

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 page 1209 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

Pressure gauge

Symbol	Pressure gauge
Nil	None (With plug)
G <small>Note 1)</small>	With pressure gauge <small>Note 2)</small> (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	Element material	Symbol	Nominal filtration rating
S	Stainless steel 304	005	5 μm (Cylindrical type, Step type)
		020	20 μm (Cylindrical type)

Element material

Symbol	Port size	Applicable model
10	Rc1	FN1
20	Rc2	FN4

Port size

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 fluid, Cutting oil, Industrial water				
Operating pressure	Max. 1.0 MPa				
Fluid temperature	Max. 80°C				
Flow rate <small>Note)</small>	Approx. 40 L/min		Approx. 80 L/min		Approx. 250 L/min
Port size	Rc1 (IN, OUT, DRAIN)				Rc2
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	Approx. 1.1 L (when reservoir is set separately)		Approx. 1.8 L (when reservoir is set separately)		Approx. 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) <small>Note 1)</small>	
Fluid	Air	
Operating pressure	0.2 to 1.0 MPa <small>Note 2)</small>	
Ambient and fluid temperature	-10 to 70°C (No freezing) <small>Note 3)</small>	
Lock	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) "Best Pneumatics No.3" 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.



Options (Sold separately)

Reservoir tank: Series FNR

This tank is used to store sufficient fluid for back-flushing (for the FN1 series).
 * Not required for the FN4, which has a built-in tank.



How to Order

RoHS

FNR10 0 N - 10

Size		Port size		Seal material		
Symbol	Capacity	Applicable model	Symbol	Port size	Symbol	Material
0	1.1 L	FN11□1	10	Rc1	N	NBR
1	1.8 L	FN11□2			V	FKM

Specifications

Model	FNR100N-10	FNR100V-10	FNR101N-10	FNR101V-10
Tank capacity	1.1 L		1.8 L	
Port size	Rc1			
Material	Bowl & Cover: Stainless steel 304			
	O-ring: NBR		FKM	
Weight	1.5 kg		1.9 kg	
Applicable filter	FN11□1□ (Element L 250)		FN11□2□ (Element L 500)	

FGD

FGE

FGG

FGA

FGB

FGC

FGF

FGH

EJ

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FQ1

FN

EB□

ES□

Dust recovery filter (produced upon receipt of order)

This filter is for recovering dust from fluid after element back-flushing.
 It enables re-use of the element (gold mesh).



How to Order

RoHS

FND100 N - 10 - M 149 X0

Seal material		Nominal filtration rating		Element type	
Symbol	Material	Symbol	Nominal filtration rating	Symbol	Type
N	NBR	149	149 μm	M	Gold mesh
V	FKM				

Port size	
Symbol	Port size
10	R1

Specifications

Model	FND100N-10-M149X0	FND100V-10-M149X0
Port size	R1	
Material	Bowl & Cover: Stainless steel 304	
	O-ring: NBR	
	FKM	
Element	Stainless steel 304	
Element nominal filtration rating	149 μm	
Weight	7.5 kg	

Note) Produced upon receipt of order.

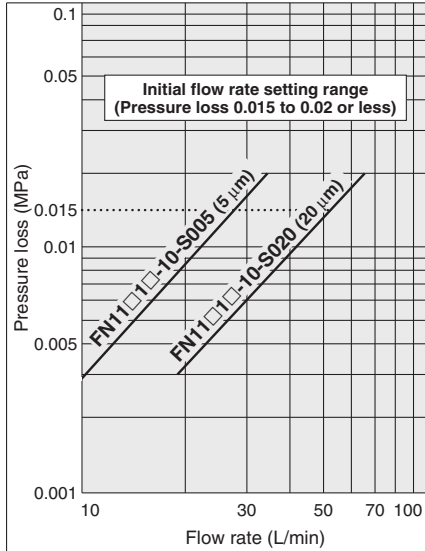
Series FN1/FN4

Flow Characteristics (Initial Value)

