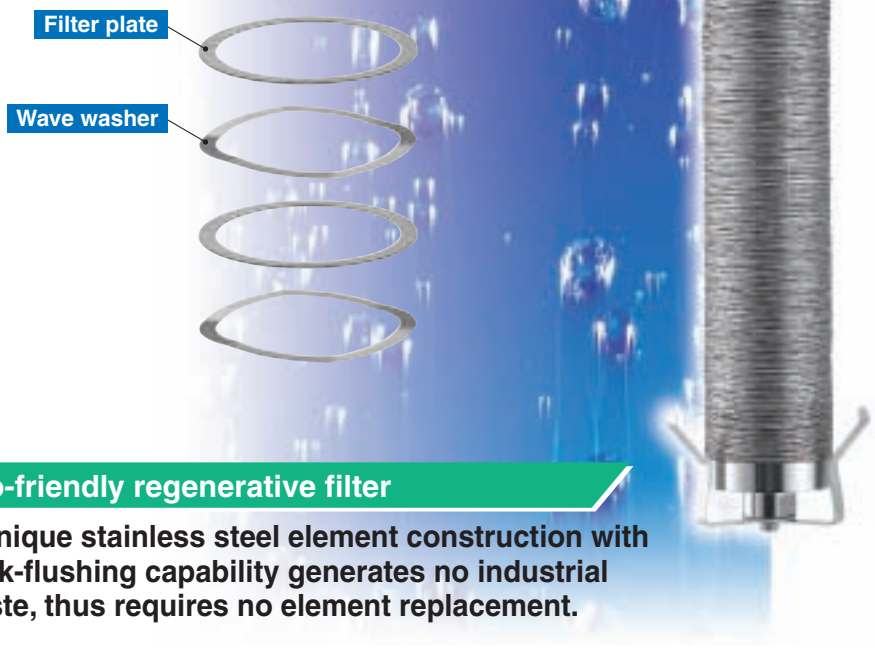
No more element replacement!

Our unique element construction with back-flushing capability (PAT.)

The element of the filter is constructed of a series of grooved filter plates and wave washers placed one above the other.

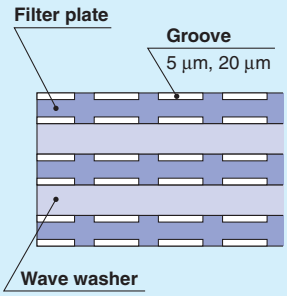


Eco-friendly regenerative filter

A unique stainless steel element construction with back-flushing capability generates no industrial waste, thus requires no element replacement.

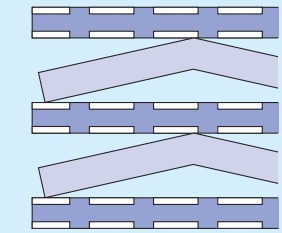
Element construction

When compressed



Gaps between the filter plates and wave washers filter foreign matter.

When decompressed



Decompressing the element widens the gap between filter plates and wave washers. While the gap is widened, dust and foreign matters caught between plates can be washed away by back-flushing the element. This restores the element and enables repeated use of the element.
The gaps between filter plates are equally maintained by the wave washers to allow stable back-flush operation.

Low Maintenance Filter

Series FN1/FN4

Series FN4 with four elements is added!

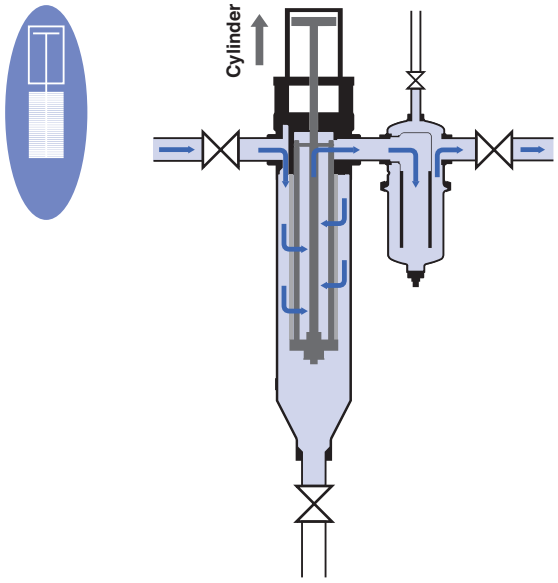
SMC

Operating Principle

FN1 Series

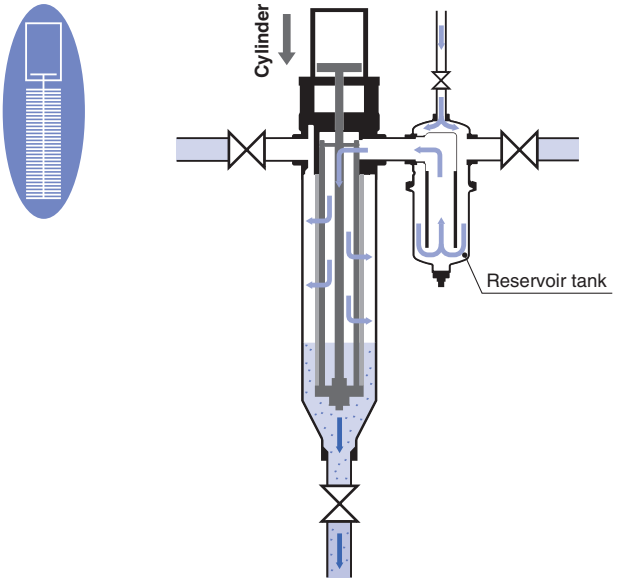
Fluid flow Air flow

Filtering



The element compressed by the cylinder filters the fluid.

Back-flushing

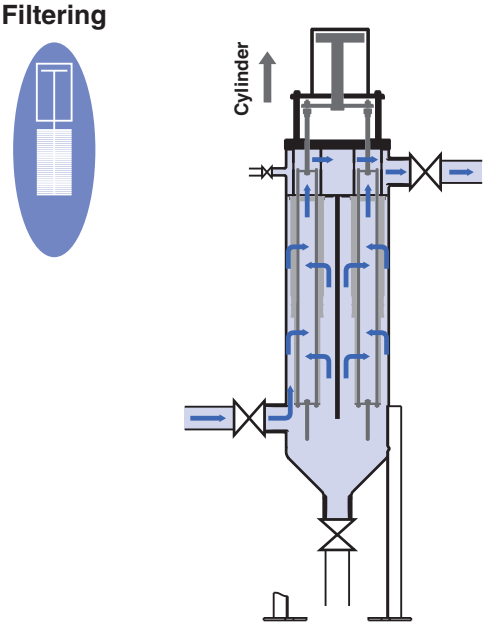


As the cylinder extends downward, the element is decompressed.
Air pressure forces the fluid in the reservoir tank out to the filter and back-flushes the element.

FN4 Series

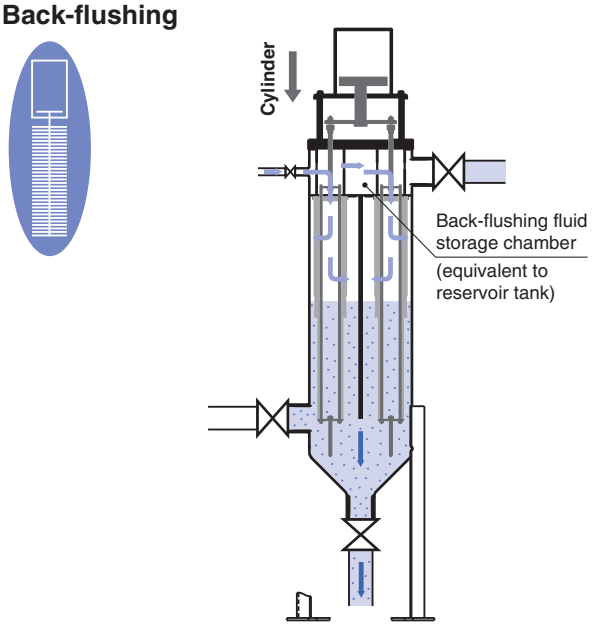
Fluid flow Air flow

Filtering



The element compressed by the cylinder filters the fluid.

