Clean filter and regulator

■ Components for air preparation and pressure adjustment / F.R.L. unit

CONTENTS

* An oil-prohibition regulator is also available.
Refer to page 474 on oil-prohibition type/modular type.

Safety precautions

Always read this section before starting use.
Refer to Intro 67 for general precautions, and to "⚠Safety Precautions" in this section for details on each series.

Clean filter / clean exhaust filter / clean regulator Series

Design & Selection

1. Common

⚠WARNING

■ Use this product in accordance with the specifications range.

■ This product is for industrial use. Must not be used in components or circuits for medical equipment or components that involve human lives.

2. FCS Series

⚠WARNING

■ Do not use this product in an atmosphere containing organic solvents or chemicals, etc., or where the product could come in contact with them.
Not observing this could damage the polyamide housing.
Use the stainless steel model in these environments.

⚠CAUTION

■ Check applicable circuit and working fluid.

To prevent drop in filter performance, install dryer, air filter and oil mist filter on the primary side, and remove water or oil.

■ Do not exceed maximum working or differential pressure.

Not observing this could damage the product or element membrane.

■ Do not flow over the maximum flow rate.

Not observing this could damage the product or element membrane.

■ This device cannot be used as an absolute filter.

FCS500 filtration is 99.99% within specified conditions.

■ Do not use where the in and out pressure difference exceeds 0.1 MPa.

Supplying air suddenly to the filter by blowing air with secondary side released to atmospheric pressure, etc., could make removal inefficient. Install a restriction valve on the filter's in side to make the pressure difference 0.1 MPa or less.

3. FAC Series

⚠WARNING

■ Piping load torque

If load or torque is applied to the body and piping when connecting pipes, piping part may be damaged, so use within required torque.
Do not apply the lateral load for FAC10.

	FAC100	FAC200	FAC3000
Max. torque N·m	15	50	50

⚠CAUTION

■ Check applicable circuit and working fluid.

Install dryer, air filter and oil mist filter on the pneumatic pressure source side, and remove water and oil.

■ Water droplets cannot be removed.

The hydrophobic element membrane does not circulate nonpressurized water. When pressurized, water flows to the discharge side.

■ Use the product within maximum working pressure and working temperature range.

If any sources of heat are present near devices, check that the product's working temperature range is not exceeded. Not observing this could damage the product or element membrane.

■ Do not flow over the maximum flow rate.

Calculate the treating flow rate of solenoid valve and actuator, and select the model with the flow rate less than maximum flow rate. Circulating air exceeding the maximum flow could reduce the cleanness of exhaust air cold and damage the element membrane.

■ Install where the device is not adversely affected by flying dust.

■ Do not installing where exhaust air blows directly onto the workpiece, etc.

Contact CKD when using this device for filtering.

■ The solenoid valve could malfunction due to reverse flow when common piping, etc., is used. Install a check valve, etc., to prevent reverse flow.

Check the relationship of flow and primary pressure in the Flow Properties Table in the catalog and select the range and circuit so operation is not adversely affected even if primary pressure flow is reverse.

■ Do not use where pressure injected to the clean exhaust filter exceeds 0.1 MPa.

Compressed air higher than 0.1 MPa flowing to the clean exhaust filter could make removal less efficient.

4. RC2000/2619

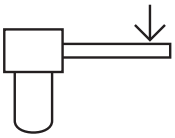
⚠WARNING

■ Output pressure exceeding the regulator's set pressure could damage secondary-side devices or cause operation faults. Be sure to install a safety device.

■ If the regulator cannot be used with the secondary side sealed circuit or balance circuit, contact CKD.

■ Piping load torque
Check that the piping load or torque is not applied to the body or piping sections.

	Rc1/8,Rc1/4	Rc3/8,Rc1/2,Rc3/4	Rc1 and over
Max. torque N·m	15	50	100



⚠CAUTION

■ Check applicable circuit and working fluid.
Circulating fluids containing solids or nonspecified fluids could cause malfunctions. Connect a filter to the product's primary side to prevent solid matter from entering.

■ The line could vibrate depending on working and piping conditions.
Lower primary pressure if pulsation occurs.

■ Secondary pressure flows to the primary side when primary pressure is released.
Secondary fluids flowing to the primary side could cause other devices to malfunction. Provide a circuit that maintains pressure.

■ Set the regulator's secondary pressure to 85% or less that of the primary side or pressure could drop further.

Installation & Adjustment

1. Common

⚠CAUTION

■ Open the package in a cleanroom.
The product is packaged in a cleanroom, and should be opened just before piping in the cleanroom.

■ Install the product avoiding direct sun lay.

■ Flush and wash pipes to be used.
Dirt or foreign materials in piping will lower product performance.

■ Check that foreign materials do not enter when tightening pipes or joints.
When screwing in piping or joints, check that swarf from piping threads or sealing agent does not get inside. Dirt or foreign materials in piping will lower product performance.

■ Check the flow direction by arrow and connect correctly.
The RC2000 does not operate correctly if installed in reverse.
With the FCS Series/FAC Series, life is shortened.

■ Securing of maintenance space
Secure sufficient space for maintenance and inspection.

■ Avoid installing where with vibration or impact.

■ When drainage levels are high
Install the air dryer and drain separator before the air filter. Use of hot humid air causes excessive drainage from the compressor and may shorten component life or cause corrosion.

■ Using a water-lubrication compressor circuit
Take measures to prevent chlorine-based substances from entering the compressed air.

2. FCS Series

⚠CAUTION

■ Pipe so no excessive force is applied to the product.
When piping or installing, do not apply tension, pressure, bending or external force by tube, etc.

■ Select correct piping tube.
Use the CKD soft nylon tube and the urethane tube.
Consult with CKD for other fluorine resin tube, etc.

■ Securely insert piping into the push-in joint before use.

■ Use the connection's width across flats when piping.
When connecting the R thread or Rc thread piping, place a wrench across the connection's width across flats, then piping. Do not fix the connection at other places.

■ When piping, tighten with correct torque.

Port thread	Tightening torque N·m
M5	1 to 1.5
Rc1/8, R1/8	3 to 5
Rc1/4, R1/4	6 to 8
Rc3/8, R3/8	13 to 15

Installation & Adjustment

⚠CAUTION

■ When supplying compressed air for the first time after connecting pipes, do not apply high pressure suddenly.

Connected piping could be dislocated and tubing could fly off.

■ When using male thread piping for both in and out sides, check that piping does not cause lateral load or bending torque during installation.

Not doing so could cause leaking.

3. FAC Series

⚠CAUTION

■ Do not apply excessive force to the product when are connecting port.

When piping, do not apply tension, pressure, bending, other forces by the pipe.

■ Apply adequate torque when connecting pipes. (Below table is torque recommended value)

Port thread	Tightening torque N·m
R1/8	3 to 5
R1/4	6 to 8
R3/8, Rc3/8	13 to 15
R1/2, Rc1/2	16 to 18

■ Tighten the hexagonal face when piping. (FAC100,FAC200)

4. RC2000

⚠CAUTION

■ Open the package in a cleanroom.

This product is packed in a double layer in a cleanroom. Open the first layer and take the product into the cleanroom. Open the second layer just before piping.

■ When the panel mounting nut is loosened, the nut acts as a jack and enables the knob to be removed easily. Install the nut before installing the knob.

5. RC2000/2619

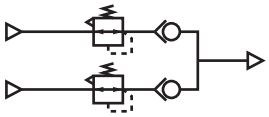
⚠CAUTION

■ Apply adequate torque when connecting pipes. (Right table is torque recommended value)

Port thread	Tightening torque N·m
M5	1.0 to1.5
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15
Rc1/2	16 to18

■ Plug the pressure gauge connection port using the pressure gauge and piping plug.

■ When using regulators in parallel as shown below, do not use the OUT side as a closed circuit. If closed circuit is required, install a check valve on each OUT side.



During Use & Maintenance

1. Common

⚠CAUTION

■ Do not disassemble and modify the products.

■ When maintenance, stop supplying flow and check that no residual pressure remains.

■ Read instructions and precautions enclosed with the product before starting use or maintenance.

■ Keeping

Do not keep in the environment with high temperature, humidity and exceeding specifications. Resin or rubber products may be deteriorated, and resin bowl clouded. Consult with CKD, when keep products exceeding specifications.

2. FCS Series

⚠CAUTION

■ Clogging will decrease performance, so inspection or maintenance, or components regularly. (The FSC500 Series cannot be replaced.)

■ Check the resin for cracks, damage, and other deterioration.

Cracks, damage or other deterioration could result in breakage, so if found, replace with a new product or SUS type.

■ While operating, do to apply vibration, impact, or other external force from tube.

3. FAC Series

⚠WARNING

■ Do not use the product where organic solvent or chemicals, etc., are present in the atmosphere or adhered to the product. Polycarbonate may be damaged.

■ Do not use this product where electrostatic discharge could occur.

■ Do not use this product in an ozone-generating environment.

■ Be sure to securely insert the FAC10 into the pushin joint before use.

⚠CAUTION

■ Clogging will decrease performance, so inspection or maintenance, or components regularly.

4. RC2000/2619

⚠CAUTION

■ Release the lock before pressure adjustment.

Turning a locked pressure adjustment knob could cause damage.

■ Adjust pressure in the direction of pressure increase.

The correct pressure cannot be set if pressure is adjusted downward.

■ Non-relief pressure cannot be reduced unless the secondary side is consuming pressure.

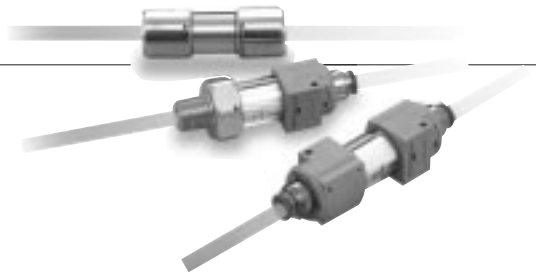
Inline clean filter

FCS 500 1000 Series

Innovating the filter performance with CKD's original hollow fiber membrane.

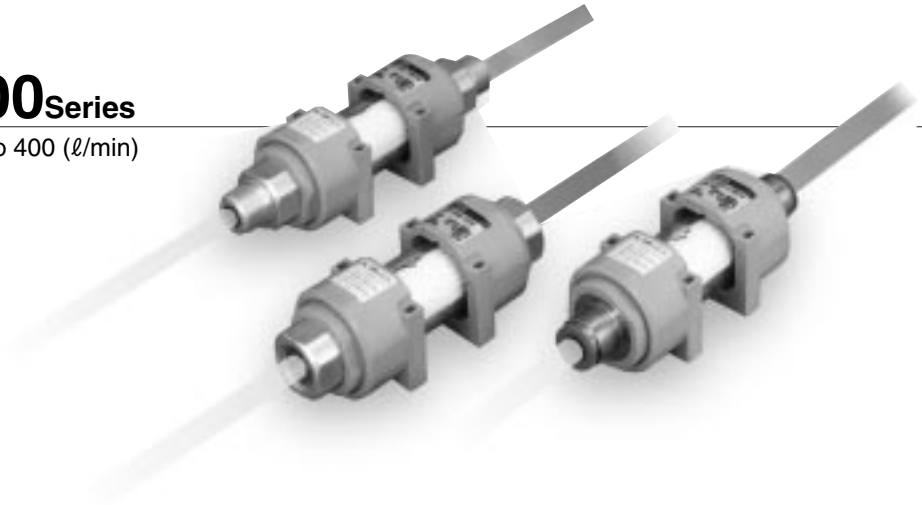
FCS500 Series

■ Flow rate/ 50, 80 (ℓ/min)

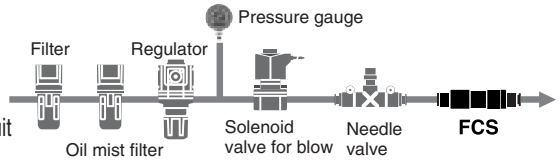


FCS1000 Series

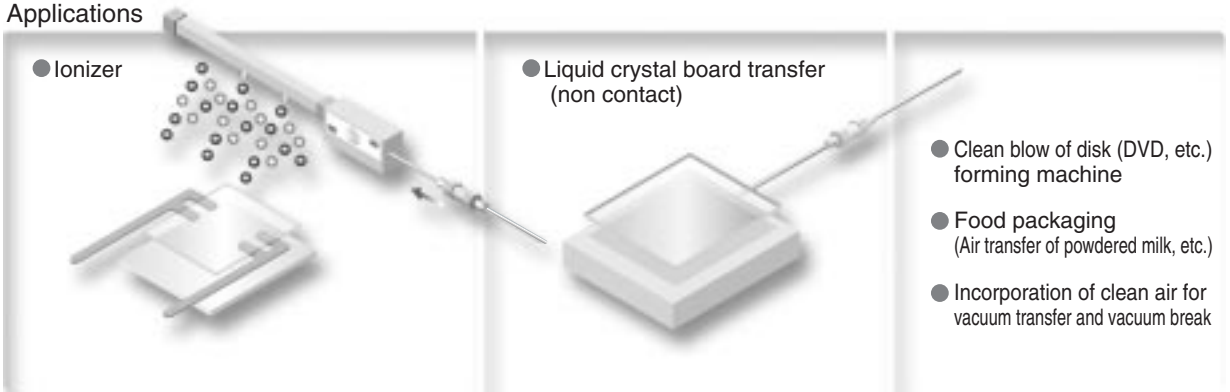
■ Flow rate/ 300 to 400 (ℓ/min)



■ Example of working circuit



Applications



- Ionizer
- Liquid crystal board transfer (non contact)
- Clean blow of disk (DVD, etc.) forming machine
- Food packaging (Air transfer of powdered milk, etc.)
- Incorporation of clean air for vacuum transfer and vacuum break

Extended life

A hollow fiber membrane is incorporated for the filter element.
The inline type clean filter FCS500 and 1000 Series provides a high performance in all aspects covering filtration performance, flow, pressure loss, life and space.
This series is perfect as the final filter for various clean applications.

