Low Maintenance Filter
Series FN1/FN4

How to Order

With single element FN1 1 0 1 N – 10 – S 020 □

With four elements FN4 1 0 2 N – 20 – S 020 □

Housing material

Symbol	Housing material
1	Stainless steel 304

Element type Note)

Symbol	Element type	Applicable model
0	Cylindrical type (5 μm, 20 μm)	FN1, FN4
1	Step type (5 μm)	FN1

Note) Refer to Features 2 for detailed element type.

Element length

Symbol	Element length	Applicable model
1	ℓ 250 mm	FN1
2	ℓ 500 mm	FN1, FN4

Seal material

Symbol	Seal material
N	NBR
V	FKM

Port size

Symbol	Port size	Applicable model
10	Rc1	FN1
20	Rc2	FN4

Element material

Symbol	Element material
S	Stainless steel 304

Pressure gauge

Symbol	Pressure gauge
Nil	None (With plug)
G Note 1)	With pressure gauge Note 2) (Wetted part: Brass)

Note 1) Contact SMC for the pressure gauge specification for stainless steel wetted parts.
Note 2) The FN4 series is equipped with two pressure gauges.

Nominal filtration rating

Symbol	Nominal filtration rating
005	5 μm (Cylindrical type, Step type)
020	20 μm (Cylindrical type)

Specifications

Filter

Model		FN1101	FN1111	FN1102	FN1112	FN4102
Element dimension		ø65 x 250 ℓ		ø65 x 500 ℓ		
Fluid		Coolant (oil-based or water-soluble), Weak alkaline cleaning solvent, Cutting oil, Industrial water				
Operating pressure		Max. 1.0 MPa				
Fluid temperature		Max. 80°C				
Flow rate Note)		≈ 40 ℓ/min		≈ 80 ℓ/min		≈ 250 ℓ/min
Port size		Rc1 (IN, OUT, DRAIN)				Rc2
Element	Material	Bowl and Cover: Stainless steel 304, O-ring: NBR/FKM				
	Material	Stainless steel 304				
	Construction	Cylindrical type	Step type	Cylindrical type	Step type	Cylindrical type
	Nominal filtration rating	5 μm, 20 μm	5 μm	5 μm, 20 μm	5 μm	5 μm, 20 μm
	Differential pressure proof	0.6 MPa				
Reservoir tank capacity		≈ 1 ℓ (when reservoir is set separately)		≈ 1.8 ℓ (when reservoir is set separately)		≈ 6 ℓ
Weight		13 kg	12.5 kg	15 kg	14.5 kg	65 kg

Note) Fluid: Water; Nominal filtration: 20 μm; Pressure drop: 0.02 MPa or less.

Operating Part

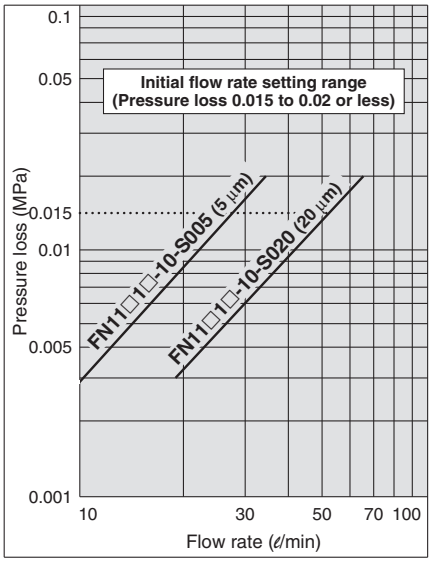
Model		CDLQB63-□D-F(FN1), CDLQA100-50-F(FN4)
Auto switch		None (Built-in magnet) Note 1)
Fluid		Air
Operating pressure		0.2 to 1.0 MPa Note 2)
Lock	Ambient and fluid temperature	–10 to 70°C (with no freezing) Note 3)
	Unlocking pressure	0.2 MPa or more
	Locking pressure	0.05 MPa or more
	Locking direction	Extension locking

Note 1) Auto switch must be ordered separately. Refer to the CLQ series (Compact Cylinder with Lock) catalog (CAT.ES20-155) for details.
Note 2) The minimum operating pressure for the cylinder is 0.1 MPa when the cylinder port and the lock port are separately piped.
Note 3) The temperature will be 0°C to 60°C when the auto switch is mounted on the cylinder.