Back-flushing

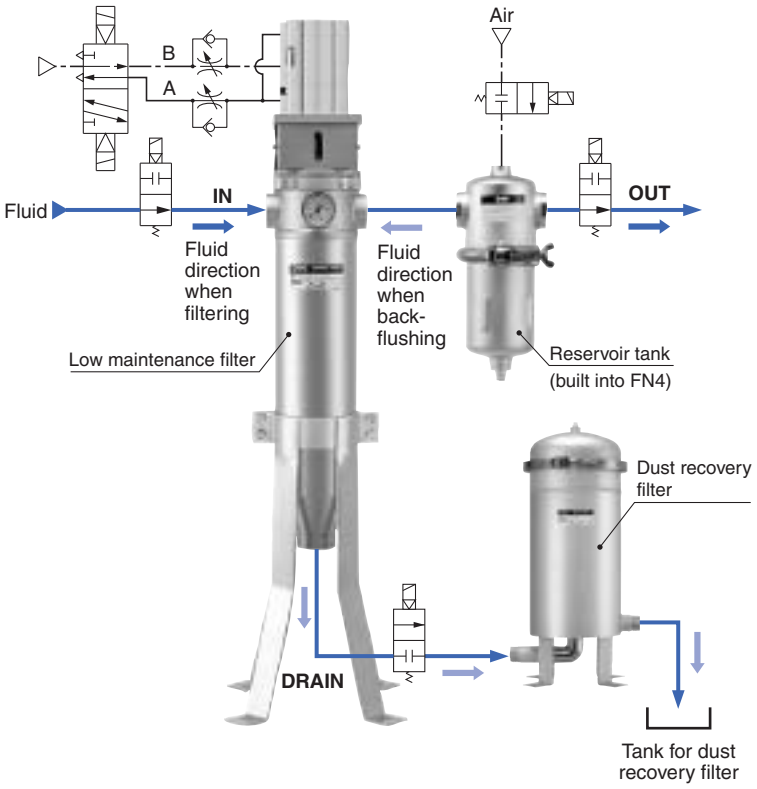


As the cylinder extends downward, the element is decompressed.
Air pressure forces the fluid in the back-flushing fluid storage chamber (equivalent to reservoir tank) out to the filter and back-flushes the element.

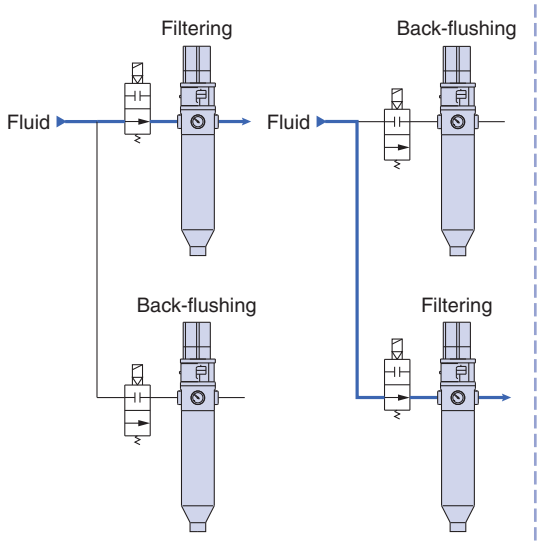
Automatic Cleaning

System circuit allows the automatic cleaning of element when clogged.

(Refer to page 5 for details.)

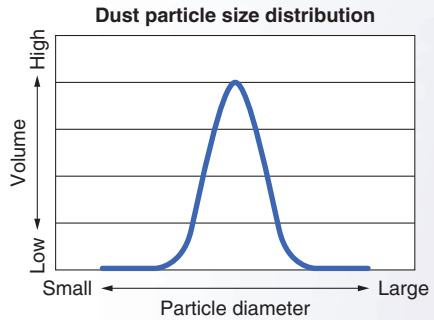


Setting up filters in a line and flushing the fluid alternately allow continuous operation during back-flushing.



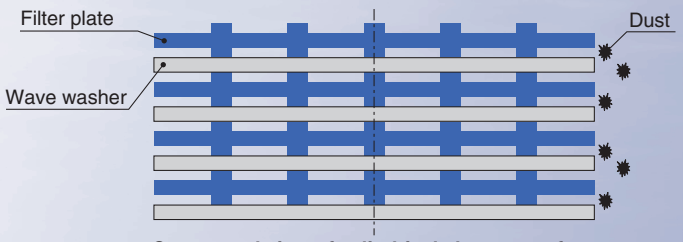
Two types of elements to match different fluid conditions

Cylindrical type



Upstream-side applicable dust particle size distribution

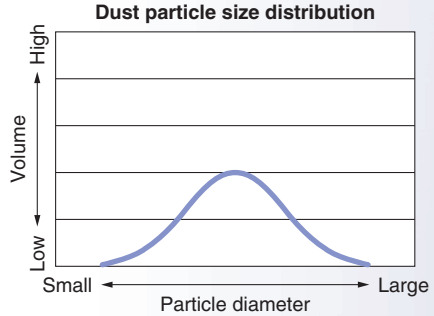
<Construction> The cylindrical type construction has a smooth surface since the dimension of the filter plate and wave washer are the same.



Conceptual view of cylindrical element surface

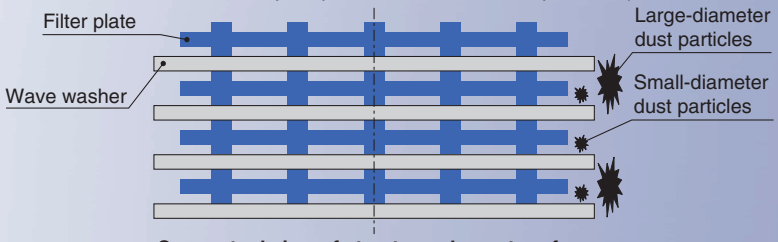
<Selection> Suitable for cases where there are dust particles with a narrow size distribution.

Step type



Upstream-side applicable dust particle size distribution

<Construction> The step type construction has an uneven (stepped) surface since the dimension of the filter plate and wave washer are different.
(Two-step filter in which outer step stops large-diameter dust particles and the inner step stops small-diameter dust particles.)



Conceptual view of step-type element surface

<Selection> Suitable for cases where there are dust particles with a wide size distribution.

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.