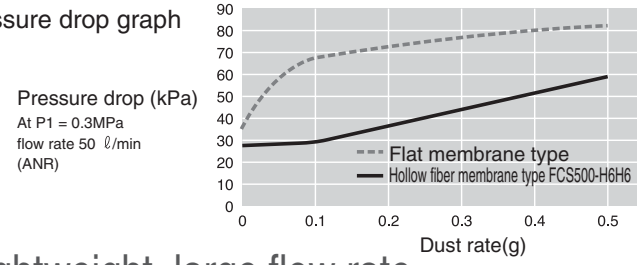
High filtration rate 0.01 μm, filtration efficiency 99.99%

A 0.01 μm filtration accuracy and 99.99% removal efficiency are attained with the hollow fiber membrane element.

Long life

The greatly improved life is approx. 5 times longer than the flat membrane type.

■ Dust rate - pressure drop graph



Compact, lightweight, large flow rate

The filtration area is 3 to 10 times larger than a flat membrane type having the same capacity so the pressure loss is low even at large flow rates.
A compact, light weight filter can be realized even for the same flow rate.

Oil-prohibited specifications

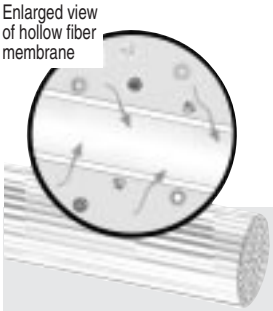
The entire part has been degreased and cleaned. In addition, all steps from assembly to packaging are completed in a clean room.

Easy maintenance

A clear case is adopted for the resin type so the filter contamination can be seen in a glance.

Diverse variations

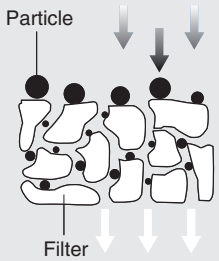
Two series, the 500 and 1000 flow rate made of either resin or stainless steel are available. The push in joint, male threading and female threading are available for mounting.



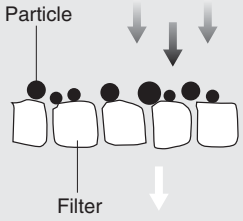
Hollow fiber membrane structure

The hollow fiber membrane is a tubular membrane with a diameter of 3mm or less, and having a multi-porous structure with an infinite number of small holes on the membrane wall. The particles found in the fluid are accurately removed when the fluid passes through this membrane. A hollow fiber membrane module, consisting of a bundle of several dozen of these hollow fiber membranes is incorporated for the filter material. The extremely large membrane area increases the flow rate per unit volume.

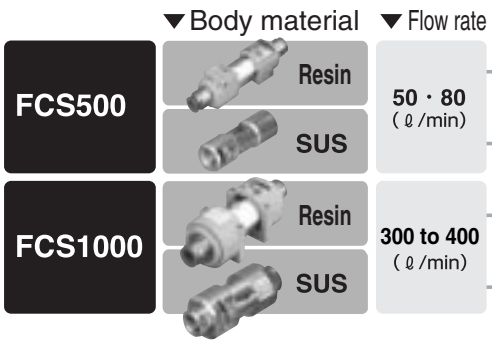
■ Hollow fiber membrane



■ Flat membrane



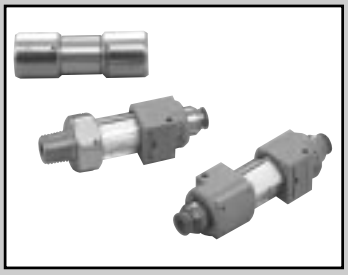
Inline clean filter
FCS Series Variation



▼Port size

Push in					Male thread			Female thread		
φ4	φ6	φ8	φ10	φ12	R1/8	R1/4	R3/8	Rc1/8	Rc1/4	Rc3/8

Read safety precautions to ensure correct, safe product use.



Inline clean filter

FCS500 Series

● Port size: Rc1/8, Rc1/4, R1/8, R1/4
Push-in joint ø4, ø6, ø8

JIS symbol 

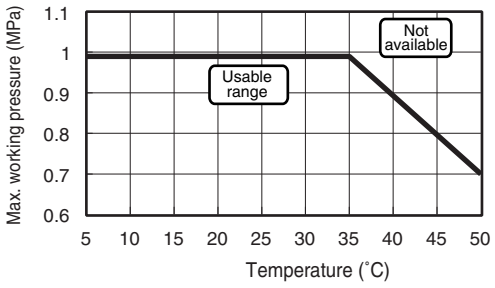
RoHS CAD

Specifications

Descriptions		Standard element resin type	Male thread piping type	P9 element stainless steel type	
		FCS500- (*1) (*2)	FCS500- (*1) (*2)	FCS500-66-P90 FCS500-66-P94	FCS500-88-P90 FCS500-88-P94
Working fluid		Compressed air, N2			
IN side port size (*1)		Select from ø4, ø6, ø8	Select from ø4, ø6, ø8, R1/8, R1/4	Rc1/8	Rc1/4
OUT side port size (*2)				Rc1/8	Rc1/4
Withstanding pressure MPa		1.5	1.5	2.25 (compressed air), 1.5 (N2)	
Differential pressure proof MPa		0.5 (0.2 for 45˚C to 50˚C)	0.5 (0.2 for 45˚C to 50˚C)	0.5	
Working pressure range MPa		-0.095 to 0.99 Note 2	-0.095 to 0.99 Note 2	-0.095 to 1.5 (compressed air), -0.095 to 0.99 (N2)	
Ambient temperature range ˚C		5 to 50	5 to 50	5 to 45	
Filtration rating µm		0.01 (removal ratio 99.99%)			
Treating flow rate ℓ/min. (ANR) Note 1		50 (80 for H8H8 type)	50 (80 for H88A, 8AH8 type)	50	80
Product weight g		45	45	100	100
Material	Body	Polyamide	Polyamide, aluminum (alumite treatment)	Stainless steel	
	Case	Transparent polyamide	Transparent polyamide	Stainless steel	
	Element	Polypropylene + urethane			
Assembly, inspection, package		Integrated production in cleanroom			
Cleaning		Degreasing and cleaning			

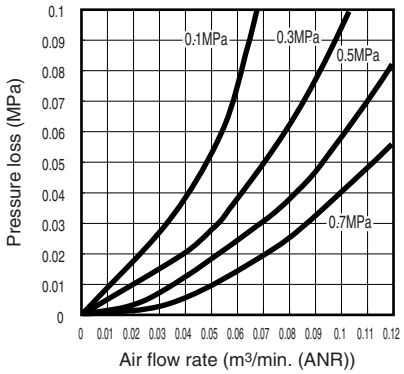
Note 1: Initial flow at primary pressure 0.7 MPa and pressure drop 0.03 MPa.
Note 2: Maximum working pressure varies with working temperature. Check graphs showing the relationship of working temperature and maximum working pressure.

Relationship of working temperature and maximum working pressure for resin elements and male piping

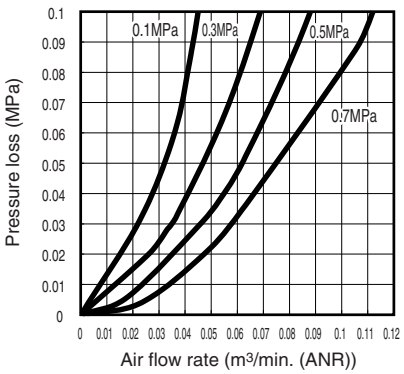


Flow characteristics

●FCS500-H8H8 ●FCS500-H88A ●FCS500-8AH8 ●FCS500-88-P90/P94



●FCS500-H4H4 ●FCS500-H6H6 ●FCS500-H46A
●FCS500-66-P90/P94 (Product including 4 and 6 joints, R1/8 and Rc1/8 connections)



How to order

● Resin type

FCS500 - H4 H4

Model no.
(Clean room specifications)
(Oil-prohibited specifications)

Ⓐ IN side port size

Ⓑ OUT side port size

Ⓐ IN side port size	
H4	ø4
H6	ø6
H8	ø8
6A	R1/8
8A	R1/4

Ⓑ OUT side port size	
H4	ø4
H6	ø6
H8	ø8
6A	R1/8
8A	R1/4

Note 1: Two setscrews (M2.5 x 25) and two flat washers are included with the product. (These are not included when 6A or 8A is selected for the IN or OUT side connection bore size.)
Note 2: When using male thread piping for both IN and OUT sides, confirm that piping does not apply a lateral load or bending torque during installation.

● Stainless steel type

FCS500 - 88 - B - P90

Model no.
(Clean room specifications)
(Oil-prohibited specifications)

Ⓐ Port size

Ⓑ Attached

Ⓒ Clean room specifications

Ⓐ Port size	
66	IN side/OUT side port size Rc1/8
88	IN side/OUT side port size Rc1/4

Ⓑ Attached	
Blank	None
B	Bracket, set screw

Ⓒ Clean room specifications		
	Structure/treatment	Material restriction
P90	Stainless steel material used Oil-prohibited	—
P94	Stainless steel material used Oil-prohibited	Use of copper-, silicon-, or halogen-based materials -- fluorine, chlorine, or bromine -- is not acceptable

Note: " P94 " is custom order.

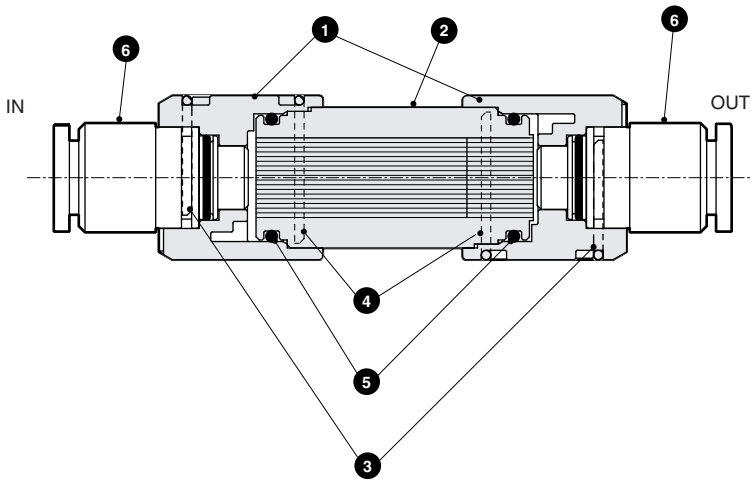
● Discrete bracket model no.

FCS500-B

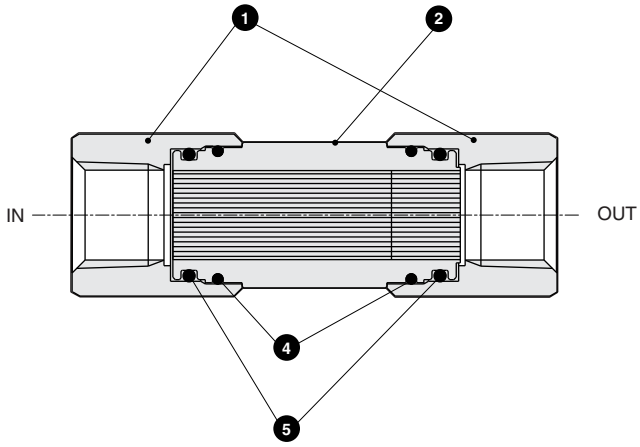
(1 bracket, 2 set screws (M4 x 6))

Internal structure and parts list

● Resin type



● Stainless steel type

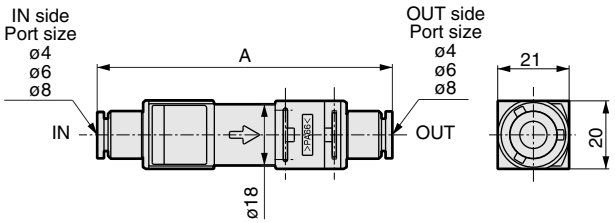


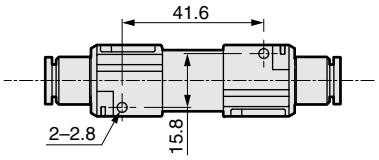
● Part list

No.	Parts name		Standard element resin type	Male thread piping type	P9*element stainless steel type
1	Body		Polyamide	Polyamide Aluminum (alumite treatment)	Stainless steel
2	Element	Housing	Transparent polyamide	Transparent polyamide	Stainless steel
		Filter	Polypropylene	Polypropylene	Polypropylene
		Potting material	Urethane	Urethane	Urethane
3	Pin		Stainless steel		
4	Pin		Stainless steel		
5	O ring		Fluoro rubber		Fluoro rubber (for clean room specifications P90) Hydrogen nitrile rubber (for clean room specifications P94)
6	Cartridge joint		Brass (nickeling) Hydrogen nitrile rubber		–

