

Medium main line filter

AF4000 (oil free)

■ Components for air preparation and pressure adjustment / main line unit / air filter

Overview

High performance main line filter with stainless steel housing for clean environments. Perfect for oil-free air lines.

Features

- (1) Differential pressure gauge mounting port provided
A differential pressure gauge (option) mounting port is provided on the top of the filter.
- (2) Easy element replacement
A band method has been adopted for tightening the housing.
The element can be replaced without tools.
- (3) Time manage element replacement
Thee replacement time is managed by time (approx. one year). The replacement timing is indicated by a flashing light.
- (4) Housing drop prevention mechanism
A mechanism prevents the housing from dropping when the hand cover is removed for replacing the element, etc.
- (5) Highly reliable drain separator mounted
A highly reliable snap drain is provided for the drain separator.
Drainage can be discharged without wasteful air loss.



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Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
Air booster
Speed control valve
Silencer
Check valve / others
Joint / tube
Vacuum filter
Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact conf. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending

Medium main line filter
Main line unit

Supporting oil-free air lines

The high-performance main line filter AF4000 Series with stainless steel housing supports clean environments.
This filter is perfect for oil-free air lines.

High-performance main line filter AF4000Series



Differential gauge mounting port

A mounting port for the differential pressure gauge (option) is provided on the top of the filter.

Preventing accidents



With residual pressure warning function

A band cover is provided as a standard to prevent unintentional removal of the band during operation or when there is a residual pressure. When the band cover's fixing screw is loosened, a small amount of air is leaked to notify the operator.

Easy element replacement

A band method is used to tighten the housing. There's no need to use tools when replacing the element.

Time-controlled element replacement timing



The conventional differential pressure method supported the fluid type oil mist for which it was difficult to determine the replacement timing. The replacement timing is now controlled by time (approx. one year). A lamp flashes to alert the operator when the replacement timing arrives.

Housing drop-prevention mechanism

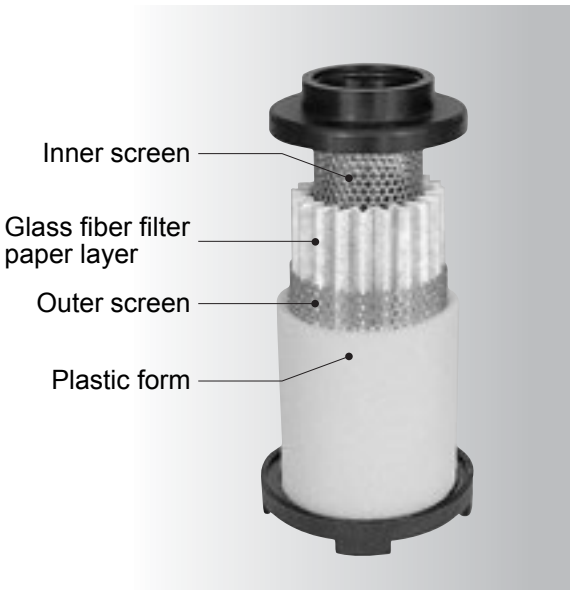
A mechanism is provided to prevent the housing from dropping when the band cover is removed for maintenance, such as when replacing the element. The housing can be removed and mounted with both hands.

Highly reliable drain separator

A highly reliable snap drain (DT Series) is mounted on the drain separator. Discharge drain without wasteful air loss.

M type element structure

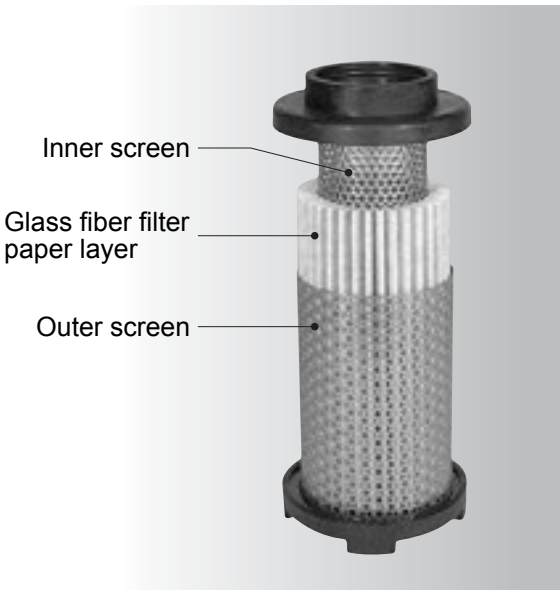
- * Removes particles 0.01 μ m or larger in size
- * Outlet oil concentration 0.01mg/m³
- * Normal pressure loss value is reduced



