



Series variation

Medium/large filter

- F.R.L.
- F.R.
- F (Filtr)
- R (Reg)
- L (Lub)
- Drain Separ
- Mech Press SW
- Res press exh valve
- SlowStart
- Anti-bac/Bac-remove Filtr
- Film Resist FR
- Oil-ProhR
- Med Press FR
- No Cu/ PTFE FRL
- Outdrs FRL
- Adapter Joiner
- Press Gauge
- CompFRL
- LgFRL
- PrecsR
- VacF/R
- Clean FR
- ElecPneUR
- AirBoost
- Speed Ctrl
- Silncr
- CheckV/ other
- Fit/Tube
- Nozzle
- Air Unit
- PrecsCompn
- Electro Press SW
- ContactSW
- AirSens
- PresSW Cool
- Air Flo Sens/Ctrl
- WaterRtSens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- Gas generator
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending



Series	Medium (general purpose)			Medium (oil-free)			
	AF2-□P	AF2-□M	AF2-□X	AF4000P	AF4000S	AF4000M	AF4000X
Specifications	Stainless steel vessel			Stainless steel vessel			
Applicable air compressor Processing flow rate m ³ /min	• Dust 1 μm	• Dust 0.01 μm • Oil content 0.01 mg/m ³	• Oil content 0.003 mg/m ³ • Deodorization	• Dust 5 μm	• Dust 1 μm	• Dust 0.01 μm • Oil content 0.01 mg/m ³	• Oil content 0.003 mg/m ³ • Deodorization
0.75	0.15						
1.5	0.22						
2.2	0.35						
3.7	0.5						
5.5	0.825						
7.5	1.0						
11	1.5						
15	3.7/4.95	● (4.95)	● (4.95)	● (4.95)			
22	3.7/4.95	● (4.95)	● (4.95)	● (4.95)	● (3.7)	● (3.7)	● (3.7)
37	6.2/7.93	● (7.93)	● (7.93)	● (7.93)	● (6.2)	● (6.2)	● (6.2)
55	10/11.3	● (11.3)	● (11.3)	● (11.3)	● (10)	● (10)	● (10)
75	12.8/13	● (12.8)	● (12.8)	● (12.8)	● (13)	● (13)	● (13)
95	16/18.8/19.8	● (19.8)	● (19.8)	● (19.8)	● (18.8)	● (18.8)	● (18.8)
120	24.1	●	●	●			
150	32						
200							
250	48						
300	64						
400	80						
480	96						
-	128						
710	160						
960	192						
1450	256						
Differential pressure gauge	● Standard equipment	● Standard equipment	-	● Option	● Option	● Option	● Option
Differential pressure alarm output	-	-	-	-	-	-	-
Auto-drain	Float	Float	-	Float	Float	Float	-
Low pressure loss element	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment
Shut-off valve	● Standard equipment	● Standard equipment	● Standard equipment	● Included in auto-drain	● Included in auto-drain	● Included in auto-drain	-
Specified color paint	×	×	×	-	-	-	-
Companion flange attached	×	×	×	-	-	-	-
Foundation bolt/nut attached	×	×	×	-	-	-	-
Foundation bolt/nut attached (SUS)	×	×	×	-	-	-	-
Outdoor	×	×	×	-	-	-	-
IN/OUT reverse direction	-	-	-	-	-	-	-
Product photo	×	×	×	-	-	-	-
Appearance							
Page	1848			1858			

Air filter

Series variation

Note) This list is a selection guideline.

Refer to the page for selection, and select a model after checking installation and operating conditions.

