

In-Line Filter

- VLF Series (5 μm)
- VSF Series (5 μm)
- PLF Series (0.01 μm)
- CLF Series (0.01 μm)

VLF Series



VSF Series



PLF Series



CLF Series



In-Line Filter Series

5- μ m filtration rating **VLF Series** Page ⑤



- Prefilter can be used for vacuum or positive pressure
- Elements can be replaced without tools and maintenance is easy!
- Applicable tube outer diameters: $\phi 4$ [0.157], $\phi 6$ [0.236], $\phi 8$ [0.315], and $\phi 10$ [0.394]
- Lineup includes ozone resistant, secondary battery production line compatible SUS303 specifications

μ m filtration rating	Model	Piping port		Process air volume L/min (ANR) [ft ³ /min (SCFM)] ^{Note}	Particle filtering efficiency %	Positive pressure	Negative pressure
5	VLF010-J4	Quick fitting	$\phi 4$ [0.157]	140 [4.945]	95	○	○
	VLF020-J4	Quick fitting	$\phi 4$ [0.157]	165 [5.828]		○	○
	VLF010-J6	Quick fitting	$\phi 6$ [0.236]	210 [7.417]		○	○
	VLF020-J6	Quick fitting	$\phi 6$ [0.236]	310 [10.949]		○	○
	VLF050-J6	Quick fitting	$\phi 6$ [0.236]	400 [14.128]		○	○
	VLF050-J8	Quick fitting	$\phi 8$ [0.315]	750 [26.490]		○	○
	VLF050-J10	Quick fitting	$\phi 10$ [0.394]	900 [31.788]	○	○	

Note: Recommended maximum flow rate at primary side pressure 0.7 MPa [102 psi]

5- μ m filtration rating **VSF Series** Page ⑩



- Prefilter can be used for vacuum lines
- Filter is internally integrated in socket-type fitting
- Applicable tube outer diameters: $\phi 3$ [0.118], $\phi 4$ [0.157], and $\phi 6$ [0.236]

μ m filtration rating	Model	Piping port		Process air volume L/min (ANR) [ft ³ /min (SCFM)] ^{Note}	Particle filtering efficiency %	Positive pressure	Negative pressure
5	VSF-J3	Fitting/tube outer diameter	$\phi 3$ [0.118] - $\phi 3$ [0.118]	Vacuum flow rate 5 [0.177]	95	—	○
	VSF-J4	Fitting/tube outer diameter	$\phi 4$ [0.157] - $\phi 4$ [0.157]	Vacuum flow rate 7.5 [0.265]		—	○
	VSF-J6	Fitting/tube outer diameter	$\phi 6$ [0.236] - $\phi 6$ [0.236]	Vacuum flow rate 11 [0.389]		—	○

Note: Recommended maximum flow rate at primary side pressure 0.7 MPa [102 psi]

0.01- μ m filtration rating **PLF Series** Page ⑬



- Uses porous hollow fiber membrane element
- Uses fluoro-type hollow fiber membrane and fluoro rubber for ozone resistant specifications (PLF600)
- For both positive and negative pressure (PLF600)
- Uses highly chemical resistant PCT for plastic housing material
Improved resistance to cutting oils and alcohol (PLF600)

μ m filtration rating	Model	Piping port		Process air volume L/min (ANR) [ft ³ /min (SCFM)] ^{Note}	Particle filtering efficiency %	Positive pressure	Negative pressure
0.01	PLF050	Female thread	M5×0.8	40 [1.413]	99.99	○	—
	PLF100	Female thread	1/8	100 [3.532]	99.99	○	—
	PLF600-J8	Quick fitting	$\phi 8$ [0.315]	300 [10.596]	99.99	○	○
	PLF600-J10	Quick fitting	$\phi 10$ [0.394]	450 [15.894]		○	○
	PLF600-02	Female thread	Rc 1/4	550 [19.426]		○	○
	PLF600-03	Female thread	Rc 3/8	600 [21.192]		○	○

Note: Recommended maximum flow rate at primary side pressure 0.7 MPa [102 psi]

0.01- μ m filtration rating **CLF Series** Page ⑳



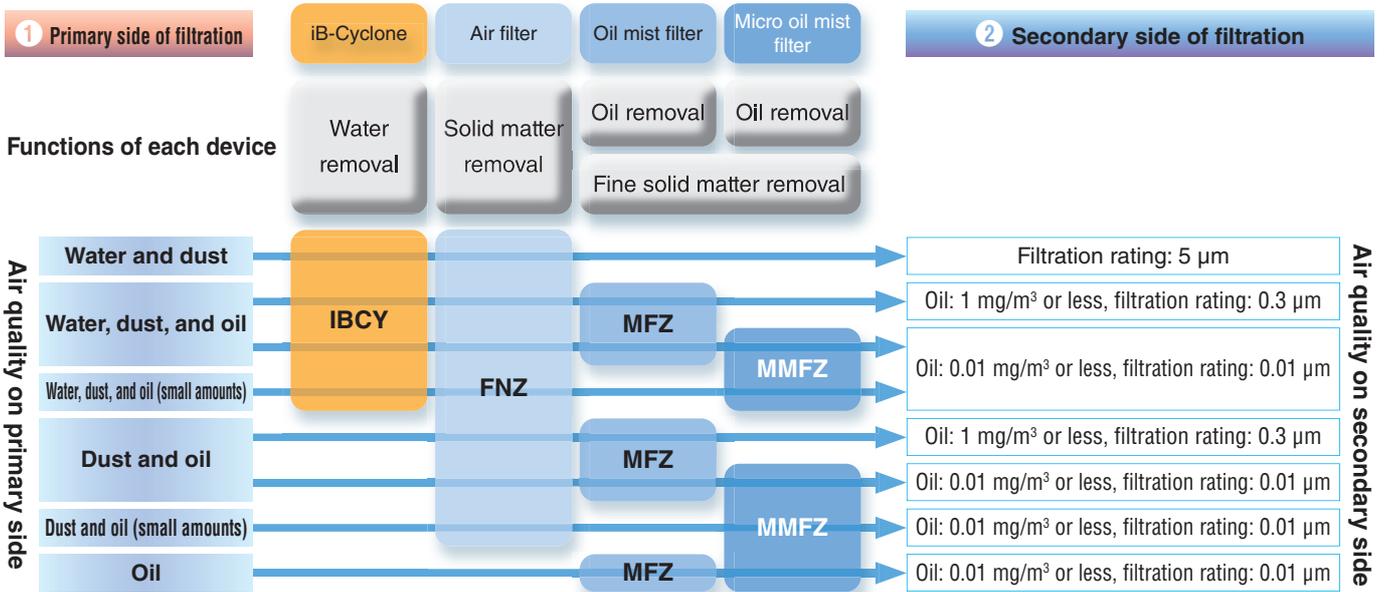
- For microfiltration of general-purpose gases in clean rooms
- Dual-layer structure with a PTFE membrane and a PTFE non-woven fabric
- Structural materials have superior resistance to corrosion. Can be used for general-purpose gases
- Integrity testing, airtightness testing, cleanliness, and clean packing implemented for CLF series

μ m filtration rating	Model	Piping port		Process air volume L/min (ANR) [ft ³ /min (SCFM)] ^{Note}	Particle filtering efficiency %	Positive pressure	Negative pressure
0.01	CLF050	Female thread	01: Rc 1/8 02: Rc 1/4	50 [1.766]	100	○	—

Note: Recommended maximum flow rate at primary side pressure 0.7 MPa [102 psi]

About air supply to in-line filters

- The objective of in-line filters is to remove solid matter, so water and oil must be removed first. Examples for removing water and oil are shown below. For detailed information about selecting a system, see Catalog No. E4051 "Filter regulator FRZ Series and Combination CMZ Series".



<Selection procedure>

- 1 Confirm quality of air used on primary side
- 2 Confirm air quality needed on secondary side
- 3 Decide configuration of devices needed for conditions in 1 and 2

CMZF550—CFMD——PG

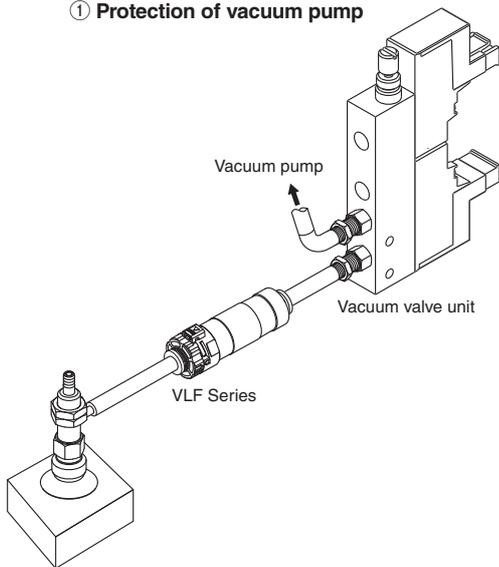
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Configured device code

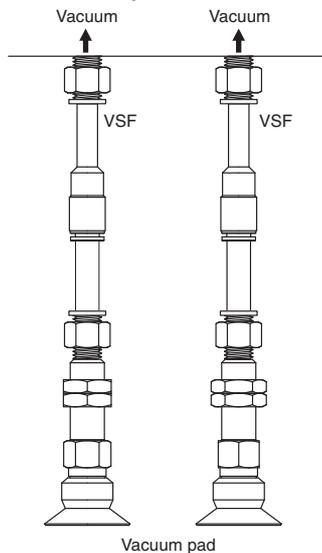


Application example

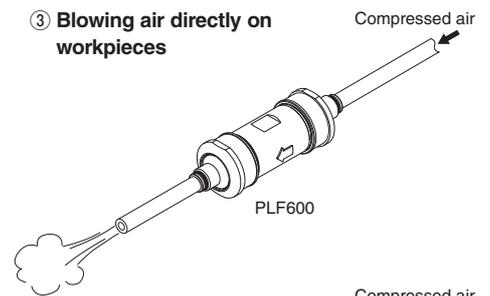
① Protection of vacuum pump



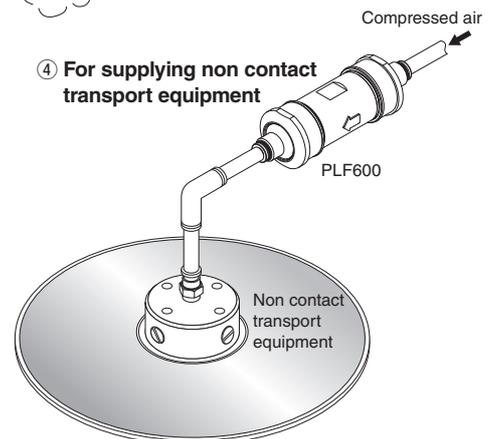
② Direct attachment to vacuum pad



③ Blowing air directly on workpieces



④ For supplying non contact transport equipment



Before selecting and using products, please read all the Safety Precautions carefully to ensure proper product use.

