of a bag. It is then fixed by a ring inside the standard element.

How to Order

RoHS

∗ Refer to "How to Order" on page 4 for standard specifications.

1 element included **FGF** ∗ **1** ∗ **– 20 – E** ∗ **B –** ∗ ∗ **– X46**

Pressure gauge Note 1)

Option Note 1)

Note 1) Without pressure gauge/Without option: "–" is not required to enter.
Example) FGFS1A-20-E005B-X46

Sub-element/Ring Part No. Note 2)

Element size	Sub-element (single part)	Sub-element with ring	Ring (single part)	Standard element (single part)
L440	**EZS340S**	**EZS320S**	**FZS310S**	**EJ501S-□**
L770	**EZS330S**	**EZS310S**		**EJ601S-□**

Note 2) When changing from a standard product to one with X46 specifications, order a sub-element with ring. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.
When replacing only the element, order a sub-element (single part) and a standard element and attach the ring before use. Enter the symbol for nominal filtration accuracy in the □ part for the standard element. (Refer to page 4.)

Specifications

Applicable model	FGF□□A	FGF□□B
Main applicable fluid Note 3)	Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water	
Nominal filtration accuracy Note 4)	5, 10, 25, 50, 100 μm (standard element), 500 to 1000 μm (sub-element)	
Operating temperature	Max. 80 °C	
Maximum flow rate Note 5)	Max. 400 l/min	
Element replacement differential pressure	Differential pressure 0.1 MPa	
Filtration material	Polyester (standard element), Vinylidene chloride (sub-element)	
Element size	Ø 190 x L440	Ø 190 x L770
Filtration area	1800 cm^2	3400 cm^2

Note 3) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.
Note 4) Depends on the filtration accuracy (nominal filtration accuracy) of the element.
Since sub-elements are specialised for coarse filtration, the nominal filtration accuracy is 500 μm or more.
Note 5) Conditions: Fluid = Water, Initial differential pressure 7 kPa, Nominal filtration accuracy 100 μm (standard element)
(For other conditions, refer to "Flow Rate Characteristics" on page 7. Equivalent to standard element)
Maximum flow rate is per one element.

X81 Sub-element equipped

Coarse filtration

- **Eliminates large foreign matter (500 μm or larger).**

(For coarse filtration)

How to Order

RoHS

∗ Refer to "How to Order" on page 4 for standard specifications.

1 element included **FGF** ∗ **1** ∗ **– 20 – B –** ∗ ∗ **– X81**

Pressure gauge Note 1)

Option Note 1)

Note 1) Without pressure gauge/Without option: "–" is not required to enter.
Example) FGFS1A-20-B-X81

Sub-element/Ring Part No. Note 2)

Element size	Sub-element (single part)	Sub-element with ring	Ring (single part)
L440	**EZS340S**	**EZS320S**	**FZS310S**
L770	**EZS330S**	**EZS310S**	

Note 2) When changing from a standard product to one with X81 specifications, order a sub-element with ring. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.
When replacing only the element, order a sub-element (single part) and attach the ring before use.

Specifications

Applicable model	FGF□□A	FGF□□B
Main applicable fluid Note 3)	Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water	
Nominal filtration accuracy Note 4)	500 to 1000 μm	
Operating temperature	Max. 80 °C	
Maximum flow rate Note 5)	Max. 400 l/min	
Element replacement differential pressure	Differential pressure 0.1 MPa	
Filtration material	Vinylidene chloride	
Element size	Ø 190 x L440	Ø 190 x L770
Filtration area	1800 cm^2	3400 cm^2

Note 3) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.
Note 4) Specialised for coarse filtration, the nominal filtration accuracy is 500 μm or more.
Note 5) Conditions: Fluid = Water, Initial differential pressure 7 kPa
(For other conditions, refer to "Flow Rate Characteristics" on page 7. Equivalent to standard element)
Maximum flow rate is per one element.

X49 HEPO element equipped

High-performance filtration

- **High-performance filtration**
- **Optimum for filtration of precision machine fluids, precision cleaning fluids, etc.**
- **Effective for the grinding powders**

(For precision filtration)

A cylindrical element in which the filter material made of P.G.P. (Polyester + Glass fibre) is sandwiched by a stainless steel mesh and pleated.

How to Order

RoHS

∗ Refer to "How to Order" on page 4 for standard specifications.