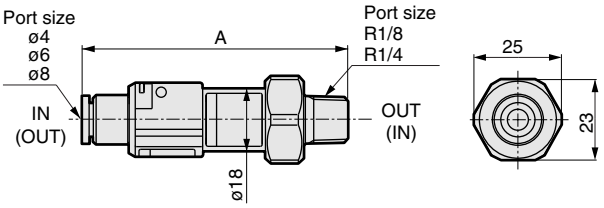
Dimensions

● Resin type
Port size
IN side (cartridge joint) - OUT side (cartridge joint)

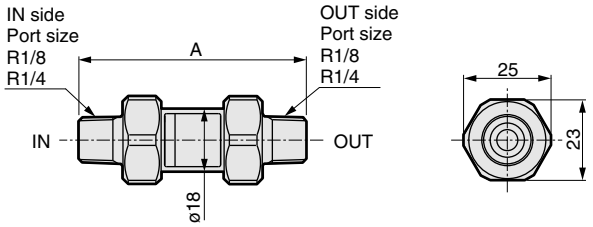




● Male thread piping type
Port size
Cartridge joint-male thread

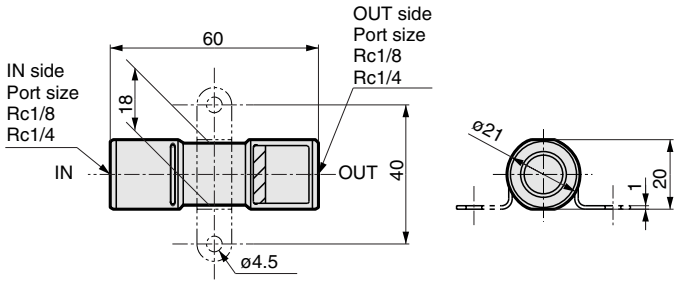


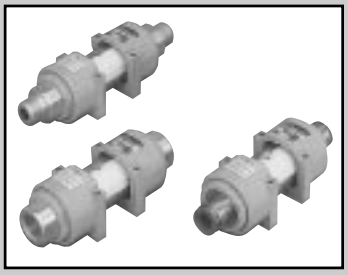
Port size
Male thread - Male thread



Model no.	FCS500 (standard element, resin type/male thread piping type)													
Port size model no	H4H4	H4H6 H6H4	H4H8 H8H4	H46A 6AH4	H48A H86A 6AH8 8AH4	6A6A	6A8A 8A6A	H6H6	H6H8 H8H6	H66A 6AH6	H68A 8AH6	8A8A	8AH8 H88A	H8H8
Dimension A	80.5	83	84	69.5	73	58.5	62	85	86	72	75	65	76	87

● Stainless steel type





Inline clean filter

FCS1000 Series

● Port size: Rc1/4, Rc3/8, R1/4, R3/8
Push-in joint ø8, ø10, ø12

JIS symbol 

RoHS CAD

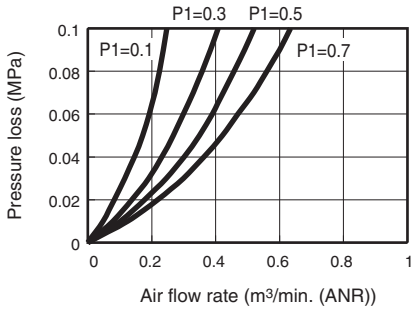
Specifications

Descriptions		Resin type	Stainless steel type (custom order)
		FCS1000- (*1) (*2)	FCS1000- (*1) (*2)-P90 FCS1000- (*1) (*2)-P94
Working fluid		Compressed air, N_2	
IN side port size (*1)		Select from Push-in joint ø8, ø10, ø12, R1/4, R3/8, Rc1/4, Rc3/8	Select from Rc1/4, Rc3/8
OUT side port size (*2)			
Withstanding pressure MPa		1.5	2.25 (compressed air), 1.5 (N_2)
Differential pressure proof MPa		0.5	
Working pressure range MPa		-0.095 to 0.99	-0.095 to 1.5 (compressed air), -0.095 to 0.99 (N_2)
Ambient temperature range ˚C		5 to 45	
Filtration rating µm		0.01 (removal ratio 99.99%)	
Treating flow rate ℓ/min.(ANR)		300 to 400 Note1	
Material	Body	Polyamide	Stainless steel
	Case	Transparent polyamide	Stainless steel
	Element	Polypropylene + urethane	
Assembly, inspection, package		Integrated production in cleanroom	
Cleaning		Degreasing and cleaning	

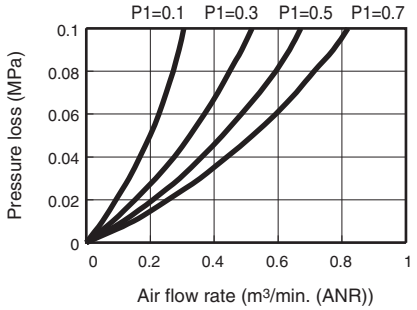
Note 1: Initial flow at primary pressure 0.7 MPa and pressure drop 0.03 MPa. (This varies with the port size.)

Flow characteristics

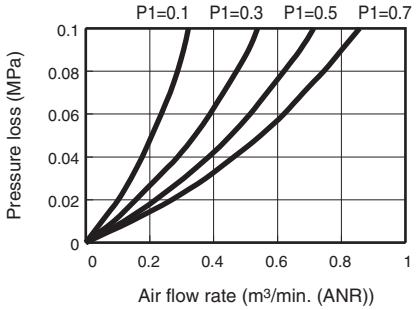
● FCS1000-H8H8
● FCS1000-8A8A



● FCS1000-H10H10
● FCS1000-10A10A
● FCS1000-88
● FCS1000-88-P90/P94



● FCS1000-H12H12
● FCS1000-1010
● FCS1000-1010-P90/P94



How to order

● Resin type

FCS1000 - H8 H8

Model no.
(Clean room specifications)
(Oil-prohibited specifications)

Ⓐ IN side Port size

Ⓑ OUT side Port size

Ⓐ IN side port size	
H8	ø8
H10	ø10
H12	ø12
8A	R1/4
10A	R3/8
8	Rc1/4
10	Rc3/8

Ⓑ OUT side port size	
H8	ø8
H10	ø10
H12	ø12
8A	R1/4
10A	R3/8
8	Rc1/4
10	Rc3/8

Note 1: Two setscrews (M3 x 40), two flat washers, and two spring washers are included with the product.

● Stainless steel type (custom order)

FCS1000 - 8 8 - P90

Model no.
(Clean room specifications)
(Oil-prohibited specifications)

Ⓐ IN side port size

Ⓑ OUT side port size

Ⓒ Clean room specifications

Ⓐ IN side port size	
8	Rc1/4
10	Rc3/8

Ⓑ OUT side port size	
8	Rc1/4
10	Rc3/8

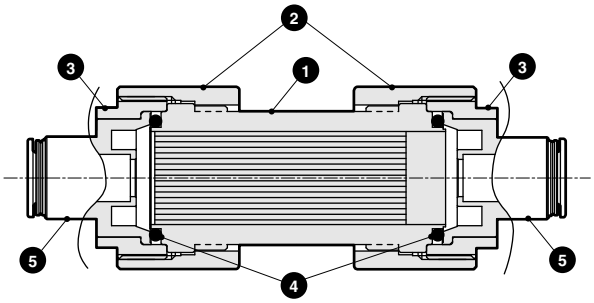
Ⓒ Clean room specifications		
	Structure/treatment	Material restriction
P90	Stainless steel material used Oil-prohibited	—
P94	Stainless steel material used Oil-prohibited	Use of copper-, silicon-, or halogen-based materials -- fluorine, chlorine, or bromine -- is not acceptable

● Discrete model for replacement element (1 element, 2 O-rings)

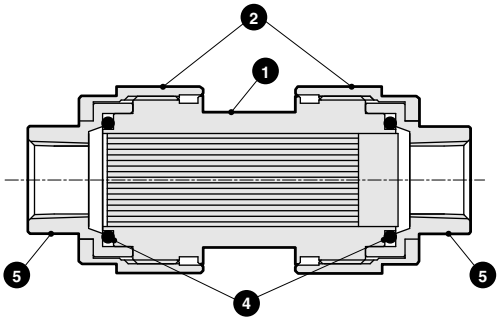
- Resin type: **FCS1000-E**
- Stainless steel type
  - P90: **FCS1000-E-P90** (custom order)
  - P94: **FCS1000-E-P94** (custom order)

Internal structure and parts list

● Resin type



● Stainless steel type

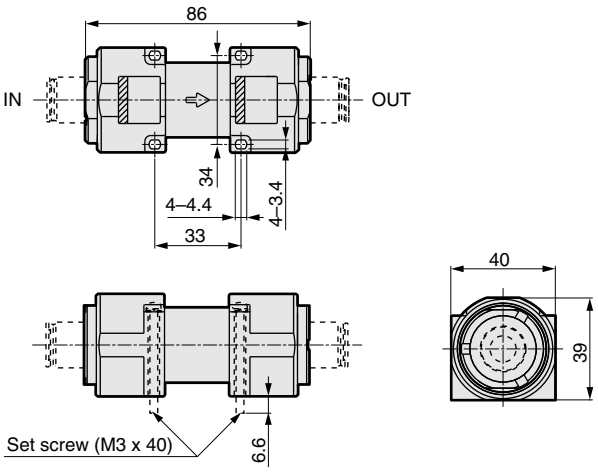


● Part list

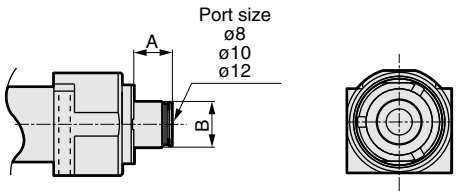
No.	Parts name		Resin type	Stainless steel type
1	Element	Housing	Transparent polyamide	Stainless steel
		Filter	Polypropylene	
		Potting material	Urethane	
2	Body		Polyamide	Stainless steel
3	Plug		Polyamide	–
4	O ring		Fluoro rubber	Fluoro rubber (for clean room specifications P90) Hydrogen nitrile rubber (for clean room specifications P94)
5	Cartridge joint (Port size ø8, ø10, ø12)		Brass (nickeling) Hydrogen nitrile rubber	–
	Adaptor (Port size Rc1/4, Rc3/8, R1/4, R3/8)		Aluminum (Alumite treatment)	Stainless steel

Dimensions

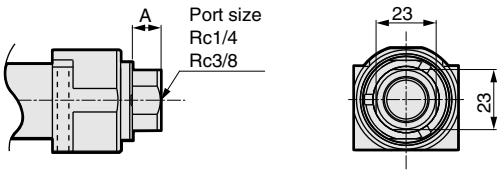
● Resin type



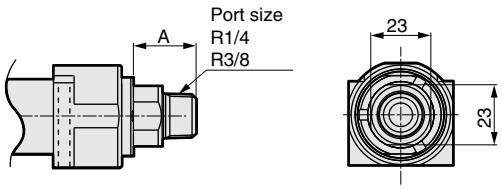
• Push-in joint (ø8, ø10, ø12)



• Rc thread (R1/4, R3/8)

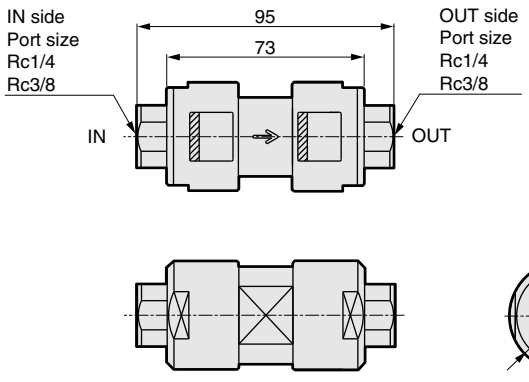


• Rc thread (R1/4, R3/8)



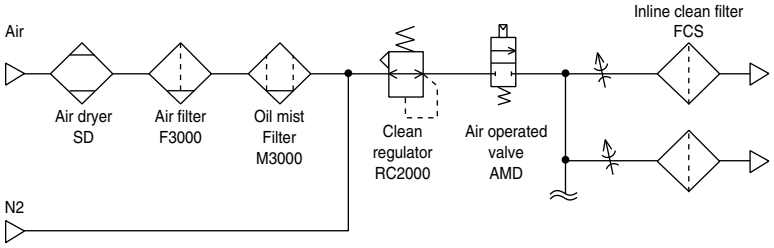
Connection model no.	Port size	A	B
H8	ø8 push-in joint	12	ø17.5
H10	ø10 push-in joint	14.5	ø17.5
H12	ø12 push-in joint	16	ø19.5
8A	R1/4	24	–
10A	R3/8	24	–
8	Rc1/4	11	–
10	Rc3/8	11	–

● Stainless steel type

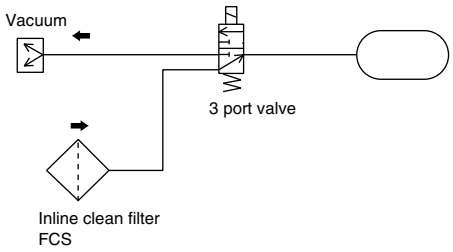


Applications and example of applicable circuit

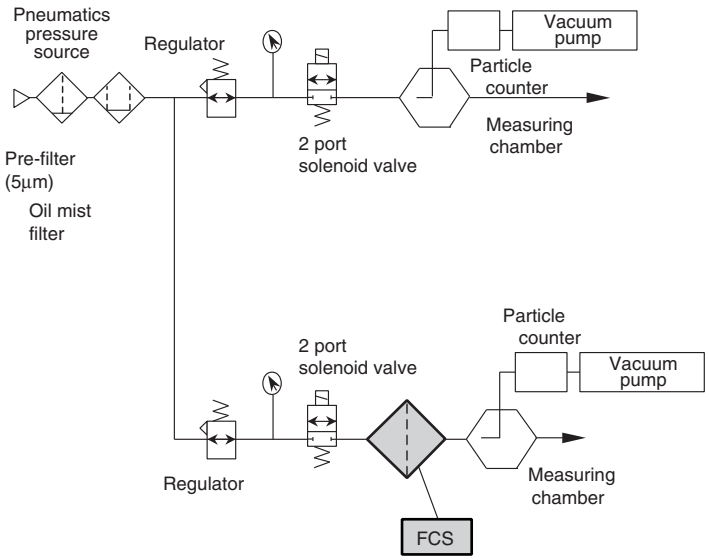
● Application 1: Use as a precision filtration blow filter to filter out air and N2 gas and provide clean air.



