

# Filter for Cleaning Fluid/Quick Change Filter

## FQ1 Series

No tools required,  
ensuring easy  
element replacement.



FGD

FGE

FGG

FGA

FGC

FGF

FGH

**FQ1**

FN

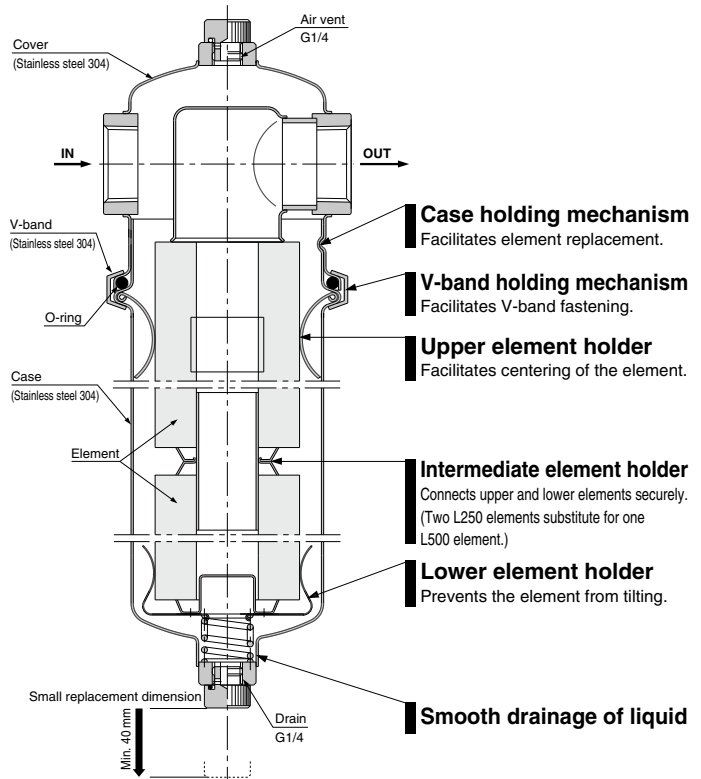
EB

ES

# Easy element replacement

Element can be replaced without using any tool.

- Replacing the element
- Air release
- Drainage of liquid



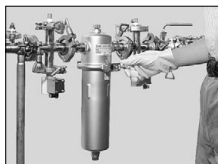
# Quick Change Filter

## FQ1 Series

### No tools required, easy element replacement

#### Removing the element

- 1 Stop liquid flowing into the filter. (If there are valves before and after the filter, close these valves.)
- 2 Release pressure inside the filter completely by loosening the air vent plug.
- 3 Discharge fluid inside the filter by removing the drain plug.
- 4 Remove the stopper from the retainer by loosening the wing bolt on the V-band.



- 5 To extract the element from the case, rotate the case counterclockwise about 20 degrees until it stops, then lower it by about 40 mm and remove it from the cover.

**Note)** When using two L250 elements, do not discard the intermediate holder since it is used.



- 6 Clean the inside of the case, gaskets, seals, holders, plugs, etc., with a pure fluid or solvent.

#### Installing the element

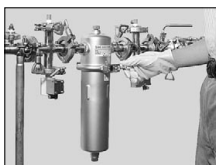
- 1 Make sure that O-rings are not damaged or deformed. If needed, replace with new ones.
- 2 Check that the lower holder inside the case is not inclined, and then insert the element.

[When using two L250 elements]

Insert the intermediate holder into the lower part of the second element (upper level), and then place one side of the intermediate holder into the case by inserting it into the upper part of the first element (lower level).



- 3 Align the indentations of the case with the projections of the cover, lift the case upward by about 10 mm and rotate it clockwise about 20 degrees.
- 4 Mount it in such a way that the entire flanged perimeter of the cover and case are held by the retainer of the V-band.



- 5 Set the stopper on the retainer while holding down the V-band outside perimeter, and then tighten the wing bolt to the prescribed position.
- 6 Tighten the drain plug.
- 7 When air release is completed, tighten the air vent plug.

## Filter Housings

### FQ1010

Element size  
L125 (125 mm)



### FQ1011

Element size  
L250 (250 mm)



### FQ1012

Element size  
L500 (500 mm)  
(L250 x 2 pcs.)