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

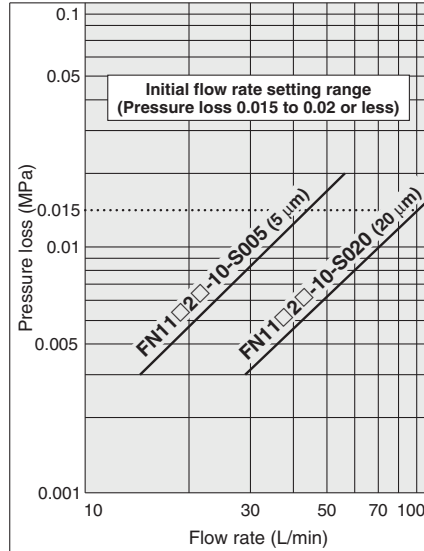
Element Length

250 L / FN11□□□-10-S □



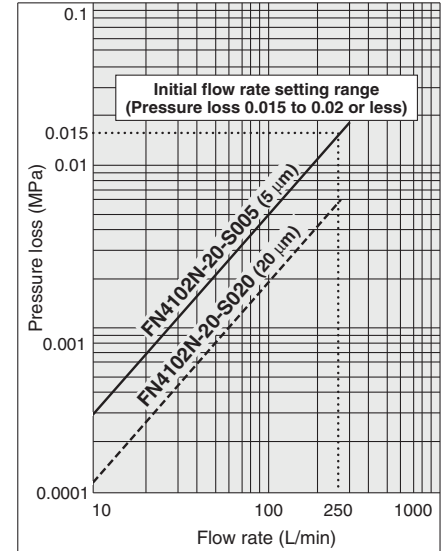
Element Length

500 L / FN11□□□-10-S □



Element Length

500 L / FN41□□□-20-S □

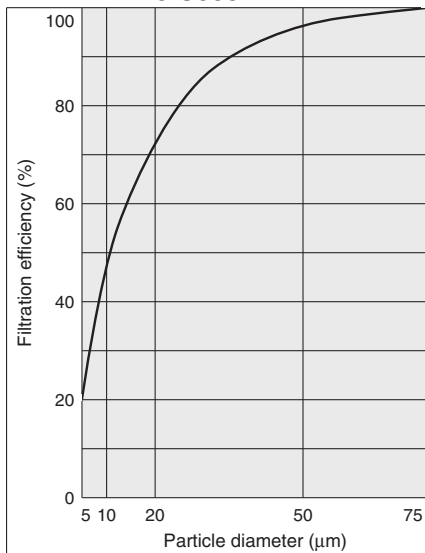


Filtration Characteristics

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

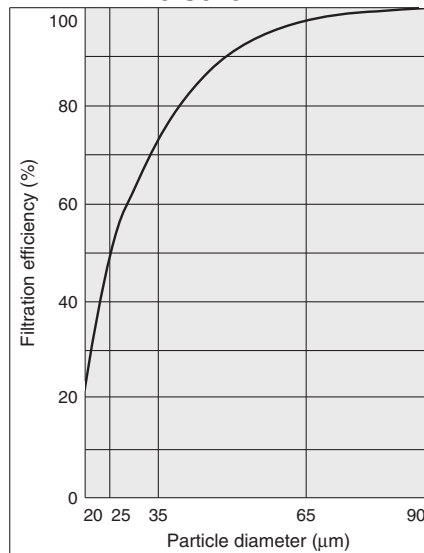
5 μm

FN11□□□-10-S005
FN41□□□-20-S005



20 μm

FN11□□□-10-S020
FN41□□□-20-S020

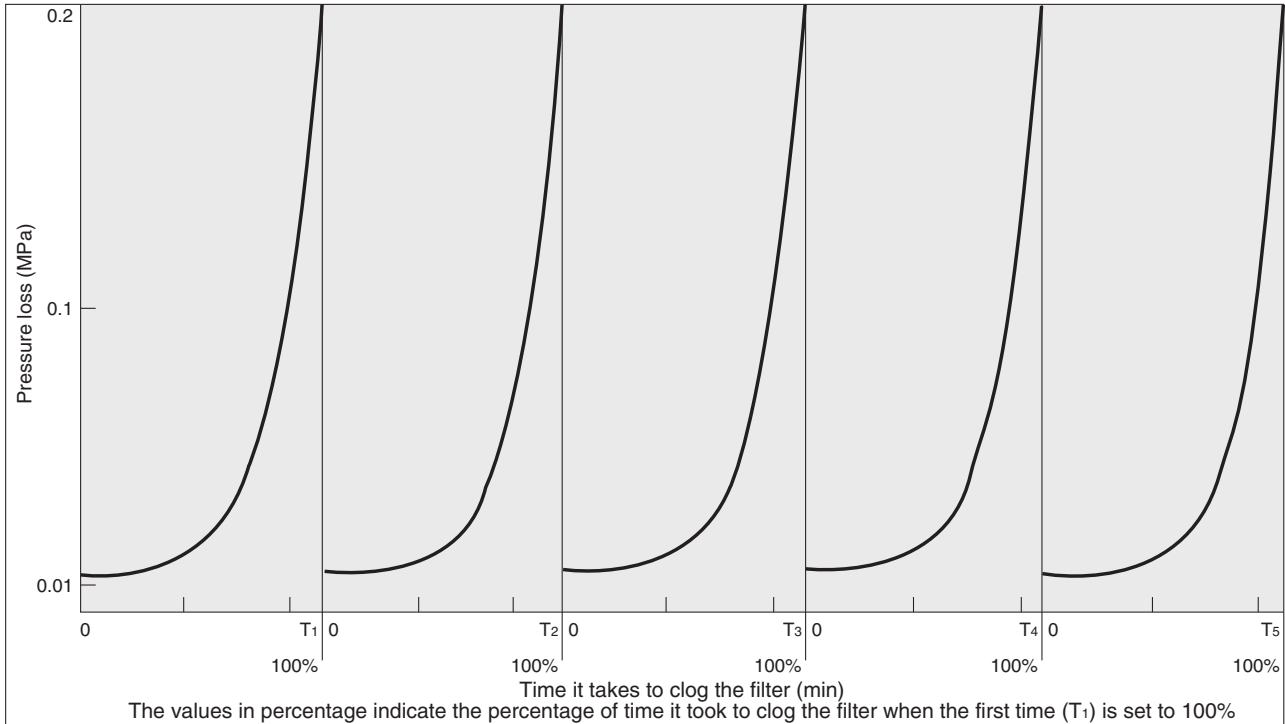


Blocking Characteristics (Repeatability)