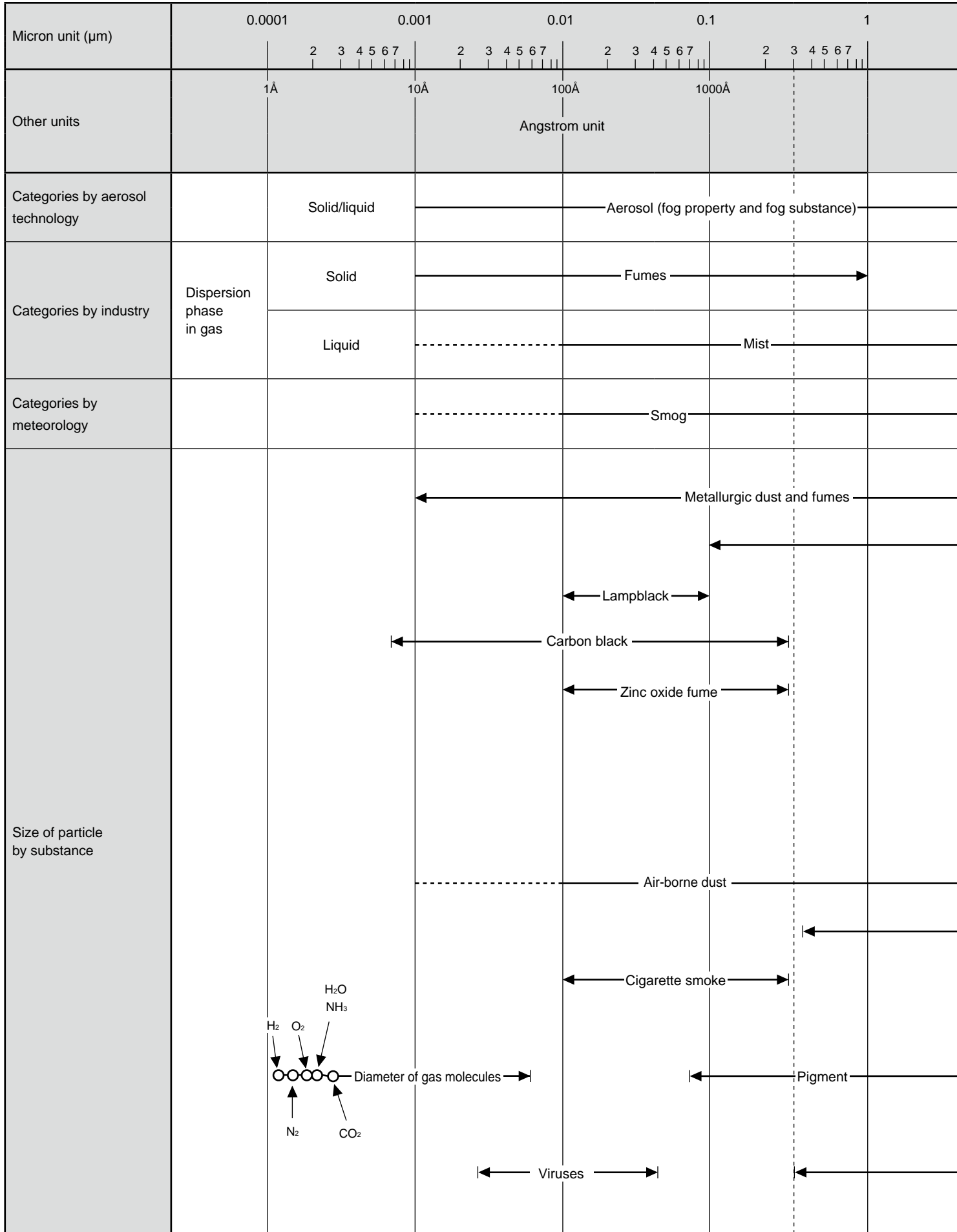
Series	Large (regular)				Large (oil-free)				
	AF3000P	AF3000S	AF3000M	AF3000X	AF5000P	AF5000S	AF5000M	AF5000X	
Specifications	Stainless steel vessel								
Applicable air compressor kW (reference)	Processing flow rate m ³ /min	• Dust 3 μm	• Dust 0.3 μm • Oil content 0.5 mg/m ³	• Dust 0.01 μm • Oil content 0.01 mg/m ³	• Oil content 0.03 mg/m ³ • Deodorization	• Dust 3 μm	• Dust 0.3 μm • Oil content 0.5 mg/m ³	• Dust 0.01 μm • Oil content 0.01 mg/m ³	• Oil content 0.003 mg/m ³ • Deodorization
0.75	0.15								
1.5	0.22								
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7.5	1.0								
11	1.5								
15	3.7/4.95								
22	3.7/4.95								
37	6.2/7.93								
55	10/11.3								
75	12.8/13								
95	16/17/18.8	● (16)	● (16)	● (16)	● (16)	● (16)	● (16)	● (16)	● (16)
120	24.1								
150	32	●	●	●	●	●	●	●	●
200									
250	48	●	●	●	●	●	●	●	●
300	64	●	●	●	●	●	●	●	●
400	80	●	●	●	●	●	●	●	●
480	96	●	●	●	●	●	●	●	●
-	128	●	●	●	●	●	●	●	●
710	160	●	●	●	●	●	●	●	●
960	192	●	●	●	●	●	●	●	●
1450	256	●	●	●	●	●	●	●	●
Differential pressure gauge		Standard equipment	Standard equipment	Standard equipment	-	Standard equipment	Standard equipment	Standard equipment	-
Differential pressure alarm output		▲ Custom made	▲ Custom made	▲ Custom made	-	● Standard equipment	● Standard equipment	● Standard equipment	-
Auto-drain		Float	Float	Float	-	● Electronic (with alarm output)	● Electronic (with alarm output)	● Float	-
Low pressure loss element		● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment	● Standard equipment
Shut-off valve		● Included in auto-drain	● Included in auto-drain	● Included in auto-drain	×	● Included in auto-drain	● Included in auto-drain	● Included in auto-drain	● Standard equipment
Specified color paint		● Option	● Option	● Option	● Option	-	-	-	-
Companion flange attached		● Option	● Option	● Option	● Option	● Option	● Option	● Option	● Option
Foundation bolt/nut attached		● Option	● Option	● Option	● Option	● Option	● Option	● Option	● Option
Foundation bolt/nut attached (SUS)		● Option	● Option	● Option	● Option	● Option	● Option	● Option	● Option
Outdoor		● Option	● Option	● Option	● Option	▲ Custom made	▲ Custom made	▲ Custom made	▲ Custom made
IN/OUT reverse direction		● Option	● Option	● Option	● Option	● Option	● Option	● Option	● Option
Product photo		● Option	● Option	● Option	● Option	● Option	● Option	● Option	● Option
Appearance									
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Air filter