The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury or damage to assets.

Follow the Safety Precautions in ISO4414 (Pneumatic fluid power—General rules and safety requirements for systems and their components), JIS B 8370 (Pneumatic system regulations), and other safety regulations.

The directions are ranked according to degree of potential danger or damage: "DANGER", "WARNING!", "CAUTION!", and "ATTENTION!".

 DANGER	Indicates situations that can be clearly predicted as dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 WARNING	Indicates situations that, while not immediately dangerous, could become dangerous. Death or serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 CAUTION	Indicates situations that, while not immediately dangerous, could become dangerous. Minor or semi-serious injury may result if the situation is not avoided. It could also result in damage or destruction of assets.
 ATTENTION	While there is no chance of injury, these points should be observed for appropriate use of the product.

■ This product was designed and manufactured as parts for use in general industrial machinery.

- In the selection and handling of the equipment, the system designer or other responsible person with fully adequate knowledge and experience should always read the Safety Precautions, Catalog, Owner's Manual and other literature before commencing operation. Incorrect handling is dangerous.
- After reading the Owner's Manual, etc., always store them where they are easily available for reference to users of this product.
- If transferring or lending the product to another person, always attach the Owner's Manual, etc., to the product where they are easily visible, to ensure that the new user can use the product safely and properly.
- The danger, warning, and caution items listed under these "Safety Precautions" do not cover all possible cases. Read the Catalog and Owner's Manual carefully, and always keep safety first.

 **DANGER**

- Do not use the product for the purposes listed below:
 1. Medical equipment related to maintenance or management of human lives or bodies
 2. Mechanical devices or equipment designed for the purpose of moving or transporting people
 3. Critical safety components in mechanical devices

This product has not been planned or designed for purposes that require advanced stages of safety. It could cause loss of human life.
- Do not use the product in locations with or near dangerous substances, such as flammable or ignitable substances. This product is not explosion-proof. It could ignite or burst into flames.
- When installing the product, always firmly support and secure it (including the workpiece) in place. Injury could result if the product overturns, falls, or is operated abnormally.
- Never attempt to modify the product. Abnormal operation could result in injury.
- Never attempt inappropriate disassembly, assembly, or repair of the product relating to its basic inner construction, performance, or functions. It could result in injury.
- Do not splash water on the product. Spraying the product with water, washing it, or using it in water could result in malfunction leading to injury.
- While the product is in operation, avoid touching it with your hands or otherwise approaching too close. Also, do not attempt to make any adjustments to internal or attached mechanisms, or to perform any type of adjustment (releasing slide locks, disconnecting tubes or sealed plugs, adjustment of the product's mounting position, etc.) while the product is in operation. Injury could result if the product falls, is operated abnormally, or ejects the medium.

 **WARNING**

- Because Koganei products may be used under a wide variety of conditions, decisions concerning conformance with a particular system should be made upon the careful evaluation by the person in charge of system design. Assurances concerning expected system performance and safety are the responsibility of the designer who decides system conformity. Be sure to use the latest catalogs and technical materials to study and evaluate specification details, to consider the possibility of machine breakdown, and to configure a system that ensures safety and reliability, such as by using fail-safes.
- Do not use the product in excess of its specification range. Using the product outside of its specified range could result in product breakdowns, stop of functions, or damage. It could also drastically reduce the operating life.
- Before supplying air to the product and starting operation, always conduct a safety check within the range of machine operations. Unintentional supply of air could result in injury caused by contact with moving parts.
- Do not throw the product into fire. The product could explode and/or release toxic gases.
- Do not sit on the product, place your foot on it, or place other objects on it. Doing so creates the risk of injury due to tripping or the product tipping over or falling, and erratic or runaway operation due to damage or breakage to the product.
- Before doing maintenance inspections, repairs, or replacement of any parts, always completely cut off all air and vacuum pressure connections, and confirm that the pressure in the product and connected pipes is atmospheric pressure. In particular, be aware that pressure remains in compressors, vacuum pumps, and air tanks. If residual air pressure remains inside the piping, the actuator could abruptly move and cause injury.
- Use safety circuits or system designs to prevent damage to machinery or injury to personnel when the machine is shut down abnormally due to emergency stop or power failure.
- Always check the catalog and other reference materials for correct product piping. Improper piping creates the risk of damage to and abnormal operation of the actuator.

Safety precautions (in-line filter)

- Do not use the product near the ocean, in direct sunlight, near mercury vapor lamps, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions or stop functions. (except for ozone resistant products)
- Do not use any medium that is not stipulated in the specifications. Using a non-specified medium could lead to loss of functions within a short period, sudden degradation in performance, or reduced operating life.
- Do not use in locations where there is a heat source nearby or that are subject to radiated heat.



CAUTION

- Do not use the product in locations subject to direct sunlight (ultraviolet radiation); in locations subjected to high temperature or humidity; in locations where dust, salt, or iron particles are present; or in locations with media and/or an ambient atmosphere that includes organic solvents, phosphate ester type hydraulic oil, sulfur dioxide gas, chlorine gas, acids, etc. Such uses could lead to loss of functions within a short period, sudden degradation in performance, or reduced operating life. For information about materials, see Major Parts and Materials.
- When installing the product, leave room for adequate working space around it. Failure to ensure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- Do not scratch, dent, or deform the product by climbing on it, using it as a step, or placing objects on top of it. Doing so could damage or break the product, resulting in operation shutdown or degraded performance.
- Post "Work in Progress" signs when doing installations, adjustments, or other work, so that air is not supplied unintentionally. Unintended power supply of air could cause sudden operation resulting in injury.
- The pressure used by vacuum devices is vacuum pressure (negative pressure). Be sure that they are not supplied positive pressure. Vacuum gauges and vacuum pumps could be damaged.
- Air leakage from pneumatic equipment is not zero. Designs should take into consideration the capacity and retention time required for an application, such as retention of pressure (as well as vacuum) within a pressurized vessel. A reduction in retaining force could cause a workpiece to fall or slip out of position and damage the equipment or cause injury.



ATTENTION

- When considering using the product for applications that demand extreme safety, such as aviation facilities, combustion equipment, leisure equipment, safety devices, or in other ways predicted to greatly affect assets or human lives, or in situations or environments not described in the Catalog or Owner's Manual, etc., take sufficient safety precautions, such as by allowing ample rating and performance margins for the application and by implementing adequate safety measures, such as fail-safes. Also, be sure to consult us about such applications.
- When handling the product, wear protective gloves, safety glasses, safety shoes, etc., as required to maintain safety.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and function over its operating life. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfactory, to prevent accidents from happening.
- For inquiries about the product, contact your nearest Koganei sales office or Koganei overseas department. The address and telephone number are shown on the back cover of this catalog.



OTHERS

- Always observe the following items.
 1. When using this product in pneumatic systems, always use genuine Koganei parts or compatible parts (recommended parts).
When doing maintenance or repairs, always use genuine Koganei parts or compatible parts (recommended parts).
Always observe the required methods.
 2. Never inappropriately disassemble or assemble the product in relation to its basic construction, performance, or functions.

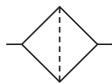
Koganei bears no responsibility if all safety precautions are not properly observed.

In-line filter for positive and negative pressure

VLF Series



Symbols



Specifications

Item	Basic type	VLF010		VLF020		VLF050		
		SUS303-VLF010		SUS303-VLF020		SUS303-VLF050		
Pipe fittings	mm [in.]	4 [0.157]	6 [0.236]	4 [0.157]	6 [0.236]	6 [0.236]	8 [0.315]	10 [0.394]
Medium		Air						
Maximum operating pressure	MPa [psi]	1.0 [145] (at 20°C [68°F]) ^{Note 1}						
Pressure used for vacuum	kPa [inHg]	-100 [-29.540]						
Withstand pressure	MPa [psi]	1.5 [35]						
Operating temperature range	°C [°F]	0 to 50 [32 to 122] (non-freezing)						
Filtration rating ^{Note 2}	µm	5						
Particle filtering efficiency	%	95						
Filtration area	cm ² [in ²]	4.7 [0.729]		7.5 [1.163]		12.7 [1.969]		
Recommended flow rate ^{Note 3}	L/min (ANR) [ft ³ /min (SCFM)]	10 [0.353]		15 [0.530]	20 [0.706]	25 [0.883]	50 [1.766]	60 [2.119]
Weight	g [oz]	9 [0.32]	8.5 [0.30]	21 [0.74]	22 [0.78]	35 [1.23]	35 [1.23]	39 [1.38]

Note 1: The maximum operating pressure value is for 20°C [68°F]. To use the product in other temperature ranges, see "Diagram on relation of operating temperature and maximum operating pressure" on page ⑥.

2: According to Koganei stipulated conditions.

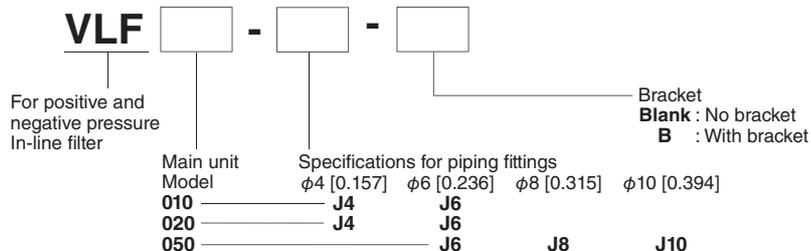
3: This flow rate is during vacuum generation. (pressure loss of 3 kPa [0.886 inHg] or less)

When using positive pressure, see "Flow rate characteristics" on page ⑥.

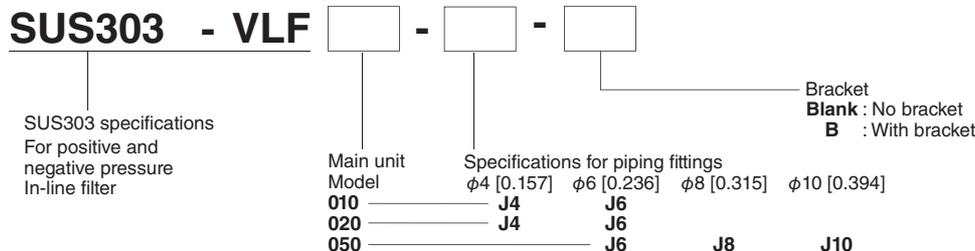
Note: When using the product in a high-temperature environment, such as due to heat compression, refer to the diagram on relation of operating temperature and maximum operating pressure to assure that the environment's temperature and the product's temperature for your application do not exceed the operating temperature.