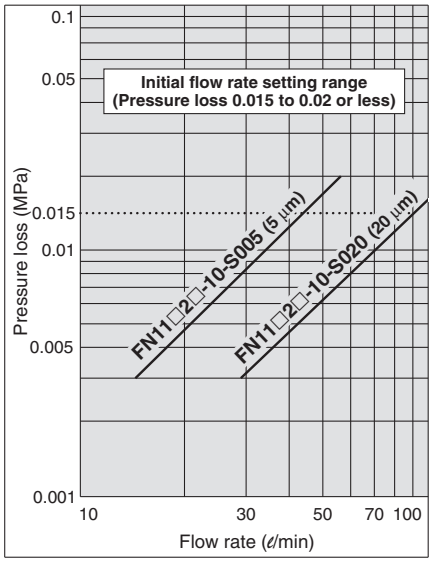
Flow Characteristics (Initial Value)

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

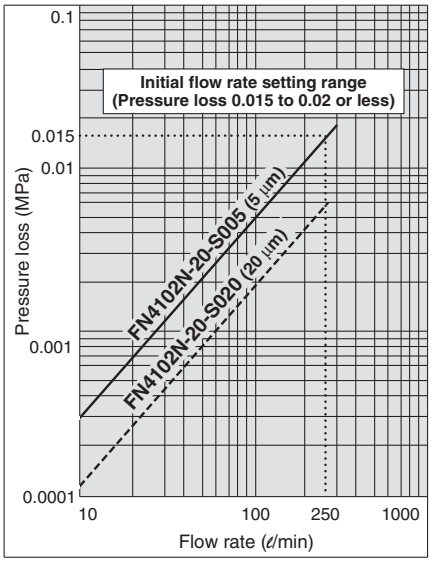
Element Length
250 ℓ / FN11□1□-10-S□



Element Length
500 ℓ / FN11□2□-10-S□



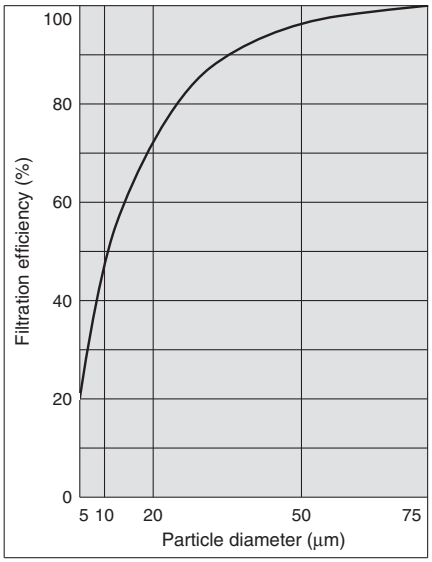
Element Length
500 ℓ / FN41□2□-20-S□



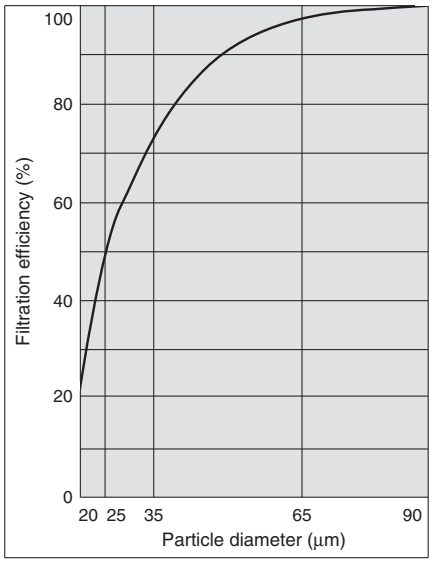
Filtration Characteristics

● Fluid: Potable water ● Flow rate: 20 ℓ/min ● Liquid temperature: Room temperature ● Test dust: AC course
● Test method: Per SMC test method