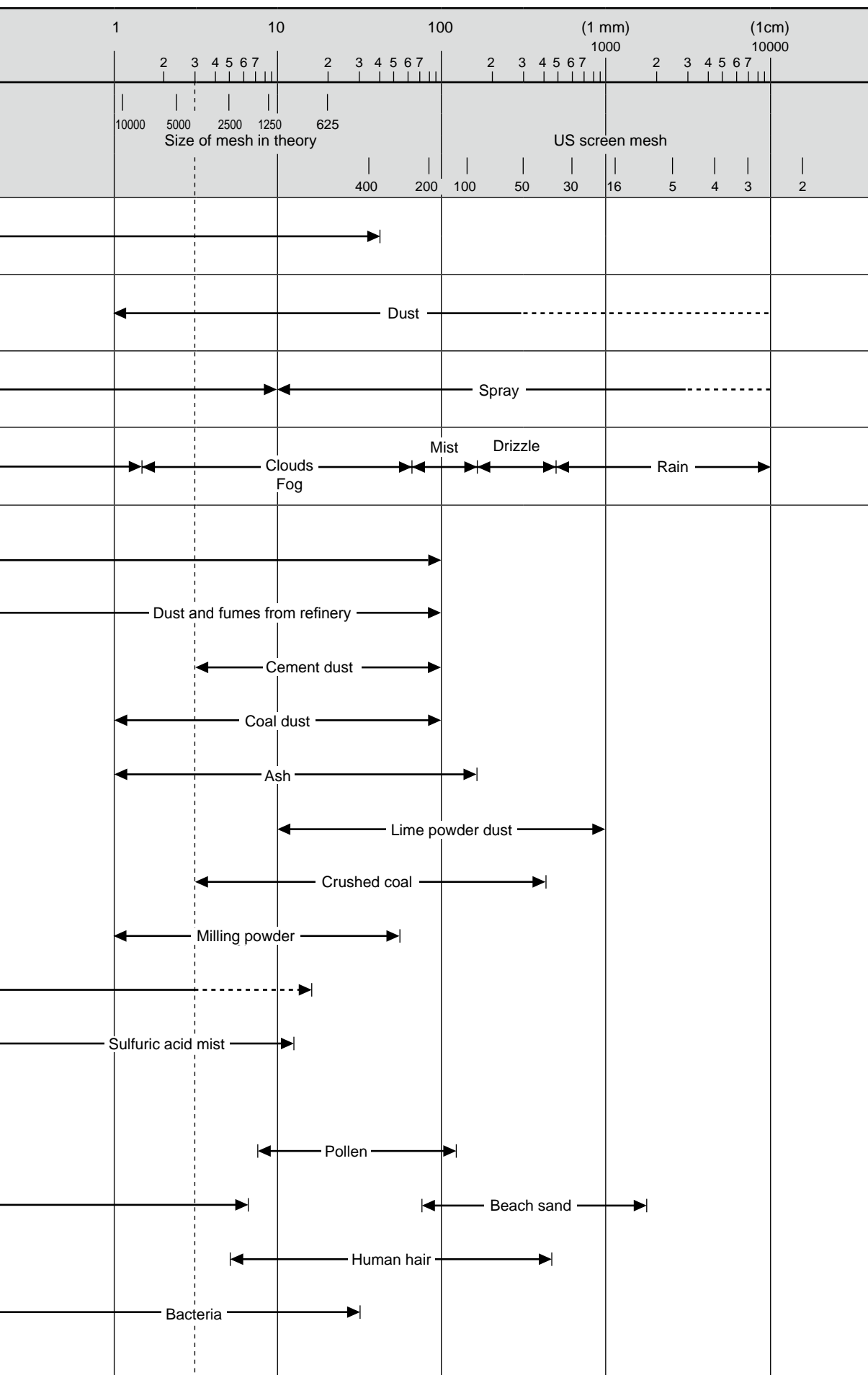
F.R.L. Guide to particle sizes

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Replacing the element

- 1**  Spent element must be disposed properly as industrial waste.
The filter cannot be regenerated and reused.
- If the filter contains toxic or harmful substances, dispose of substances based on local laws.
- 2** Replace the element based on the following replacement standards.
- P type:** Replace when the differential pressure indicator in the filter body reaches the red zone or after one year of use, whichever comes first.
- If use is continued while the indicator is in the red zone, the filter element could be damaged by the pressure difference, or pressure required for device operation may not be attained.
- S type, M type:**
- Replace when the differential pressure indicator in the filter body reaches the red zone or after one year of use, whichever comes first.
- If use is continued while the indicator is beyond the red zone, the filter element could be damaged by the pressure difference, or pressure required for device operation may not be attained.
- When using the filter to remove oil, if the indicator is in the red zone and it is still being used, the oil captured by the element may flow out into the air again, and be carried to the secondary side. This will inhibit oil removal.
- X type:** Replace the element after the period specified for each model, or when the deodorizing effect is lost.
- The X type filter adsorbs odorous molecules with adsorbent, so the service life cannot be detected by the element's pressure difference. Judge the status by odor or manage the service life based on usage time.

Valve operation at start and end of daily operations

- If the large ball valve, etc., is opened when starting and ending operations, pay attention to the following and open the valve slowly.
- If the large bore size valve is opened suddenly, an excessive flow rate several-fold larger than set device specifications may flow and damage the internal structure.
 - If the large bore size valve is opened suddenly to discharge any residual pressure from the air line at the end of daily operations, excessive amounts of flow may result as above and reverse flow could occur, damaging devices.
 - Note that the differential pressure gauge can be easily damaged by the increase of pressure loss due to an excessive flow rate (proportional to the square of the flow rate), and reverse pressure caused by reverse flow.