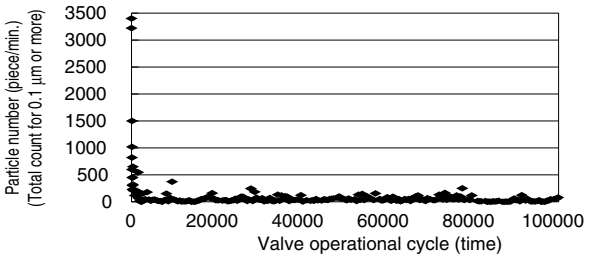
● Application 2: Use a vacuum break filter to blow in vacuum break circuit and provide clean air.



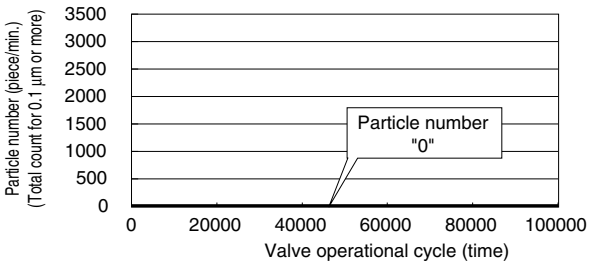
Particle generation data



■ Particle generation is detected from the regulator and 2-port solenoid valve, etc.



■ Particles generated at the regulator and 2-port solenoid valve, etc., are removed by FCS



Custom

These products are available as customized parts. Contact the CKD Sales Office for details.

FCS500 connection section integrated type

■ This integrated connection having no sealed members is ideal for leakage testers.
■ Flow : 10 ℓ/min. (ANR) *1
■ Port size : R1/8

FCS500 large flow rate type

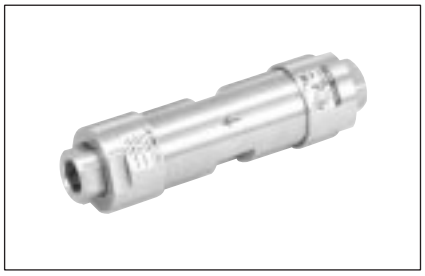
■ FCS500 Series increased flow rate specifications
■ Flow : 100 to 120 ℓ/min. (ANR) *1
■ Port size : ø6, ø8 push-in joint, R1/8, R1/4

FCS500 L type joint type

■ L-type push-in joint saves space during piping
■ Flow : 50 to 80 ℓ/min. (ANR) *1
■ Port size : ø4, ø6, ø8L type push-in joint

FCS1000 stainless steel large flow rate type

■ Flow : 450 ℓ/min. (ANR) *1
■ Port size : Rc1/4, Rc3/8



*1: Initial flow at primary pressure 0.7 MPa and pressure drop 0.03 MPa.
Consult with CKD for other piping methods or port sizes.

FCS large flow rate large bore size type

■ Flow : 2000 ℓ/min. (ANR) and over *2
■ Port size : Rc1
■ Body material : Aluminum (alumite treatment)

*2: Initial flow at primary pressure 0.7 MPa and pressure drop 0.03 MPa.
Consult with CKD for other flows or port sizes.

FAC Series

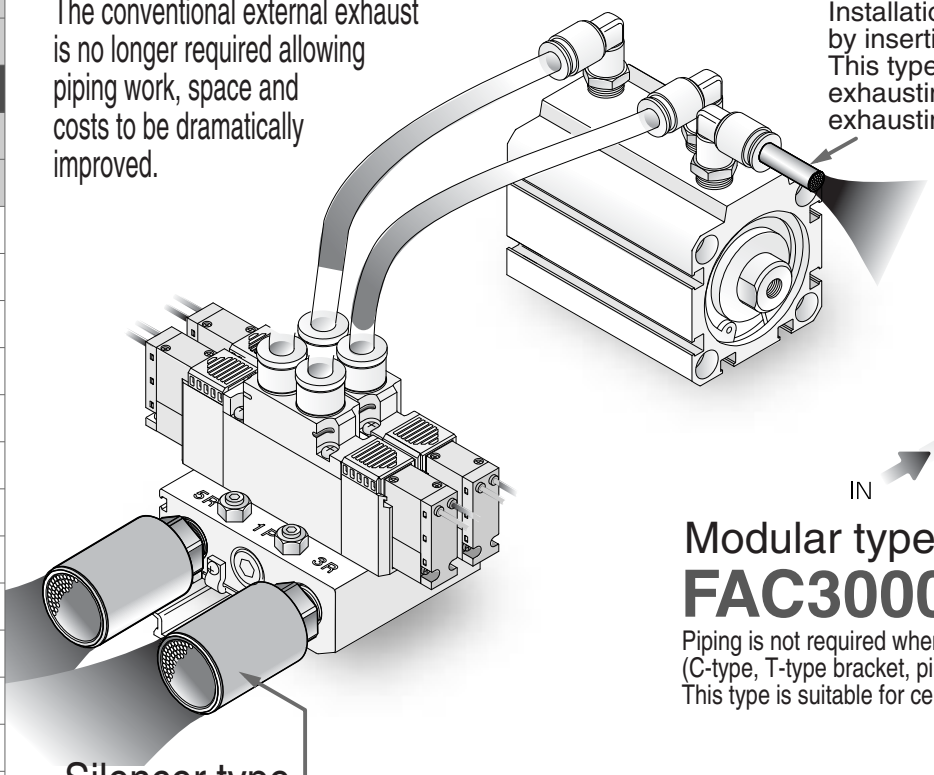
● Port size: ø4, ø6, ø8, ø10, Rc1/8, R1/4, R3/8
R1/2, Rc3/8, Rc1/2

Directly exhaust in clean rooms.

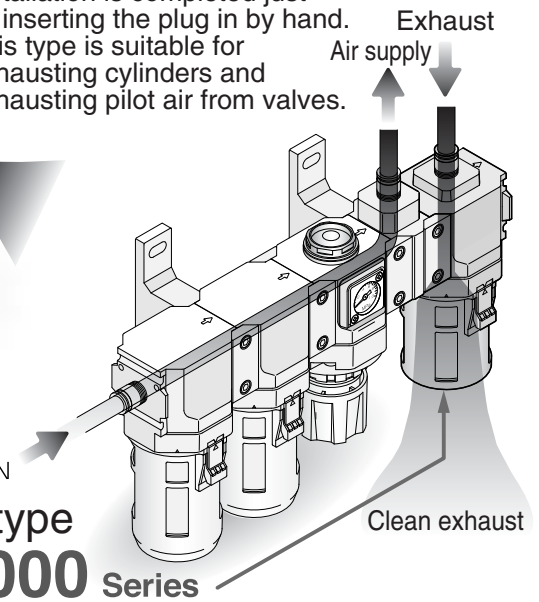
The innovative clean exhaust filter FAC Series allows the exhaust air in the pneumatic circuit to be cleaned to a high precision with the newly incorporated hollow fiber membrane structure. Direct exhausting is possible just by mounting this filter onto the exhaust port of devices in a Class 10 or less clean room. The conventional external exhaust is no longer required allowing piping work, space and costs to be dramatically improved.

Plug type
FAC10 Series

Installation is completed just by inserting the plug in by hand. This type is suitable for exhausting cylinders and exhausting pilot air from valves.



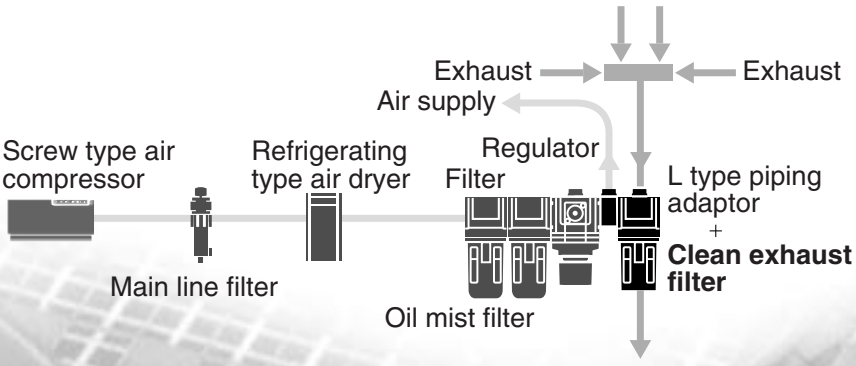
Modular type
FAC3000 Series



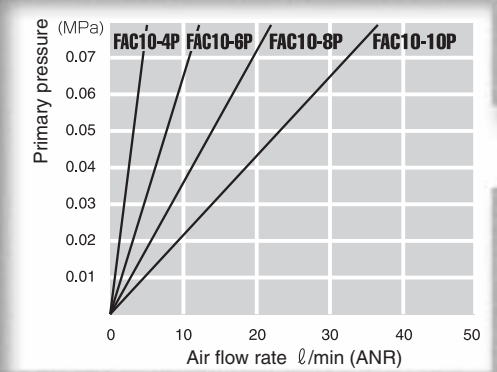
Piping is not required when this type is connected to other modular devices (C-type, T-type bracket, piping adaptor, distributor, etc.).
This type is suitable for central exhaust and large flow rate exhausting.

Silencer type
FAC100·200 Series

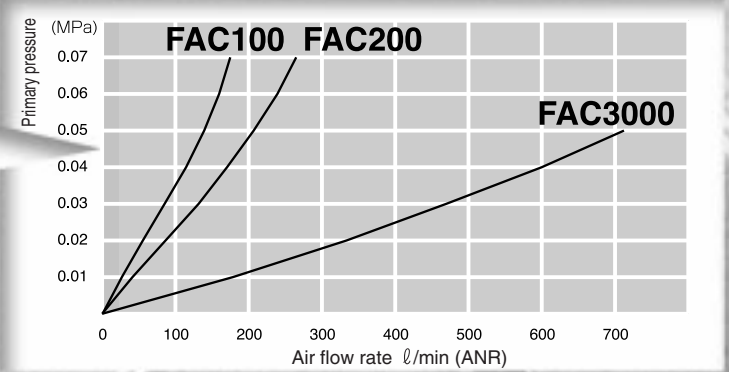
This male thread type is provided with a silencer function, and can be directly installed on the valve's R port.



Flow characteristics／FAC10



Flow characteristics／FAC100・FAC200・FAC3000



Revolutionary exhaust system for clean rooms

Precise filtration

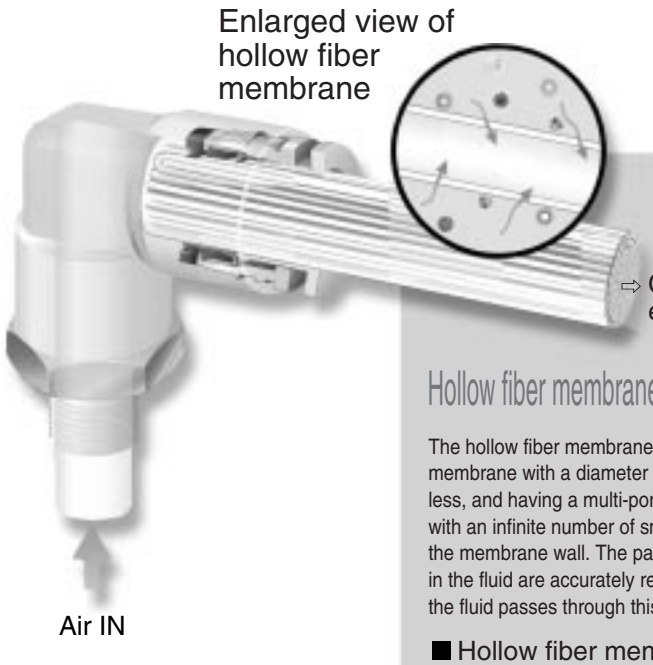
0.01 μm filtration, 99.99% removal efficiency

High secondary cleanliness

100% of 0.1 μm and larger particles are removed
* Measurement conditions: 28.3 R/min (ANR) flow rate

Cost reducing and space saving

The work, costs and space required for conventional external exhaust piping are eliminated.