1. The waterproof and oil-proof glass fiber filter paper captures and condenses oil mist and reduced the pressure loss value.
2. The pleat structure ensures a wide filtration area.
3. Polyvinyl chloride resin has been eliminated in view of the global environment.

S type element structure

- * Removes particles 1 μ m or larger in size



1. The standard glass fiber filtration paper improves the catching performance and water resistance.
2. The pleat structure ensures a wide filtration area.
3. A stable catching performance is realized even if there are water drops in the air.

AF4000 Series

Water drop removal
Solid particle removal
For air dryer pre-filter

- * Removes particles 5 μ m or larger
- * Water drop separation rate 99%



PType

Oil mist removal
Solid particle removal
Protect your expensive air compressor

- * Removes particles 1 μ m or larger



SType

High-performance removal of oil mist
High-performance removal of solids
Suitable for pneumatic pressure circuits which are susceptible to oil

- * Removes particles 0.01 μ m or larger
- * Secondary oil concentration Removes oil up to 0.01mg/m³ (at 20°C)



MType

Oil vapor removal
Odor removal
Suitable for pneumatic pressure circuits which are susceptible to odors

- * Absorption with active carbon fibers
- * Secondary oil concentration Remove vaporous oil mist and odors up to 0.003mg/m³ (at 20°C)



XType



Pneumatic components (main line filter)

Safety precautions

Always read this section before starting use.
Refer to Intro 67 for general precautions.

Medium main line filter AF4000 Series.

Manufacturer's Liability

WARNING

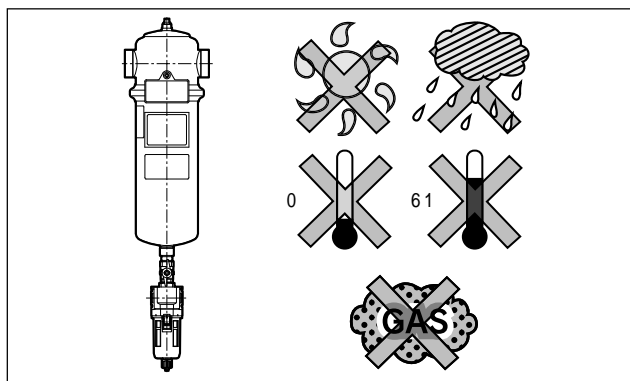
- The manufacturer cannot be held liable in the following cases:
 - Serious errors in use occur due to the operator.
 - Illegal modifications or repairs using nonstandard parts by user.

Design & Selection

WARNING

- Do not use for applications other than compressed air.
- This product must not be used for medical devices for caisson shields or breathing devices.
 - There is a risk of personal injury.
- Do not mount and use this device onto transportation equipment such as vehicles or ships.
 - The internal devices could be damaged by vibration, etc.
- Avoid direct sunlight and rain water. The resin parts, etc., could deteriorate and break.
- Avoid use in the area containing corrosive gas.
- Use this product within the range of working temperature.
- Do not use the product where it could freeze. The accumulated drainage could freeze and damage the product.
- Do not use in dangerous places (atmosphere with risk of explosions, etc.).

- The inlet temperature should be kept as low as possible. The oil removing rate will drop if the temperature is high.
- Do not use this product in an ozone generating environment.
- Avoid using this product where vibration and impact are present.
- Do not use this product in areas containing dust, etc.