Information on recommended alternative models for air filters (flange)

As of August 2006

Production and sales of the "Old products" listed below have been discontinued.

Select alternative models from "Current products".

Note: The comparison table given below shall be used only as a guideline. When making an actual selection, the current working air pressure, inlet air temperature, ambient temperature, and required dew point, etc., must be taken into consideration to ensure sufficient performance.

Comparison table for new and old air filter model No.

Class equivalent to 3 μm

Old product		Current product	
Flow rate (m ³ /min)	Model No.	Flow rate (m ³ /min)	Model No.
12	1113-16C-MD		
		16	AF3016P-50
20	1114-40C-MD		
		32	AF3032P-80
40	1123-48C-MD		
		48	AF3048P-100
60	1128-64C-MD		
		64	AF3064P-100
		80	AF3080P-150
		96	AF3096P-150
		128	AF3128P-150
		160	AF3160P-200
		192	AF3192P-200
		256	AF3256P-200

Class equivalent to 0.3 μm

Old product		Current product	
Flow rate (m ³ /min)	Model No.	Flow rate (m ³ /min)	Model No.
7.2	1113-16C-MDY		
9.5	1151J-16C-MD		
19	1152-24C-MD		
		16	AF3016S-50
28.5	1152J-32C-MD		
		32	AF3032S-80
38	1153-32C-MD		
57	1154-32C-MD		
		48	AF3048S-100
		64	AF3064S-100
76	1155-48C-MD		
		80	AF3080S-150
95	1155J-48C-MD		
114	1156-48C-MD		
		96	AF3096S-150
		128	AF3128S-150
152	1157-48C-MD		
		160	AF3160S-200
190	1158-64C-MD		
		192	AF3192S-200
		256	AF3256S-200

Class equivalent to 0.01 μm

Old product		Current product	
Flow rate (m ³ /min)	Model No.	Flow rate (m ³ /min)	Model No.
11.9	1251J-16C-MD		
		16	AF3016M-50
23.8	1252-24C-MD		
		32	AF3032M-80
35.7	1252J-32C-MD		
47.6	1253-32C-MD		
		48	AF3048M-100
		64	AF3064M-100
71.4	1254-32C-MD		
		80	AF3080M-150
95.2	1255-48C-MD		
		96	AF3096M-150
119	1255J-48C-MD		
		128	AF3128M-150
142.8	1256-48C-MD		
		160	AF3160M-200
190.4	1257-48C-MD		
238	1258-64C-MD		
		192	AF3192M-200
		256	AF3256M-200