Order Codes

● In-line filter for positive and negative pressure (release ring color: light grey)



● SUS303 specifications In-line filter for positive and negative pressure (release ring color: dark grey)



■ Additional parts

● Bracket (1 pc./bag)

BK - VLF []

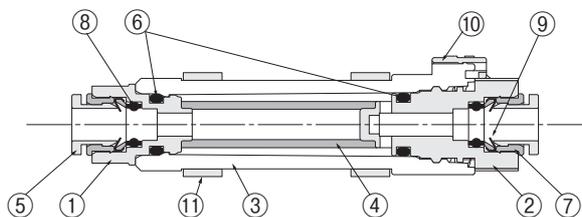
Main unit model
010 : 10 L/min (ANR) [0.353 ft³/min (SCFM)]
020 : 20 L/min (ANR) [0.706 ft³/min (SCFM)]
050 : 50 L/min (ANR) [1.766 ft³/min (SCFM)]

● Replacement elements (10 pc./bag)

E - [] VLF

Main unit model
010 : 10 L/min (ANR) [0.353 ft³/min (SCFM)]
020 : 20 L/min (ANR) [0.706 ft³/min (SCFM)]
050 : 50 L/min (ANR) [1.766 ft³/min (SCFM)]

Inner construction

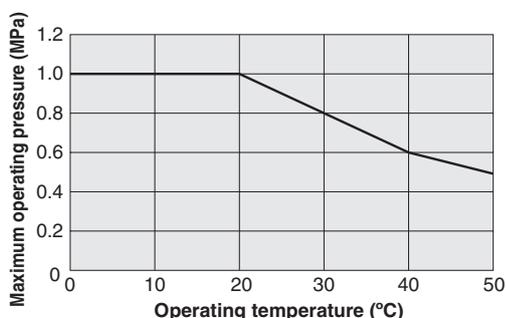


Major parts and materials

No.	Model Name	VLF□	
		VLF□	SUS303-VLF□
①	Main fitting A	PBT	
②	Main fitting B	PBT	
③	Cover	PCTG	
④	Element	PVF	
⑤	Release ring	POM (light grey)	POM (dark blue)
⑥	O-ring	NBR	HNBR
⑦	Guide ring	Brass, electroless nickel plated	Special stainless steel
⑧	Elastic sleeve	NBR	HNBR
⑨	Lock claw	Stainless steel	
⑩	Slide lock	POM	
⑪	Bracket	POM	

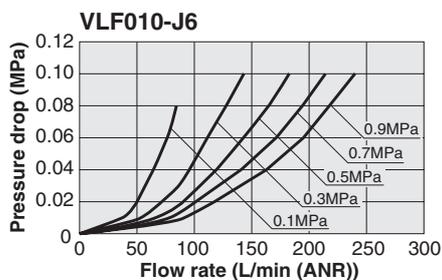
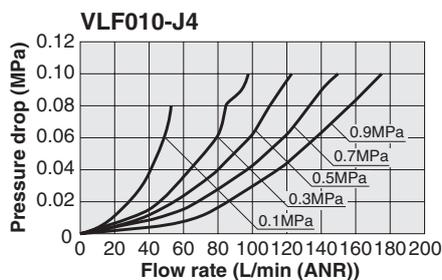
Note: SUS303 equivalent (austenitic or ferritic)

Diagram on relation of operating temperature and maximum operating pressure

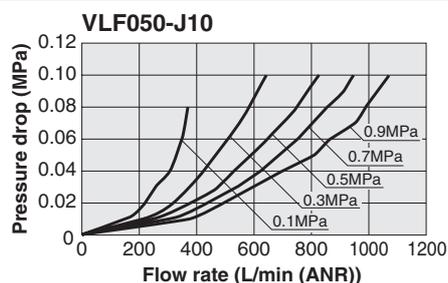
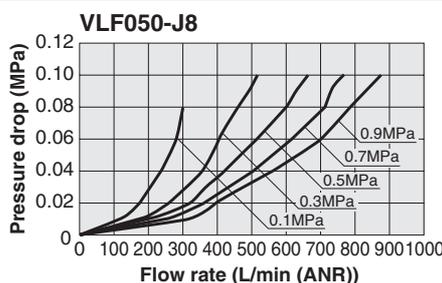
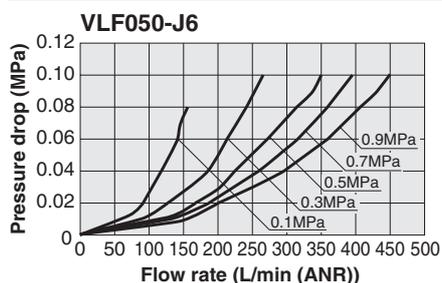
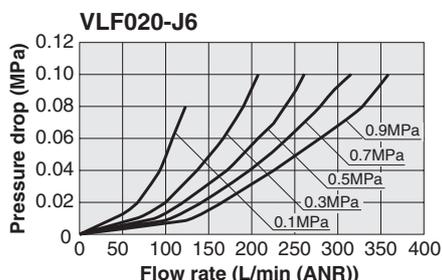
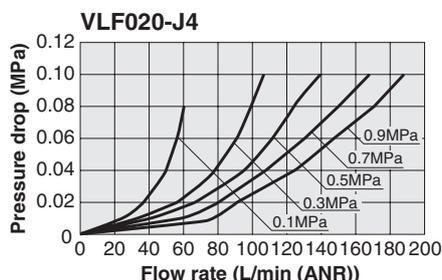


1 MPa = 145 psi

Flow rate characteristics



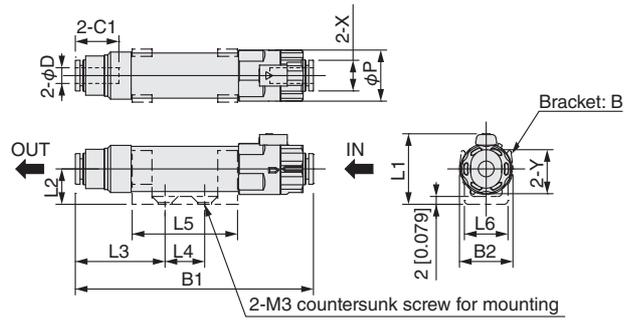
1 MPa = 145 psi
1 l/min (ANR) = 0.03532 ft³/min



Dimensions (mm [in.])

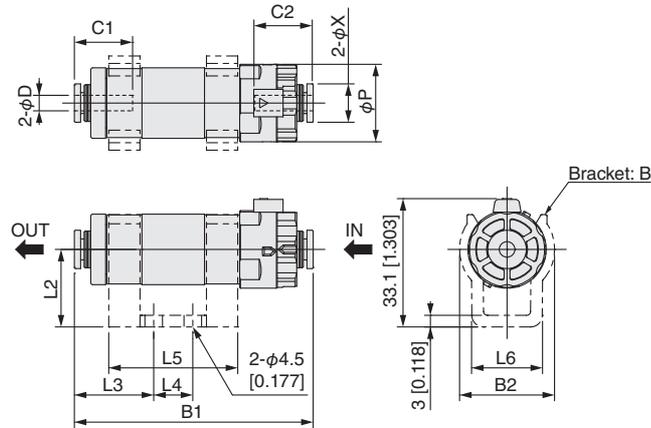
VLF010 - □ - □

SUS303-VLF010 - □ - □



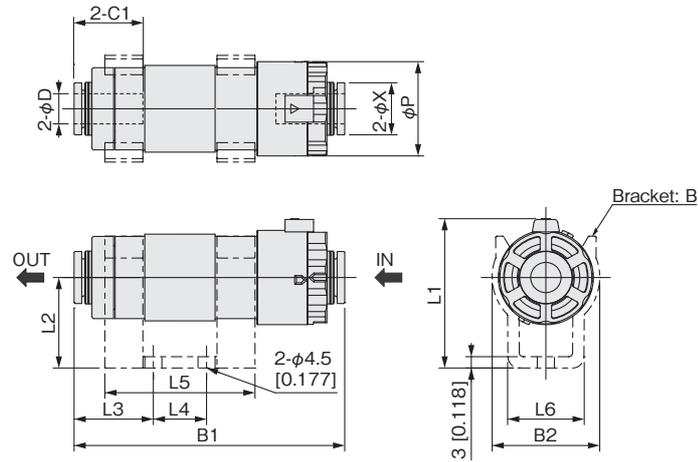
VLF020 - □ - □

SUS303-VLF020 - □ - □



VLF050- □ - □

SUS303-VLF050- □ - □



Model	Tube outer diameter φ D	C1	C2	B1	B2	L1	L2	L3	L4	L5	L6	φ P	X	Y
VLF010-J4- □	4 [0.157]	11 [0.433]	—	60.1 [2.366]	13.5 [0.531]	18 [0.709]	9 [0.354]	22.7 [0.894]	10 [0.394]	26.6 [1.047]	11 [0.433]	13 [0.512]	7.8 [0.307]	9.8 [0.386]
VLF010-J6- □	6 [0.236]	11.6 [0.457]	—	64.4 [2.535]	13.5 [0.531]	18 [0.709]	9 [0.354]	25.1 [0.988]	10 [0.394]	26.6 [1.047]	11 [0.433]	13 [0.512]	9.8 [0.386]	11.8 [0.465]
VLF020-J4- □	4 [0.157]	14.9 [0.587]	14.9 [0.587]	61.1 [2.406]	24.3 [0.957]	33.1 [1.303]	20 [0.787]	20.3 [0.799]	10 [0.394]	33 [1.299]	18.2 [0.717]	20 [0.787]	9.9 [0.390]	—
VLF020-J6- □	6 [0.236]	16 [0.630]	17 [0.669]	65.5 [2.579]	24.3 [0.957]	33.1 [1.303]	20 [0.787]	24.2 [0.953]	10 [0.394]	33 [1.299]	18.2 [0.717]	20 [0.787]	11.8 [0.465]	—
VLF050-J6- □	6 [0.236]	17 [0.669]	—	71.9 [2.831]	28.3 [1.114]	39.6 [1.559]	24 [0.945]	19.6 [0.772]	14 [0.551]	39.5 [1.555]	20.2 [0.795]	25 [0.984]	11.8 [0.465]	—
VLF050-J8- □	8 [0.315]	18.1 [0.713]	—	71.1 [2.799]	28.3 [1.114]	39.6 [1.559]	24 [0.945]	20.9 [0.823]	14 [0.551]	39.5 [1.555]	20.2 [0.795]	25 [0.984]	13.8 [0.543]	—
VLF050-J10- □	10 [0.394]	19.2 [0.756]	—	77.3 [3.043]	28.3 [1.114]	39.6 [1.559]	24 [0.945]	26.8 [1.055]	14 [0.551]	39.5 [1.555]	20.2 [0.795]	25 [0.984]	16.8 [0.661]	—

Handling Instructions and Precautions (VLF Series)

WARNING

1. Periodically do maintenance inspections of filter elements. Clogged elements could cause reduced performance or trouble. Before replacing elements, take safety precautions, make the pressure inside the filter atmospheric pressure, and fully understand the "Element replacement procedure".
2. Do not subject the product to pulling, twisting, or bending loads, and do not drop it or subject it to extreme impacts. There is a risk of damage or breakage.
3. The cover material is PCTG, so avoid use in areas where the product is in contact with or exposed to chemical (see below) environments, which could damage the product.