- Fluid: Tap 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□

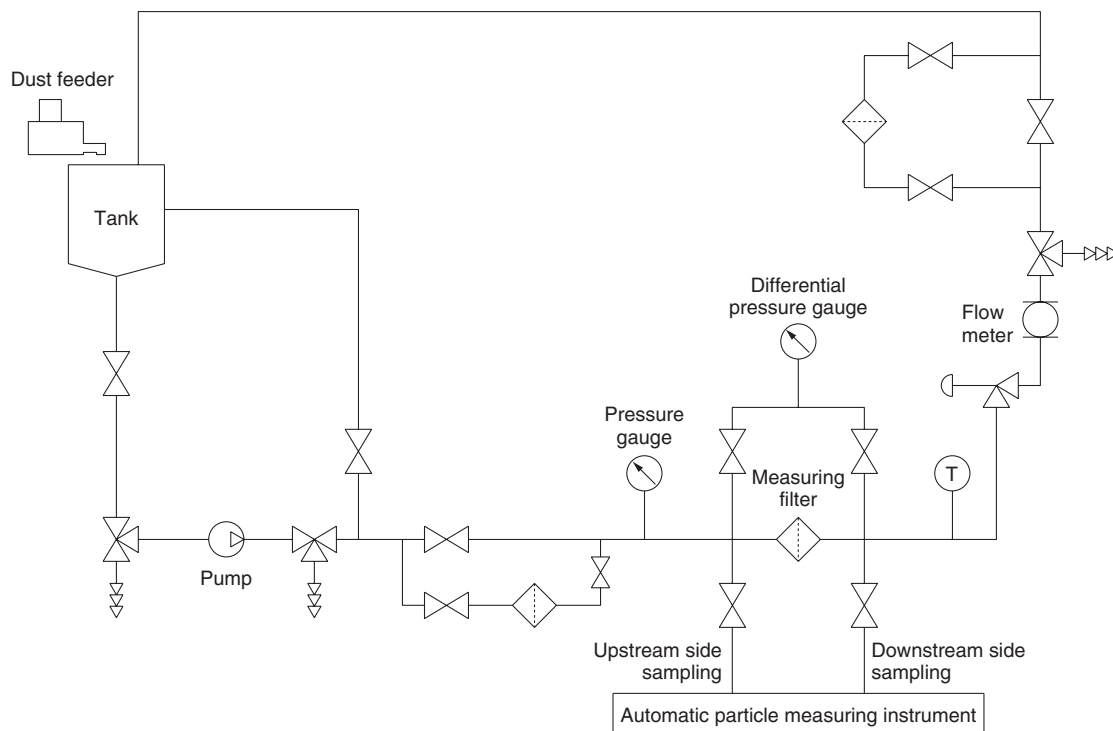
Element: END100-020 (Cylindrical type, 20 μm)



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 ($\Delta P = 0.015$ MPa) and time it takes to reach the pressure loss of $\Delta P = 0.2$ MPa return to the rough initial value even after repeated back-flushing.

Measurement Circuit



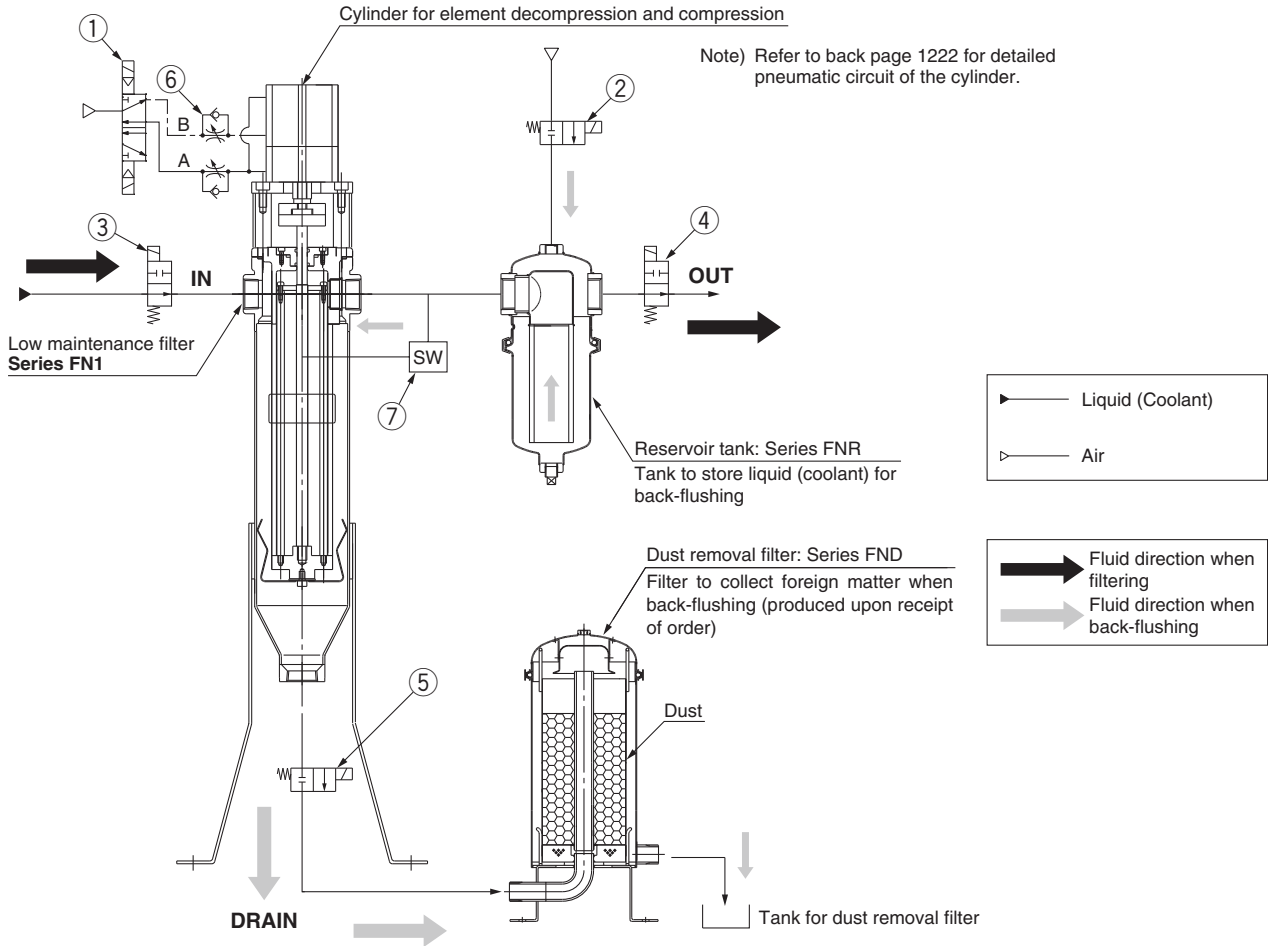
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FQ1
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EB <input type="checkbox"/>
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Series FN1/FN4