Installation & Adjustment

CAUTION

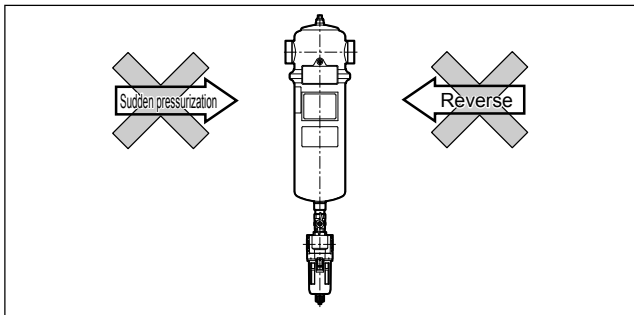
- Do not step onto this product.
- When piping, remove cutting oil and rust proof oil, etc.
- Secure enough space for maintenance and inspection.
- Do not mount directly after a valve which opens/closes suddenly. Do not install in a system where a back flow could occur, or where the product could be subject to impact.
Do not install this filter in a system where a reverse flow could occur or where impact could be applied easily.
- Flash the drain piping before installing to remove any foreign matter from inside.
- Use an inner diameter $\varnothing 5.7$ to 6.0 pipe within 5m long for the P, S or M type drain separator piping. Avoid laying the pipe with an upward slope.
- Drainage is discharged with pressure, so securely fix the piping at the drain port so that drainage does not splatter.

- When mounting a differential pressure gauge on the P, S or M type, check the high pressure side and low pressure side ports, and mount properly.
- Mount the bowl vertically facing downward. Failure to do so could cause drainage discharge faults.
- Ensure that the product's weight can be sufficiently withstood when installing. Fix the inlet and outlet piping to the floor or ceiling with a holder or supporter, etc.
- When connecting pipes, make sure that the front and back pipes are straight.
- Do not apply excessive force on the connected pipes. Excessive force could deform or damage the connection port threads or the joint.

During Use & Maintenance

⚠ CAUTION

- The air filter has reached its life when the pressure drops or it has reached the service life (8000 hours or one year). Change the element when the life span is reached. Replace the element with a new part when it has reached its life. When using an element life indicator, replace the indicator battery with a new one when replacing the element. (Replace the X type when the service life is reached, or when the deodorizing effect is lost.)
- The M type is equipped with an element life indicator as a standard, so the element's service



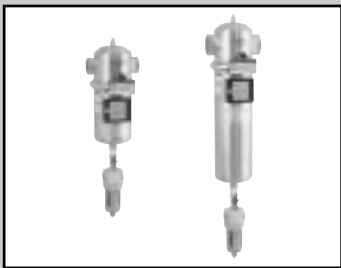
life can be seen in a glance.

- Do not flow air in reverse. Do not pressurize suddenly. Otherwise, original performance may not be attained.
- Confirm that no pressure is applied before removing the band.
- The drain separator is a normal open type. The applicable compressor capacity is 0.75kW and over (discharge flow rate 90/min. and over).
- Close the stop valve and release the air in the drain separator's bowl before servicing the drain separator for a drain fault, etc. Wash the drain unit with water, and then remove all moisture with an air gun.
- Use a household neutral detergent to wash the bowl, and then rinse with water.
- The drain separator's bowl is made of polycarbonate. Avoid using the following chemicals or using the product in an atmosphere containing these chemicals.

● Chemical resistance of drain separator's plastic bowl.