1 element included FGF ∗ 1 ∗ – 20 – Z 003 B – ∗ ∗ – X49

Pressure gauge Note 1)

Option Note 1)

Note 1) Without pressure gauge/Without option: "–" is not required to enter.
Example) FGFS1A-20-Z003B-X49

Element/Element-Fixing Component Part No. Note 2)

Element size	HEPO element (single part)	Element-fixing component 1 included
L440	**EZFN20AS**	**FGF-OP03**
L770	**EZFN30AS**	

Note 2) When changing from a standard product to one with X49 specifications, additionally order a HEPO element (single part) and an element-fixing component. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.
When replacing only the element, order a HEPO element (single part).

Specifications

Applicable model	FGF□□A	FGF□□B
Main applicable fluid Note 4)	Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water	
Nominal filtration accuracy Note 5)	3 μm	
Operating temperature	Max. 80 °C	
Maximum flow rate Note 6)	Max. 100 l/min	Max. 200 l/min
Element replacement differential pressure	Differential pressure 0.1 MPa	
Filtration material	Polyester/Glass fibre	
Element size	Ø 186 x L312	Ø 186 x L642
Filtration area	16500 cm²	31600 cm²

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.
Note 5) Specialised for precision filtration. The filtration accuracy indicates 98 % of filtered particle size.
Note 6) Conditions: Fluid = Water. For other fluids, maximum flow rate changes based on viscosity, etc. Maximum flow rate is per one element.

X82 Long service life element equipped

Large filtration area

- **Four to five times the filtration area (compared with the standard elements)**
- **Reduction in number of element replacements**

(For coarse filtration)

A cylindrical element in which the non-woven material made of PP (Polyprovddpylene) is sandwiched by a PET (Polyester) mesh and pleated.

How to Order

RoHS

∗ Refer to "How to Order" on page 4 for standard specifications.

1 element included FGF ∗ 1 ∗ – 20 – Z 050 B – ∗ ∗ – X82

Pressure gauge Note 1)

Option Note 1)

Note 1) Without pressure gauge/Without option: "–" is not required to enter.
Example) FGFS1A-20-Z050B-X82

Element/Element-Fixing Component Part No. Note 2)

Element size	Long service life element (single part)	Element-fixing component 1 included
L440	**EZD810AS-050**	**FGF-OP03**
L770	**EZF730AS-050**	

Note 2) When changing from a standard product to one with X82 specifications, additionally order a long service life element (single part) and an element-fixing component. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.
When replacing only the element, order a long service life element (single part).

Specifications

Applicable model	FGF□□A	FGF□□B
Main applicable fluid Note 4)	Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water	
Nominal filtration accuracy Note 5)	50 μm	
Operating temperature	Max. 80 °C	
Maximum flow rate Note 6)	Max. 100l/min	Max. 200l/min
Element replacement differential pressure	Differential pressure 0.1 MPa	
Filtration material	Polypropylene/Polyester	
Element size	Ø 186 x L312	Ø 186 x L642
Filtration area	9400 cm²	12400 cm²

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.
Note 5) The filtration accuracy is based on SMC criteria, and differs from the absolute filtration accuracy (filtration efficiency of 97 % or more).
Note 6) Conditions: Fluid = Water. For other fluids, maximum flow rate changes based on viscosity, etc. Maximum flow rate is per one element.

X292 Branch type element equipped — Large filtration area

- **1.8 times the filtration area (compared with the standard element)**
- **Filtration area is the same for short size elements (L440) and long size (L770). More compact vessels are possible.**

(For coarse filtration)

Two-bag construction made of polyester non-woven material.

How to Order

RoHS

∗ Refer to “How to Order” on page 4 for standard specifications.

FGF ∗ 1 A − 20 − E ∗ B − ∗ ∗ − X292

- ∗ (after B-): **Pressure gauge** Note 1)
- ∗ (last): **Option** Note 1)

Note 1) Without pressure gauge/Without option: “–” is not required to enter. Example) FGFS1A-20-E005B-X292

Element Part No. Note 2)

Element size	Branch type element (single part)	Basket
L440	**EJ111S-□** Note 3)	**FGF-BT03**

Note 2) When changing from a standard product to one with X292 specifications, additionally order a branch type element (single part) and a basket component. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.
When replacing only the element, order a branch type element (single part).
Note 3) Enter the symbol for nominal filtration accuracy in the □ part. (Refer to page 4.)