Names of chemicals	
Thinner	Cyclohexane
Carbon tetrachloride	Trichloroethylene
Chloroform	Sulphuric acid
Acetic ester	Lactic acid
Aniline	Water soluble cutting oil (alkaline oil)

* Contact your nearest Koganei sales office for other chemicals, which are not mentioned above, that cannot be used.

4. Always lock the slide lock before using the product. Also, while the slide lock is locked, if the fittings are rotated or excessive force is applied to the slide lock, there is a risk of the slide lock malfunctioning and the fitting and cover separating and being damaged.
5. The product's maximum operating pressure varies depending on the operating temperature range (temperature in operating environment). To use the product, be sure to refer to the "Diagram on relation of operating temperature and maximum operating pressure" on page ⑥, and use the product within that range.
6. Do not use the product in direct sunlight, near mercury vapor lamps, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions, stop functions, rapidly reduce performance, or reduce operating life.

CAUTION

1. Before connecting pipes, confirm the direction of air flow by the arrow on the cover. The filter cannot perform fully if connected backwards.
2. Note that, when using the product in a circuit that alternates application of vacuum and vacuum breaker, the dust removed by the element could be exhausted in the breaker air.
3. When disassembling and assembling the product for maintenance, confirm whether the O-rings have been damaged. Using a damaged O-ring could cause problems, such as leaks, to occur.
4. After removing dust and replacing the element, securely fasten main fitting B and confirm there are no leaks.



General precautions

Precautions for attaching tubes

- ① Confirm that the cut surface of the tube is cut straight across, that the outer surface of the tube is not damaged, and that the tube has not become oval shaped.
- ② When connecting tubes, if you do not insert the tube all the way to the tube end, it may result in leaks.



Tube end

- ③ After installing the tube, pull on it to check that it does not come off.
- ④ Do not meaninglessly press on the release ring before attaching a tube. Doing so may cause the tube to become detached.

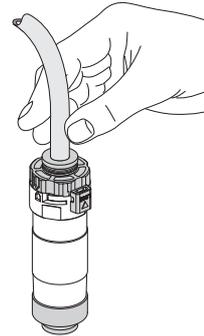
Precautions for removing tubes

- ① Before removing tubing, be sure to confirm that the pressure inside the tubing is zero.
- ② Uniformly press the release ring inwards as far as it goes and then pull out the tubing. If you do not fully press in the release ring, the tube may not come out, or the tubing may become scratched causing debris to be left inside the fitting.

How to attach and detach tubes

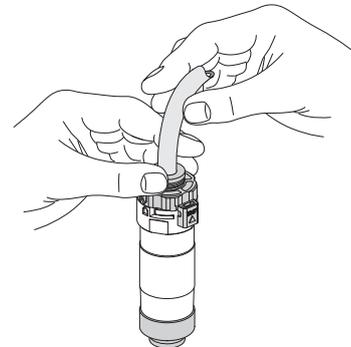
1. Attaching tubes

Push the tube all the way to the end so the lock claws hold it in place, and the elastic sleeve seals around the outside of the tube.



2. Removing tubes

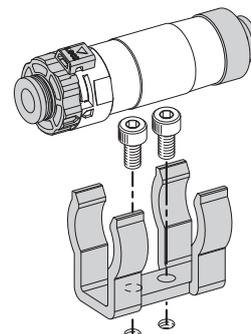
When removing a tube, pressing the release ring opens the lock claws and the tube can be pulled out. Be sure to stop the air before removing tubes.



Securing the bracket

Use the mounting holes on the bracket to securely fasten the bracket with the following screws. (Refer to the diagram for the external dimensions of the body regarding the pitch of the holes for mounting.)

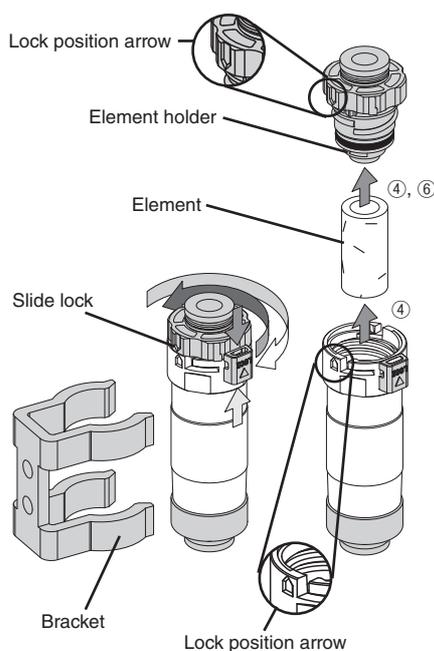
Mounting screws **VLF010**: M3 countersunk screw, **VLF020, 050**: M4 screws



Handling Instructions and Precautions (VLF Series)

Element replacement procedure

- ① Make the internal pressure of the in-line filter the same as atmospheric pressure.
- ② Release the red slide lock. (Opposite direction of the LOCK arrow.)
- ③ Rotate the main fitting B 180° counterclockwise.
- ④ Remove the rotated main fitting B from the cover, and then replace the element.
- ⑤ Use compressed air or something, to remove any dust from inside the cover if necessary.
- ⑥ Attach the element to the element holder on the cover and insert it into main fitting B, and then rotate main fitting B clockwise until it stops.
- ⑦ When you close them up, confirm that the lock position arrow on the cover aligns with the lock position arrow on main fitting B, and then raise (direction of the LOCK arrow) the slide lock and confirm it is securely locked.



Usable tubes

Use of both nylon tubing and urethane tubing is supported. Tubing outside diameter precision should be within ± 0.1 mm [0.004 in] (nominal) for nylon tubing and within ± 0.15 mm [0.006 in] (nominal) for urethane tubing. Use tubing with ovality (difference between major axis and minor axis) within 0.2 mm [0.008 in]. (Use of Koganei tubing is recommended.) Use of tubing that is not a Koganei genuine product or a compatible (recommended) product may result in tube disconnection, air leakage, or other problems. Be sure to check on tubing before building a pneumatic system.



1. Use tubing with an exterior that is not damaged. If tubing becomes damaged after repeated use, cut off the damaged portion.
2. Do not allow tubing to become severely bent or twisted near the connection to a fitting. Such a condition creates the risk of air leakage. The table below shows minimum bending radius for nylon and urethane tubing.
3. Do not use extremely soft tubing, which causes a severe drop in pull-out strength.
4. Before removing any tubes, always turn off the air supply. Also, be sure to confirm that the air inside the pipes is completely vented before starting.

mm [in.]

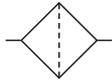
Tube size	Minimum bending radius	
	Nylon tube	Urethane tube
$\phi 4$ [0.157]	20 [0.787]	10 [0.394]
$\phi 6$ [0.236]	30 [1.181]	15 [0.591]
$\phi 8$ [0.315]	50 [1.969]	20 [0.787]
$\phi 10$ [0.394]	80 [3.150]	27 [1.063]

Socket filter for vacuum

VSF Series



Symbols



Specifications

Item	Basic type	VSF-J3	VSF-J4	VSF-J6
Medium		Air		
Operating pressure range	kPa [inHg]	-100 to 0 [-29.540 to 0] ^{Note 1}		
Operating temperature range	°C [°F]	0 to 60 [32 to 140] (non-freezing)		
Filtration rating ^{Note 2}	µm	5		
Particle filtering efficiency	%	95		
Filtration area	cm ² [in ²]	0.8 [0.124]		1.1 [0.171]
Recommended flow rate ^{Note 3}	L/min (ANR) [ft ³ /min (SCFM)]	5 [0.177]	7.5 [0.265]	11 [0.389]
Weight	g [oz]	1.4 [0.05]	1.5 [0.05]	2.5 [0.09]

Note 1: When used for vacuum breaking applications, the proof pressure is maximum 0.2 MPa [29 psi].

2: According to Koganei stipulated conditions.

3: This flow rate is during vacuum generation. (pressure loss of 3 kPa [0.886 inHg] or less)

Remarks: The internal elements cannot be replaced. Replace the filters with new socket filters for vacuum.

Order Codes

● Socket filter for vacuum

VSF -

Socket filter for vacuum

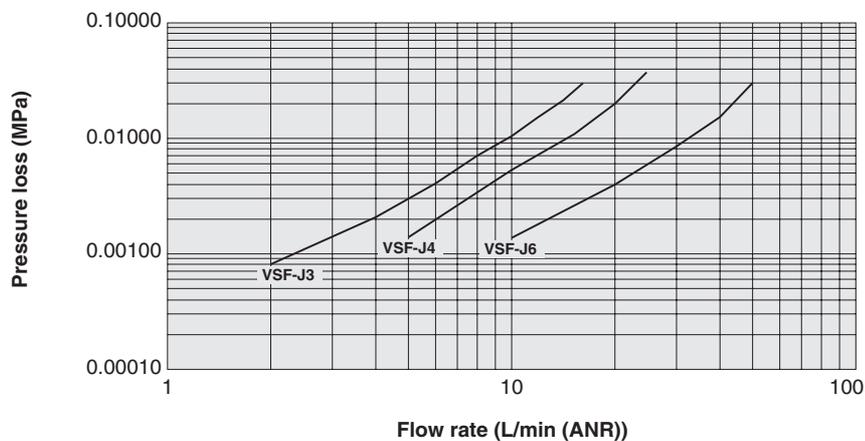
Applicable fitting/tube diameter

J3 : φ3 mm [0.118 in.] (socket side φ3 mm [0.118 in.])

J4 : φ4 mm [0.157 in.] (socket side φ4 mm [0.157 in.])

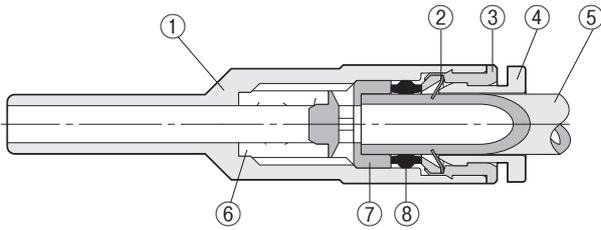
J6 : φ6 mm [0.236 in.] (socket side φ6 mm [0.236 in.])

Flow rate characteristics



1 MPa = 145 psi
1 l/min (ANR) = 0.03532 ft³/min

Inner construction

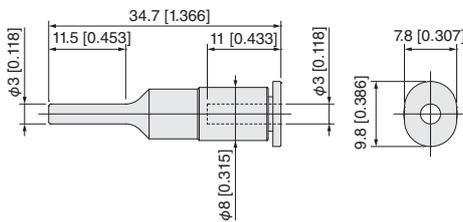


Major parts and materials

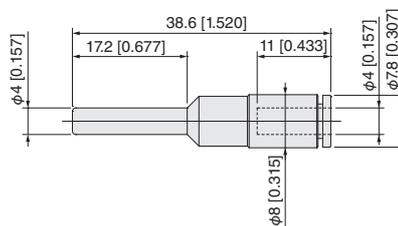
No.	Name	Model	VSF□
①	Main unit		PP
②	Lock claw		Stainless steel
③	Guide ring		Brass, electroless nickel plated
④	Release ring		POM
⑤	Tube		Urethane or nylon
⑥	Element		PVF
⑦	Element brace		POM
⑧	Elastic sleeve		NBR

Dimensions (mm [in.])