Types of chemicals	Category of chemicals	Main products of chemicals	General usage examples	Polycarbonate	Nylon
Inorganic compound	Acid	Hydrochloric acid, sulfuric acid, fluorine, phosphoric acid, chromic acid, etc.	Acid washing of metals, acidic degreasing solution, film treatment liquid, film treatment liquid	×	×
	Alkaline	Caustic soda, caustic potash, calcium hydroxide, aqueous ammonia, sodium carbonate, etc.	Alkaline degreasing of metals	×	○
	Inorganic salt	Sodium sulfide, nitric acid potash, potassium bichromate, sodium sulfide, etc.		×	○
Organic compound	Aromatic hydrocarbon	Benzene, toluene, xylene, ethyl benzen, styrene, etc.	Contained in paint thinner (benzene, toluene, xylene)	×	×
	Chlorinated aliphatic hydrocarbons	Methyl chloride, ethylene chloride, methylene chloride, acethylene chloride, chloroform, trichlene, perchlene, carbon tetrachloride	Organic solvent-based washing solution for metals (trichlene, perchlene, carbon tetrachloride, etc.)	×	○
	Chlorinated aromatic hydrocarbons	Chlorobenzene, dichlorobenzene, benzene hexachloride (B/H/C), etc.	Agricultural chemicals	×	○
	Petroleum components	Solvent, naphtha, gasoline		×	○
	Alcohol	Methyl alcohol, ethyl alcohol, cyclohexanol, benzyl alcohol	Anti-freeze	×	×
	Phenol	Carbolic acid, cresol, naphthol, etc.	Liquid disinfectant	×	×
	Ether	Methyl ether, methyl ethyl ether, ethyl ether	Brake fluid additive	×	○
	Ketone	Acetone, methyl ethyl keton, cyclohexanone, acetophenone, etc.		×	×
	Carboxylic acid	Formic acid, acetic acid, butyl acid, acrylic acid, oxalic acid, phthalic acid, etc.	Dyes; oxalic acid for aluminum processing, phthalic acid for paint base	×	×
	Phosphate ester	Dimethyl phthalate (DMP), diethyl phthalate (DEP), dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricant, synthetic hydraulic fluid, rust-preventing agent, additive plasticizer for synthetic resin	×	○
	Oxyacid	Glycocholic acid, lactic acid, malic acid, citric acid, tartrate		×	×
	Nitro compound	Nitro methane, nitro ethane, nitro ethylene, nitro benzene, etc.		×	○
	Amine	Methylamine, diethylamine, ethylamine, aniline, acetoanilide, etc.	Brake fluid additive	×	×
	Nitrile	Acetnitrile, achrylonitrile, benznitrile, acetoxyldyne nitrile, etc.	Raw material for nitril rubber	×	○

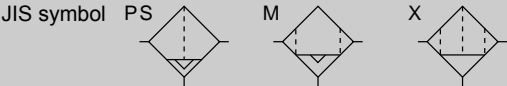
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Medium main line stainless steel filter

AF4000P/S/M/X Series

Suitable for pre-filter, oil removal and deodorizing applications.
Treating air flow rate: 3.7 to 18.8m³/min. (ANR) (0.7MPa)



Specifications

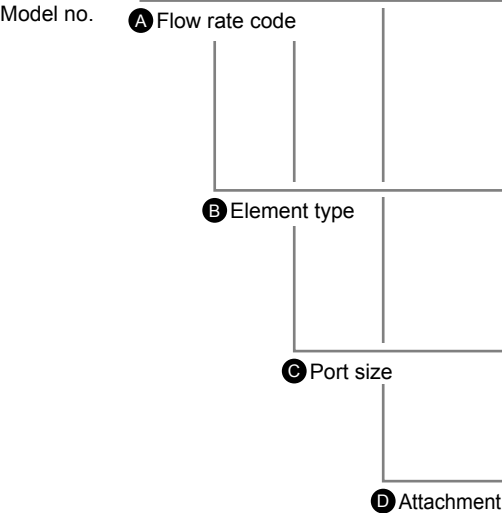
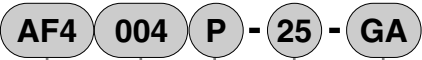
Descriptions		AF4004*-25	AF4007*-40	AF4010*-40	AF4013*-50	AF4020*-50
Treating air flow rate	m ³ /min. (ANR)	3.7	6.2	10	13	18.8
Working fluid		Compressed air				
Working pressure range	MPa	0.1 to 1.0				
Ambient temperature range	°C	5 to 60				
Withstanding pressure	MPa	1.5				
Port size	Rc	1	1 1/2		2	
Product weight	kg	3	3.3	3.7	4.3	6
Element life indicator		Standard only for M type				
Automatic drain		DT3000-15-W (excluding X type)				
Drain outlet diameter		Inner diameter ø5.7 to ø6 nylon tube direct connection (excluding X type)				

Series name is indicated in *.