Simplified piping

All external exhaust piping can be eliminated by mounting the plug type on the cylinder and the silencer type on the switching valve, thereby simplifying the piping.

Silencer function

The exhaust noise can be suppressed to 60dB (A) or less.

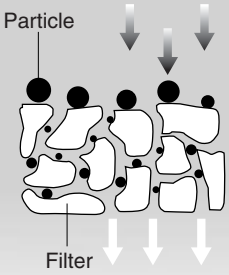
Ample variations

Three styles, the plug type, silencer type and modular type, as well as four flow rate series, 4 to 35, 100, 200 and 600 ℓ/min (ANR) are available.

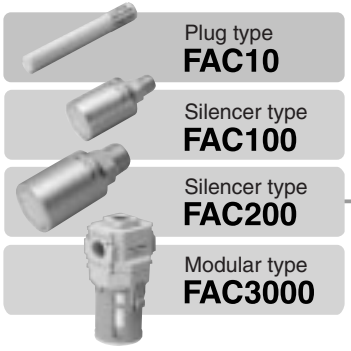
Hollow fiber membrane structure

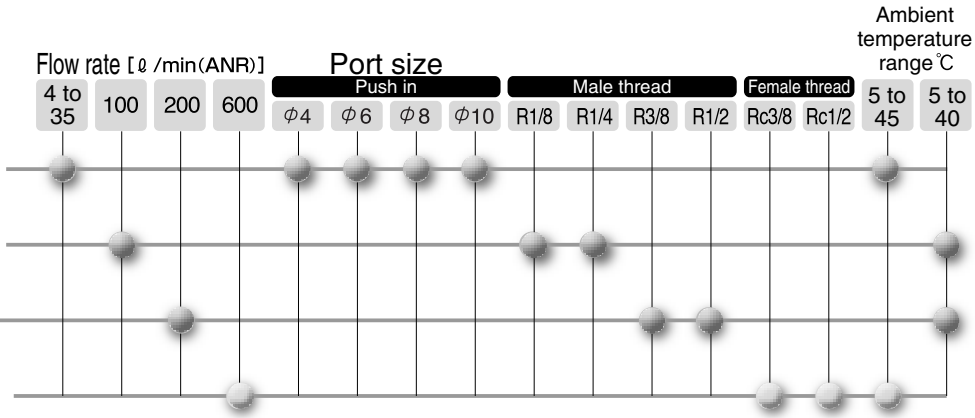
The hollow fiber membrane is a tubular membrane with a diameter of 3mm or less, and having a multi-porous structure with an infinite number of small holes on the membrane wall. The particles found in the fluid are accurately removed when the fluid passes through this membrane.

■ Hollow fiber membrane



Clean exhaust filter
FAC Series Variation





Precautions for selecting model

This is a high precision filtration type, so the flow rate is lower than the normal silencer and cleaner. Refer to each specification for details.

Read safety precautions to ensure correct, safe product use.

Clean exhaust filter

FAC10 Series

● Port size: ø4, ø6, ø8, ø10

RoHS CAD

Specifications

Model no.	FAC10-4P	FAC10-6P	FAC10-8P	FAC10-10P
Working fluid	Compressed air			
Max. working pressure MPa	0.1			
Min. working pressure MPa	0			
Withstanding pressure MPa	0.3			
Ambient temperature range ˚C	5 to 45			
Port size	ø4	ø6	ø8	ø10
Product weight g	2			3
Filtration rating µm	0.01 (removal ratio 99.99% and over)			
High secondary cleanness	100% of 0.1 µm and larger particles are removed Note 1			
Maximum flow rate ℓ/min.(ANR)	4	10	20	35

Note 1: Maximum flow for measurement, or 28.3 ℓ/min. (ANR) when the maximum flow is 28.3 ℓ/min. (ANR) or more

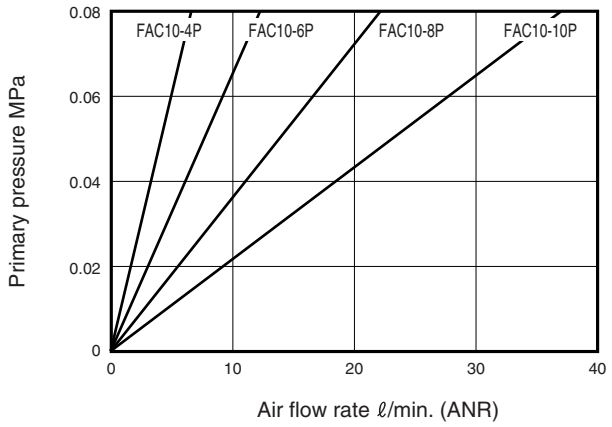
How to order

FAC10 - **4P**

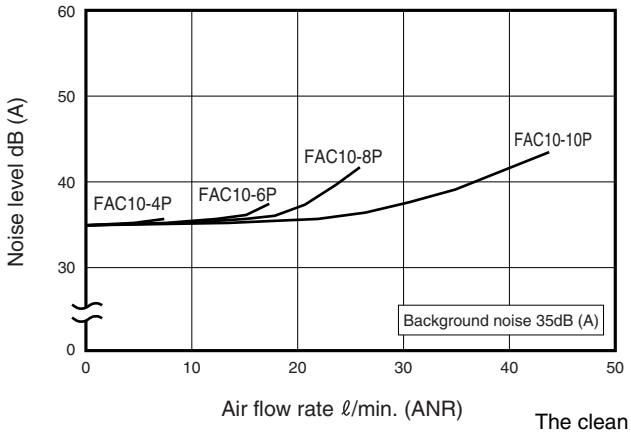
Ⓑ Port size

Symbol	Descriptions
Ⓑ **Port size**	
4P	ø4
6P	ø6
8P	ø8
10P	ø10

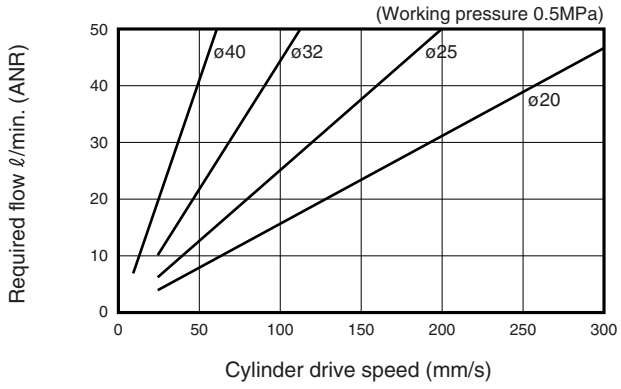
Flow characteristics



Noise level



Selection guide



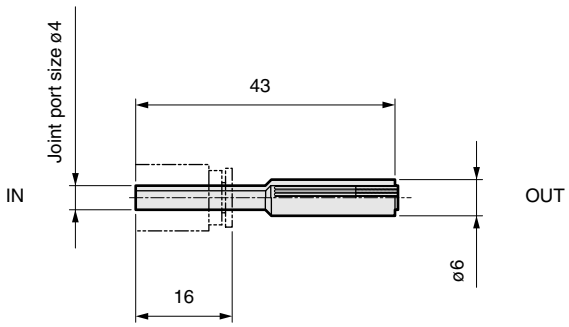
The clean exhaust filter model is selected based on the working circuit's required flow.

(1) Calculate the required flow for the actuator being used.
(2) Multiply the calculated required flow by 1.4.
(3) Select a model having a flow exceeding the required flow multiplied by 1.4.

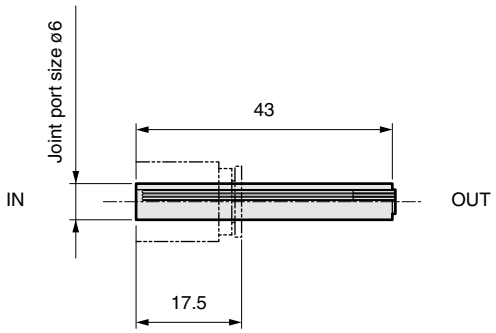
The above graphs show the required flow multiplied by 1.4 for each air cylinder size.
Use this diagram to select a model.

Internal structure and parts list / Dimensions

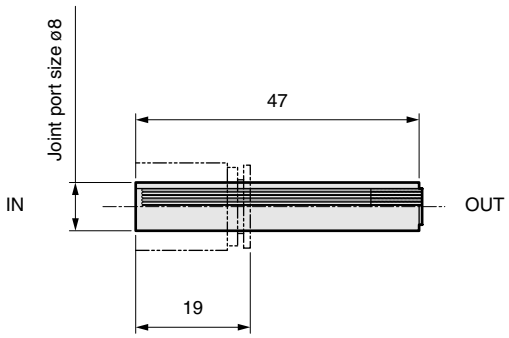
● FAC10-4P



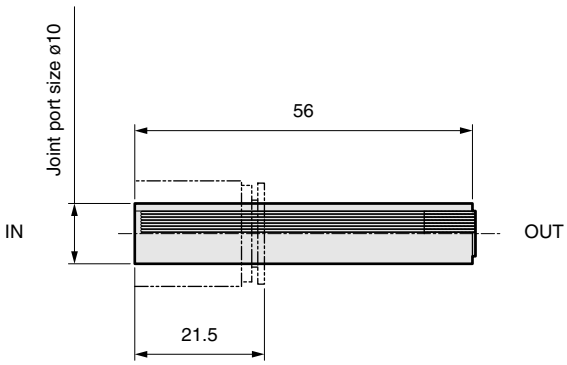
● FAC10-6P



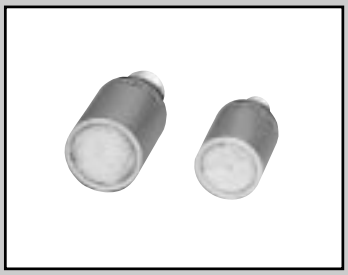
● FAC10-8P



● FAC10-10P



No.	Parts name		Material
1	Body	Housing	Polyamide
		Filter	Polypropylene
		Potting material	Urethane



Clean exhaust filter

FAC100/FAC200 Series

● Port size: R1/8,R1/4,R3/8,R1/2

RoHS CAD

Specifications

Model no.		FAC100	FAC200
Working fluid		Compressed air	
Max. working pressure	MPa	0.1	
Min. working pressure	MPa	0	
Withstanding pressure	MPa	0.3	
Ambient temperature range	˚C	5 to 40	
Port size		R1/8, R1/4	R3/8, R1/2
Product weight	g	65	85
Filtration rating	µm	0.01 (removal ratio 99.99% and over)	
		100% of 0.1 µm and larger particles are removed Note 1	
Maximum flow rate	ℓ/min.(ANR)	100	200

Note 1: Measurement conditions: 28.3 ℓ/min. (ANR) flow

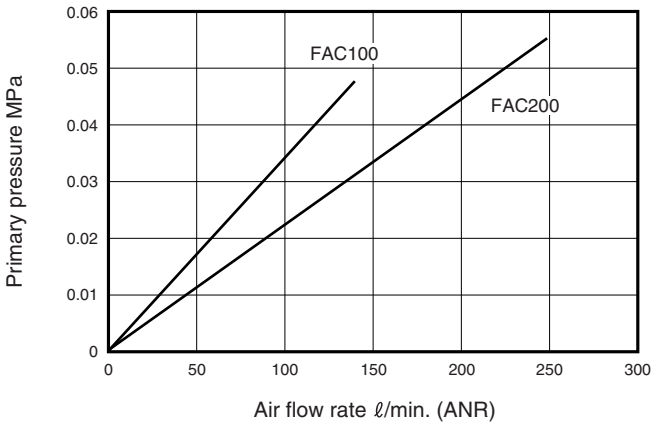
How to order

FAC100 - **8A**

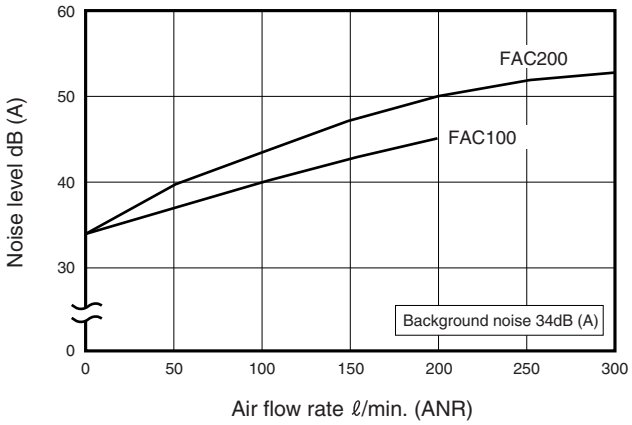
Ⓐ Model no. Ⓑ Port size

Symbol	Descriptions	Ⓐ Model no. FAC100	Ⓐ Model no. FAC200
Ⓑ Port size			
6A	R1/8	●	
8A	R1/4	●	
10A	R3/8		●
15A	R1/2		●