## Filter Elements

### (Standard elements)

#### Fiber element

- Nominal filtration accuracy: 0.5 to 100 μm
- Ideal for a relatively high level of impurities
- Ideal for use as a prefilter
- Material: P.P. (EHM)  
Cotton (EH)



#### Micromesh element

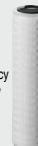
- Nominal filtration accuracy: 5 to 105 μm
- High filtration accuracy with stainless steel micromesh
- Pleated type provides three times more filtration area than a cylinder.
- Element cleaning and regeneration are possible.
- Material: Stainless steel 304 (EM100, EM200)  
Stainless steel 316 (EM500, EM600)



### (Made to order elements)

#### HEPO II element

- Absolute filtration accuracy: 2 to 13 μm (Filtration efficiency 99%)
- Nonwoven fabric element with high filtration accuracy of more than 99% removal and without fiber outflow and release of chemical components
- Material: P.P. (EJ102S ... x 0)



#### PP depth element

- Nominal filtration accuracy: 1 to 75 μm
- Material: P.P.  
EJ202S ... x 11 (L125)  
EJ302S ... x 11 (L250)  
EJ402S ... x 11 (L500)



#### Membrane element

- Absolute filtration accuracy: 0.2, 0.4 μm (Filtration efficiency 99%)
- Material: P.P. (ED102S ... x 0)  
CA (ED111S ... x 0)



Note) P.P. : Polypropylene

FGD

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FQ1

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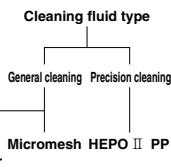
ES

# FQ1 Series Model Selection

## Selecting the Element and Housing

### 1 Selecting the element

According to the type and the cleaning level of a cleaning fluid, select corresponding element and seal types by referring to the "Standard Element Fluid Compatibility" table on the right.



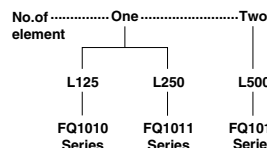
• Specifications: Select desired temperature conditions and filtration accuracy from the "Standard Element Selection Guide" on the right.

### 2 Calculating the number of elements

- Verify the recommended flow rate of the selected element with the "Standard Element Selection Guide".
- Find a value for the formula, Necessary flow rate = Recommended flow rate, rounding up to the nearest whole number. The value obtained is the number of necessary elements (equivalent to L250).

### 3 Selecting the housing

Select a housing type to hold the elements selected in 2.



- Consult SMC if the number of elements calculated in 2 exceeds two.
- Make sure whether the operating temperature range, pressure and cleaning fluid type meet the specifications.

### 4 Determining the filter model

Determine the filter model from the element type and the number of elements selected in 1 and 2, and the housing type selected in 3, referring to "How to Order".

## Standard Element Fluid Compatibility

Cleaning level and Element	Cleaning level	General cleaning				Precision cleaning	Applicable seal material and cleaning fluid	
		Nominal filtration accuracy 105 μm ↔ 0.5 μm				Absolute filtration accuracy 13 μm ↔ 2 μm (Filtration efficiency 99%)	Nitrile rubber	Fluoro rubber
		Name	Fiber element	Fiber element	Micromesh element	Micromesh element		
		Material	P.P.	Cotton	Stainless steel 304	Stainless steel 316	PP	NBR
Cleaning fluid type	Element part no.	EHM- x3	EH	EM	EM	EJ		
	Element symbol	T	H	M	L	R		
Water	Industrial water	Optimal	Suitable	Optimal	Suitable	Unsuitable	Optimal	Suitable
Alkali	Ammonia	Optimal	Unsuitable	Optimal	Suitable	Optimal	Optimal	Unsuitable
	Sodium hydroxide	Optimal	△ <sup>(Note)</sup>	Optimal	Suitable	Optimal	Optimal	Unsuitable
Chlorine, Fluorine	Trichlorethylene	Unsuitable	Optimal	Unsuitable	Optimal	Unsuitable	Unsuitable	Optimal
	Methylene chloride	Unsuitable	Optimal	Unsuitable	Optimal	Unsuitable	Unsuitable	Optimal
Alcohol	Isopropyl alcohol (IPA)	Optimal	Suitable	Optimal	Suitable	Optimal	Suitable	Optimal

\* For detailed element specifications, refer to the applicable element symbol in the "Standard Element Selection Guide" below. Furthermore, consult SMC for other fluids.

\*\* Made to order

Note) △ : Can be used at low temperatures and low concentration.

## Made to Order

### ■ P.P. depth element EJ

- General cleaning
- Nominal filtration accuracy: 1 to 75 μm
- Water, alkali, or alcohol bases

### ■ Membrane element ED

- Precision cleaning
- Absolute filtration accuracy: 0.2, 0.4 μm (Filtration efficiency 99%)
- Water, alkali, or alcohol bases

## Standard Element Selection Guide

Cleaning level	Name	Element symbol	Material	Element part no.	Temperature range (°C)	Recommended flow rate (L/min)		Differential pressure resistance (MPa)
						Filtration accuracy (μm)	Pressure loss: 0.01 to 0.02 MPa Fluid: Water equiv.	
General cleaning	Fiber element	T	P.P.	EHM	0 to 50	0.5 (Nominal)	5	0.2
						1 (Nominal)	15	
		H	Cotton	EH	0 to 100	5 (Nominal)	25	
						10 (Nominal)	25	
						20 (Nominal)	30	
						50 (Nominal)	30	
	Micromesh element	M	Stainless steel 304	EM1, 2	0 to 100	5 (Nominal)	25	0.7
						20 (Nominal)	25	
		L	Stainless steel 316	EM5, 6	0 to 250	40 (Nominal)	30	
						74 (Nominal)	30	
						105 (Nominal)	30	
							30	
Precision cleaning	HEPO II ** element	R	P.P.	EJ	0 to 80	2 (Absolute)	30	0.5
						4 (Absolute)	30	
						6 (Absolute)	30	
						13 (Absolute)	30	