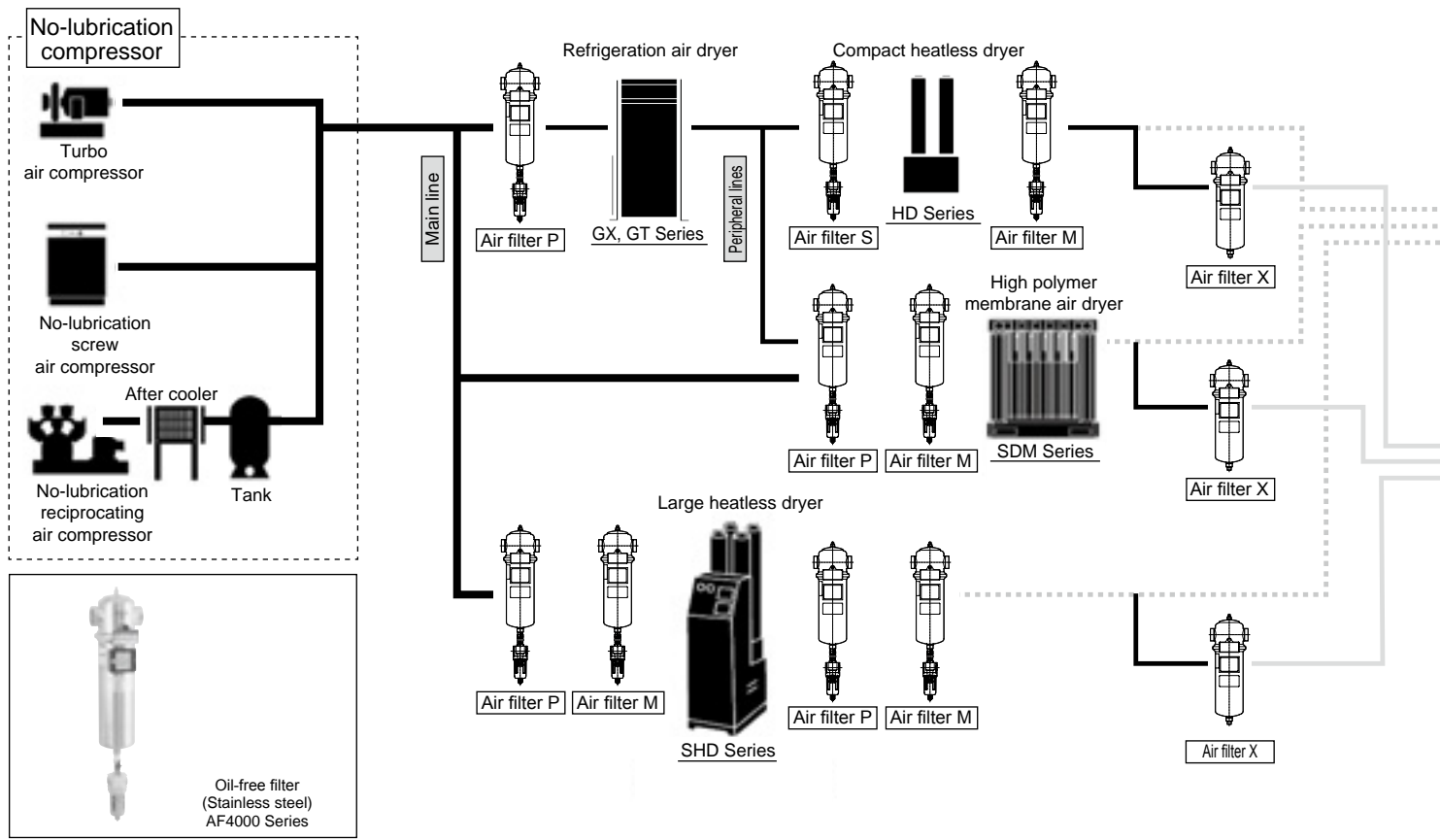