Piping Example

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

FN1



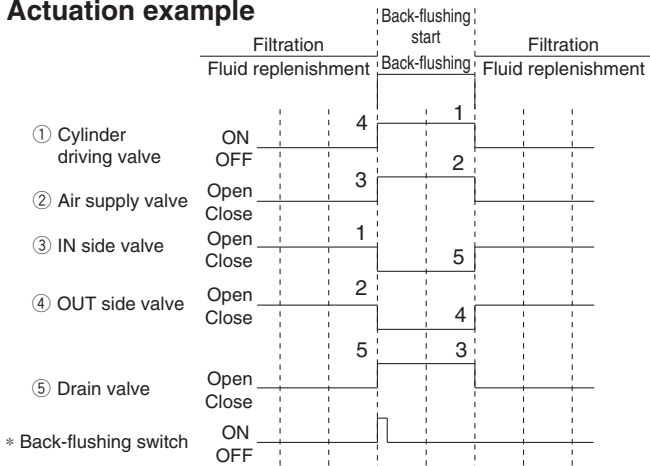
The products indicated in the table below refer to coolant related products. The SGC and VNC series coolant valves (with bodies made of cast iron) cannot be used with any fluids (such as industrial water) other than coolant.

No.	Description	Device	No.	Description	Device
1	Cylinder driving valve	5-port solenoid valve (Series SY)	5	Drain valve	Coolant valve (Series FNVB)
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 FNVB, SGC or VNC)			Differential pressure controller (Series PSE200 + Series PSE560)

Series inside () indicate SMC products.

Note) Please check the fluid compatibility with each device when selecting connection device.