\* Made to order

# Quick Change Filter FQ1 Series

RoHS

## How to Order

**FQ1010N-04-M005N-B**

**Model symbol (In-line filters)**

**Housing material**

Symbol	Cover	Case
0	Stainless steel 304	Stainless steel 304

**Element sealing method**

1	Flat gasket (Double, Open, End)
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**Element size**

Symbol	Element size
0	L125
1	L250
2	L500 (L250 x 2 pcs.)

**Housing O-ring material**

Symbol	Material
N	NBR
V	FKM

**Made to order specifications**

Nil	Note
X19	Without V-band Supprt
X61	Cover with Bracket Seat
X68	Chemical Resistant Type

\* Refer to page 83 for the details of Made to Order specifications.

**Options**

Nil	N/A
-B	Bracket

**Element type**  
Select from tables below.

**Port size**

Symbol	Port size	Applicable model		
		FQ1010	FQ1011	FQ1012
04	Rc 1/2	●	●	●
06	Rc 3/4	●	●	●
10	Rc 1	●	●	●

FQ1010 □ FQ1011 □ FQ1012 □

## Element and Seal Part Numbers

### 1. Fiber element (P.P.)

Dimensions	Element symbol	Nominal filtration accuracy (µm)	Part number
ø65 x L250	TX50	0.5	EHM10A
	T001	1	EHM39R10AY
	T005	5	EHM23R10AY
	T010	10	EHM19R10AY
	T020	20	EHM15R10A
	T050	50	EHM11R10A
	T075	75	EHM10R10A
T100	100	EHM8R10A	

### 2. Fiber element (Cotton)

Dimensions	Element symbol	Nominal filtration accuracy (µm)	Part number
ø65 x L250	HX50	0.5	EH10G
	H001	1	EH39R10GV
	H005	5	EH23R10GV
	H010	10	EH19R10GV
	H020	20	EH15R10G
	H050	50	EH11R10G
	H075	75	EH10R10G
H100	100	EH8R10G	

### 3. Micromesh element (Stainless steel 304)

Bonding material: Epoxy resin

Dimensions	Element symbol	Nominal filtration accuracy (µm)	Part number
ø65 x L250	M005□	5	EM100-005□
	M010□	10	EM100-010□
	M020□	20	EM100-020□
	M040□	40	EM100-040□
	M074□	74	EM100-074□
	M105□	105	EM100-105□
	ø65 x L125	M005□	5
M010□		10	EM200-010□X4
M020□		20	EM200-020□X4
M040□		40	EM200-040□X4
M074□		74	EM200-074□X4
M105□	105	EM200-105□X4	

Note) Specify seal material in place of "□" (N for NBR or V for FKM).

### 4. Micromesh element (Stainless steel 316)

Dimensions	Element symbol	Nominal filtration accuracy (µm)	Part number
ø65 x L250	L005□	5	EM500-005□
	L010□	10	EM500-010□
	L020□	20	EM500-020□
	L040□	40	EM500-040□
	L074□	74	EM500-074□
	L105□	105	EM500-105□
	ø65 x L125	L005□	5
L010□		10	EM600-010□X4
L020□		20	EM600-020□X4
L040□		40	EM600-040□X4
L074□		74	EM600-074□X4
L105□	105	EM600-105□X4	

Note) Specify seal material in place of "□" (N for NBR or V for FKM).



### Made to order specifications

Elements other than 1 to 4 listed above are also available. Refer to "Made to Order" elements on pages 84 and 85 for details.

# FQ1 Series



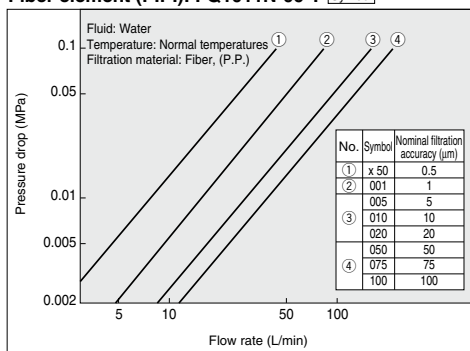
## Specifications

Model	FQ1010	FQ1011	FQ1012
No. of built-in elements (L: Element length in mm)	1 (L125)	1 (L250)	2 (L250 x 2)
Operating pressure	Maximum 1 MPa		
Operating temperature	Maximum 80°C (Not exceeding boiling point)		
Applicable fluids	Industrial water, weak alkali cleaning fluids etc., * Can not be used for gases.		
Port size (Rc)	1/2, 3/4	1/2, 3/4, 1	3/4, 1
Material	Housing	Stainless steel 304	
	Seal	NBR or FKM	
Weight (kg)	Approx. 1.5	Approx. 1.9	Approx. 2.7
Internal capacity (L)	Approx. 1	Approx. 1.7	Approx. 3.1