5 μm
FN11□□□-10-S005
FN41□2□-20-S005



20 μm
FN11□□□-10-S020
FN41□2□-20-S020

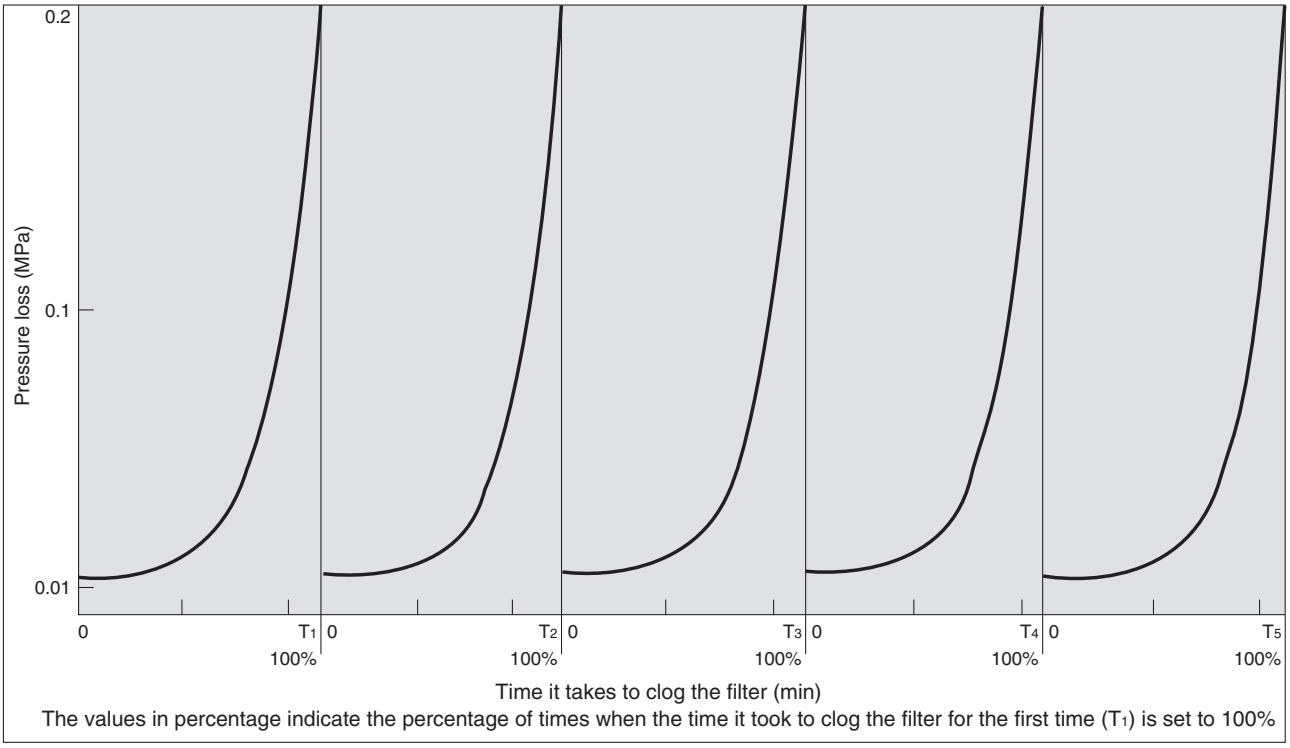


Blocking Characteristics (Repeatability)

● Fluid: Potable water ● Supply pressure: 0.2 MPa ● Flow rate: 20 ℓ/min ● Test dust: AC course test dust
● Test method: Per SMC test method