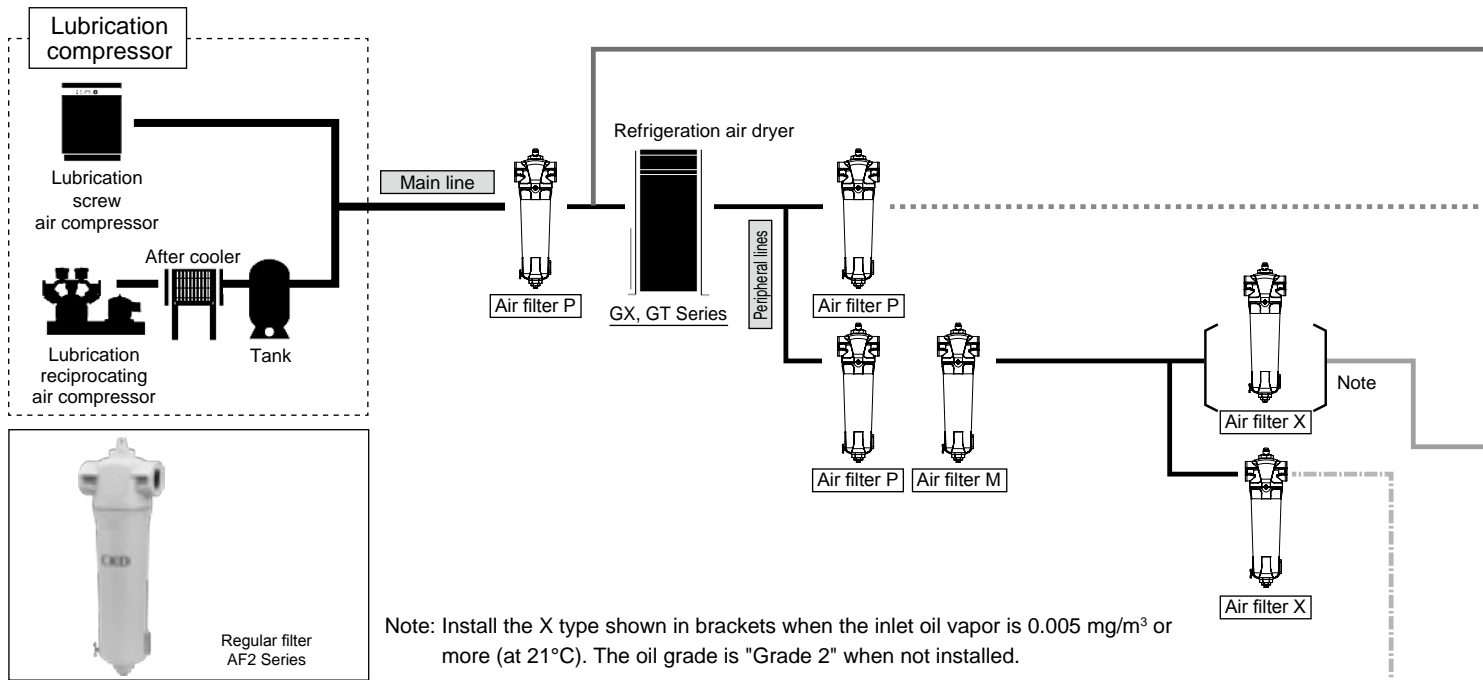
Class equivalent to deodorization