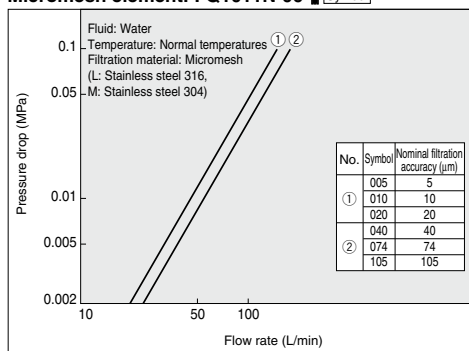
Note) For FQ1010, only micromesh elements and PP depth elements are used.  
For details, refer to the pages on element series.

## Flow Rate Characteristics

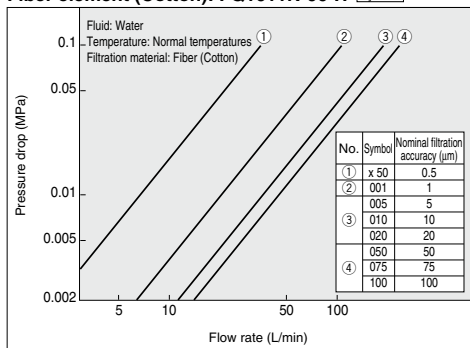
### Fiber element (P.P.): FQ1011N-06-T Symbol



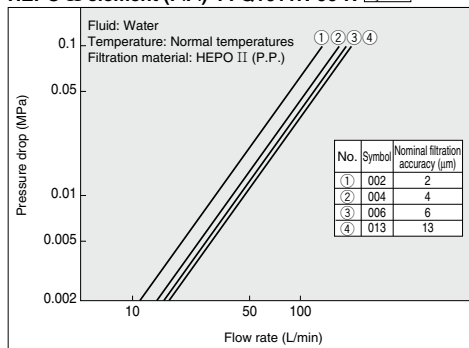
### Micromesh element: FQ1011N-06-L Symbol



### Fiber element (Cotton): FQ1011N-06-H Symbol



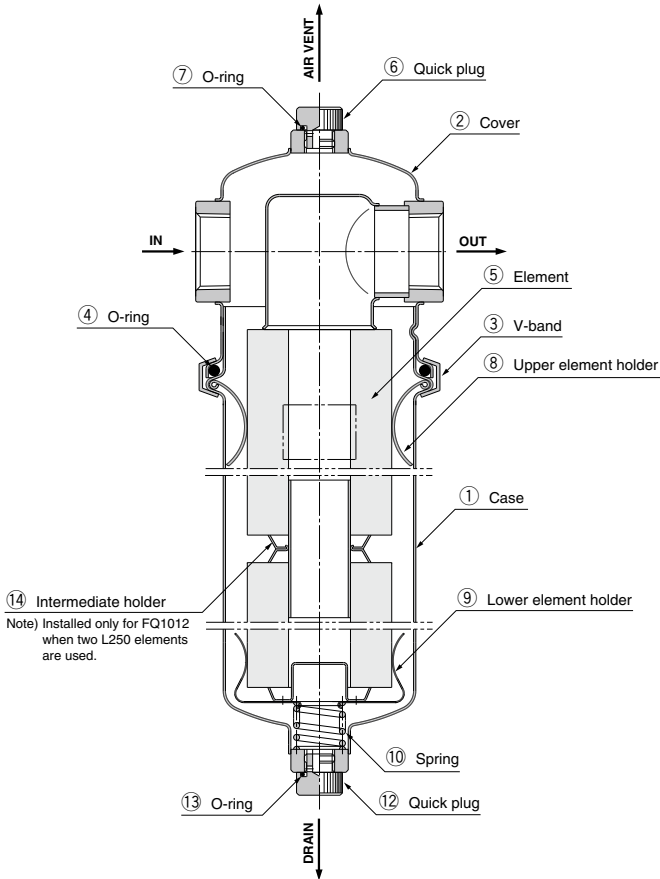
### HEPO II element (P.P.)\*: FQ1011N-06-R Symbol



Note) The recommended flow rate is the rate for an initial pressure drop of 0.01 to 0.02 MPa.