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

FNR10 0 N – 10

Size

Symbol	Capacity	Applicable model
0	1.1 ℓ	FN11□1
1	1.8 ℓ	FN11□2

Seal material

Symbol	Material
N	NBR
V	FKM

Port size

Symbol	Port size
10	Rc1

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	NBR	FKM
Weight		1.5 kg		1.9 kg	
Applicable filter		FN11□1□ (Element ℓ 250)		FN11□2□ (Element ℓ 500)	

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

FND100 N – 10 – M 149 X0

Seal material

Symbol	Material
N	NBR
V	FKM

Port size

Symbol	Port size
10	R1

Element type

Symbol	Type
M	Gold mesh

Nominal filtration rating

Symbol	Nominal filtration rating
149	149 μm

Specifications

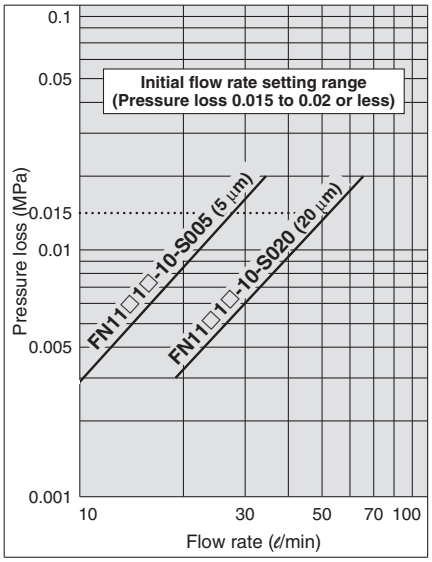
Model		FND100N-10-M149X0	FND100V-10-M149X0
Port size		R1	
Material	**Bowl & Cover**	Stainless steel 304	
	O-ring	NBR	FKM
	Element	Stainless steel 304	
Element nominal filtration rating		149 μm	
Weight		7.5 kg	

Note) Produced upon receipt of order.

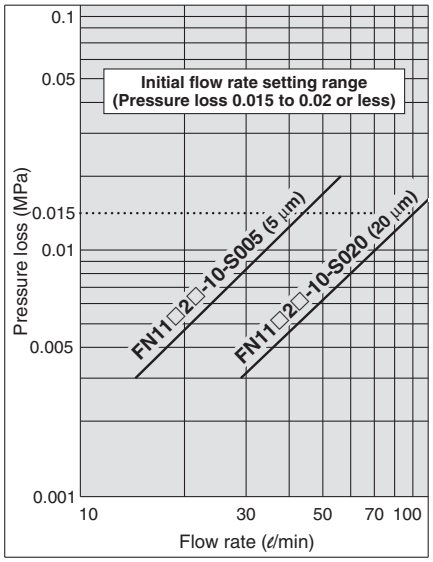
Flow Characteristics (Initial Value)

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

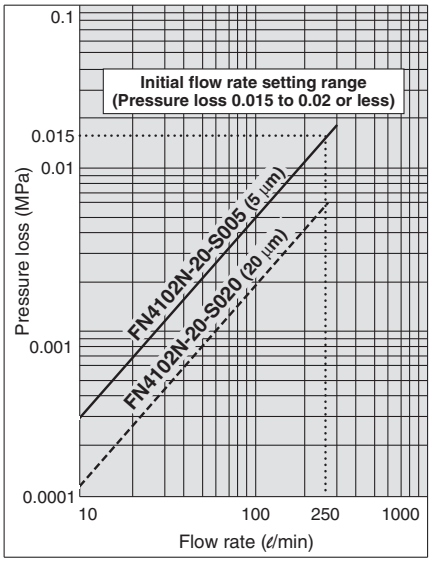
Element Length
250 ℓ / FN11□1□-10-S□



Element Length
500 ℓ / FN11□2□-10-S□



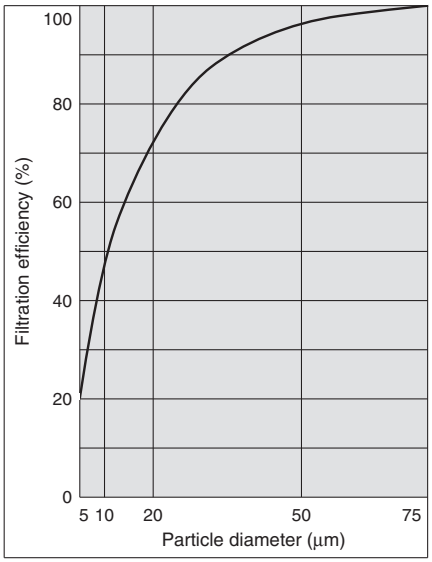
Element Length
500 ℓ / FN41□2□-20-S□



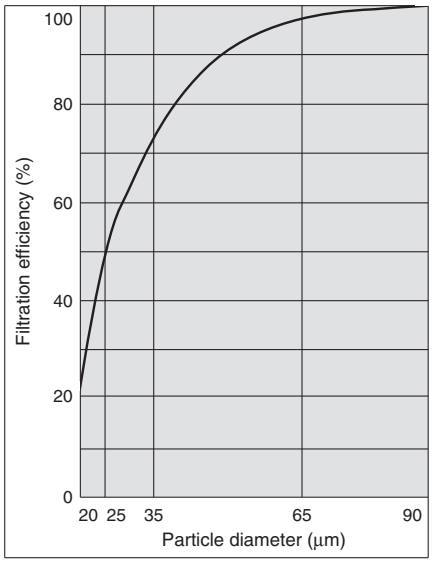
Filtration Characteristics

● 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

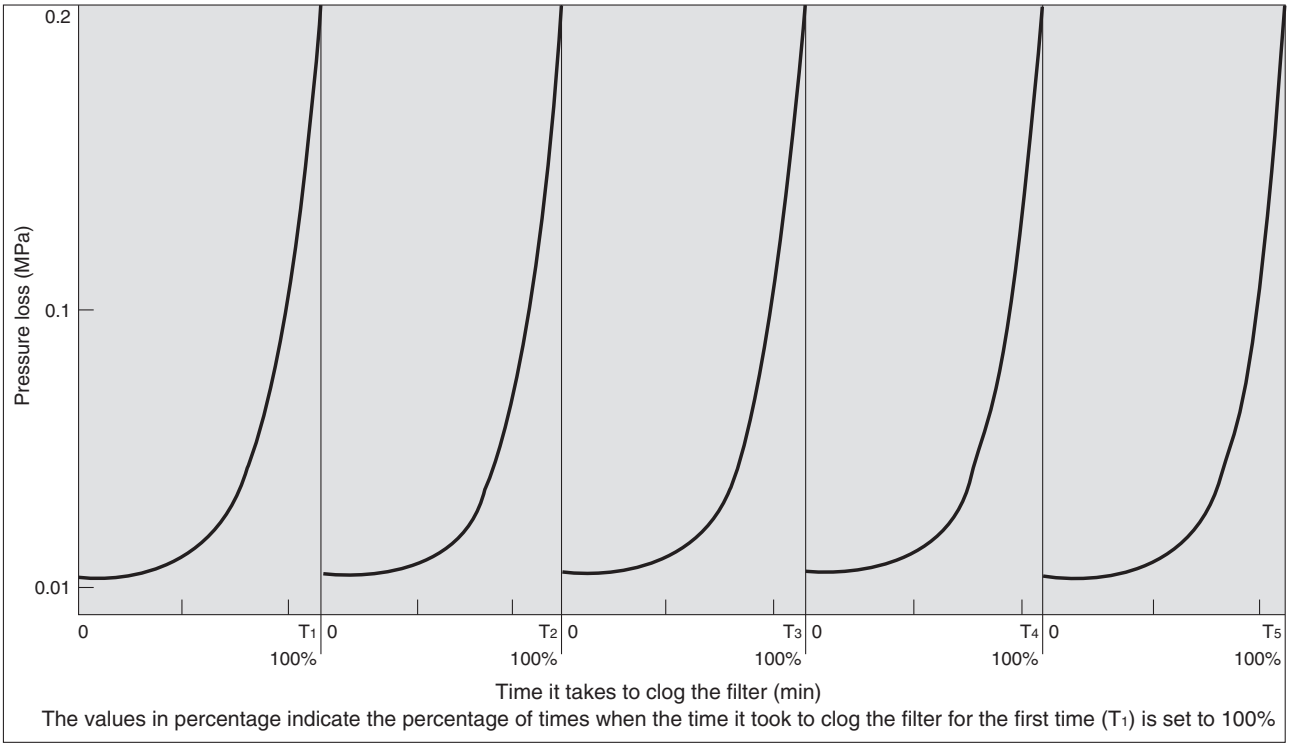


Blocking Characteristics (Repeatability)