Old product		Current product	
Flow rate (m ³ /min)	Model No.	Flow rate (m ³ /min)	Model No.
11.9	1251J-16C-MX		
		16	AF3016X-50
23.8	1252-24C-MX		
		32	AF3032X-80
35.7	1252J-32C-MX		
47.6	1253-32C-MX		
		48	AF3048X-100
		64	AF3064X-100
71.4	1254-32C-MX		
		80	AF3080X-150
95.2	1255-48C-MX		
		96	AF3096X-150
119	1255J-48C-MX		
		128	AF3128X-150
142.8	1256-48C-MX		
		160	AF3160X-200
190.4	1257-48C-MX		
238	1258-64C-MX		
		192	AF3192X-200
		256	AF3256X-200

□ indicates the general purpose. Processing flow rates are guidelines. (Based on the temporary pressure of 0.7 MPa and pressure loss of 0.01 MPa; however, rates may slightly differ depending on the model No.)

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F.R.L. Medium main line filter device recommended system configuration



JIS B 8392-1:2012 Compressed air purity grade

Grade	Solid particles			Humidity and moisture		Oil	
	Max. number of particles per 1 m ³ for particle diameter d (μm)	Mass concentration Cp	Pressure dew point	Water concentration Cw	Total oil concentration		
	0.1 < d ≤ 0.5	0.5 < d ≤ 1.0	1.0 < d ≤ 5.0	mg/m ³	°C	g/m ³	mg/m ³
0	Conditions stricter than Grade 1 to be specified by user or supplier.						
1	≤ 20,000	≤ 400	≤ 10	-	≤ -70	-	≤ 0.01
2	≤ 400,000	≤ 6,000	≤ 100	-	≤ -40	-	≤ 0.1
3	-	≤ 90,000	≤ 1,000	-	≤ -20	-	≤ 1
4	-	-	≤ 10,000	-	≤ +3	-	≤ 5
5	-	-	≤ 100,000	-	≤ +7	-	-
6	-	-	-	0 < Cp ≤ 5	≤ +10	-	-
7	-	-	-	5 < Cp ≤ 10	-	Cw ≤ 0.5	-
8	-	-	-	-	-	0.5 < Cw ≤ 5	-
9	-	-	-	-	-	5 < Cw ≤ 10	-
X	-	-	-	Cp > 10	-	Cw > 10	> 5

For example,

What is Grade 1:2:1?