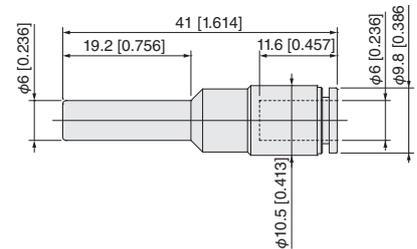
VSF-J3



VSF-J4



VSF-J6



Handling Precautions

⚠ WARNING

- The VSF are vacuum filters. Avoid use in locations subject to continuous pressurized conditions. They are not built to be explosion-proof, so there is a risk of injury to people if the main unit is damaged.
- Do periodic inspections. Clogged elements cause reduced performance or trouble. Individual elements cannot be replaced, so replace the vacuum filter with a new one when doing replacements.
- The material for the filter body is PP, so the plastic may deteriorate in direct sunlight or ultraviolet radiation. If using the product where it is in contact with or exposed to chemical environments, first confirm whether there is any effect on the material. Also, contact your nearest Koganei sales office.
- Do not use the product in direct sunlight, near mercury vapor lamps, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions, stop functions, rapidly reduce performance, or reduce operating life.

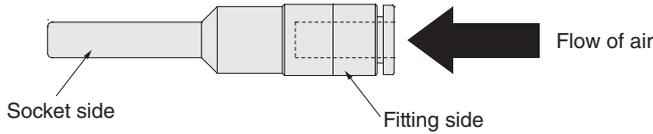
⚠ CAUTION

- Piping connections are: Socket side to the vacuum generator side port; and the fitting side to the workpiece side port. The product can be used with the connections reversed, but the filter area is reduced. Also, the element cannot be checked for clogs.
- Note that, when using the product in a circuit that alternates application of vacuum and vacuum breaker, the dust removed by the element could be exhausted in the breaker air.
- When attaching tubes, do not apply excessive force. There is a risk of damaging the filter.

Handling Instructions and Precautions (VSF Series)

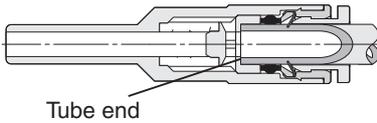
Piping direction

Connect the pipes so the air flows from the fitting side to the socket side. (Refer to the diagram below)



Precautions for attaching tubes

- ① Confirm that the cut surface of the tube is cut straight across, that the outer surface of the tube is not damaged, and that the tube has not become oval shaped.
- ② When connecting tubes, if you do not insert the tube all the way to the tube end, it may result in leaks.



- ③ After installing the tube, pull on it to check that it does not come off.
- ④ Do not meaninglessly press on the release ring before attaching a tube. Doing so may cause the tube to become detached.

Precautions for removing tubes

- ① Before removing tubing, be sure to confirm that the pressure inside the tubing is zero.
- ② Uniformly press the release ring inwards as far as it goes and then pull out the tubing. If you do not fully press in the release ring, the tube may not come out, or the tubing may become scratched causing debris to be left inside the fitting.

Usable tubes

Use of both nylon tubing and urethane tubing is supported. Tubing outside diameter precision should be within ± 0.1 mm [0.004 in] (nominal) for nylon tubing and within ± 0.15 mm [0.006 in] (nominal) for urethane tubing. Use tubing with ovality (difference between major axis and minor axis) within 0.2 mm [0.008 in]. (Use of Koganei tubing is recommended.) Use of tubing that is not a Koganei genuine product or a compatible (recommended) product may result in tube disconnection, air leakage, or other problems. Be sure to check on tubing before building a pneumatic system.



1. Use tubing with an exterior that is not damaged. If tubing becomes damaged after repeated use, cut off the damaged portion.
2. Do not allow tubing to become severely bent or twisted near the connection to a fitting. Such a condition creates the risk of air leakage. The table below shows minimum bending radius for nylon and urethane tubing.
3. Do not use extremely soft tubing, which causes a severe drop in pull-out strength.
4. Before removing any tubes, always turn off the air supply. Also, be sure to confirm that the air inside the pipes is completely vented before starting.

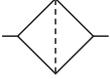
mm [in.]

Tube size	Minimum bending radius	
	Nylon tube	Urethane tube
φ3 [0.118]	—	7 [0.276]
φ4 [0.157]	20 [0.787]	10 [0.394]
φ6 [0.236]	30 [1.181]	15 [0.591]

In-line filter

PLF Series

Symbols



Specifications

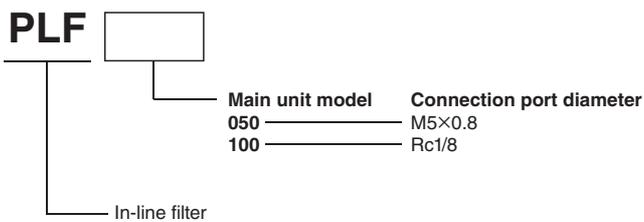
Item	Model	PLF050	PLF100	PLF600
Medium		Air, N ₂		
Connection port diameter		M5×0.8	Rc1/8	Female thread type Rc1/4, Rc3/8
				Quick fitting type φ8 [0.315], φ10 [0.394]
Filtered particle size	μm	0.01		
Particle filtering efficiency	%	99.99		
Process air volume ^{Note 1}	L/min (ANR) [ft ³ /min (SCFM)]	40 [1.413]	100 [3.532]	600 [21.192]
Operating pressure range	Positive pressure MPa [psi]	0 to 1.0 [0 to 145]		
	Negative pressure kPa [inHg]	—		
Proof pressure		1.5		
Proof pressure differential ^{Note 2}	MPa [psi]	0.2 [29]		0.3 [44]
Operating temperature range	°C [°F]	5 to 45 [41 to 113]		5 to 60 [41 to 140]
Weight	g [oz]	15 [0.53]	35 [1.23]	Female thread type PLF600-02: 160 [5.64] PLF600-03: 154 [5.43]
				Quick fitting type PLF600-J8: 130 [4.59] PLF600-J10: 136 [4.80]

Note 1: Recommended maximum flow rate when primary side pressure is 0.7 MPa [102 psi] (pressure drop of 0.03 MPa [4 psi], maximum connection port diameter). See flow rate characteristics on page 15 for details.

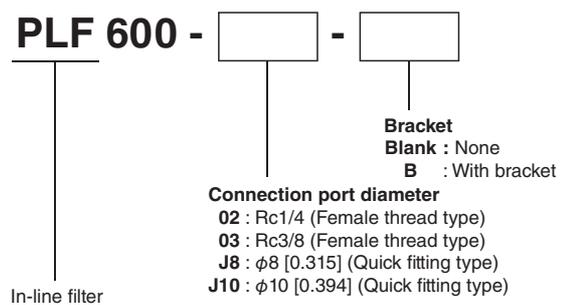
2: This is when momentary pressure differential occurs, normally use the product within the recommended maximum flow rate.

Order Codes

● PLF050, PLF100



● PLF600



Additional Parts (sold separately for PLF600)

● Mounting bracket (2 included)

BK-PLF600



13 g [0.46 oz]×2

● Filter elements (with 2 O-rings)

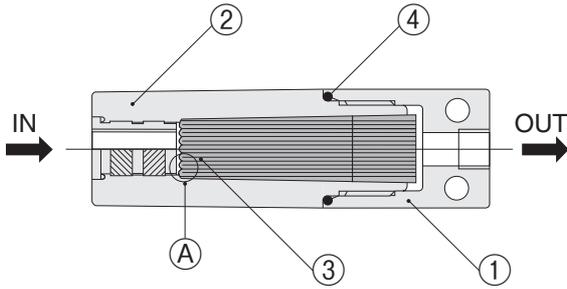
E-600PLF



Caution: The PLF050 and PLF100 have no additional parts.

Inner Construction and Parts Names and Major Materials

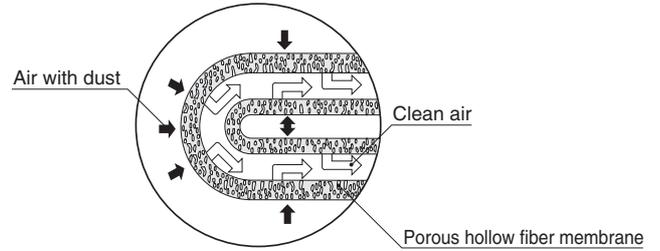
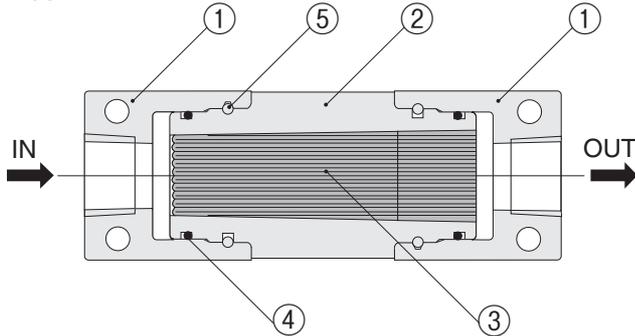
PLF050



No.	Name	Material
①	Main unit (cover)	Die cast aluminum (electroless nickel plated)
②	Plastic housing	Nylon
③	Element	Porous hollow fiber membrane
④	O-ring	Synthetic rubber (NBR)
⑤	Retaining ring (PLF100 only)	SUS304

Ⓐ : Enlarged diagram of element

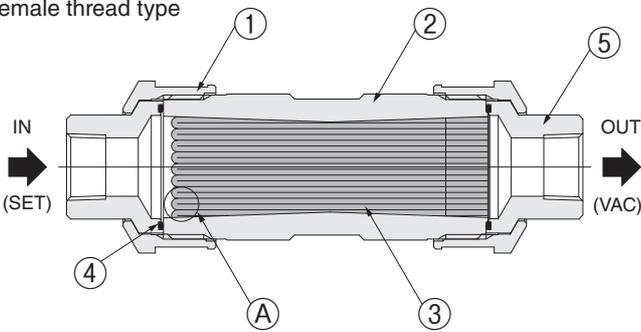
PLF100



Caution: Do not disassemble the PLF050 or PLF100.