● 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

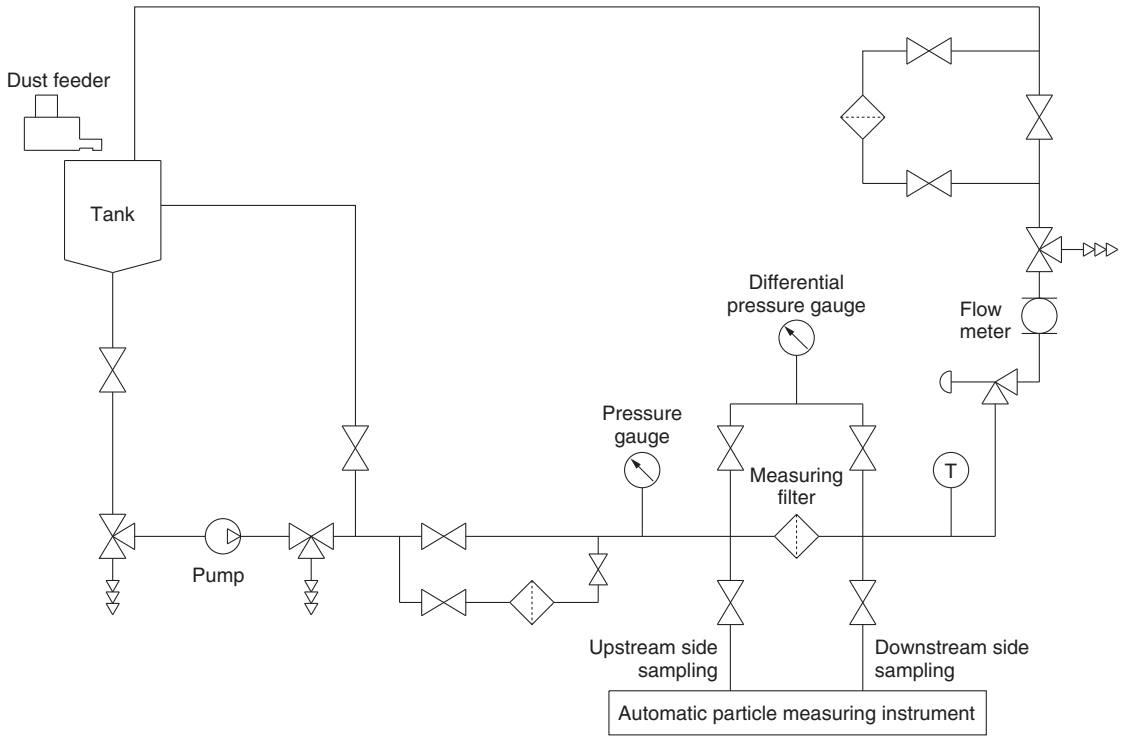
Filter part no.: FN1101N-10-S□, FN4102N-20-S□

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.

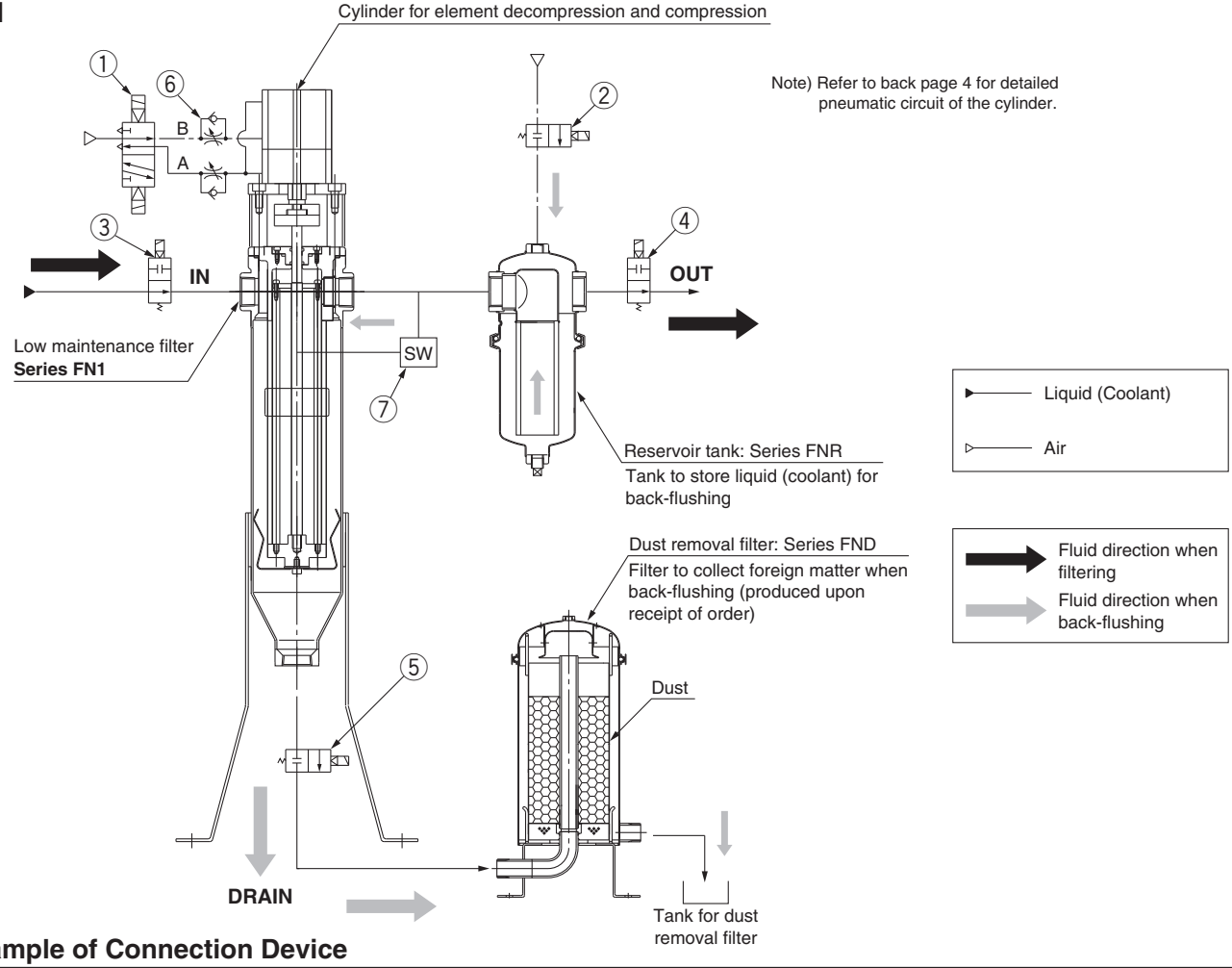
Measurement Circuit



Piping Example

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

FN1

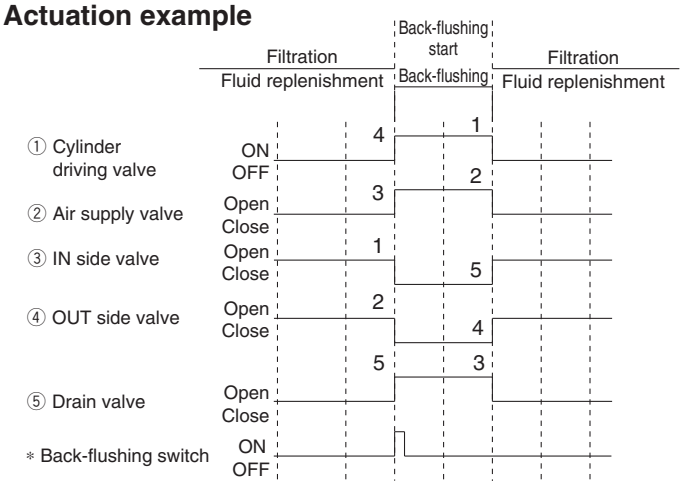


Example of Connection Device

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.