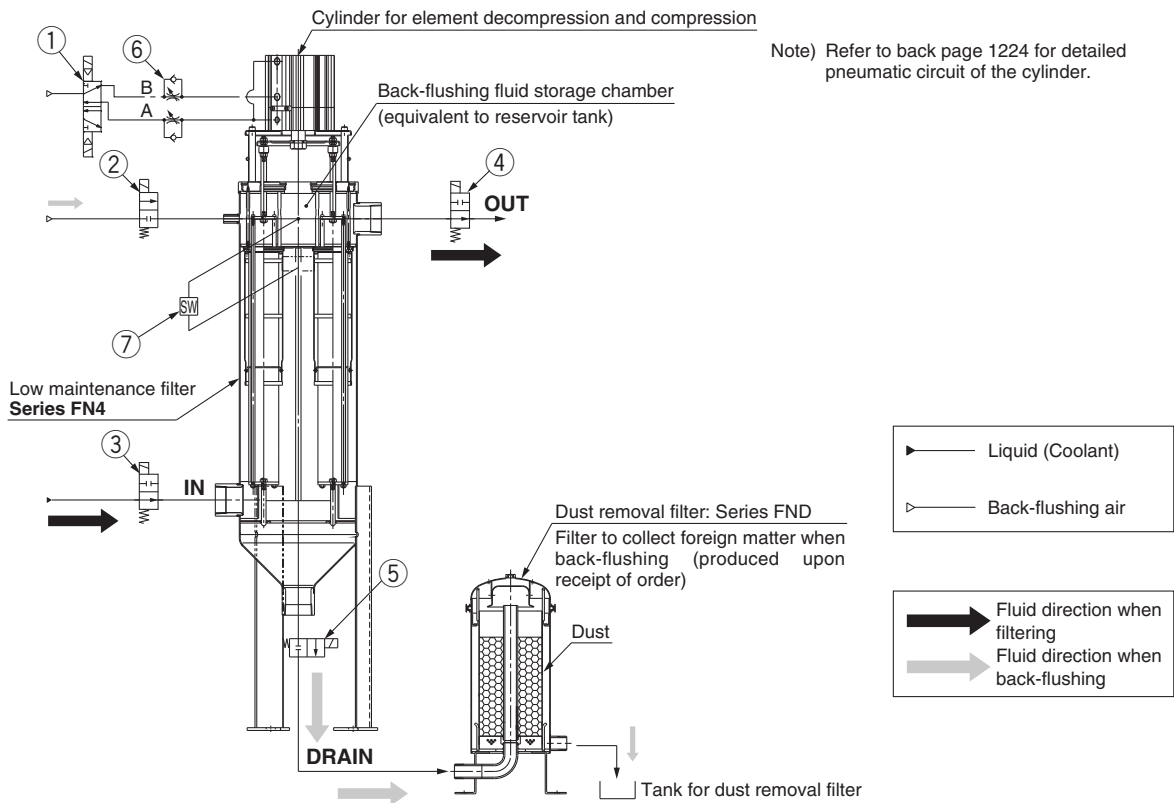
Actuation example



* 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



Example of Connection Device The products indicated in the table below refer to coolant related products. The SGC and VNC series coolant valves (with bodies made of cast iron) cannot be used with any fluids (such as industrial water) other than coolant.

No.	Description	Device	No.	Description	Device
1	Cylinder driving valve	5-port solenoid valve (Series SY)	5	Drain valve	Coolant valve (Series FNVB)
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 FNVB, SGC or VNC)			Differential pressure controller (Series PSE200 + Series PSE560)

Series inside () indicate SMC products.

Note) Please check the fluid compatibility with each device when selecting connection device.

⚠ 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 1222 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.

FGD

FGE

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FN

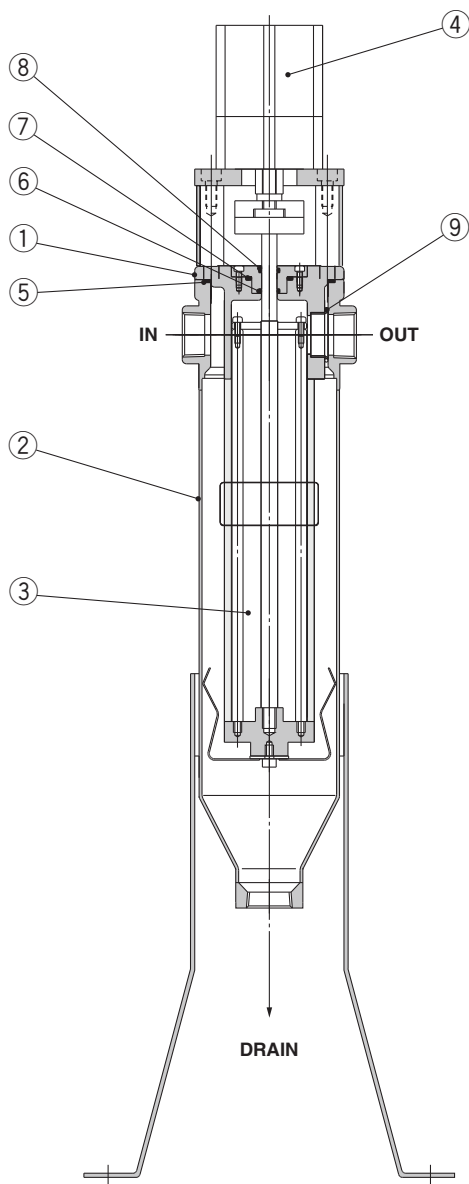
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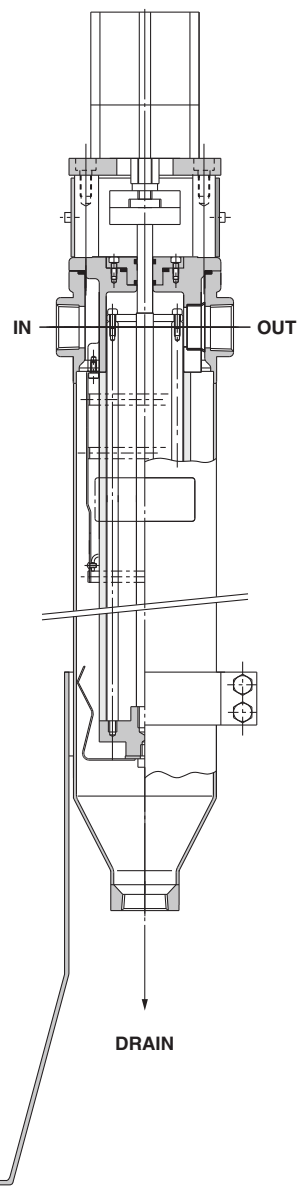
Series FN1/FN4

Construction

FN1□1□-10-S□□□□



FN1□2□-10-S□□□□



Component Parts

No.	Description	Material	Note
1	Cover	SCS13	
2	Bowl	SCS13	
3	Element	Stainless steel 304	ø65 x 250 L
			ø65 x 500 L
4	Compact cylinder with lock	FN1□1	CDLQB63-30D-F
		FN1□2	CDLQB63-50D-F