Descriptions			P type	S type	M type	X type
Performance	Air processing conditions	Inlet air pressure MPa	0.7			
		Inlet air temperature °C	32			
		Inlet air dew point °C	—	—	With no water infiltration or generation	Pressure dew point 10°C
		Inlet oil concentration mg/m ³	—	—	3	0.01
	Filtration rating	µm	5	1	0.01	Absorbed with active carbon fibers
		Secondary side oil concentration mg/m ³	—	—	0.01	0.003
		Water separation efficiency %	99	—	—	—
	Pressure drop	Initial MPa	0.005	0.005	0.01	0.009
		Pressure drop MPa	0.02	0.07	0.07	—
	Element replacement time	Service life	8000 hours or one year			

Note 1: Treating air flow rate is the atmospheric pressure conversion value where inlet pressure is 0.7MPa.
 Note 2: ANR shows conditions where 20°C atmospheric pressure and relative humidity 65%.
 Note 3: The secondary side oil concentration is the value when the inlet air temperature is 20°C.
 Note 4: The drain separator is a NO type. The drain separator is air purged with the initially generated drainage until the pressure rises to 0.1MPa.
 Note 5: The P/S/M type element must be replaced when the pressure drops or the service life is reached, whichever is earlier.
 Note 6: Replace the X type when the service life is reached or when the deodorizing effect is lost.
 Note 7: P type is not available in AF4020.

How to order



Symbol	Descriptions
A Port size	
004	3.7m ³ /min. (ANR)
007	6.2m ³ /min. (ANR)
010	10m ³ /min. (ANR)
013	13m ³ /min. (ANR)
020	18.8m ³ /min. (ANR) (S, M or X only)
B Element type	
P	P type (solid, water removing filter)
S	S type (solid removing filter)
M	M type (oil mist removing filter)
X	X type (deodorizing filter)
C Port size	
25	Rc1
40	Rc1 1/2
50	Rc2
D Attachment	
GA	Differential pressure gauge (GA400-8-PO2) enclosed
EL	Element life indicator enclosed

⚠ Precautions for selection

The required performance may not be attained if using at a level less than the selected pressure. Always select the model with the working pressure.

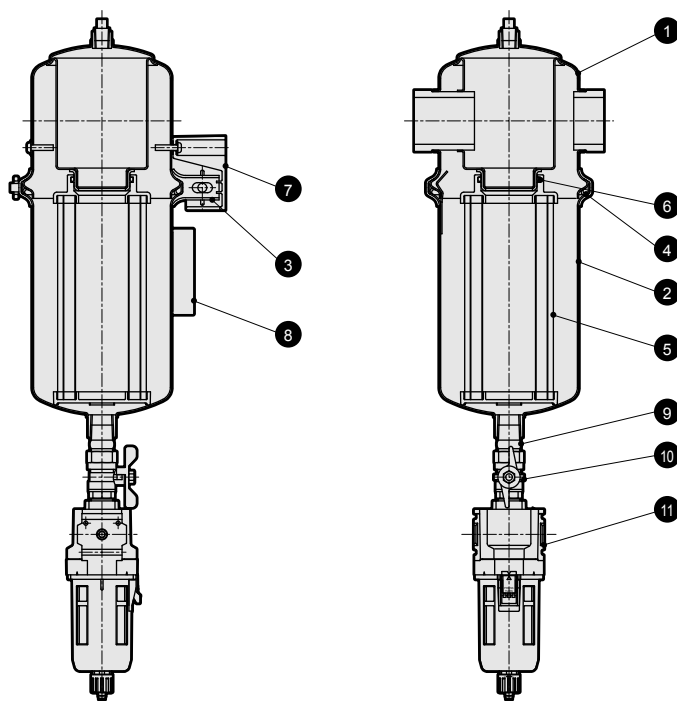
Flow rate compensation coefficient

Pressure (MPa)	Auxiliary coefficient
0.2	0.36
0.3	0.5
0.4	0.62
0.5	0.75
0.6	0.88
0.7	1.0
0.8	1.13
0.9	1.25
1.0	1.38

If the inlet pressure is not 0.7Mpa, multiply the coefficient above with the treating air flow rate.