Specifications

Applicable model	**FGF□□A**
Main applicable fluid Note 4)	Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water
Nominal filtration accuracy Note 5)	5, 10, 25, 50, 100 µm
Operating temperature	Max. 80 °C
Maximum flow rate Note 6)	Max. 400 l/min
Element replacement differential pressure	Differential pressure 0.1 MPa
Filtration material	Polyester
Element size	Ø 190 x L440
Filtration area	3300 cm²

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.
Note 5) Depends on the filtration accuracy (nominal filtration accuracy) of the element.
Note 6) Conditions: Fluid = Water, Initial differential pressure 7 kPa, Nominal filtration accuracy 100 µm (standard element)
(For other conditions, refer to “Flow Rate Characteristics” on page 7. Equivalent to standard element)
Maximum flow rate is per one element. When there are three elements or five elements, multiply by 3 or 5.

X72 PP (Polypropylene) bag element equipped — Polypropylene

- **Polypropylene filter material can be used with a wide variety of fluids.**
- **Applicable for strong alkali-based cleaning fluid**

(For coarse filtration)

How to Order

RoHS

∗ Refer to “How to Order” on page 4 for standard specifications.

1 element included FGF ∗ 1 ∗ − 20 − E ∗ B − ∗ ∗ − X72

- ∗ (after E): **Nominal filtration accuracy**
- ∗ (after B-): **Pressure gauge** Note 1)
- ∗ (last): **Option** Note 1)

Note 1) Without pressure gauge/Without option: “–” is not required to enter. Example) FGFS1A-20-E005B-X72

Nominal filtration accuracy

Symbol	Nominal filtration accuracy (µm)
001	1
003	3
005	5

Element Part No. Note 2)

Element size	PP (Polypropylene) bag element (single part)
L440	**EJ501S-□X30** Note 3)
L770	**EJ601S-□X30** Note 3)

Note 2) When changing from a standard product to one with X72 specifications, order a PP (Polypropylene) bag element. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.
When replacing only the element, order a PP (Polypropylene) bag element (single part).
Note 3) Enter the symbol for nominal filtration accuracy in the □ part.

Specifications

Applicable model	**FGF□□A**	**FGF□□B**
Main applicable fluid Note 4)	Strong alkali-based cleaning fluid, Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water	
Nominal filtration accuracy Note 5)	1, 3, 5 µm	
Operating temperature	Max. 80 °C	
Maximum flow rate Note 6)	Max. 400 l/min	
Element replacement differential pressure	Differential pressure 0.1 MPa	
Filtration material	Polypropylene	
Element size	Ø 190 x L440	Ø 190 x L770
Filtration area	1800 cm²	3400 cm²

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used.
Note 5) Depends on the filtration accuracy (nominal filtration accuracy) of the element.
Note 6) Conditions: Fluid = Water, Initial differential pressure 8 kPa, Nominal filtration accuracy 5 µm (standard element)
(For other conditions, refer to “Flow Rate Characteristics” on page 7. Equivalent to standard element)
Maximum flow rate is per one element.

X142 Filter paper element equipped — For cutting/grinding oil

- Optimum for filtration of cutting or grinding oil
- Large filtration area makes it suitable for filtrating fluids containing highly dense contaminants.

(For coarse filtration)

A cylindrical element with a cotton-made filter inside and a pleated material on the outside for reinforcement.

How to Order

RoHS

∗ Refer to "How to Order" on page 4 for standard specifications.

1 element included FGF ∗ 1 ∗ − 20 − Z 010 B − ∗ ∗ − X142

- Pressure gauge Note 1)
- Option Note 1)

Note 1) Without pressure gauge/Without option: "–" is not required to enter.
Example) FGFS1A-20-Z010B-X142

Element/Element-Fixing Component Part No. Note 2)

Element size	Filter paper element (single part)	Element-fixing component 1 included
L440	**EJ501S-010X6**	**FGF-OP03**
L770	**EJ601S-010X6**	

Note 2) When changing from a standard product to one with X142 specifications, additionally order a filter paper element (single part) and an element-fixing component. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.
When replacing only the element, order a filter paper element (single part).