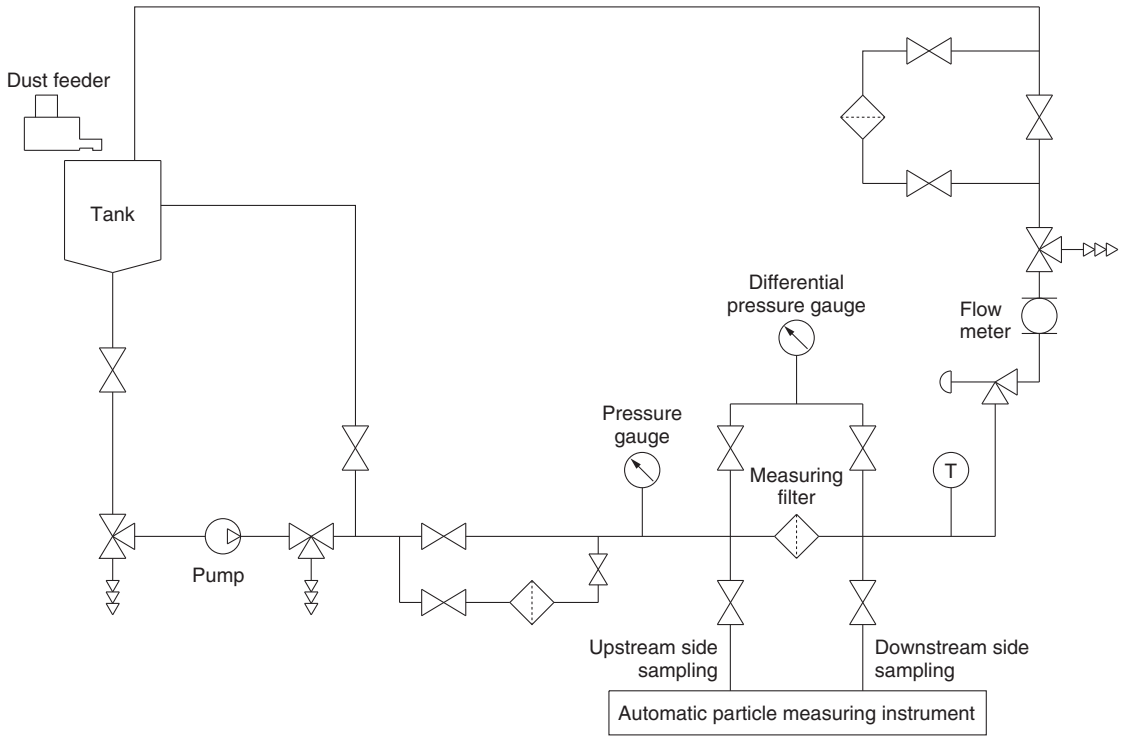
Filter part no.: FN1101N-10-S□, FN4102N-20-S□

Element: END100-020 (Cylindrical type, 20 μm)



Introduce a certain concentration of dust and back-flush the filter when the pressure loss reaches 0.2 MPa. Repeat filtering and back-flushing process (up to five times shown in the graphs).
The graphs above show that the initial pressure loss (⊿P = 0.015 MPa) and time it takes to reach the pressure loss of ⊿P = 0.2 MPa return to the rough initial value even after repeated back-flushing.