\* Made to order

**Construction**



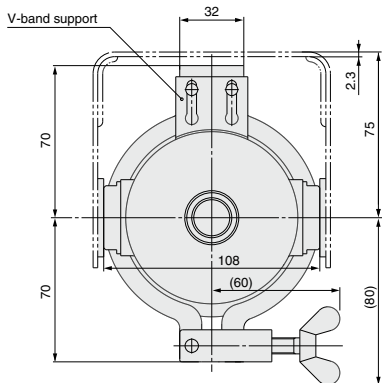
FGD
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<b>FQ1</b>
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**Replacement Parts**

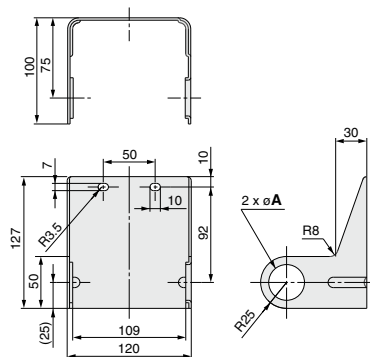
Description	Part number	Material	Applicable model	Part no. (Set contents)	Note
Case assembly	<b>FQ1-CA001N</b>	Stainless steel 304 Note) O-ring material N: NBR V: FKM	FQ1010N	①, ⑧, ⑨, ⑩, ⑫, ⑬: 1 pc. each Note) Only the FQ1-CA003□ includes ⑭ intermediate holder in the set.	Element size: L125
	<b>FQ1-CA001V</b>		FQ1010V		Element size: L250
	<b>FQ1-CA002N</b>		FQ1011N		Element size: L500 (L250 x 2)
	<b>FQ1-CA002V</b>		FQ1011V		
	<b>FQ1-CA003N</b>		FQ1012N		
	<b>FQ1-CA003V</b>		FQ1012V		
V-band for replacement	<b>FQ-BA001</b>	Stainless steel 304	FQ1 series	③	
O-ring kit	<b>FQ-KT005N</b>	NBR	FQ101□N	④, ⑦, ⑬: 1 pc. each	④: OR NBR-70-1 P85 ⑦, ⑬: OR NBR-70-1 P11
	<b>FQ-KT005V</b>	FKM	FQ101□V		④: OR FKM-70 P85 ⑦, ⑬: OR FKM-70 P11
Quick plug	<b>AG-9S</b>	Stainless steel 304	FQ1 series	⑥, ⑫	
Upper element holder	<b>L-131S</b>	Stainless steel 304	FQ1 series	⑧	
Lower element holder	<b>L-135S</b>	Stainless steel 304	FQ1 series	⑨, ⑩	
Intermediate holder	<b>FQ-OP001</b>	Stainless steel 304	FQ1 series	⑭	
Bracket	<b>BP-15S</b>	SPC	FQ101□□-04		For port size Rc 1/2
	<b>BP-14S</b>		FQ101□□-06		For port size Rc 3/4
	<b>BP-13S</b>		FQ101□□-10		For port size Rc 1

# FQ1 Series

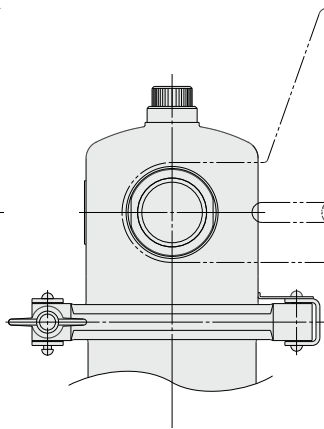
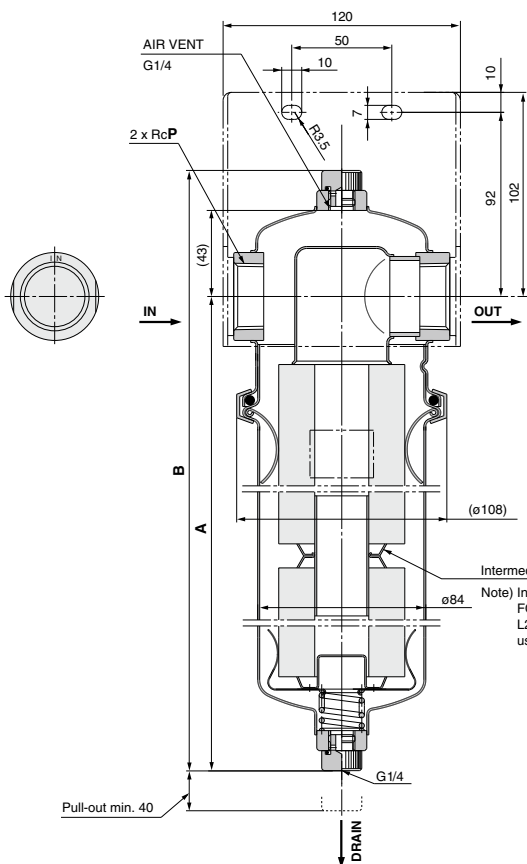
## Dimensions



### Bracket



Part number	A	Applicable port size
<b>BP-13S</b>	34.5	Rc 1
<b>BP-14S</b>	27.5	Rc 3/4
<b>BP-15S</b>	22	Rc 1/2



Note) Installed only for FQ1012 when two L250 elements are used.