PLF600

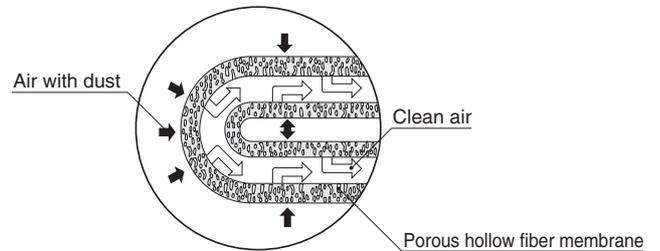
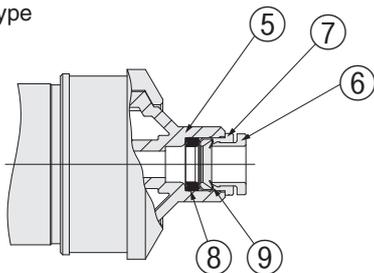
Female thread type



No.	Name	Material
①	Cover	Aluminum (anodized)
②	Plastic housing	PCT
③	Element	Fluorine type porous hollow fiber membrane
④	O-ring	Fluoro rubber (FKM)
⑤	Adapter	Female thread specifications: Aluminum (anodized) Quick fitting specifications: PBT
⑥	Release ring	POM
⑦	Guide ring	Brass (electroless nickel plated)
⑧	Elastic sleeve	FKM
⑨	Lock claw	Stainless steel

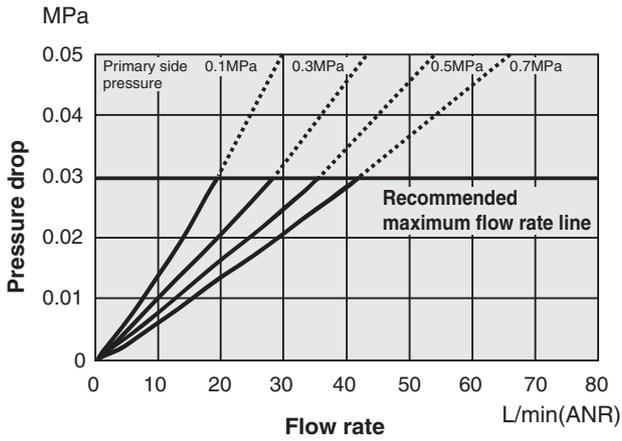
Ⓐ : Enlarged diagram of element

Quick fitting type



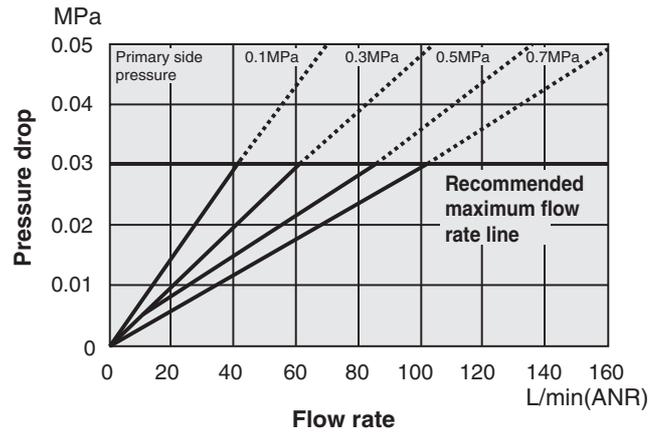
Flow rate characteristics

PLF050



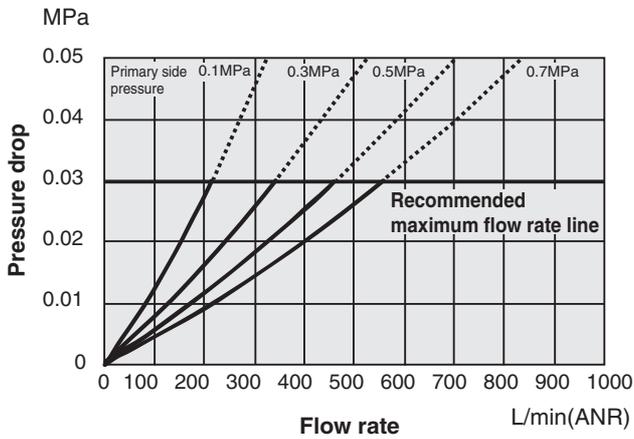
PLF100

1 MPa = 145 psi
1 l/min (ANR) = 0.03532 ft³/min

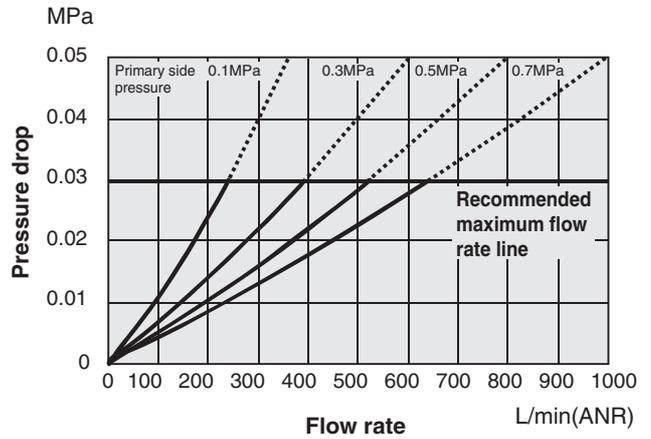


Female thread type

PLF600-02

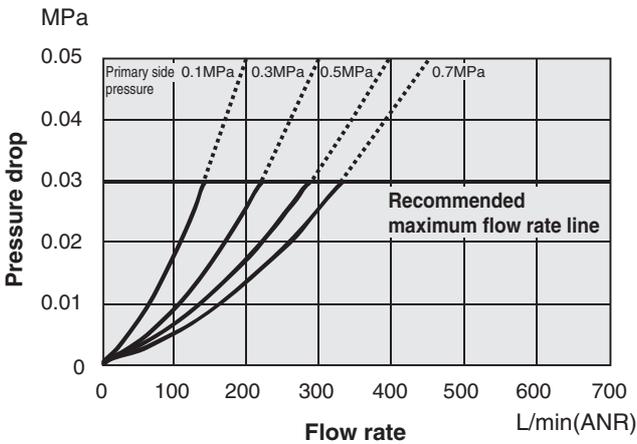


PLF600-03

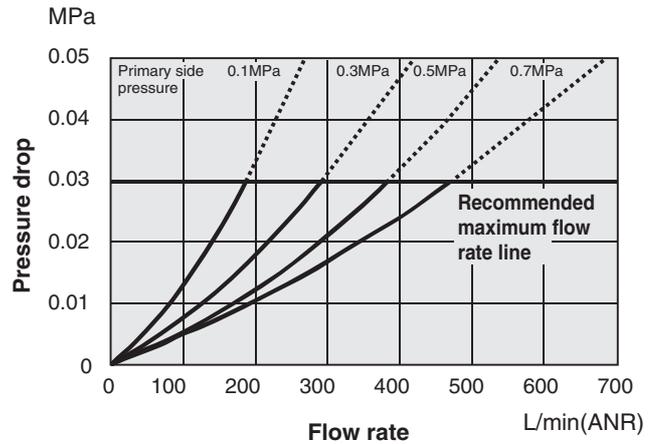


Quick fitting type

PLF600-J8



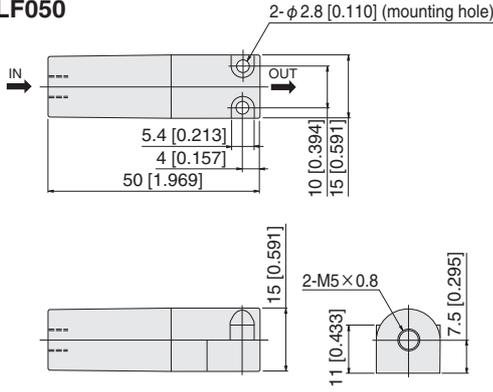
PLF600-J10



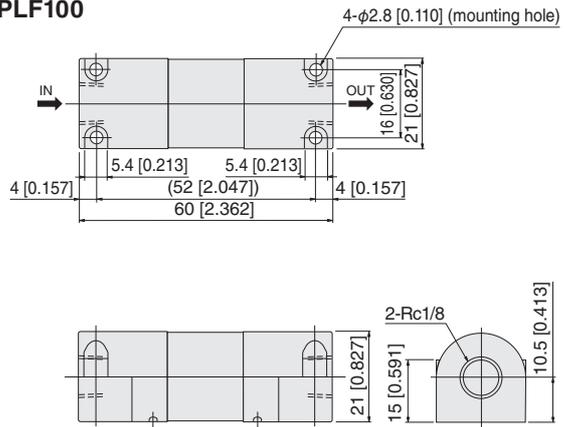
Caution: Normally use the product within the recommended maximum flow rate.

Dimensions (mm [in.])

PLF050

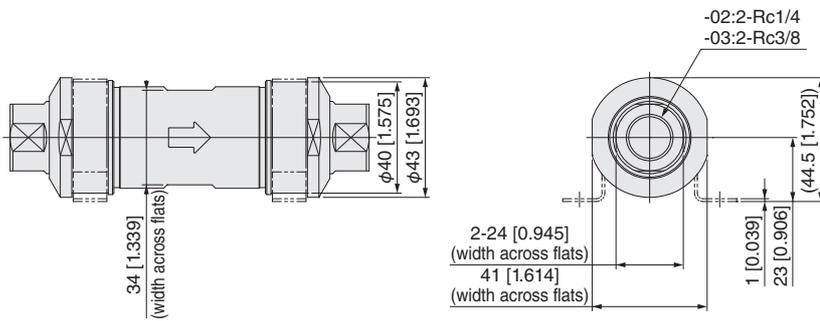
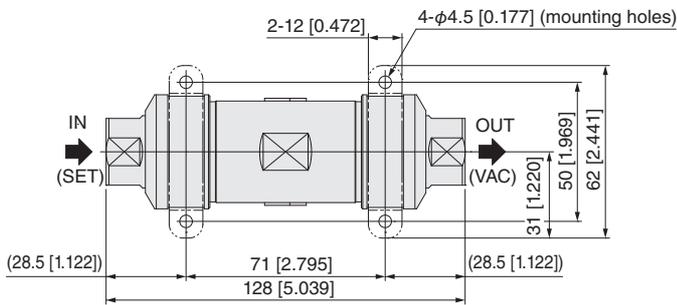