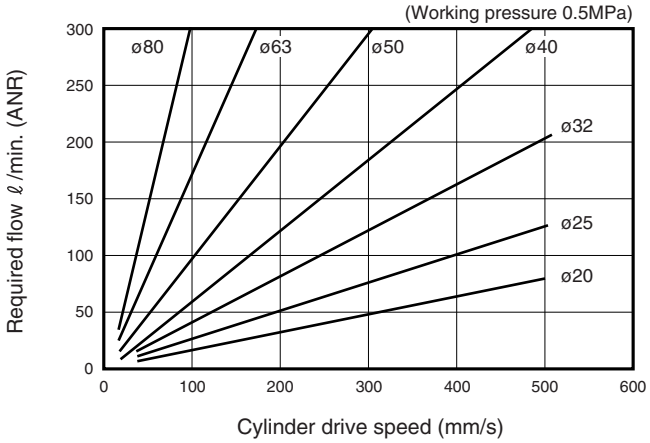
Flow characteristics



Noise level



Selection guide



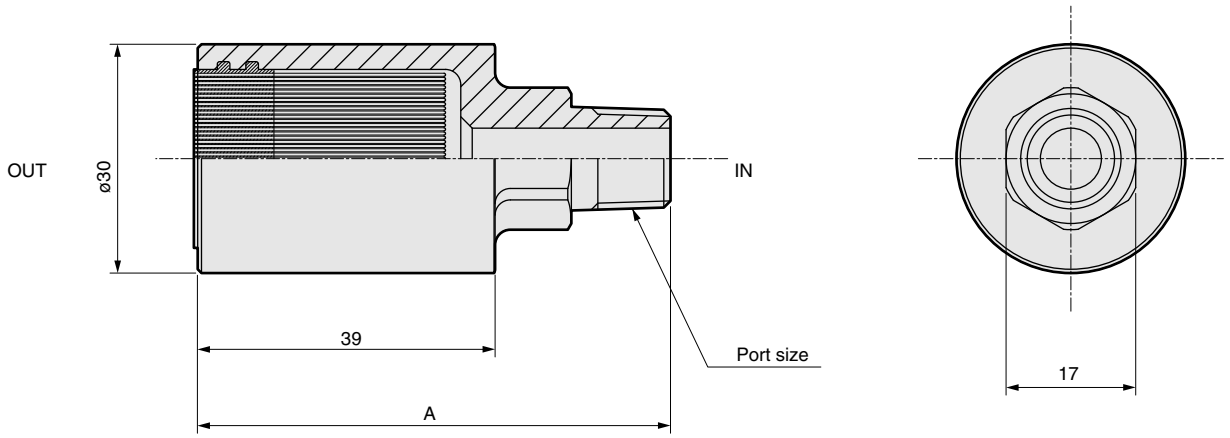
The clean exhaust filter model is selected based on the working circuit's required flow.

(1) Calculate the required flow for the actuator being used.
(2) Multiply the calculated required flow by 1.4.
(3) Select a model having a flow exceeding the required flow multiplied by 1.4.

The above graphs show the required flow multiplied by 1.4 for each air cylinder size.
Use this diagram to select a model.

Internal structure and parts list / Dimensions

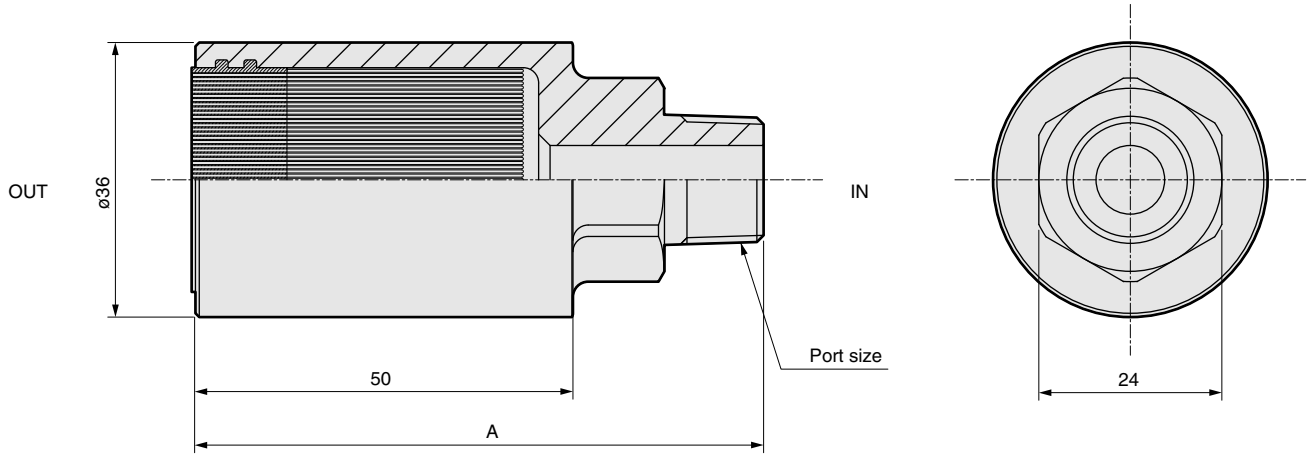
● FAC100



No.	Parts name		Material
1	Body	Housing	Aluminum alloy (alumite treatment)
		Filter	Polypropylene
		Potting material	Urethane

Model no.	A	Port size
FAC100-6A	59	R1/8
FAC100-8A	62	R1/4

● FAC200



No.	Parts name		Material
1	Body	Housing	Aluminum alloy (alumite treatment)
		Filter	Polypropylene
		Potting material	Urethane

Model no.	A	Port size
FAC200-10A	75	R3/8
FAC200-15A	78	R1/2

Clean exhaust filter

FAC3000 Series

● Port size: Rc3/8,Rc1/2

RoHS CAD

Specifications

Model no.	FAC3000
Working fluid	Compressed air
Max. working pressure MPa	0.1
Min. working pressure MPa	0
Withstanding pressure MPa	0.3
Ambient temperature range ˚C	5 to 45
Port size	Rc3/8, Rc1/2
Product weight g	290
Filtration rating μm	0.01 (removal ratio 99.99% and over)
High secondary cleanness	100% of 0.1 μm and larger particles are removed Note 1
Maximum flow rate ℓ/min.(ANR)	600

Note 1: Measurement conditions: 28.3 ℓ/min. (ANR) flow

How to order

FAC3000 - **10** - **B**

Model no.

Ⓐ Port size

Ⓑ Attachment

Symbol	Descriptions
Ⓐ Port size	
10	Rc3/8
15	Rc1/2
Ⓑ Attachment (attached)	
Blank	Without attachment
B	C type bracket: B320-P70

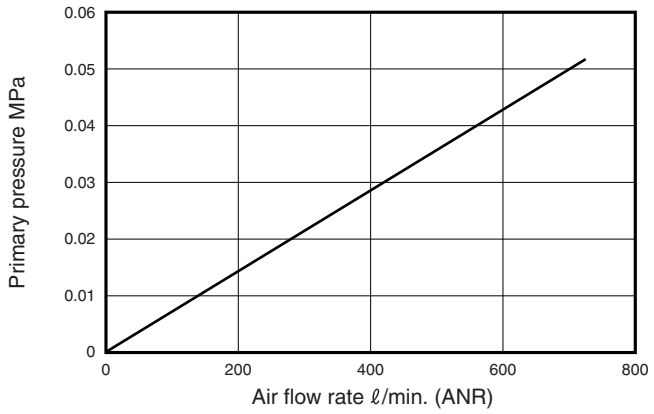
Note: Two attachments are included, one R1/8 plug and one plug corresponding to the connection bore size (R3/8 or R1/2).

Discrete bracket model no.

B320-P70

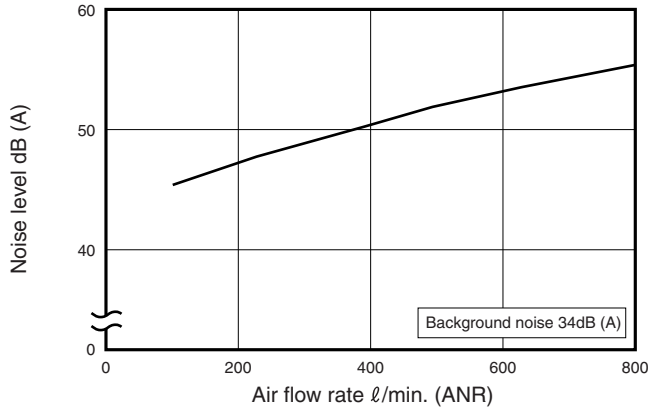
Flow characteristics

● FAC3000



Noise level

● FAC3000

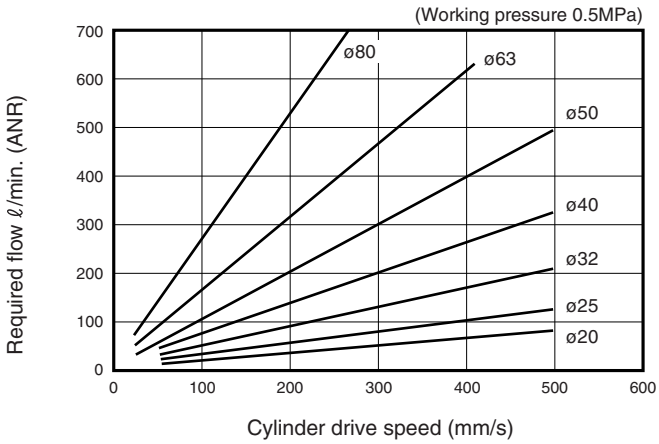


Selection guide

The clean exhaust filter model is selected based on the working circuit's required flow.

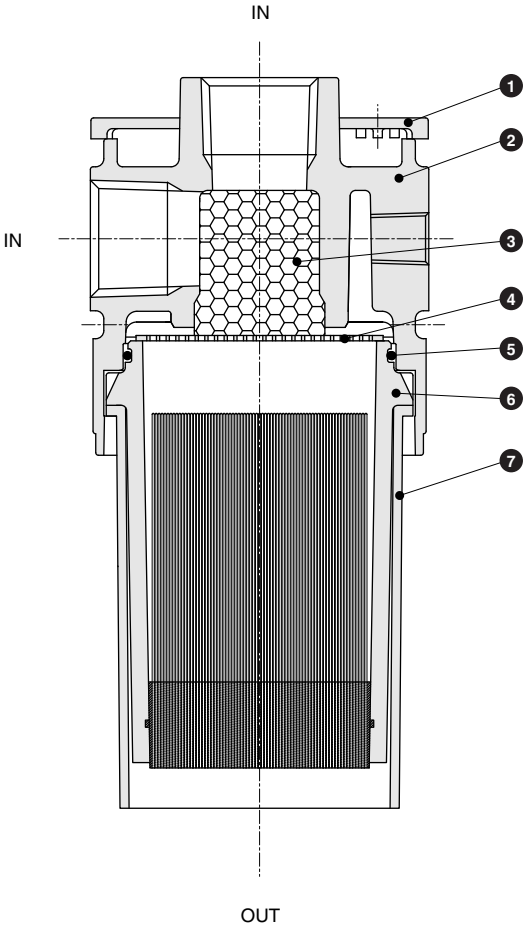
(1) Calculate the required flow for the actuator being used.
(2) Multiply the calculated required flow by 1.4.
(3) Select a model having a flow exceeding the required flow multiplied by 1.4.

The right graphs show the required flow multiplied by 1.4 for each air cylinder size. Use this diagram to select a model.



Internal structure and parts list

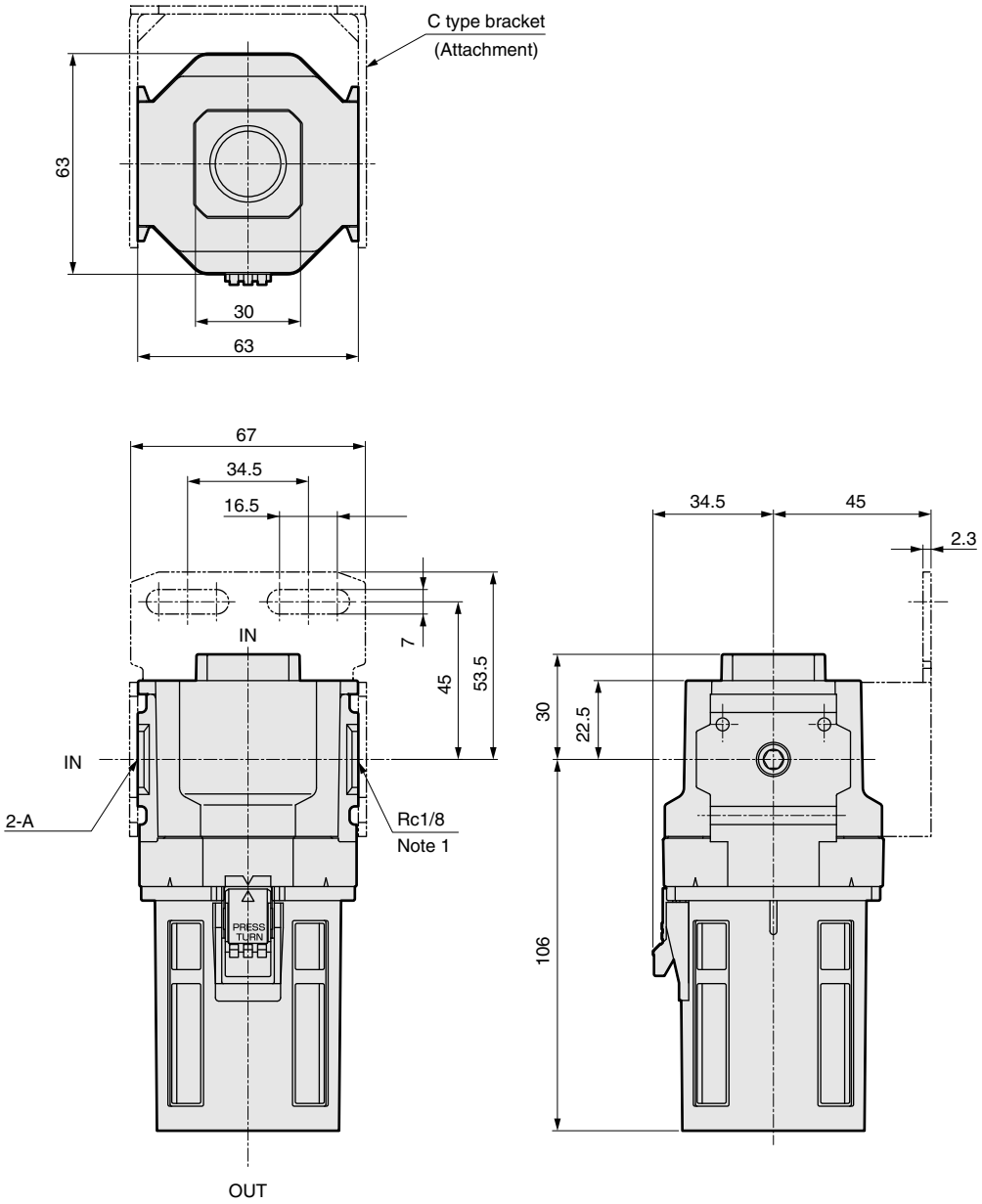
● FAC3000



No.	Parts name		Material
1	Plate cover		ABS resin
2	Body		Aluminum alloy die-casting
3	Noise reduction material		Vinylidene chloride
4	Rectification plate		Stainless steel
5	O ring		Special nitrile rubber
6	Hollow string membrane element	Housing	Polycarbonate
		Filter	Polypropylene
		Potting material	Urethane
7	Bowl guard		Polyamide resin, stainless steel