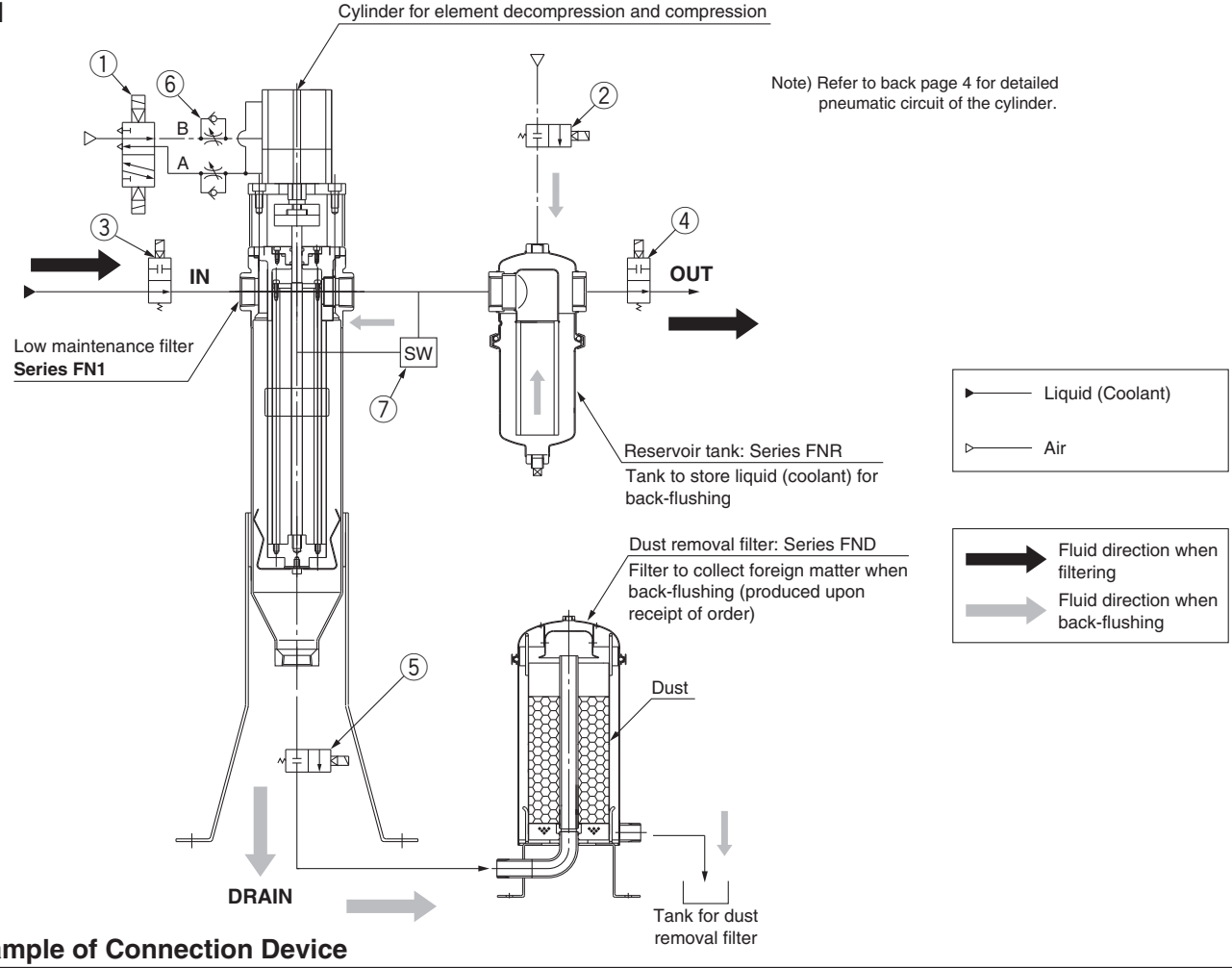
Measurement Circuit



Piping Example

Series FN1/FN4 Low Maintenance Filter cannot be used alone.
Please follow the component configuration and operation steps illustrated below.

FN1

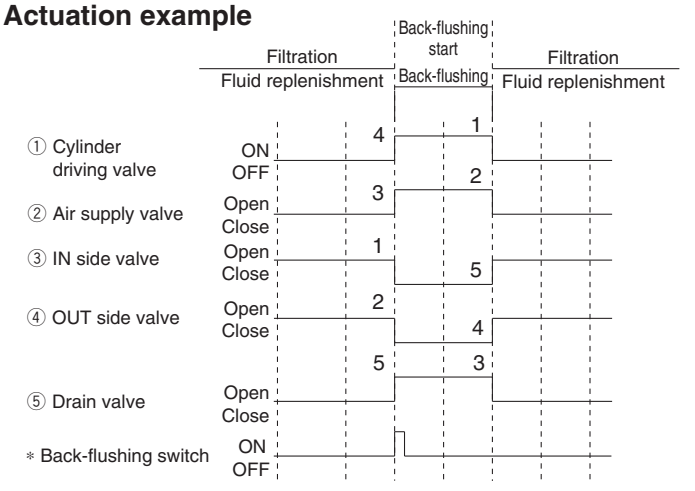


Example of Connection Device

No.	Description	Device	No.	Description	Device
1	**Cylinder driving valve**	5-port solenoid valve (Series SY)	5	**Drain valve**	Coolant valve (Ball type)
2	**Air supply valve**	Process valve (Series VNB)	6	**Speed controller**	Speed controller (Series AS)
3	**IN side valve**	Coolant valve (Series FNVB)	7	**Differential pressure switch**	Differential pressure switch (Series OPL550)
4	**OUT side valve**	Coolant valve (Series SGC, VNC or FNVB)			Differential pressure controller (Series PSE200 + Series PSE560)

Series inside ( ) indicate SMC products.