Model	A	B	P	No. of elements
<b>FQ1010</b>	204	267	1/2, 3/4	L125 x 1
<b>FQ1011</b>	332	395	1/2, 3/4, 1	L250 x 1
<b>FQ1012</b>	593	656	3/4, 1	L250 x 2



## Made to Order Specifications:

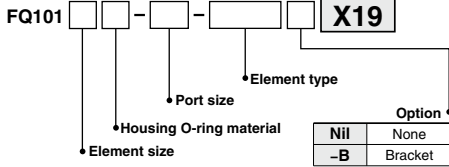
Please contact SMC for detailed dimensions, specifications and lead times.



### 1 Without V-band Support

Symbol  
**X19**

Useful for reverse IN-OUT installation, as the position of the V-band can be changed.

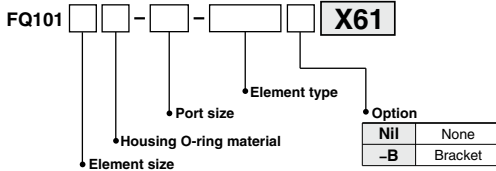


### 2 Cover with Bracket Seat

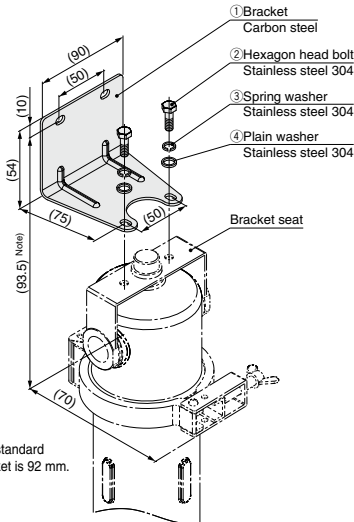
Symbol  
**X61**

Reliable securing is possible.

- Use the bracket assembly (Part no.: BP-12S-A). (The standard bracket cannot be used.)



#### Dimensions



Note) The standard bracket is 92 mm.

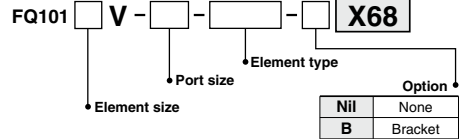
#### Replacement Parts

Description	Part number	Part no. (Set contents)	
Bracket assembly	BP-12S-A	①: 1 pc.	1 set
		②, ③, ④: 2 pcs. each	

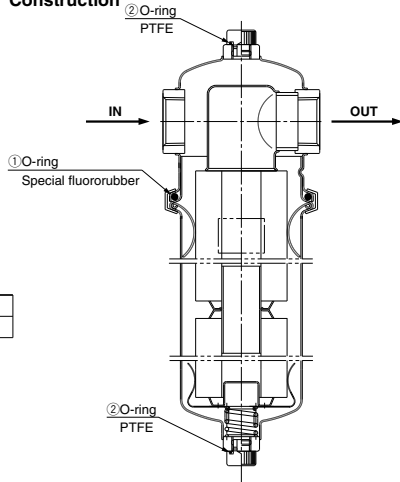
### 3 Chemical Resistant Type

Symbol  
**X68**

O-ring materials have been changed to special fluororubber and PTFE, improving chemical resistance.



#### Construction



#### Replacement Parts

Description	Part number	Part no. (Set contents)
Seal kit	FQ-KT002	①: 1 pc. ②: 2 pcs. } 1 set

#### Special fluororubber O-ring chemical resistance

Applicable solvents <small>Note)</small>	
Hydrocarbon	Fuel C
	Hexane
	Benzene
	Toluene
Hydrogen halide	Chloroform
Ketone	Acetone
	MEK
Ester	Ethyl acetate
Amide	Formaldehyde
	DMF
Alcohol	Methanol
	Ethylene glycol
Ether	1, 4-dioxane
	MTBE
Amine	TAME
	Pyridine
Gasohol	Butyl amine
	Fuel C: Methanol = 75/25
	Fuel C: Methanol = 50/50
	Fuel C: Methanol = 25/75

\* Consult SMC for fluids other than those listed.

Note) When using with liquids that contain flammable ingredients, implement safety measures, such as fire prevention and leakage detection sensors, and measures against static.

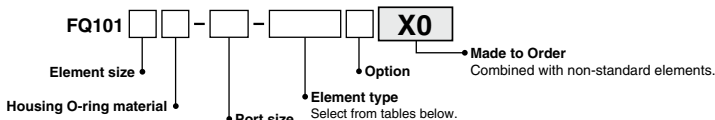
# Made to Order Specifications:

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



\* The standard element is shared with the element of the FG series. (For details, refer to the standard elements on page 41. Additionally, for element selection, refer to the selection on page 3.)