Dimensions

● FAC3000



Model no.	A
FAC3000-10	Rc3/8
FAC3000-15	Rc1/2

Note 1: The Rc1/8 port can be used for treating air exhaust and monitoring element life.
Replace the element when primary pressure exceeds 0.1 MPa.
When not using this port, plug it with the R1/8 plug provided.
Contact CKD for details on consumables such as elements.

Custom

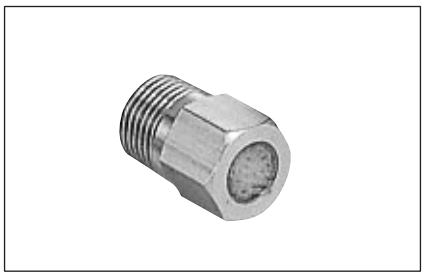
These products are available as customized parts. Contact the CKD Sales Office for details.

FAC10–M5

- Maximum flow rate: 2 ℓ/min. (ANR) and over
- Port size: M5
- Body material: Stainless steel

FAC10–6

- Maximum flow rate: 4 ℓ/min. (ANR) and over
- Port size: R1/8
- Body material: Stainless steel

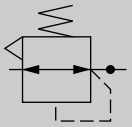


MEMO

Clean regulator

RC2000 Series

● Port size: Rc1/4, Rc3/8, Rc1/2

JIS symbol 

RoHS CAD

Overview

The RC2000 Series has oil-prohibition specifications is stainless steel, making it suitable for controlling the pressure of clean air and N_2 used in semiconductor and liquid crystal manufacturing equipment. This regulator is also suitable for air (N_2) blow since it is compact and has a large flow.

Features

● Oil-prohibition specifications
All parts are precisely cleaned (wetted sections) and are integrally produced from assembly to packaging in a cleanroom. No grease is used on wetted areas.

● Compact and large flow
A large flow of 0.8 m^3/min. is realized even with just 50 mm face to face.
(Flow at 0.7 MPa primary pressure, 0.5 MPa set pressure, 0.1 MPa pressure drop)

● Reverse function when back pressure is not applied
This function reverses secondary pressure to the primary side when primary pressure is exhausted.
This safety-oriented product does not leave any pressure on the secondary side.

Specifications

Model no.		RC2000-8-P90	RC2000-10-P90	RC2000-15-P90
Working fluid		Compressed air, N_2		
Max. working pressure MPa		1.0 (for low pressure 0.5)		
Withstanding pressure MPa		1.5		
Ambient temperature range ˚C		5 to 60		
Set pressure range MPa		Standard: 0.05 to 0.7 Low pressure: 0.02 to 0.2 Note 1		
Port size (IN/OUT)		Rc1/4	Rc3/8	Rc1/2
Pressure gauge port size		Rc1/8		
Product weight kg		0.47	0.45	0.59
Wetted section material	Metal	SUS316		
	Resin	PTFE		
	Rubber	FKM		
Assembly, inspection, package		Integrated production in cleanroom		
Cleaning (wet areas)		Precision cleaning		

Note 1: When using the standard type with a set pressure of 0.4 MPa or less, confirm that the primary pressure difference for the set pressure is within 0.5 MPa.
When using the low pressure type, confirm that the primary pressure difference for set pressure is within 0.3 MPa.

How to order

RC2000 - 8 - LN - GY49B3E1 - P90

Model no.
(Clean room specifications)
(Oil-prohibited specifications)

Ⓐ Port size

8	Rc1/4
10	Rc3/8
15	Rc1/2
	(Custom order)

Ⓑ Option Note 1

Pressure range Note 2	Blank	0.05 to 0.7 MPa
	L	0.02 to 0.2 MPa
Relief mechanism	Blank	Relief type
	N	Nonrelief type

Ⓒ Attachment (attached) Note 1, 3

Blank	Without attachment
GY49	Pressure gauge (G49D-6-*-P94)
GZ49	Pressure gauge (G49D-6-*-P90)
B3	L type bracket
E1	Joint (exhaust treatment)

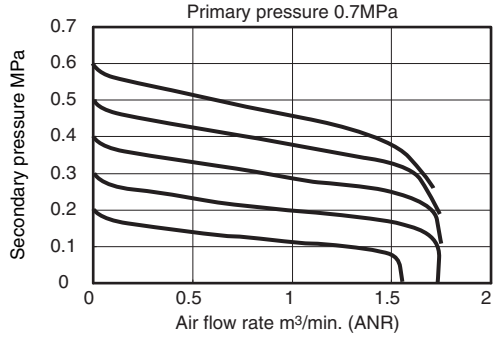
Ⓓ Clean room specifications

	Treatment
P90	Stainless steel material used Oil-prohibited

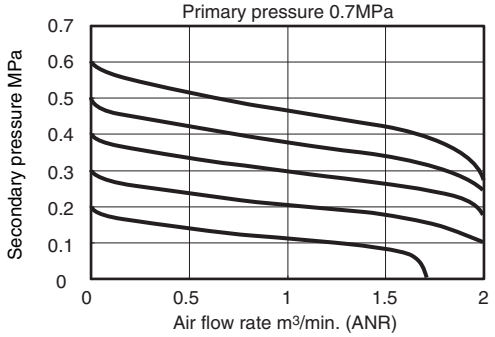
Note 1: When selecting multiple options or attachments, indicate the model symbol in order from the top.
If there is no symbol for the option or attachment, delete the hyphen "-". (Example: RC2000-8-P90)
Note 2: If "Blank" is selected for the pressure range, the 1.0 MPa pressure gauge (pressure gauge model: G49D-6-P10-P9*) is used.
If "L" is selected for the pressure range, the 0.2 MPa pressure gauge (pressure gauge model: G49D-6-P02-P9*) is used.
Note 3: Two pipe plugs (R1/8) are included with the product. If a pressure gauge is selected as an attachment, one plug is included.

Flow characteristics

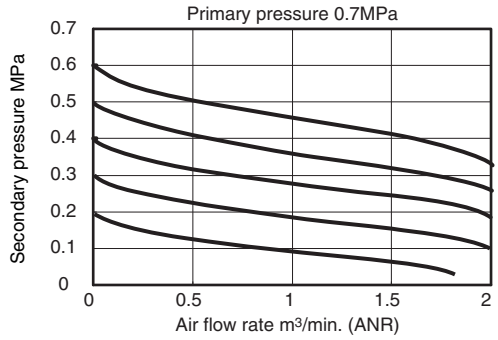
● RC2000-8-P90



● RC2000-10-P90

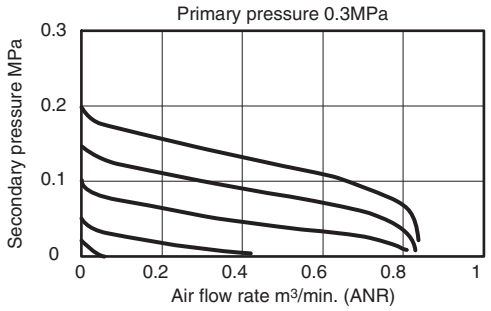


● RC2000-15-P90

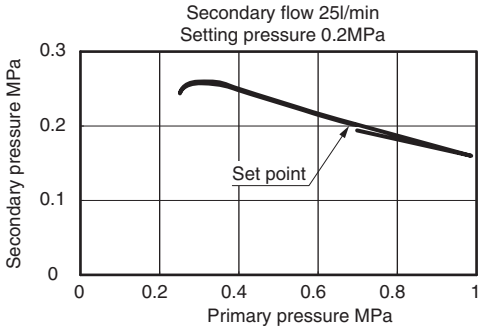


Flow characteristics (low pressure)

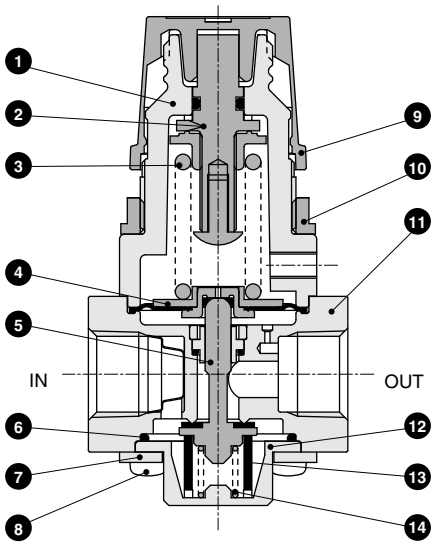
● RC2000-*-L-P90



Pressure characteristics



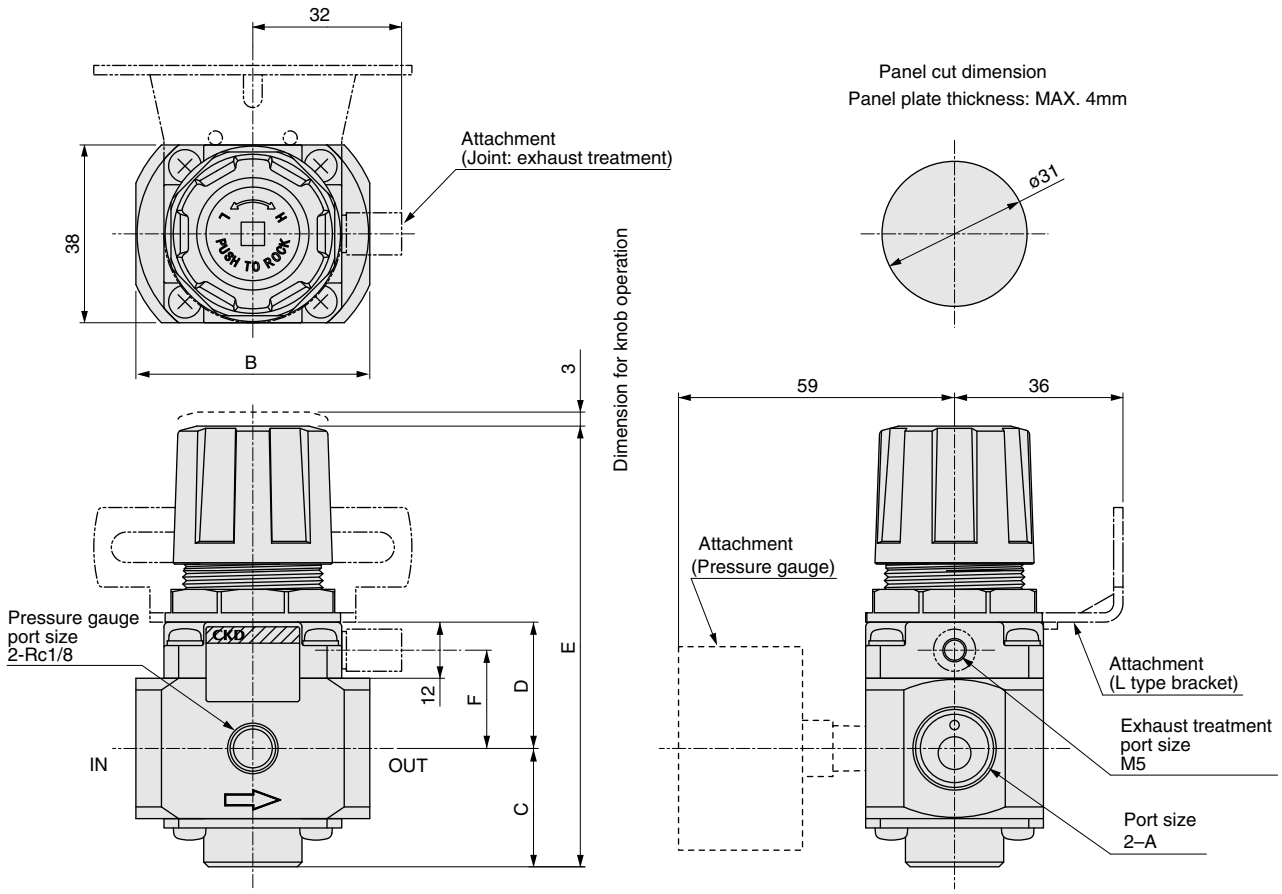
Internal structure and parts list



No.	Parts name	Material (treatment)
❶	Guard	PA66
❷	Pressure adjusting screw assembly	Steel, SUS, FKM, POM
❸	Spring	Steel
❹	Diaphragm	SUS316, FKM, SUS303
❺	Valve	SUS316, FKM
❻	O ring	FKM
❼	Plate	SUS304
❽	Screw	Steel (nickel plating)
❾	Knob	POM
❿	Mounting nut	Zinc die casting (nickel plating)
⓫	Body	SUS316, FKM, PTFE
⓬	Bottom cap	SUS316
⓭	Bottom rubber	FKM
⓮	Spring	SUS316

* A mesh filter is installed on IN sides of RC2000-8-P90 and RC2000-10-P90.