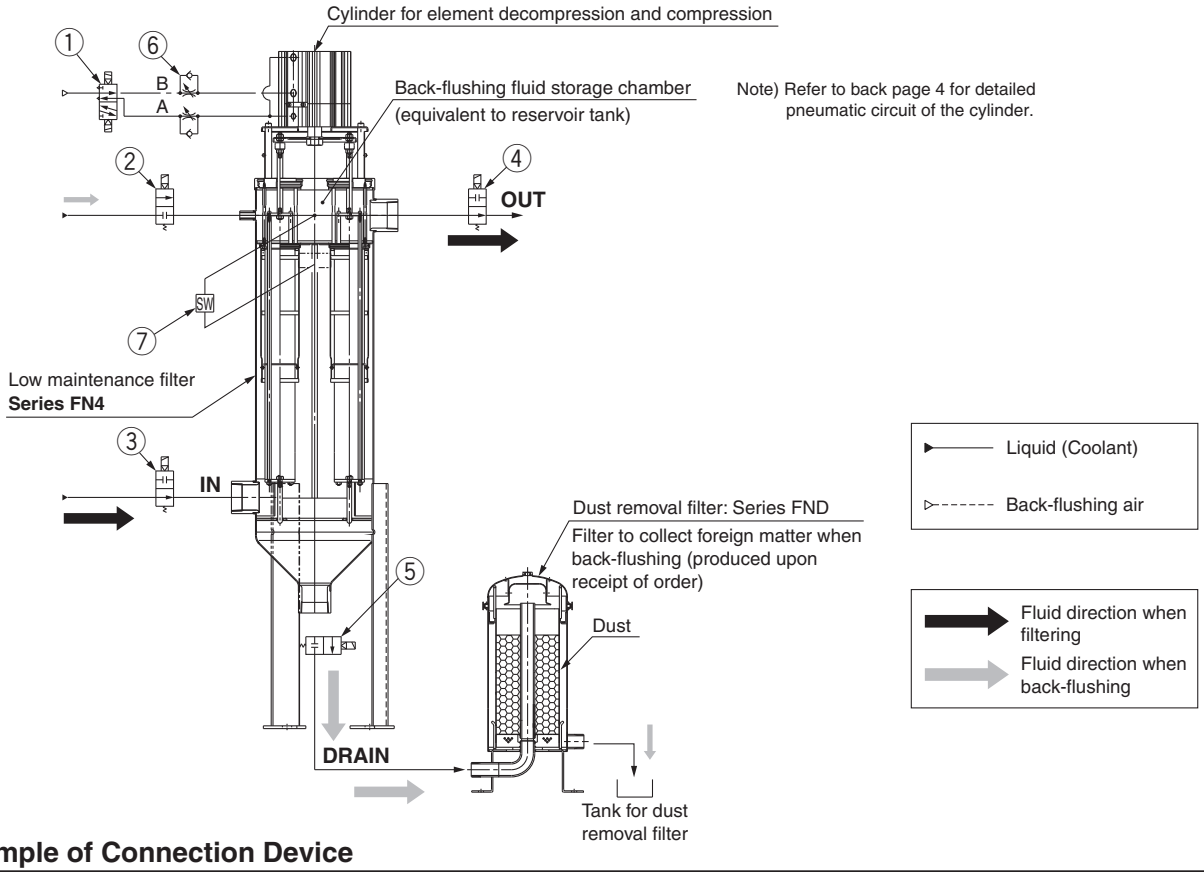
Actuation example



∗ The M/C stop signal and a signal for element clogging (differential signal switch) are used to start back-flushing. Numbers in the chart indicate the order for each operation.

Step		Operation description	
When back-flushing	1	③ IN side valve: Close	Stops fluid supply to the filter.
	2	④ OUT side valve: Close	Seals the filter and reservoir tank containing fluid.
	3	② Air supply valve: Open	Supplies the fluid in the reservoir tank to the filter.
	4	① Cylinder driving valve: ON	Lowers the cylinder to decompress the element.
	5	⑤ Drain valve: Open	The fluid in the reservoir tank passes through the decompressed element and forces out to the tank.
When filtering	1	① Cylinder driving valve: OFF	Raises the cylinder to compress the element.
	2	② Air supply valve: Close	Stops pressure feed.
	3	⑤ Drain valve: Close	
	4	④ OUT side valve: Open	
	5	③ IN side valve: Open	

FN4



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4	**OUT side valve**	Coolant valve (Series SGC, VNC or FNVB)			Differential pressure controller (Series PSE200 + Series PSE560)

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⚠ Caution

1. Cylinder for element decompression and compression

- Do not overthrottle the speed controller when adjusting the cylinder retraction speed (element decompression). If the element is decompressed too slowly, the back-flushing may become ineffective.
- Refer to back page 4 for “Cylinder for element decompression and compression” regarding the detailed pneumatic circuit of the cylinder and lock.