## 4 Nonstandard Elements for Precision Cleaning



### Membrane P.P. element "ED102S Series"



- Material: P.P.
- Optimal for high precision filtration (99% or more) of various cleaning fluids (mainly alkali-base)
- Dimensions:  $\phi 70 \times L250$

#### Recommended flow rate

Filtration accuracy ( $\mu\text{m}$ ) Filtration efficiency 99%	Recommended flow rate (L/min)*
0.2	5
0.4	

- \* Pressure loss: 0.01 to 0.02 MPa
- \* Operating temperature: 0 to 70°C
- \* Differential pressure resistance: 0.5 MPa/25°C

#### Element and seal part numbers

Dimensions	Element symbol	Filtration accuracy ( $\mu\text{m}$ ) Filtration efficiency 99%	Element part number (single part)
$\phi 70 \times 250$	UX20□	0.2	ED102S-X20□X0
	UX40□	0.4	ED102S-X40□X0

Note) Specify seal material in place of "□" (N for NBR, V for FKM or T for PTFE).  
The suffix of the filter model part number is "X0".

### Membrane CA element "ED111S Series"



- Material: CA
- Optimal for high precision filtration (99% or more) of various kinds of water
- Dimensions:  $\phi 70 \times L250$

#### Recommended flow rate

Filtration accuracy ( $\mu\text{m}$ ) Filtration efficiency 99%	Recommended flow rate (L/min)*
0.2	5
0.4	

- \* Pressure loss: 0.01 to 0.02 MPa
- \* Operating temperature: 0 to 80°C
- \* Differential pressure resistance: 0.5 MPa/25°C

#### Element and seal part numbers

Dimensions	Element symbol	Filtration accuracy ( $\mu\text{m}$ ) Filtration efficiency 99%	Element part number (single part)
$\phi 70 \times 250$	DX20□	0.2	ED111S-X20□X0
	DX40□	0.4	ED111S-X40□X0

Note) Specify seal material in place of "□" (N for NBR, V for FPM, T for PTFE, E for EPDS, or S for Silicon).  
The suffix of the filter model part number is "X0".

### P.P. depth element "EJ202S, 302S, 402S Series"



- Material: Polypropylene and polyethylene
- No fiber separation due to thermal fusion of fibers
- A wide range of applications to various cleaning fluids
- Dimensions  
EJ202S:  $\phi 65 \times L125$   
EJ302S:  $\phi 65 \times L250$   
EJ402S:  $\phi 65 \times L500$

#### Recommended flow rate

Nominal filtration accuracy ( $\mu\text{m}$ )	Recommended flow rate (L/min)*
1, 3, 5, 10 25, 50, 75	30

- \* Pressure loss: 0.01 to 0.02 MPa
- \* Operating temperature: 0 to 60°C
- \* Differential pressure resistance: 0.2 MPa

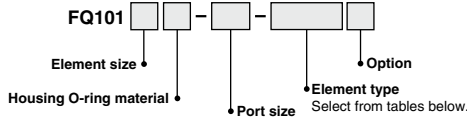
#### Element and seal part numbers

Dimensions	Element symbol	Nominal filtration accuracy ( $\mu\text{m}$ )	Element part number (single part)
$\phi 65 \times 125$	W001	1	EJ202S-001X11
	W003	3	EJ202S-003X11
	W005	5	EJ202S-005X11
	W010	10	EJ202S-010X11
	W025	25	EJ202S-025X11
	W050	50	EJ202S-050X11
	W075	75	EJ202S-075X11
$\phi 65 \times 250$	W001	1	EJ302S-001X11
	W003	3	EJ302S-003X11
	W005	5	EJ302S-005X11
	W010	10	EJ302S-010X11
	W025	25	EJ302S-025X11
	W050	50	EJ302S-050X11
	W075	75	EJ302S-075X11
$\phi 65 \times 500$	W001	1	EJ402S-001X11
	W003	3	EJ402S-003X11
	W005	5	EJ402S-005X11
	W010	10	EJ402S-010X11
	W025	25	EJ402S-025X11
	W050	50	EJ402S-050X11
	W075	75	EJ402S-075X11

Note) Seals are not necessary. The suffix of the filter model part number is "X0".



## 5 Nonstandard Elements for Precision Cleaning



### HEPO II element "EJ101S Series"



- Material: PET
- Optimal for high precision filtration (99% or more) of a wide range of fluids
- Dimensions:  $\phi 70 \times L250$  (EJ101S)

#### Recommended flow rate

Absolute filtration accuracy ( $\mu\text{m}$ )	Recommended flow rate (L/min)*
2	20
4	
6	
13	

- \* Pressure loss: 0.01 to 0.02 MPa
- \* Operating temperature: 0 to 80°C
- \* Differential pressure resistance: 0.5 MPa/25°C

#### Element and seal part numbers

Dimensions	Element symbol	Absolute filtration accuracy ( $\mu\text{m}$ )	Element part number (single part)
$\phi 70 \times 250$	<b>J002</b> <input type="checkbox"/>	2	EJ101S-002 <input type="checkbox"/>
	<b>J004</b> <input type="checkbox"/>	4	EJ101S-004 <input type="checkbox"/>
	<b>J006</b> <input type="checkbox"/>	6	EJ101S-006 <input type="checkbox"/>
	<b>J013</b> <input type="checkbox"/>	13	EJ101S-013 <input type="checkbox"/>

Note) Specify seal material in place of "" (N for NBR, V for FKM, T for PTFE, C for CR (chloroprene rubber)).  
The suffix of the filter model part number is not necessary.