Specifications

Applicable model	FGF□□A	FGF□□B
Main applicable fluid Note 4)	Coolant (oil-based), Lubricating oil	
Nominal filtration accuracy Note 5)	10 μm	
Operating temperature	Max. 80 °C	
Maximum flow rate Note 6)	Max. 100 l/min	Max. 200 l/min
Element replacement differential pressure	Differential pressure 0.1 MPa	
Filtration material	Cotton	
Element size	Ø 186 x L312	Ø 186 x L642
Filtration area	8900 cm^2	18500 cm^2

Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in the elements cannot be used. Only oil-based fluids can be used.
Note 5) Depends on the filtration accuracy (nominal filtration accuracy) of the element.
Note 6) Conditions: When fluid has a kinematic viscosity of 36 mm^2/sec (equivalent to turbine oil VG36).
For other fluids, maximum flow rate changes based on viscosity, etc.
Maximum flow rate is per one element.

X47 Leg material: Stainless steel

- Legs made of stainless steel can be used.

How to Order

RoHS

∗ Refer to "How to Order" on page 4 for standard specifications.

FGF ∗ 1 A − 20 − E ∗ B − ∗ ∗ − X47

- Option Note 1)
- Pressure gauge Note 1)

Note 1) Without pressure gauge/Without option: "–" is not required to enter.
Example) FGFS1A-20-E005B-X47

Legs Part No.

Part no. Note 2)	Material	Included parts
FGF-OP02	Stainless steel	Mounting bolt/Nut/Flat washer

Note 2) When changing from a standard product to one with X47 specifications, order the part numbers above and replace only the legs. Since the model number will change when replacement is conducted, we ask that the customer manage the model number.

Specifications

Applicable model			FGF□1A	FGF□1B
Common	**Operating pressure**		Max. 0.5 MPa	
	Operating temperature		Max. 80 °C	
	Maximum flow rate Note 3)		Max. 400 l/min	
	Main applicable fluid Note 4)		Coolant (oil-based, water-soluble), Weak alkali-based cleaning fluid, Industrial water	
Vessel	**Material**	**Cover**	Stainless steel 304	
		Case		
		Legs	Stainless steel 304	
	Port size		Rc2	
	Internal volume		23 L	35 L
	Weight		13 kg	16 kg
Element	**Filtration material**		Polyester	
	Nominal filtration accuracy Note 5)		5, 10, 25, 50, 100 μm	
	Element replacement differential pressure		Differential pressure 0.1 MPa	
	Number of elements		1	
	Element size		Ø 190 x L440	Ø 190 x L770
	Filtration area		1800 cm^2	3400 cm^2

Note 3) Conditions: Fluid = Water, Initial differential pressure 7 kPa, Nominal filtration accuracy 100 μm (standard element)
(For other conditions, refer to "Flow Rate Characteristics" on page 7. Equivalent to standard product.)
Note 4) Fluids that cause corrosion, deterioration or expansion of the material used in this filter and elements cannot be used.
Note 5) Depends on the filtration accuracy (nominal filtration accuracy) of the element.

FGF Series
Specific Product Precautions

Be sure to read this before handling the products.
Refer to back for Safety Instructions and the Operation Manual for details.
Please download the Operation Manual via SMC website, http://www.smc.eu

Model Selection/Design

Do not select a model exceeding specification ranges and carefully consider the purpose of use, required specifications and operating conditions such as fluid, pressure, flow rate, temperature and environment. Mishandling may lead to an unexpected accident.

⚠Warning

1. Operating pressure

Do not use the product beyond the operating pressure range. Do not use in locations where peak pressure exceeds the operating pressure due to water hammer, surge pressure, etc.

2. Operating temperature

Do not use the product beyond the operating temperature range. Do not use at temperatures at or above the boiling point of the fluid.

3. Fluid

- Use the product for filtering coolant (oil-based or water-soluble), weak alkali-based cleaning fluid or industrial water.
- Never use the product with **gases**.
- Do not use the product with corrosive fluids.
- Do not use the product with fluids which will likely cause the expansion and deterioration of seals, O-rings or the element. Some fluids can deteriorate a seal or an O-ring, and have an affect on the filter function, causing leakage.
- The wetted parts of the pressure gauge is made of brass. Check the compatibility with fluid in use.

4. Operating environment

- Do not use in operating conditions or environments where changes in colour or deterioration of material due to corrosion occur.
- Do not use this product in a place where shock or vibrations occur.

⚠Caution

1. Pressure drop (ΔP)

- Use the product with a flow which has an initial pressure drop which will become 10 kPa or less.
- The pressure drop fluctuates depending on operating conditions. Since the pressure drop is one of the factors indicating filter characteristics, use the filter by setting a controlling standard.

2. Installation space

Arrange the necessary space for inspection, before installing and piping the product.