Internal structure and parts list

● P, S, M type



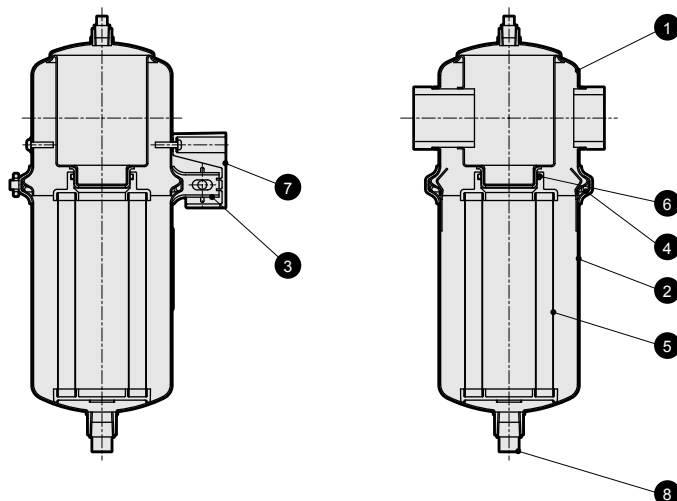
Parts list

No.	Part name	Material
1	Guard	SUS304
2	Bowl	SUS304
3	Band	SUS304
4	O ring	NBR
5	Element	
6	O ring	NBR
7	Band cover	Polyamide
8	Element life indicator	
9	Nipple	SUS304
10	Ball valve	C3771, PTFE, SUS, etc.
11	Automatic drain	DT3000-15-W

Automatic drain and ball valve are attached.

The element life indicator is mounted only on the M type.

● X type



Parts list

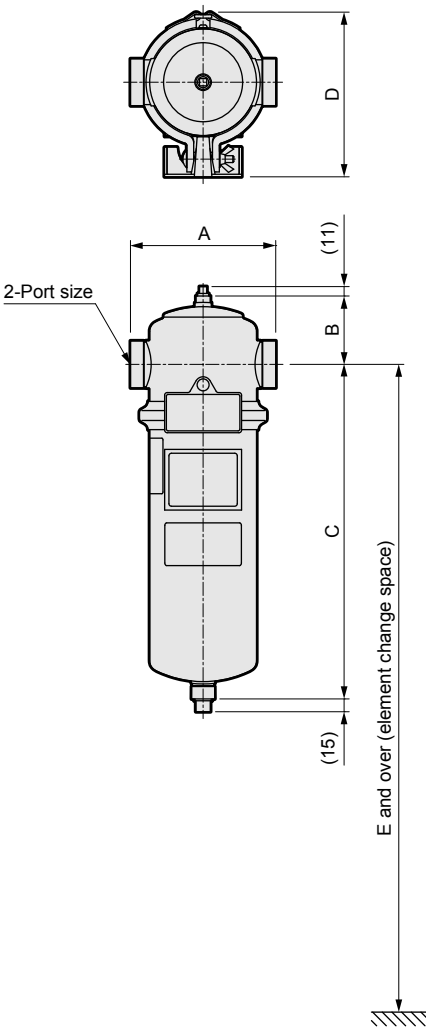
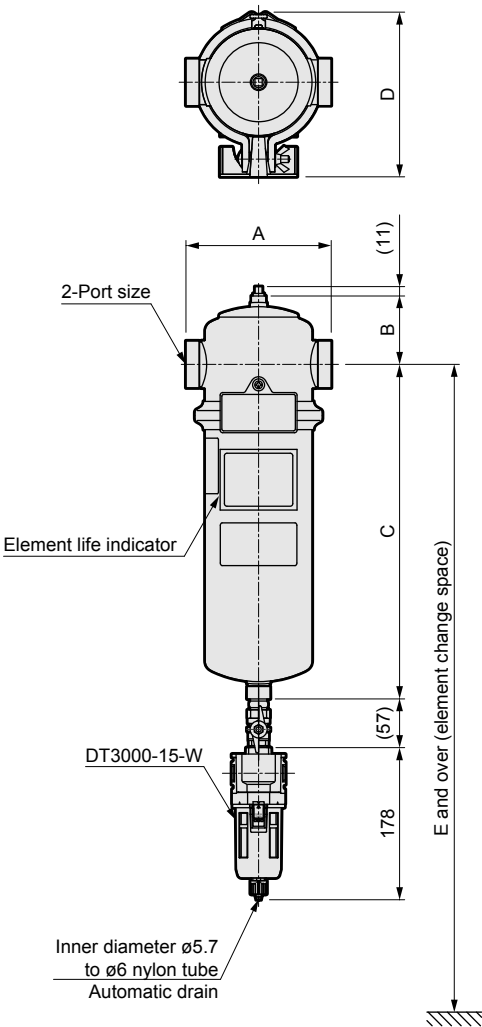
No.	Part name	Material
1	Guard	SUS304
2	Bowl	SUS304
3	Band	SUS304
4	O ring	NBR
5	Element	
6	O ring	NBR
7	Band cover	Polyamide
8	Plug	SUS304