PLF100



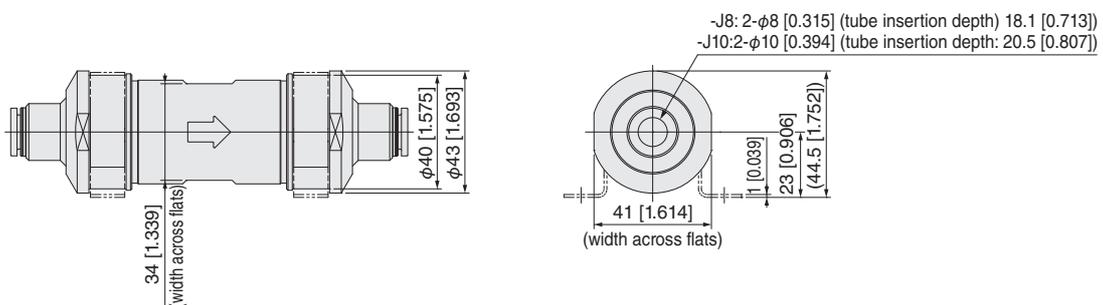
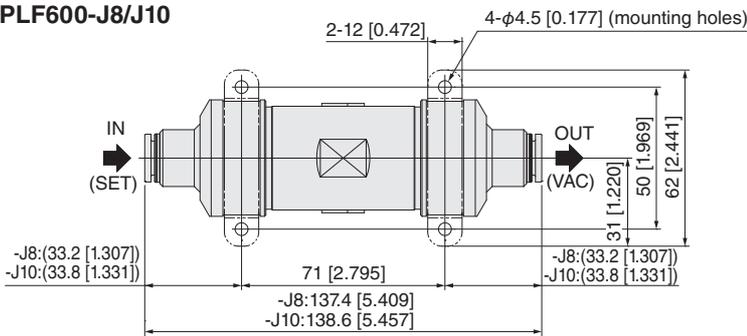
Female thread type

PLF600-02/03



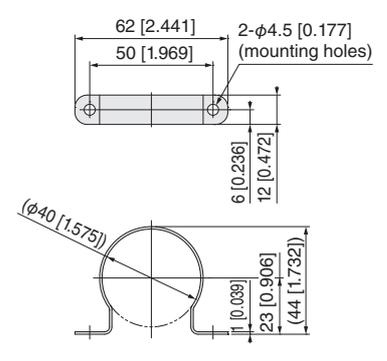
Quick fitting type

PLF600-J8/J10



BK-PLF600

(individual mounting bracket)



Handling Instructions and Precautions (PLF Series)

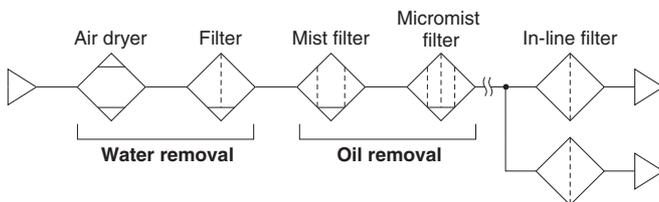


General precautions

Common to PLF050, PLF100, and PLF600

1. Before doing piping work, thoroughly flush the inside of the pipes (blow out with compressed air). Machining chips, sealing tape, rust and other debris remaining from the piping work may cause reduced performance and functionality or stop functions.
2. Do not use any medium except air and N₂. Contact the nearest Koganei sales office or overseas department if you are considering using something other than these.
3. This product cannot be used if the medium or ambient atmosphere includes any of the substances below.
Organic solvents, phosphate type hydraulic oil, sulfur dioxide gas, chlorine gas, acids, or other corrosive gases.
Also, the plastic housing material of the PLF050 and PLF100 is nylon. It is not resistant to alcohol, etc., confirm chemical resistance before use.
4. Avoid installation and use in locations where the supplied air or ambient temperature exceeds the operating temperature range.
5. Cover the unit when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
6. Do not allow excessive external forces to act on the product.
7. Avoid uses that exceed the maximum operating pressure.
8. Do not directly expose the product to ultraviolet light or wind and rain.
9. This is an industrial product. Do not use it in life-support equipment.
10. The objective of in-line filters is to remove solid matter, so remove any water and oil first.

● Recommended circuit (positive pressure)



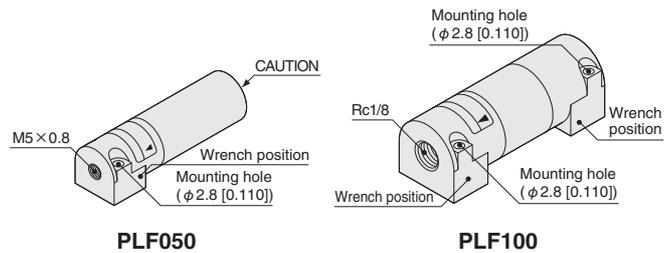
11. Performance and functions may decrease as the pneumatic equipment ages. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfactory, to prevent accidents from happening.
12. See the "Element replacement procedure" section for the correct procedure to replace the element of the PLF600. As a guideline, replace elements if you notice a reduction in performance during operation, such as the element appears dirty or a lower vacuum is reached during operation.



Mounting and Piping

PLF050 and PLF100

1. When doing piping work, use the flat area for wrench, shown in the diagram below, when the main body has threaded pipes. Furthermore, for the PLF100, the main body and plastic part will rotate when force is applied, but they cannot withstand rotation during use. Prevent them from rotating, as much as possible, during installation, and do not rotate them during use after installation.



	Recommended tightening torque	
	N·m [in·lbf]	
	PLF050	PLF100
Connecting thread	M5 × 0.8	R1/8
Torque	1 to 1.5 [8.851 to 13.277]	4.5 to 6.5 [39.830 to 57.532]



The PLF050 has inserted plastic parts. Excessive tightening can cause damage. Always tighten piping to a torque of 1.57 N·m [13.896 in·lbf] or less.

2. Use the mounting holes shown in the above diagram for mounting. Furthermore, for the PLF100, it is possible to use just 2 of the 4 mounting holes.
3. Do piping so the air flows in the direction of the black arrow on the label.
(Do not use the opposite direction.)



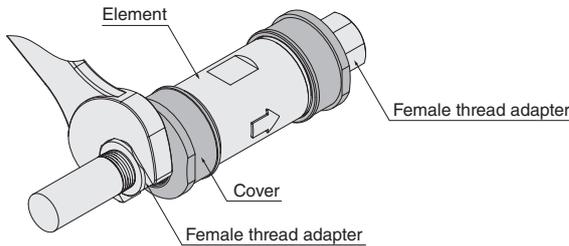
4. In-line filters use plastic parts. Do not use them where excessive force is applied, such as being connected to steel pipes.

Handling Instructions and Precautions (PLF Series)

PLF600

Mounting and Piping

- When doing piping work, place the wrench across the two flat places on the female thread adapter of the tightening side.



NOTE Using the two flat places on the cover or element during piping work could damage them.

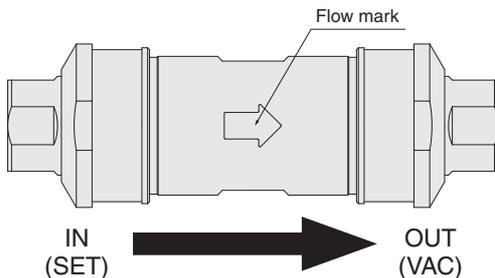
- If steel pipes and fittings are attached to the threaded sections of the female thread adapter, tighten them to the torque recommended in our standards.

NOTE Tightening with excess torque may damage the product or injure workers or operators.

Recommended tightening torque N·m [in·lbf]

PLF600		
Connecting thread	R1/4	R3/8
Torque	7 to 9 [61.957 to 79.659]	12.5 to 14.5 [110.6 to 128.3]

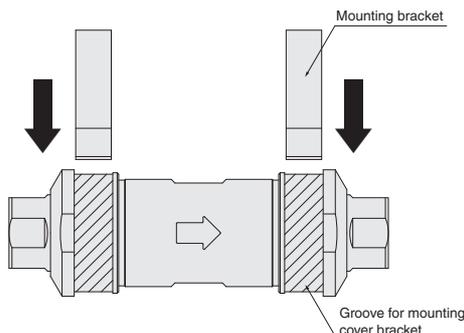
- Do piping so the air flows in the direction of the arrow (flow mark) shown on the product. (Do not use the opposite direction.)



- In-line filters use plastic parts, so the installation cannot apply a bending moment or torsional moment. Doing so could damage the product.
- Mounting orientation is can be varied, but do not subject the main unit directly to strong impact or vibration.
- Install optional mounting brackets (2 pc) on both sides to secure the product.

Bracket installation procedure

- Slot the mounting brackets into the mounting grooves (see image below) on the cover.



- Tighten M4 screws into the 4 mounting holes of the mounting brackets to install them securely. Refer to the dimension diagrams on page 16 for the installation dimensions of mounting brackets.

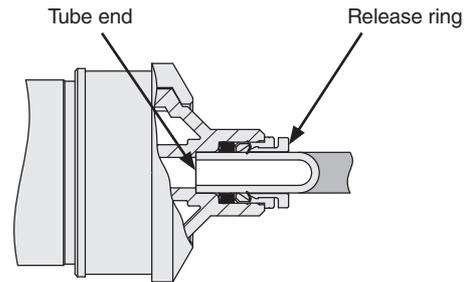
- Assure there is sufficient space for maintenance inspections and replacing elements.



If you do not ensure enough space to remove the mounting bracket and cover, you cannot replace the element.

- Attaching and detaching tubes
Precautions for attaching tubes

- Confirm that the cut surface of the tube is cut straight across, that the outer surface of the tube is not damaged, and that the tube has not become oval shaped.
- When connecting tubes, if you do not insert the tube all the way to the tube end, it may result in leaks.



- After installing the tube, pull on it to check that it does not come off.

- Precautions for removing tubes

- Before removing tubing, be sure to confirm that the pressure inside the tubing is zero (atmospheric pressure).
- Uniformly press the release ring inwards as far as it goes and then pull out the tubing. If you do not fully press in the release ring, the tube may not come out, or the tubing may become scratched causing debris to be left inside the fitting.

Recommended usable tubes

Use of Koganei urethane tubes is recommended. Use tubing with outside diameter precision within ± 0.15 mm [0.006 in] (nominal) and with ovality (difference between major axis and minor axis) within 0.2 mm [0.008 in].



- Use tubing with an exterior that is not damaged. If tubing becomes damaged after repeated use, cut off the damaged portion.
- Do not allow tubing to become severely bent or twisted near the connection to a fitting. Such a condition creates the risk of air leakage. The table below shows minimum bending radius for urethane tubing.
- Do not use extremely soft tubing, which causes a severe drop in pull-out strength.

Tube size	Minimum bending radius	mm [in.]
ϕ 8 [0.315]	20 [0.787]	
ϕ 10 [0.394]	27 [1.063]	

Handling Instructions and Precautions (PLF Series)

■ Element replacement

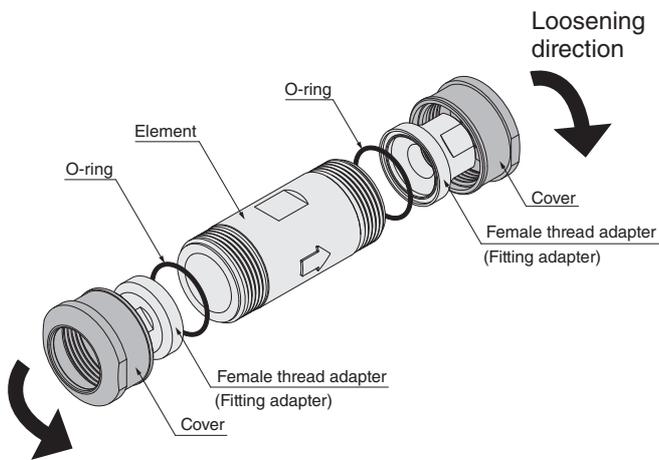
Replace the PLF600 according to the following procedure.