Replacement Element

Model	Order no.	Quantity	Note
FN1□1□	END100-005	1	5 μm, Cylindrical type
	END100-020	1	20 μm, Cylindrical type
	END110-005	1	5 μm, Step type
FN1□2□	END200-005	1	5 μm, Cylindrical type
	END200-020	1	20 μm, Cylindrical type
	END210-005	1	5 μm, Step type

Replacement Parts

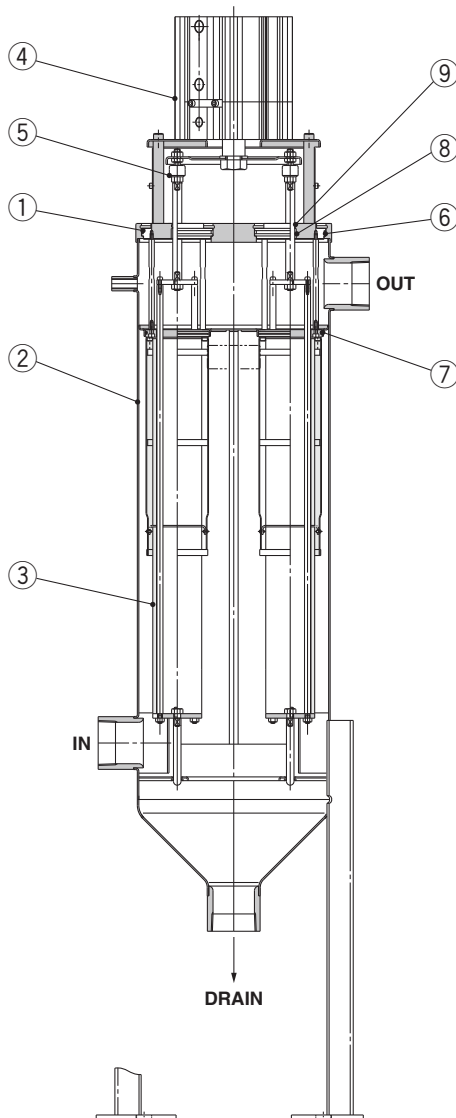
No.	Description	Quantity	Material
5	O-ring	1	NBR FPM
6	Penta seal	1	
7	O-ring	1	
8	Scraper	1	
9	O-ring	1	

Replacement Parts: Seal Kit

Model	Order no.	Material	Note
FN1□□N	KT-FN11N	NBR	Items ⑤ through ⑨ from the above chart, 1 pc. each
FN1□□V	KT-FN11V	FPM	

Construction

FN4102□-20-S□



- FGD
- FGE
- FGG
- FGA
- FGB
- FGC
- FGF
- FGH
- EJ
- ED
- FQ1
- FN**
- EB□
- ES□

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 Parts

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

Replacement Element

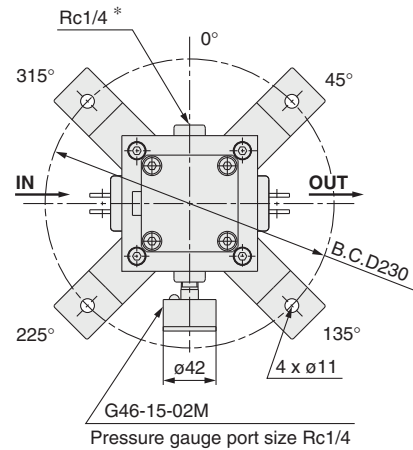
Model	Order no.	Quantity	Note
FN4102□	END400-005	1	5 μm
	END400-020	1	20 μm