- Solid particles 0.1 to 0.5 μm are 20,000 particles or less, 0.5 to 1.0 μm are 400 particles or less, and 1.0 to 5.0 μm are 10 particles or less
- Pressure dew point -40°C or less
- Oil concentration 0.01 mg/m³ or less.

Air quality	Applications	Impurities in air			Grade
		Solid particle	Moisture	Oil content	
Water drip removal air/ coarse dust removal air	For construction/civil engineering machinery Air for cleaning (dry air not required)	1 μm	-	-	2.-.
General dry air	General pneumatic components General pneumatic tools Labor saving components Pneumatic jigs and tools Air chuck Air vice Air for cleaning precision parts	1 μm	Pressure dew point 10°C	0.6 mg/m ³	2.6.3
			Pressure dew point 7°C		2.5.3
Dry air (oil-free)	Instrumentation Measurement Sequence control High-grade coating	0.01 μm	Pressure dew point 10°C	0.01 mg/m ³ [0.003 mg/m ³]	1.6.1
			Pressure dew point 7°C		1.5.1
Dry air (odorless)	Food processing industry (where air is not directly blown onto food) Pharmaceutical industry Agitation/transportation/dry/package/air for brewing	0.01 μm	Pressure dew point 10°C	0.003 mg/m ³	1.6.1
			Pressure dew point 7°C		1.5.1
Ultra dry air (oil-free)	Ozone generator Powder transfer Drying furnace gas Drying the insulation gas of a high-voltage generator Drying computer rooms Centralized control instrumentation	0.01 μm	Pressure dew point -20°C	0.01 mg/m ³	1.3.1
			Pressure dew point -40°C		1.2.1
			Pressure dew point -60°C		1.2.1
Ultra dry air (odorless)	Food processing industry (where air is not directly blown onto food) Pharmaceutical industry Agitation/transportation/dry/package/air for brewing	0.01 μm	Pressure dew point -20°C	0.003 mg/m ³	1.3.1
			Pressure dew point -40°C		1.2.1
			Pressure dew point -60°C		1.2.1

⚠ Precautions for system selection

- *1: If your conditions are different, refer to the specifications in the catalog in order to select a model.
- *2: This example of system selection is based on an air-cooling refrigeration air dryer.
When making a selection based on an air-cooling refrigeration air dryer, the since standard processing air flow rate may differ, the model No. of the filter may vary.
Contact CKD for details.
- *3: Air filter and oil mist filter are to be used where the inlet air temperature is 60°C or less, and X type where the inlet air temperature is 30°C or less.
If air temperature from the secondary side of the refrigeration air dryer is high, keep enough distance from the refrigeration air dryer to maintain a temperature no greater than the inlet air temperature.
- *4: This system cannot be used for high pressure specifications (1 to 1.6 MPa). Consult with CKD for details.
- *5: Use anti-rust processed materials for piping (zinc plated pipe, lining pipe or stainless steel pipe).
- *6: If a processing air rates larger than the refrigeration air dryer supplies may though they be used instantaneously, install a tank to the secondary side of the refrigeration air dryer. Installing a tank supplies stable moisture removed air.
- *7: The air filter at the secondary side of the refrigeration air dryer can be used as a pre-filter before an oil mist filter.
- *8: Depending on working conditions, condensation may form on the inside of the refrigeration air dryer and drip to the floor. To prevent water drops from flowing out, install a drain-pan, etc., before installing the dryer.
- *9: Consult with CKD for energy-saving systems.
- *10: Install a filter immediately before the equipment to be used to remove contaminants existing in the piping.

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