1. Stop operations

- Stop operations and then confirm that the pressure inside the filter is zero (atmospheric pressure).
- If brackets are installed, remove the mounting brackets from the in-line filter.

2. Remove the element

- Rotate the cover counterclockwise and remove it from the element. If the cover is difficult to remove, use a wrench or something across the two flat places on the element to rotate it. When doing this, be careful not to damage the element. Remove the opposite side in the same way.
- Remove the O-ring from the female thread adapter (fitting adapter).
- Use an air blower to remove dust, etc. that has collected on the female thread adapter (fitting adapter) and cover.



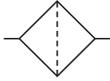
3. Installing the element

- Assemble the replacement O-ring to the groove on the female thread adapter (fitting adapter).
- Put the female thread adapter (fitting adapter) through the cover, and then install the cover to the element. To tighten the cover, tighten it by hand without using a tool. There is a possibility of causing damage to the plastic parts if you use a tool and over tighten them, so do not use excessive force when tightening. (Tightening torque guidelines: 1.5 to 2 N·m [13.277 to 17.702 in·lbf])
- Be careful that you do not touch the hollow fiber membrane inside the element. Doing so could reduce performance or damage the hollow fiber membrane.
- Do the opposite side with the same procedure.

Clean Line Filters

CLF Series

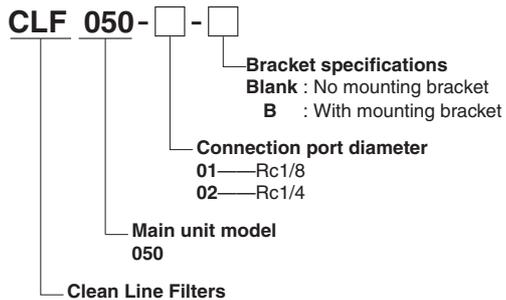
Symbols



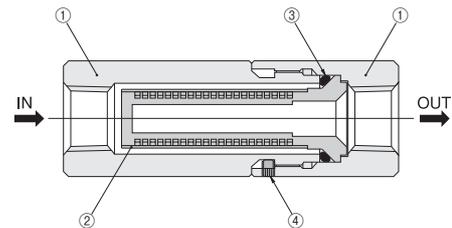
Specifications

Item	Model	CLF050-01	CLF050-02
Medium		Air, N ₂ , Ar, He, O ₂ , CO ₂	
Connection port diameter	Rc	1/8	1/4
Operating temperature range	°C [°F]	80 [176] (MAX.)	
Particle filtering efficiency	%	100% (0.01μm)	
Filtration rating	μm	0.01	
Filtration area	cm ² [in ²]	10 [1.550] or more	
Maximum operating pressure	MPa [psi]	1.0 [145]	
Proof pressure	MPa [psi]	1.5 [218]	
Element differential pressure	MPa [psi]	0.5 [73]	
Element reverse tolerance differential pressure	MPa [psi]	0.07 [10]	
Element structure		Dual-layer structure with PTFE membrane and PTFE non-woven fabric	
Weight	g [oz]	135 [4.76]	
Production method		Entirely produced in class10000 clean room	

Order Codes



Inner Construction and Parts Names and Major Materials



Additional Parts (sold separately)

Replacement elements (with O-ring)



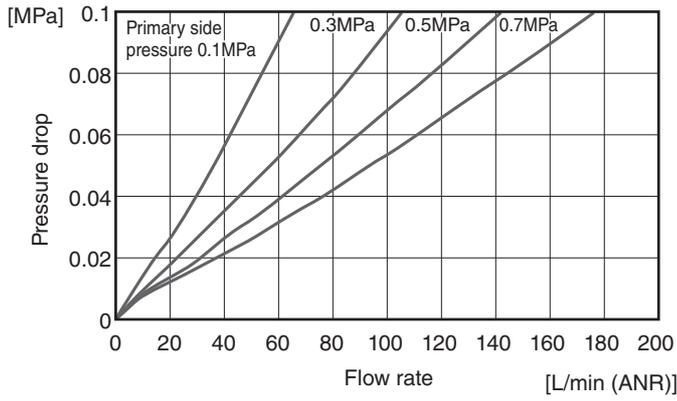
Mounting bracket



No.	Name	Material
①	Main unit (housing)	SUS316 (outer and inner surfaces electro polished)
②	Element (membrane, non-woven fabric)	Housing: PFA, element: PTFE
③	O-ring (seal)	FPM
④	Lock screw (M3×0.5)	SUS304
—	Mounting bracket	SUS304

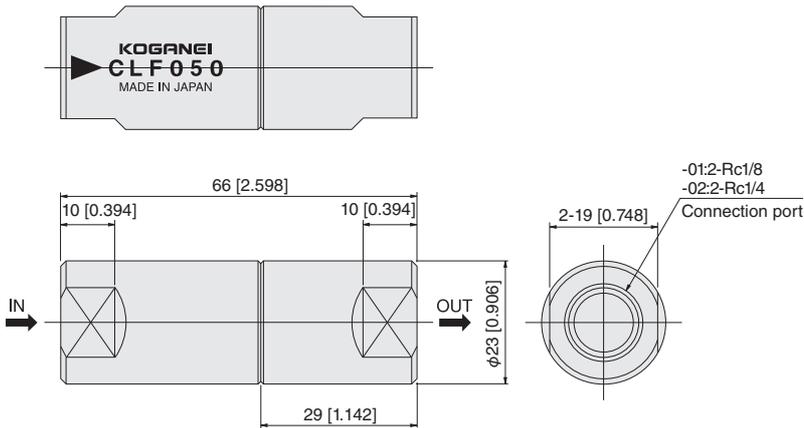
Flow rate characteristics

1 MPa = 145 psi
 1 l/min (ANR) = 0.03532 ft³/min



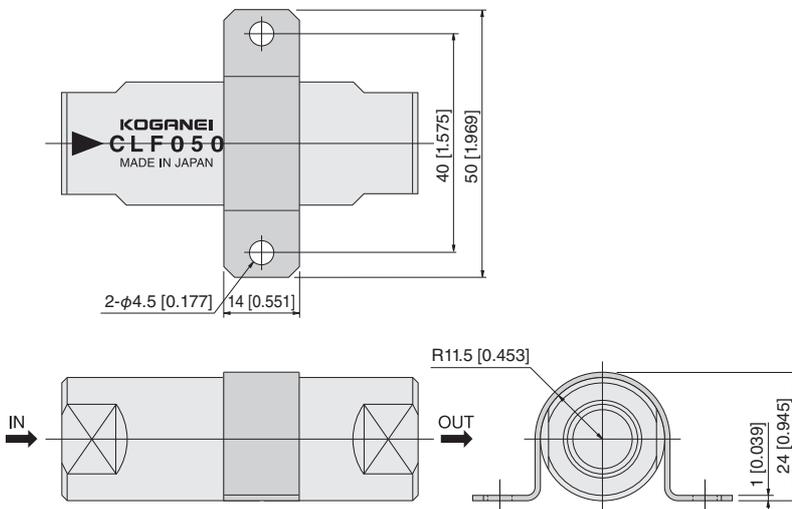
Dimensions (mm [in.])

CLF050-□



Options

-B: Mounting bracket



Handling Instructions and Precautions (CLF Series)



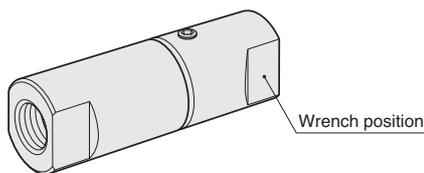
Mounting and Piping

Opening the packaging

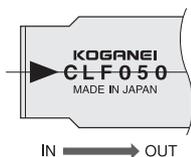
The filters and replacement elements are clean packed in double packaging in a clean room, so when you open the package, we recommend opening it in a clean room or in a clean environment.

Installation

Piping work is done by placing a wrench across the flat parts of a main unit that has piping threads, and preventing the main unit from rotating.



Do piping so the air flows in the direction of the arrow shown on the main unit. (Refer to the diagram below)



Use the optional mounting brackets when installing the product.

Flushing

The products are cleaned with clean air before shipping, however, micro-particles could be generated by the effect of vibrations during transportation.

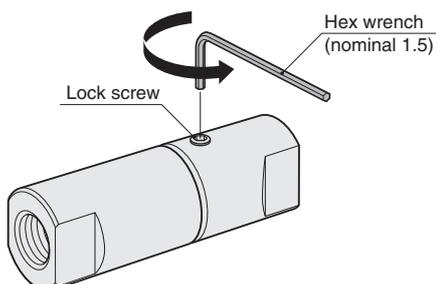
Before initial use and when replacing elements, flush (blow out with clean air) the inside of the pipes.

Element replacement

To replace an element, remove the main unit from the pipe fittings. The elements come with an O-ring, so replace them and the O-ring together.

When replacing elements, do not touch the element or the inside of the main unit with your bare hands. We recommend wearing dust-proof gloves while replacing elements.

The main units have a break-down system that is tightened using screws, and a lock screw is tightened to secure them, so before loosening the screws on the main unit, first loosen the lock screw. Also, after installing the main unit, be sure to tighten the lock screw.



Main unit tightening torque: 3.92 N·m [34.696 in·lbf]
 Lock screw tightening torque: 0.39 N·m [3.452 in·lbf]

Medium

General-purpose gases are the intended medium for the product. (General purpose gases are noted in the specifications.)

Note that other gases cannot be used.

●Usable medium

Of general purpose gases, gases used as carrier gases in particular, can be used.

Nitrogen (N₂), argon (Ar), helium(He), Oxygen(O₂), carbon dioxide (CO₂)

●Unusable medium

Note that the specialized gases, which are used in processing lines, that are listed below cannot be used.

CVD and epitaxial gases

Mono-silane (SiH₄), dichlorosilane (SiH₂Cl₂), phosphine (PH₃), diborane (B₂H₆), amonia (NH₃), tungsten hexafluoride (WF₆), hydrogen chloride (HCl)

Gases for ion implantation

Arsine (AsH₃), boron trifluoride (BF₃)

Etching gases

Boron trichloride (BCl₃), carbon tetrafluoride (CF₄), Nitrogen trifluoride (NF₃)



General precautions

1. Use a medium that is within the specified range for a medium. Do not use any other medium.
2. Avoid use in locations where the ambient temperature exceeds the operating temperature range.
3. Avoid uses that exceed the maximum operating pressure.
4. Do not allow excessive external forces to act on the product.
5. Do not directly expose the product to ultraviolet light or wind and rain.

Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

Limitations

- This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.

- KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.

- This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.

- Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.

- This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

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