Replacement Parts: Seal Kit

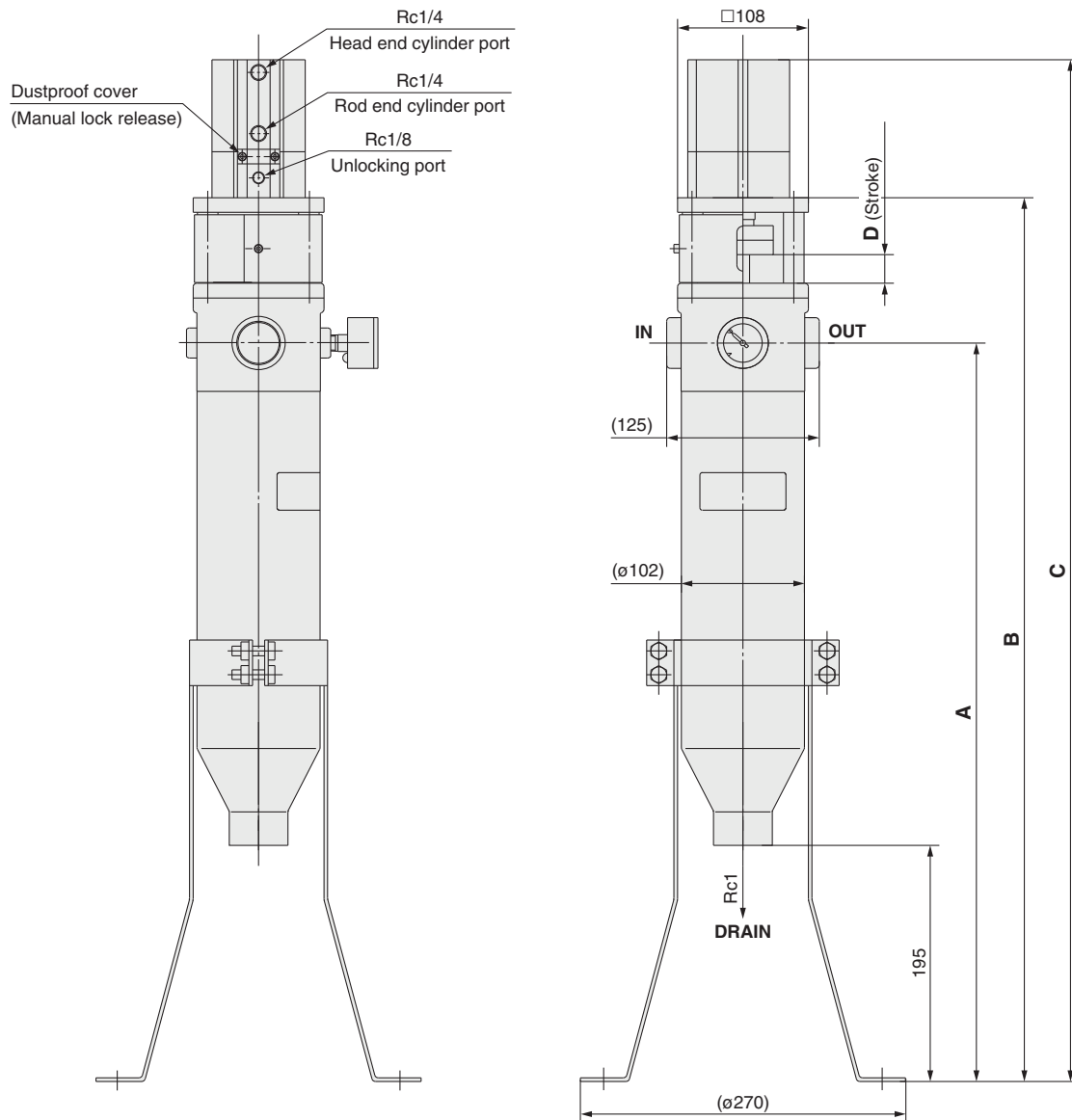
Model	Order no.	Material	Note
FN4102N	KT-FN41N	NBR	Items ⑥ through ⑨ from the above chart, 1 pc. each
FN4102V	KT-FN41V	FPM	

Series FN1/FN4

Dimensions: FN1



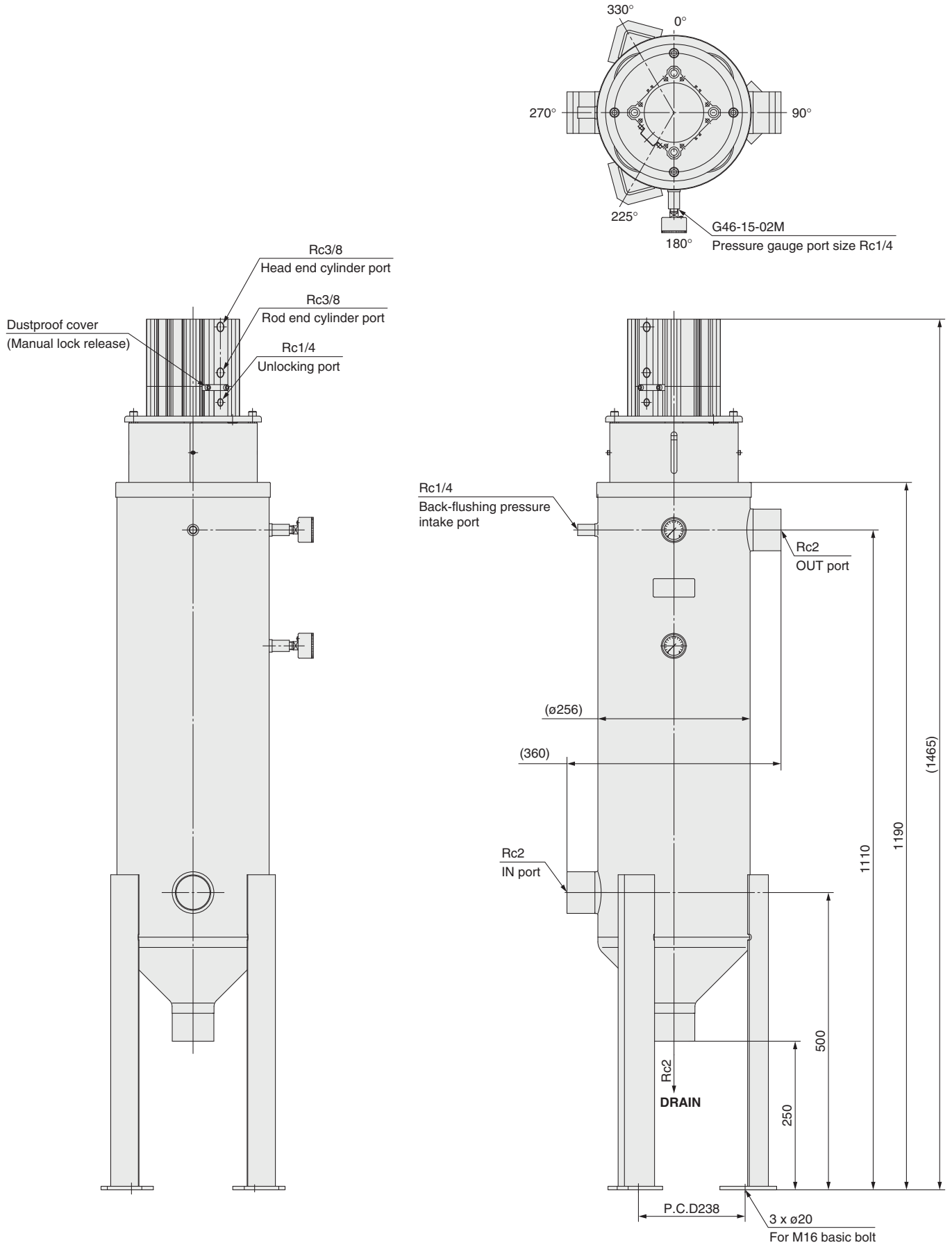
Note) Use the Rc1/4 port marked with an asterisk when designing an air release circuit.