### HEPO II element "EJ102S Series"



- All parts of this element are made of polypropylene, which is optimal for various cleaning fluids including alkali and organic solvents.
- Nearly fiber separation or release of chemicals, since fibers themselves are directly fused and no adhesives are used.
- Pressure loss is low and relatively long service life is provided due to a larger filtration area
- Dimensions:  $\phi 70 \times L250$

#### Recommended flow rate

Absolute filtration accuracy ( $\mu\text{m}$ )	Recommended flow rate (L/min)
2	20
4	
6	
13	

- \* Operating temperature: 0 to 80°C
- \* Differential pressure resistance: 0.5 MPa

#### Element and seal part numbers

Dimensions	Element symbol	Absolute filtration accuracy ( $\mu\text{m}$ )	Element part number (single part)
$\phi 70 \times 250$	<b>R002</b> <input type="checkbox"/>	2	EJ102S-002 <input type="checkbox"/> X0
	<b>R004</b> <input type="checkbox"/>	4	EJ102S-004 <input type="checkbox"/> X0
	<b>R006</b> <input type="checkbox"/>	6	EJ102S-006 <input type="checkbox"/> X0
	<b>R013</b> <input type="checkbox"/>	13	EJ102S-013 <input type="checkbox"/> X0

Note) Specify seal material in place of "" (N for NBR, V for FKM, T for PTFE, E for EPR, or S for Silicon).

Can be also combined with elements for industrial filter (FG Series).  
For details, see the selection method on page 3.

- FGD
- FGE
- FGG
- FGA
- FGC
- FGF
- FGH
- FQ1**
- FN
- EB
- ES



# FQ1 Series

## Specific Product Precautions

Be sure to read this before handling the products.  
Refer to back page 50 for safety instructions.

### Design

#### ⚠ Caution

1. Do not apply pressure beyond the operating pressure range.
2. Do not use at temperatures beyond the operating temperature range.
3. **Fluid**
  - Do not use with gases.
  - Do not use any liquid that corrodes, deteriorates, or swells the materials used for this product and any toxic fluid.
  - Customers are responsible for confirming the compatibility of the liquid to be used.
4. **Fatigue fracture**

Be sure to implement necessary measures for the following operating conditions:

  - 1) When surge pressure is applied to the filter.
  - 2) When exposed to sliding or vibration due to insecure filter installation
  - 3) When the expansion, contraction, etc., is repeated due to thermal influence on the filter.
5. **Pressure drop**

Adjust initial pressure drops to 0.02 MPa or less.
6. **Corrosion**

Be aware that corrosion can be caused depending on operating conditions or environments.

### Selection

#### ⚠ Warning

1. When selecting a model, a model that does not specification ranges after due consideration of the purpose of use, specification requirements, and operating conditions (fluid, pressure, flow rate, temperature, environment).
2. Do not use at temperatures at or above the boiling point of the fluid.
3. Never use with gases, including air.
4. Do not use in locations where peak pressure rises to 1 MPa or more due to water hammer, surge pressure, etc.

#### ⚠ Caution

1. Design circuits so that back pressure or back flow will not occur. If back pressure occurs, it may damage the element.

### Fluid

#### ⚠ Warning

1. Use a quick change filter for filtration of water, alkali and cleaning fluids, etc.
2. There may be circumstances where a seal or an O-ring deteriorates, causing leakage.

### Piping

#### ⚠ Caution

1. When performing the piping, secure the width across flats of the piping connection part so that any load such as bending moment or twisting is not applied to it.
2. Be sure to install and secure the piping firmly so that any external vibration or load is not applied to the piping connection part during operation.
3. Install and connect piping ensuring space necessary for maintenance work and inspections.
4. Before piping is connected, air blow (flush) or wash it thoroughly to remove chips, cutting oil and other impurities from inside the piping.
5. Install piping after confirming IN and OUT.
6. **Connection**

Be sure that chips from the pipe threads and sealing material do not get inside the piping.  
Further, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of male threads.
7. **Line flushing**

Flush the piping lines at the time of initial use and when replacing the element.
8. **Element replacement**
  - 1) Replace the element after removing the liquid from the piping and confirming that pressure inside the filter is zero (to assure safety).  
Further more, conduct replacement using an IN, OUT differential pressure of 0.1 MPa as a guide.
  - 2) Start replacement after confirming that the temperature of the filter body is within a range of 0 to 40°C.
  - 3) When setting the element, be sure that it does not tilt inside the case.

### Operating Environment

#### ⚠ Caution

1. Discoloration or material deterioration may occur, in locations or atmospheres where there is a danger of corrosion. If corrosion progresses, the filter will lose its functions.
2. When used in locations where exposed to vibration or impact, fatigue fracture may occur.  
Use it by implementing appropriate reinforcement.

### Maintenance

#### ⚠ Caution

1. 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.