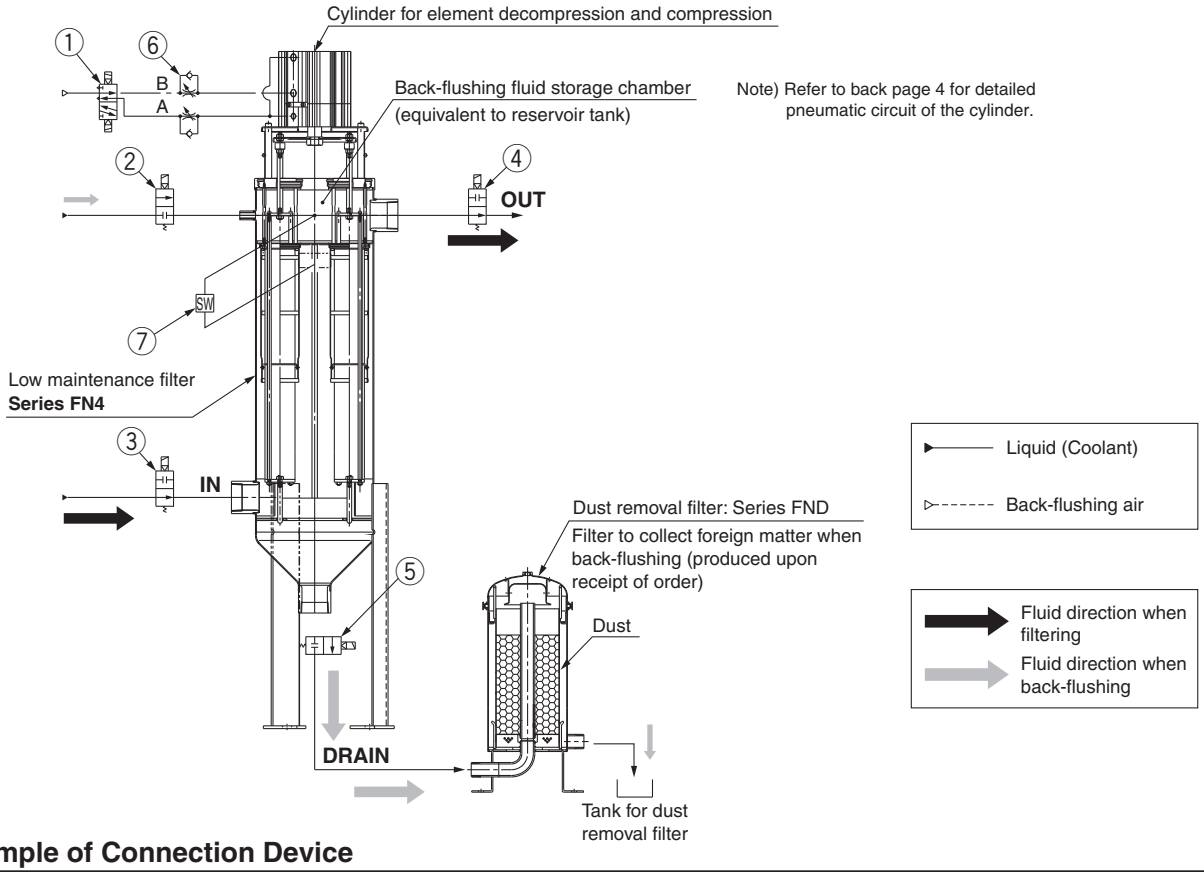
Actuation example



∗ 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



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.

⚠ 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

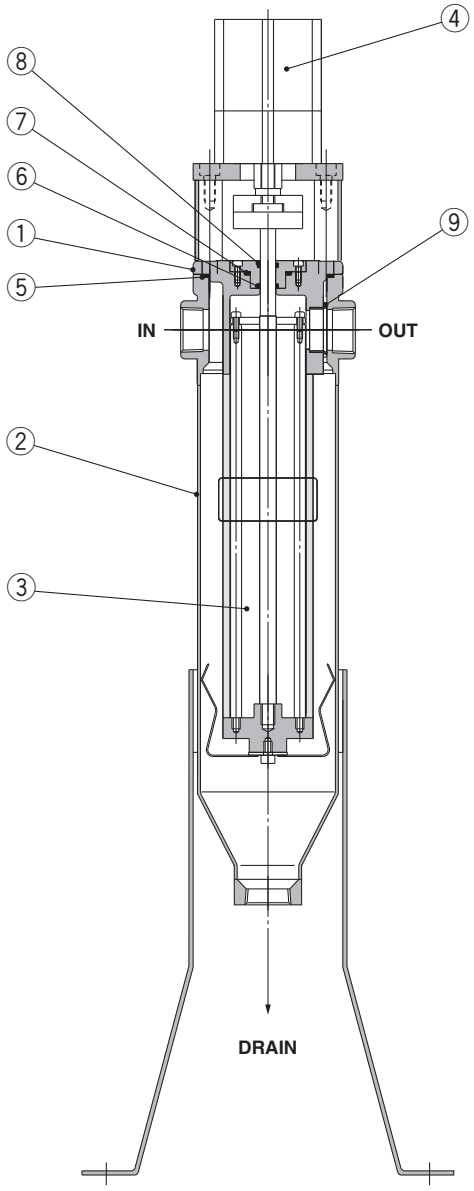
- Devise the by-pass circuit on the upstream side of IN side valve to prevent the line pressure during back-flushing from rising and to protect the pump.