2. Reservoir tank installation

- Installation of a reservoir tank (optional) is recommended to store fluid for back-flushing. If a reservoir tank is not going to be installed, make sure to allow piping capacity equivalent to a size of reservoir between the low maintenance filter and air supply valve.
  The FN4 series is equipped with a back-flushing fluid storage chamber equivalent to a reservoir tank, so there is no need to install an optional reservoir tank.

3. Air pressure

- Set the pressure of the air supply valve to 0.25 to 0.3 MPa. Increasing the pressure will not improve the back-flushing effect.
- Use the same set pressure for the supply pressure of the lock cylinder. Exceeding this pressure range may increase the load applied to the filtering plate when the element is compressed, causing malfunction.

4. IN side circuit

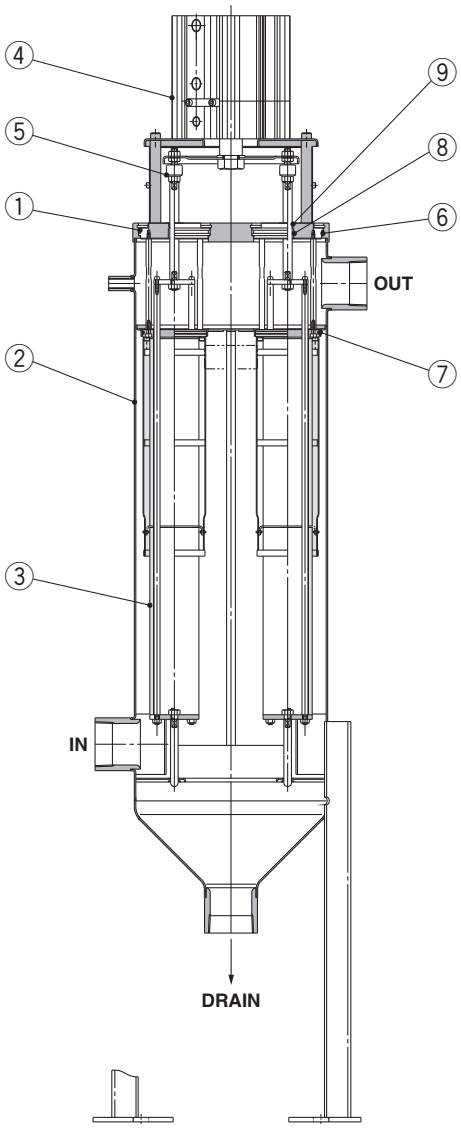
- Devise the by-pass circuit on the upstream side of IN side valve to prevent the line pressure during back-flushing from rising and to protect the pump.

5. Others

- The filter should be back-flushed until the differential pressure reaches 0.1 MPa to avoid a drop in the flow rate due to the element clogging and to maintain back-flushing efficiency.
- Time it takes to clog the element varies depending on the dust condition. Monitor the clogging condition of the element using a detection switch for differential pressure.
- Since the element of this low maintenance filter provides rough filtration efficiency (with conventional notch wire level), it can be used as a pre-filter to extend the life of the check filter depending on the fluid condition in use.
  Installing these low maintenance filters side by side to use them alternately enables continuous operation during back-flushing. Use an element with 500 mm in length for highly contaminated fluid. A sufficient flow rate can be ensured by installing two to three low maintenance filters in a row in case of the insufficient flow capacity.

Construction

FN4102□-20-S□



Component Parts

No.	Description	Note
1	**Cover**	
2	**Bowl**	
3	**Element**	ø65 x 500 ℓ
4	**Compact cylinder with lock**	CDLQA100-50D-F
5	**Floating joint**	JA20-8-125

Replacement Element

Model	Order no.	Quantity	Note
FN4102□	END400-005	1	5 μm
	END400-020	1	20 μm

Replacement Parts

No.	Description	Quantity	Material
6	**O-ring**	1	NBR or FKM
7	**O-ring**	1	
8	**Penta seal**	1	
9	**Scraper**	1	

Replacement Parts: Seal Kit

Model	Order no.	Material	Note
FN4102N	**KT-FN41N**	NBR	Items ⑥ through ⑨ from the above chart, 1 pc. each
FN4102V	**KT-FN41V**	FPM	

Dimensions: FN4