[Maintenance work space]

- Above vessel (for removal of basket during element replacement) ... At least 450 mm of space above vessel
- Around band (for removal of band during element replacement) ... At least 50 mm of space around band

∗ Applies to FGF□1□

Installation and Piping

⚠Caution

1. Use the product with a circuit having lesser fluctuation to the filter caused by pressure or flow. (Refer to Fig. 1.)

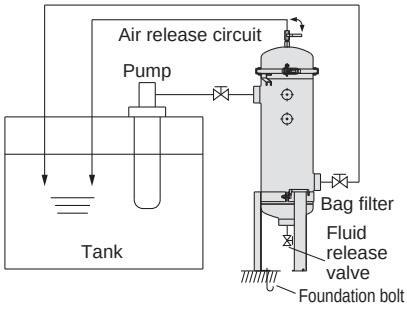


Fig. 1 Example of cyclical filtration circuit

2. Use the product in a circuit where no backflow occurs in the filter. If any backflow occurs, take appropriate measures, such as installation of a non-return valve. The riser piping at the outlet of the filter may also cause backflow. So, take appropriate measures shown above.

3. Firmly fix the bottom to the ground using foundation bolts, etc.

4. Connect the valves or fittings suited to the operating conditions by checking the size of each connection port. During connection work, make sure that powder from the piping screws or seal material does not get into the interior of the piping. Prior to operating, flush the piping line and check for abnormalities, such as fluid leakage.

5. Firmly fix the piping to the mounting frame using a saddle, etc., to avoid vibration or force caused by the weight.

6. During element replacement, it is necessary to release fluid from the vessel. Be sure to connect the pipe to the fluid release port so that fluid releasing work can be absolutely performed.

7. Pipe so that air releasing work can be absolutely performed.

The air releasing work can be done firmly if you make the piping in order to flow a small flow constantly into a tank by resin tubing, etc. from the air release valve. (Refer to Fig. 2.)
However, because the pump is in a high position, idling sometimes occurs during re-start. Take measures such as releasing the air in a high position, etc.

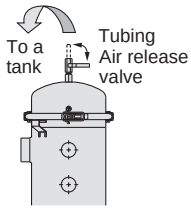


Fig. 2 Air release circuit

Operation

⚠Warning

1. Never loosen the V-band under pressurised conditions.

Operation

⚠Caution

1. Releasing the air

When applying pressure for starting a pump, etc., be sure to release the air by opening the air release valve on the top. (Refer to Fig. 3.)

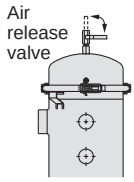


Fig. 3 Releasing the air

2. When operating

When applying pressure for starting a pump, etc., confirm that each connecting parts are completely sealed. If any abnormality is found, such as fluid leakage, stop the product immediately and locate the possible cause of the failure. Resume operation after taking appropriate measures to stop the fluid leakage by replacing the O-rings or additionally tightening the fittings, etc.

Maintenance

⚠Warning

1. Failure to observe the procedure will likely cause fluid leakage or removal of a cover, which may lead to an unexpected accident. (Follow the procedure in the operation manual.)

2. Confirm that the line has stopped and pressure has been reduced to zero before performing maintenance work.

⚠Caution

1. Timing of element replacement

When the time has come to replace the element, replace it with a new element immediately.
= Timing of element replacement =
• When pressure drop has reached to 0.1 MPa.

2. Element replacement work

- Carry out element replacement work based on the procedure in the operation manual. Mishandling could lead to malfunction or damage the machinery and equipment.
- Replace the elements only after confirming that the pressure is zero.
- The parts used for tightening the cover (V-band, etc.) must be properly positioned after replacing elements.

3. Cleaning each component

During element replacement, in order for firm sealing to take place, clean the sealing surface of the seal and/or remove the paint which is left on the tightened parts of the cover or the thread parts.

4. Replacing seals

Replace the deteriorated or expanded O-ring, gasket holder assembly or other seals. Also, replace the seal after it has been used for one year or when fluid leakage occurs.

5. Parts used for tightening the cover

If a part used for tightening the cover (V-band, etc.) is deformed or the threads are galled, it must be replaced.

6. Temperature

When operating at high temperatures (40 °C to 80 °C), there is danger of burns, etc.

Confirm that the surface temperature of the filter or the parts for operation (V-band, element, etc.) are 40 °C or less, to prevent a burn from occurring.

⚠ 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 catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.
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 catalogue.
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 catalogue 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.

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