5. Others

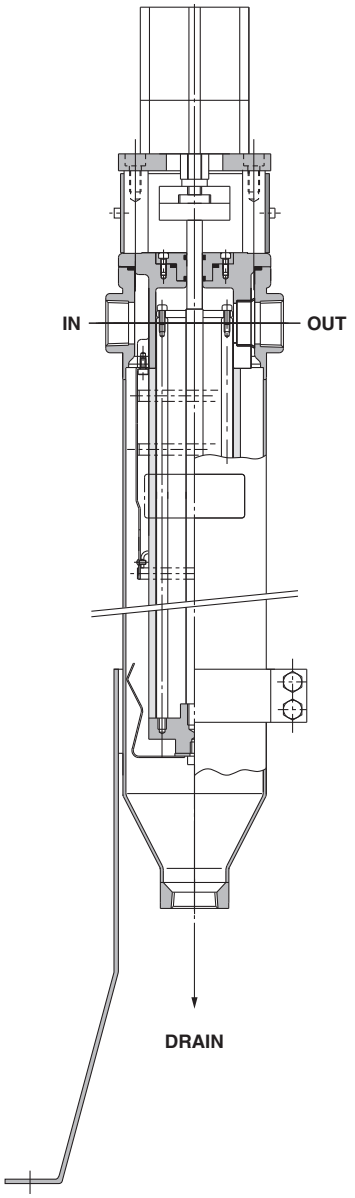
- The filter should be back-flushed until the differential pressure reaches 0.1 MPa to avoid a drop in the flow rate due to the element clogging and to maintain back-flushing efficiency.
- Time it takes to clog the element varies depending on the dust condition. Monitor the clogging condition of the 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

FN11□1□-10-S□□□□



FN11□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**	**FN11□1**	CDLQB63-30D-F
		FN11□2	CDLQB63-50D-F

Replacement Element

Model	Order no.	Quantity	Note
FN11□1□	END100-005	1	5 µm, Cylindrical type
	END100-020	1	20 µm, Cylindrical type
	END110-005	1	5 µm, Step type
FN11□2□	END200-005	1	5 µm, Cylindrical type
	END200-020	1	20 µm, Cylindrical type
	END210-005	1	5 µm, Step type

Replacement Parts

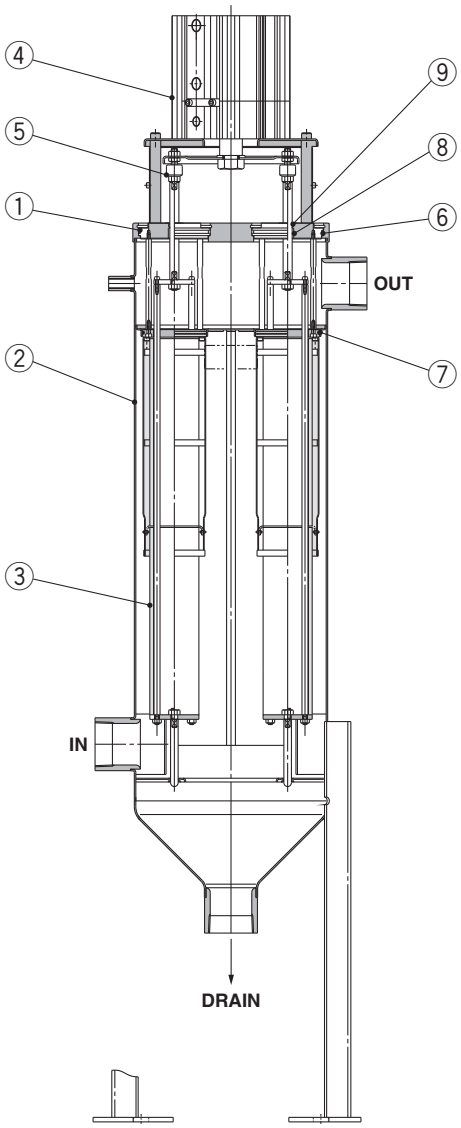
No.	Description	Quantity	Material
5	**O-ring**	1	NBR FPM
6	**Penta seal**	1	
7	**O-ring**	1	
8	**Scraper**	1	
9	**O-ring**	1	

Replacement Parts: Seal Kit

Model	Order no.	Material	Note
FN11□□N	**KT-FN11N**	NBR	Items ⑤ through ⑨ from the above chart, 1 pc. each
FN11□□V	**KT-FN11V**	FPM	