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
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Air booster
Speed control valve
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Vacuum regulator
Suction plate
Magnetic spring buffer
Mechanical pressure SW
Electronic pressure SW
Contact / close contact cont. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
Ending
Medium main line filter
Main line unit

Dimensions

● AF4004P/S/M to AF4020S/M

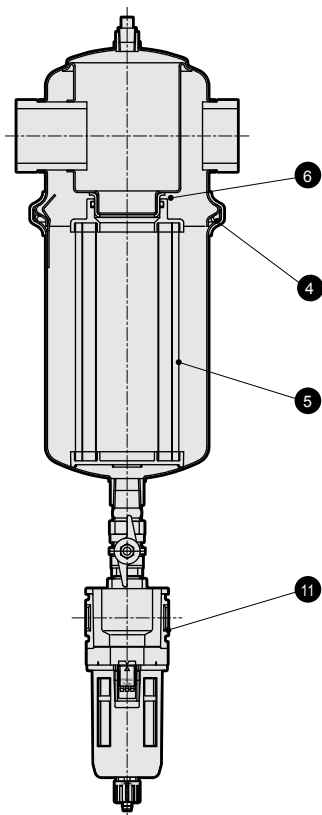
● AF4004X to AF4020X



Model no.	Port size	A	B	C	D	E
AF4004P/S/M/X-25	Rc1	160	72.5	209	192.7	570
AF4007P/S/M/X-40	Rc1 1/2	170	80	283.5	192.7	730
AF4010P/S/M/X-40	Rc1 1/2	170	80	391.5	192.7	940
AF4013P/S/M/X-50	Rc2	173	86.5	478	192.7	1100
AF4020S/M/X-50	Rc2	173	86.5	635	192.7	1420

The element life indicator is mounted only on the M type.
E dimensions indicate the maintenance space.
Automatic drain and ball valve are attached.

Repair parts list



Repair parts list

Repair part kit No. Model	O ring (4)	Automatic drain (11)
AF4004*-25	AF4004P-QFL-391648	DT3000-15-W
AF4007*-40		
AF4010*-40		
AF4013*-50		
AF4020*-50		

The P/S/M/X series name is indicated with *.
The drain separator cannot be mounted on the X type.

Element

Repair part kit No. Model	P type element	S type element	M type element	X type element
AF4004*-25	AF4004P-KFL-391451	AF4004S-KFL-391461	AF4004M-KFL-391471	AF4004X-KFL-391481
AF4007*-40	AF4007P-KFL-391452	AF4007S-KFL-391462	AF4007M-KFL-391472	AF4007X-KFL-391482
AF4010*-40	AF4010P-KFL-391453	AF4010S-KFL-391463	AF4010M-KFL-391473	AF4010X-KFL-391483
AF4013*-50	AF4013P-KFL-391454	AF4013S-KFL-391464	AF4013M-KFL-391474	AF4013X-KFL-391484
AF4020*-50	—	AF4020S-KFL-391465	AF4020M-KFL-391475	AF4020X-KFL-391485

The P/S/M/X series name is indicated with *.
The element kit consists of the O ring (6) and element (5).
The O ring (6), element (5) and battery kit applies only for the M type element.

Refrigerating type dryer
Desiccant type dryer
High polymer membrane type dryer
Air filter
Auto. drain / others
F.R.L. (Module unit)
F.R.L. (Separate)
Compact F.R.
Precise regulator
F.R.L. (Related products)
Clean F.R.
Electro pneumatic regulator
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Vacuum filter
Vacuum regulator
Suction plate
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Mechanical pressure SW
Electronic pressure SW
Contact / close contact conf. SW
Air sensor
Pressure SW for coolant
Small flow sensor
Small flow controller
Flow sensor for air
Flow sensor for water
Total air system
Total air system (Gamma)
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Main line unit