Dimensions

Model	Port size (Nominal size B)	A	B	C	D
FN11□1	Rc1	610	(730)	(844)	20
FN11□2		860	(1000)	(1134)	40

Dimensions: FN4

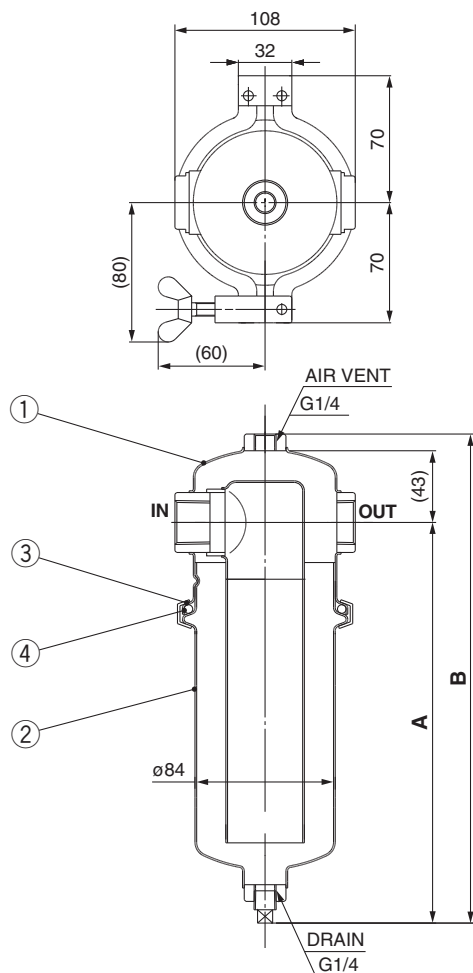


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Series FN1/FN4

Construction/Dimensions: Reservoir Tank, Dust Recovery Filter (Options, sold separately)

Reservoir tank (when using the FN1)



Dimensions (mm)

Model	Port size (Nominal size B)	A	B
FNR100 ^N -10	Rc1	204	(257)
FNR101 ^N -10		332	(385)

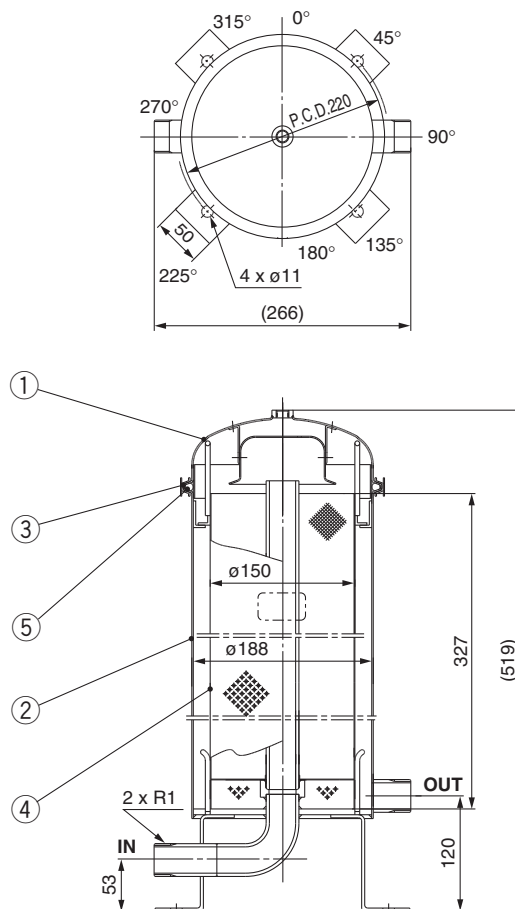
Component Parts

No.	Description	Material	Note
1	Cover	Stainless steel 304	
2	Bowl	Stainless steel 304	
3	V-band	Stainless steel 304	

Replacement Parts

No.	Description	Material	Quantity	Note
4	O-ring	NBR	1	JIS B 2401-1A-P85
		FKM	1	JIS B 2401-4D-P85

Dust recovery filter



Component Parts

No.	Description	Material	Note
1	Cover	Stainless steel 304	
2	Bowl	Stainless steel 304	
3	V-band	Stainless steel 304	

Replacement Parts

No.	Description	Material	Quantity	Note
4	Element	Stainless steel 304	1	EZH710AS-149
5	O-ring	NBR	1	JIS B 2401-1A-P185
		FKM	1	JIS B 2401-4D-P185