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

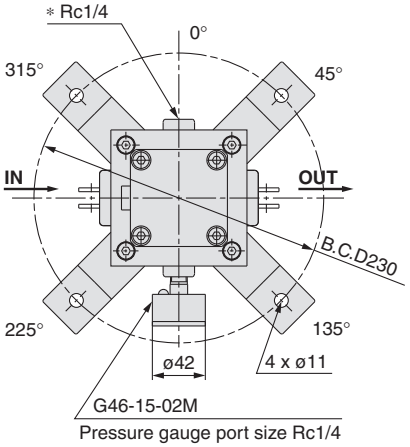
Replacement Parts

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

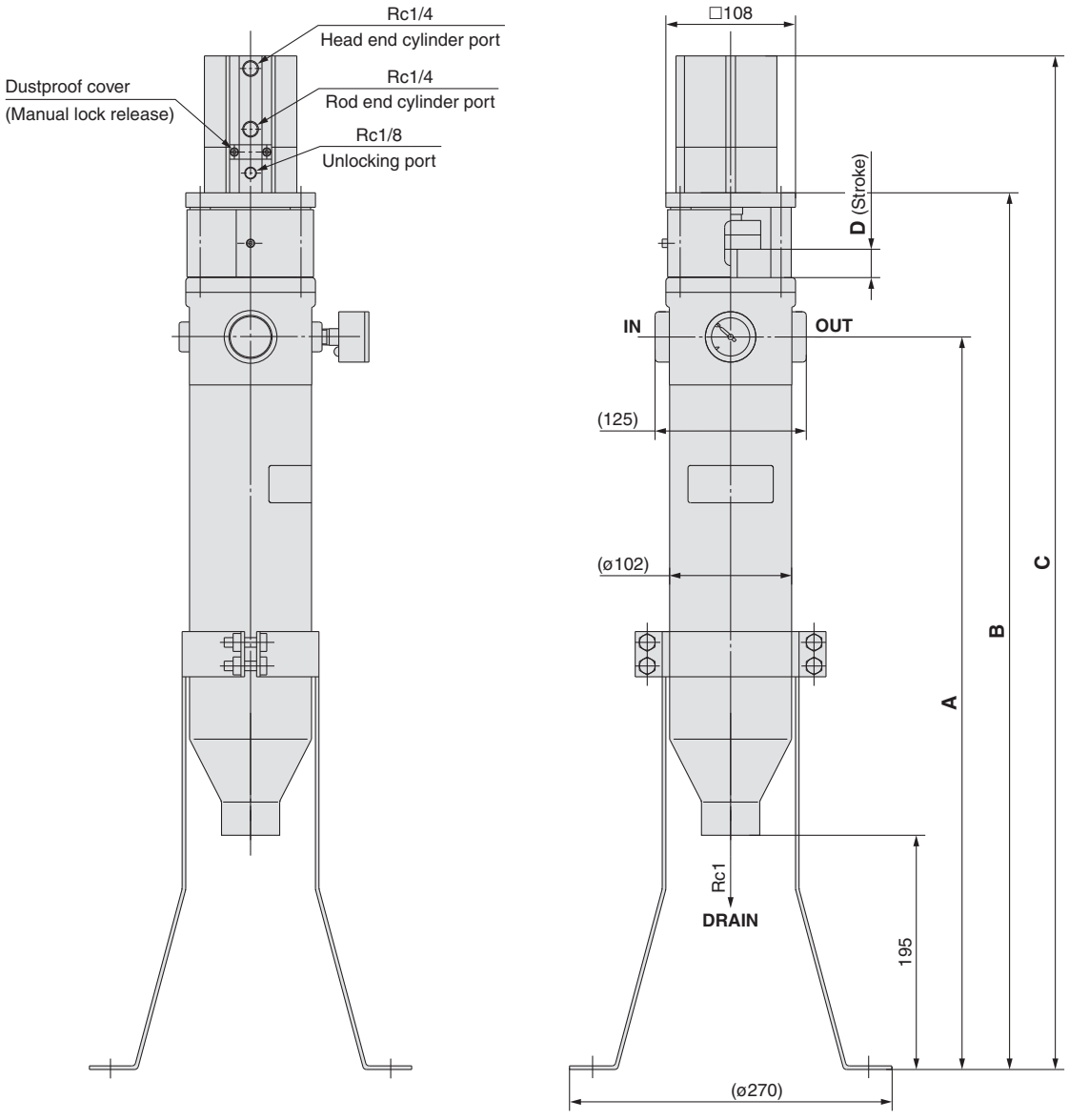
Replacement Parts: Seal Kit

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: FN1



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

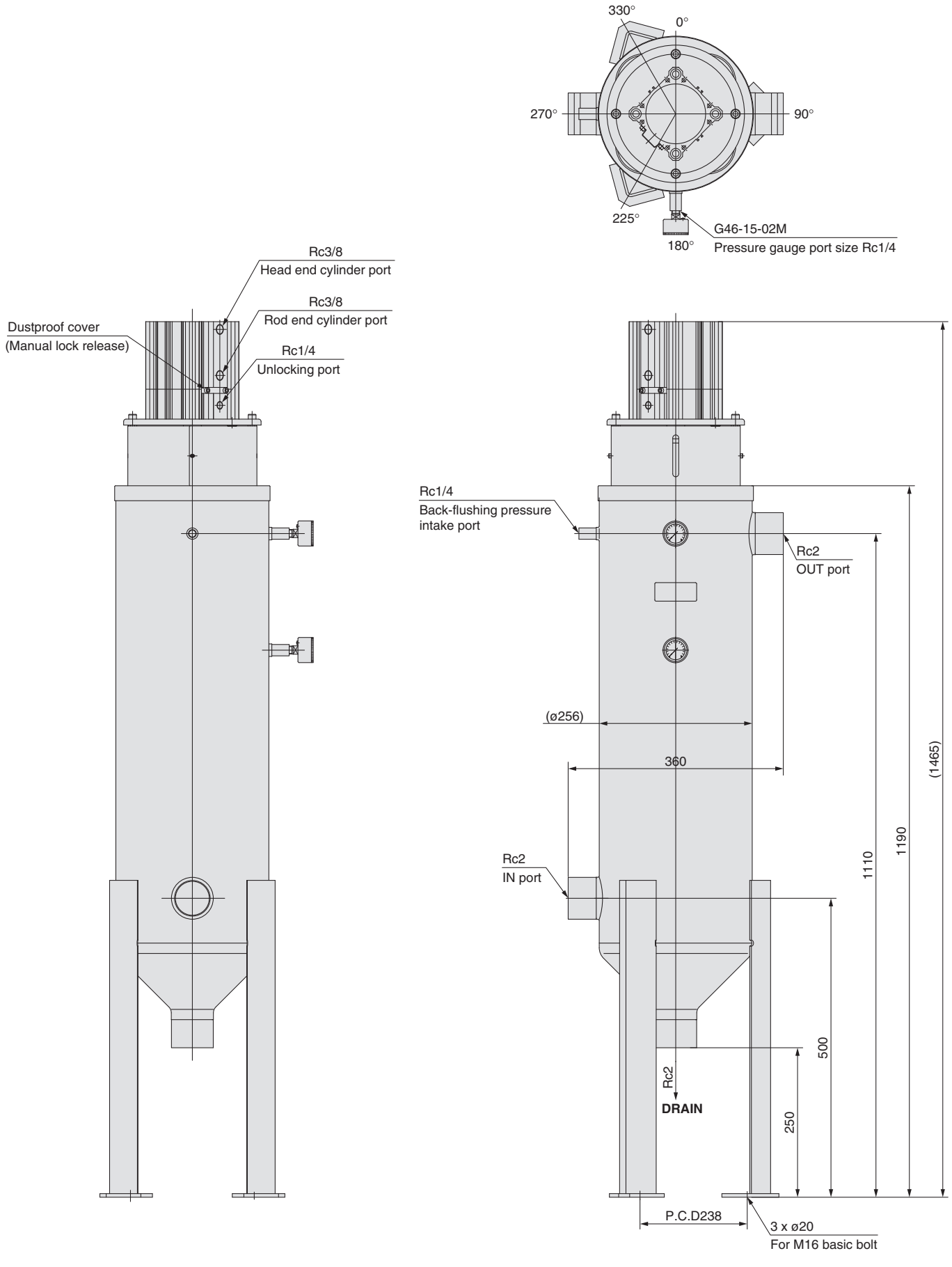


Dimensions

(mm)

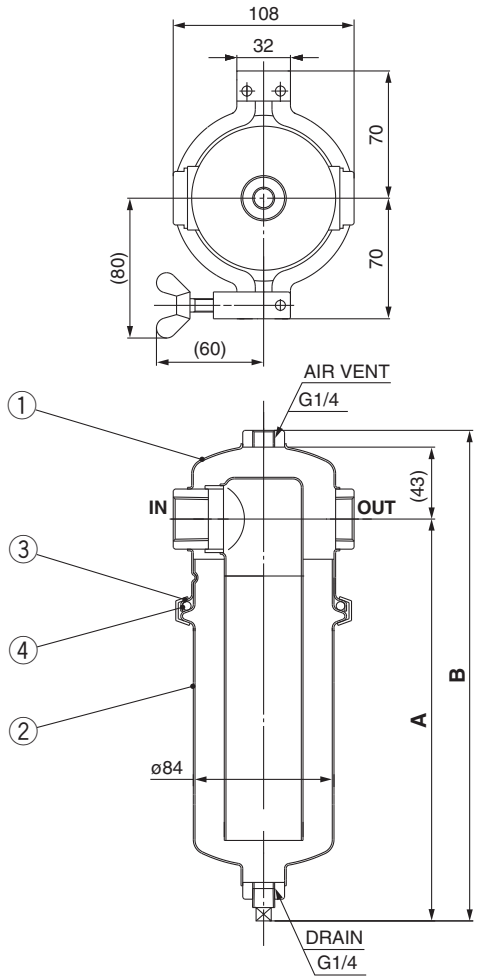
Model	Bore size (Nominal size B)	A	B	C	D
FN11□1	Rc1	610	(730)	(844)	20
FN11□2		860	(1000)	(1134)	40

Dimensions: FN4

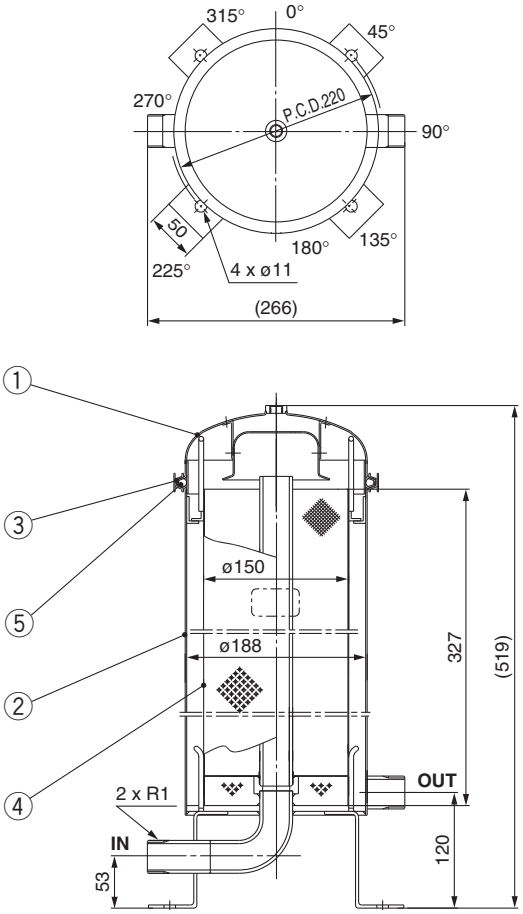


Construction/Dimensions: Reservoir Tank, Dust Recovery Filter (Options, sold separately)

Reservoir tank (when using the FN1)



Dust recovery filter



Dimensions

(mm)

Model	Bore size (Nominal size B)	A	B
FNR100$^{N}_{V}$-10	Rc1	204	(257)
FNR101$^{N}_{V}$-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

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

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), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

* 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 10218-1992: Manipulating industrial robots -Safety.
JIS B 8370: General rules for pneumatic equipment.
JIS B 8361: General rules for hydraulic equipment.
JIS B 9960-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
JIS B 8433-1993: Manipulating industrial robots - Safety.
etc.
* 2) Labor Safety and Sanitation Law, etc.

⚠ Caution: Operator error could result in injury or equipment damage.

⚠ Warning: Operator error could result in serious injury or loss of life.

⚠ Danger : In extreme conditions, there is a possibility of serious injury or loss of life.

⚠ 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 catalog 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 catalog.
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.

Safety Instructions

⚠ Caution

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.*3)**
   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 catalog for the particular products.**

*** 3) 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

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

Series FN1/FN4
Specific Product Precautions 1

Be sure to read this before handling.
Refer to the back of pages 1 and 2 for Safety Instructions.

Design

⚠ Caution

1. Do not operate exceeding the operating pressure range.

2. Do not operate exceeding the operating temperature range.

3. Fluid

Do not operate with gases.

4. Fatigue failure

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

1) When surge pressure is applied to the element
2) Unstable filter causes sliding or vibration.
3) When the element repeatedly expands and shrinks due to thermal effect.

5. Pressure drop

Adjust the initial pressure drop to 0.01 MPa to 0.02 MPa or less.

6. Corrosion

Corrosion may occur depending on the operating condition and environment.
The wetted part of the pressure gauge is made of brass. Confirm the compatibility with fluid in use.

Selection

⚠ Warning

1. For model selection, confirm application purpose, required specification, and operating condition (such as fluid, pressure, flow rate, temperature, and environment) so that the selected model is within the specified range.

2. Do not use at temperature that exceeds the boiling point of the fluid.

3. Never use with gases, including air.

4. Do not use in locations where pressure rises over 1 MPa due to water hammer or surge pressure.

Fluid

⚠ Warning

1.A low maintenance filter should be used for filtering coolant (oil-based or water-soluble), cutting oil, weak alkaline cleaning solvent, or industrial water.
There may be circumstances where a seal or an O-ring deteriorates, causing leakage.

Piping

⚠ Caution

1. Ensure sufficient clearance for maintenance when piping.

2. Before piping is connected, it should be thoroughly flushed out with air or water to remove chips, cutting oil, and other debris.

3. Before piping is connected, confirm IN and OUT sides.

4. Connection

When screwing together pipes and fittings, be certain that chips from the pipe threads and sealing material do not get inside the piping.
Also, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the male threads.

5. Line flushing

Flush the piping lines at the time of initial use and when replacing the element.

6. Connect piping to prevent rise of line pressure on the IN side at the time of back-flushing.

7. When starting normal operation after back-flushing, release residual pressure in the filter to completely replace the air with the fluid.

Operating Environment

⚠ Caution

1.Discoloration or material deterioration may occur in an atmosphere where there is a possibility of corrosion.
As a corrosion advances, the filter will lose its function.

2. When the filter used in locations where there is a vibration or impact, fatigue failure may occur.
Provide proper reinforcement for operation.

Maintenance

⚠ Caution

1. The pressure drop fluctuates depending on operating conditions. Since the pressure drop is one of the factors indicating filter characteristics, set a control standard for the filter.

2. Be sure to conduct a back-flush to prevent dust adhesion before operation stop (pause).

3. If it is necessary to remove the element for cleaning or to replace the element, refer to the disassembly and assembly instructions in the operating manual for the product when performing maintenance.

Series FN1/FN4
Specific Product Precautions 2

Be sure to read this before handling.
Refer to the back of pages 1 and 2 for Safety Instructions.

<Cylinder for element decompression and compression>

Pneumatic Circuit

⚠ Warning

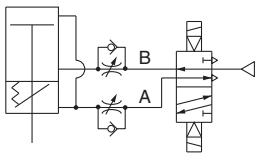
1. Do not use 3-position valves.
Unlocking pressure may unlock the lock.

2. Use a speed controller with meter-out control.
Malfunction may occur if meter-in control is used.

3. Be careful of backflow of pressure exhausted from a common exhaust type valve manifold.
A backflow of exhaust pressure may release the lock. Use an individual exhaust type manifold or single type valve.

4. Split the pneumatic piping for the lock unit between the cylinder and the speed controller.
Splitting the piping outside of these 2 components may shorten a service life.

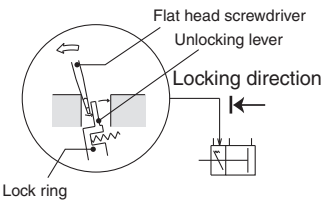
5. Keep the piping of the lock unit from the branching short.
Long piping can cause malfunctioning of unlocking and shorten a service life of the lock.



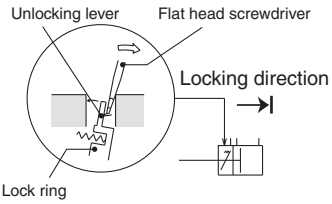
Manual Lock Release

⚠ Warning

1. Follow the steps shown below for manual release after confirming safety.
Make sure that there will be no danger even when the load moves suddenly. Also, confirm that no personnel is present in the movement range of the load.



Extension locking
1) Remove the dustproof cover.
2) As shown above, insert a f lat head screwdriver in the clearance of the rod end of the manual lock release lever. Tilt the driver slightly toward the direction indicated by the arrow (to the rod end) to release the lock.



Retraction locking
1) Remove the dustproof cover.
2) As shown above, insert a flat head screwdriver in the clearance of the head end of the manual lock release lever. Tilt the driver slightly toward the direction indicated by the arrow (to the head end) to release the lock.

<Floating joint for element coupling>
(FN4)

Mounting

⚠ Warning

1. When screwing a male rod into the female thread in a socket or bowl, do not contact with the bottom.
If the rod is screwed in all the way so that it touches the bottom, the stud will not be able to float and damage will result. Screw in the rod to a position one or two turns before the point at which it would make contact with the bottom.

2. Remove the dust cover before screwing a stud, socket, or bowl into the driven body. If they are screwed in without removing the dust cover, the dust cover could be damaged.

3. When connecting the driven body and cylinder rod with a floating joint, make sure to secure them using the appropriate tightening torque for the thread size. If there are concerns regarding loosening during use, use pin stoppers or adhesive to prevent loosening.
When the connection loosens and come undone, the driven body could run out of control or fall, possibly damaging or destroying the equipment.

4. The floating joint is not a shaft fitting designed for rotation, and it should not be used for that purpose.

Maintenance

⚠ Warning

1. Do not disassemble and reuse the floating joint.
A very strong adhesive has been applied to the threaded coupling portion to prevent it from being disassembled. Disassembling it by force could damage it.

Record of changes		
B edition	∗ Addition of low maintenance filter, FN4 series. ∗ Number of pages from 16 to 20.	LZ

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