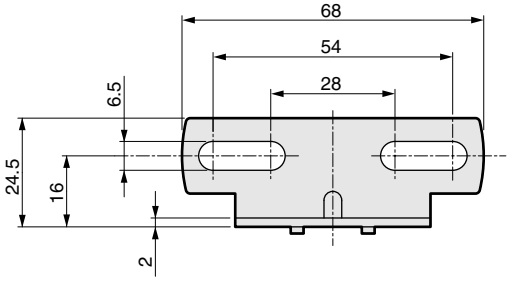
Dimensions



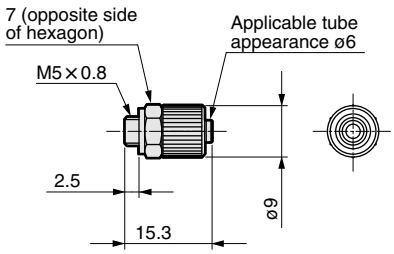
Model no.	A	B	C	D	E	F
RC2000-8	Rc1/4	50	25.5	27	95	21
RC2000-10	Rc3/8					
RC2000-15	Rc1/2	58	27.5	29	99	23

Attachment

● L type bracket (-B3)
Part model no.: RC2000-B3



● Joint (-E1)
Part model no.: RC2000-E1



Model no.	RC2000-E1
Working fluid	Compressed air, N_2
Fluid temperature ˚C	5 to 60
Ambient temperature ˚C	5 to 60
Applicable tube	Urethane tube

Item	Material (treatment)
Metal part	Brass (nickel plating)
Rubber part	NBR

Custom

These products are available as customized parts. Contact the CKD Sales Office for details.

RC large flow rate large bore size type

■ Flow : 3000 ℓ/min. (ANR) *1
■ Port size : Rc3/4, Rc1

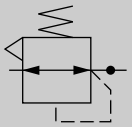
*1: Initial flow at primary pressure 0.7 MPa and pressure drop 0.03 MPa.

Regulator

2619 Series

Port size: Rc1/8, Rc1/4

JIS symbol



RoHS

Specifications

Descriptions		2619-1C2619-1C/2C-P80	2619-1C2619-1C/2C-P90/P94
Working fluid		Compressed air	
Max. working pressure	MPa	2.06	1.0
Withstanding pressure	MPa	3.09	1.5
Fluid temperature	˚C	5 to 60	
Set pressure range	MPa	0.04 to 0.83	
Relief		With relief mechanism	
Gauge port size	Rc	1/8	
Port size	Rc	1/81/8 / 1/4	1/81/8 / 1/4
Product weight	kg	0.27	0.42

How to order

2619 - 1 C - L B - P80

Model

- A Port size
- B Regulator
- C Attachment
- D Clean room specifications Note 2

Symbol	Descriptions	
A Port size		
1	Rc1/8	
2	Rc1/4	
B Regulator		
Blank	Standard	
N	Without relief mechanism	
L	Low pressure (0.04 to 0.34MPa)	
C Attachment		
Blank	None	
G	Pressure gauge	*1
B	Bracket	
D Clean room specifications		
	Structure/treatment	Material restriction
P80	Oil-prohibited	–
P90	Stainless steel material used Oil-prohibited	–
P94	Stainless steel material used Oil-prohibited	Use of copper-, silicon-, or halogen-based materials -- fluorine, chlorine, or bromine -- is not acceptable

⚠ Note on model no. selection

Note 1: The clamp joint and pipe plug are included.
Note 2: "P94" is a special-order part.

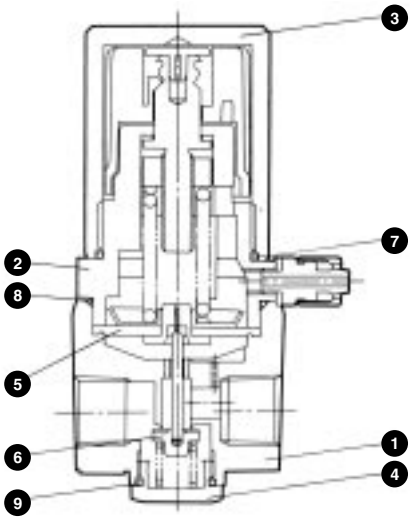
*1: The following pressure gauge is included:

Model	Standard pressure	L low pressure option
2619-*-P80	G49D-6-P10-P94	G49D-6-P04-P94
2619-*-P90	G49D-6-P10-P90	G49D-6-P04-P90
2619-*-P94	G49D-6-P10-P94	G49D-6-P04-P94

Discrete bracket model no.

2619-B-P80

Internal structure and parts list

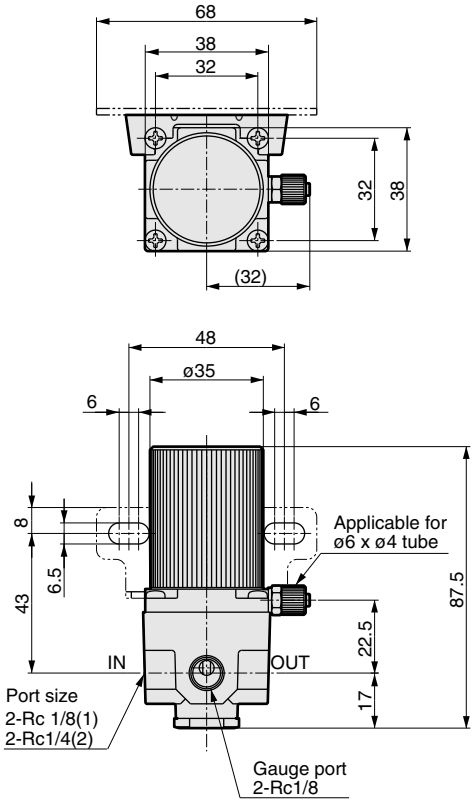


Part list

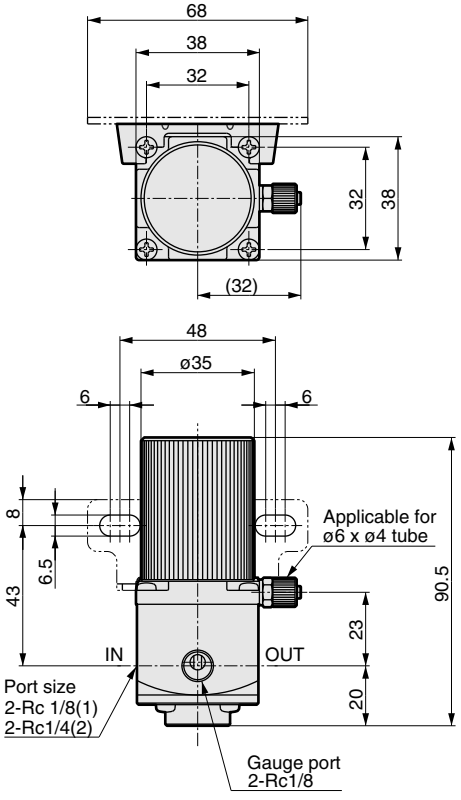
No.	Main parts	Material (treatment)		
		2619-*-P80	2619-*-P90	2619-*-P94
1	Body	Aluminum alloy die casting (paint)	Stainless steel	Stainless steel
2	Bonnet	Zinc alloy die casting (paint)	Zinc alloy die casting (paint)	Zinc alloy die casting (paint)
3	Cap	Aluminum (alumite treatment)	Aluminum (alumite treatment)	Aluminum (alumite treatment)
4	Bottom plug	Aluminum (alumite treatment)	Stainless steel	Stainless steel
5	Diaphragm assembly	Fluoro rubber, stainless steel	Fluoro rubber, stainless steel	Nitrile rubber, stainless steel
6	Valve assembly	Fluoro rubber, stainless steel	Fluoro rubber, stainless steel	Nitrile rubber, stainless steel
7	O ring	Nitrile rubber	Nitrile rubber	Nitrile rubber
8	O ring	Nitrile rubber	Nitrile rubber	Nitrile rubber
9	O ring	Fluoro rubber	Fluoro rubber	Nitrile rubber

Dimensions

● 2619-P80



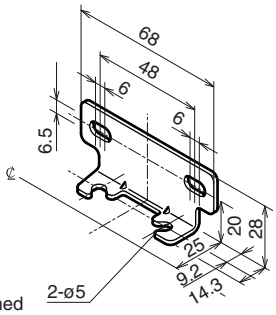
● 2619-P90/P94



Bracket dimensions

● 2619-B-P80

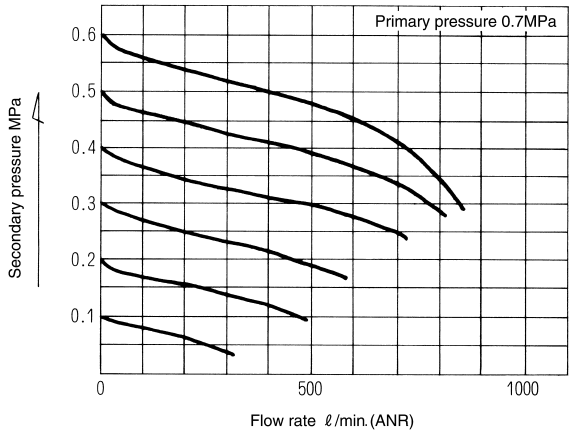
Bracket plate thickness 2mm



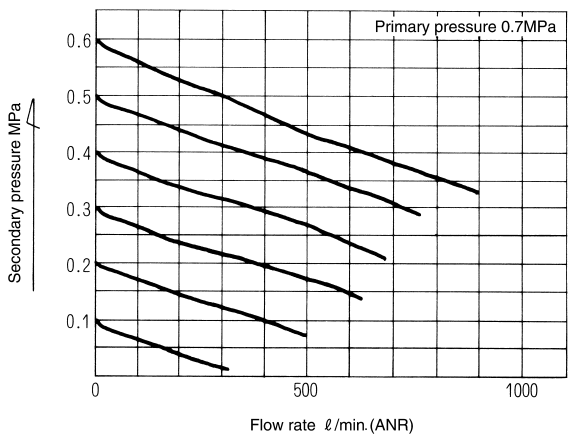
● Screw attached

Flow characteristics

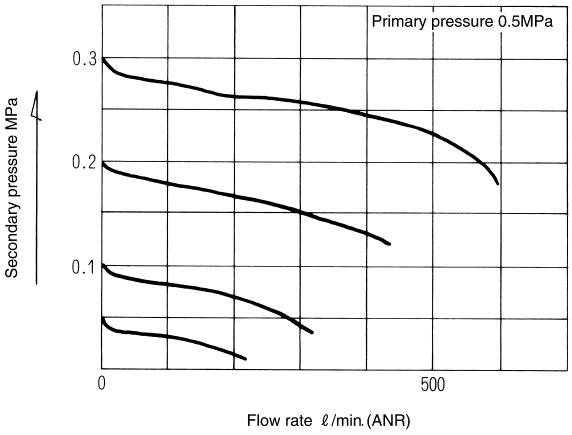
● 2619-1C-P80/P90/P94



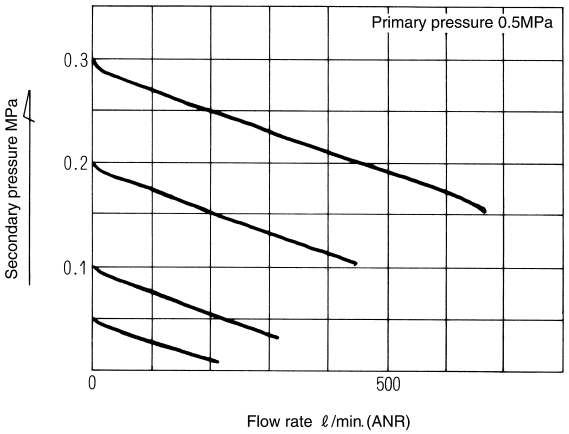
● 2619-2C-P80/P90/P94



● 2619-1C-L-P80/P90/P94

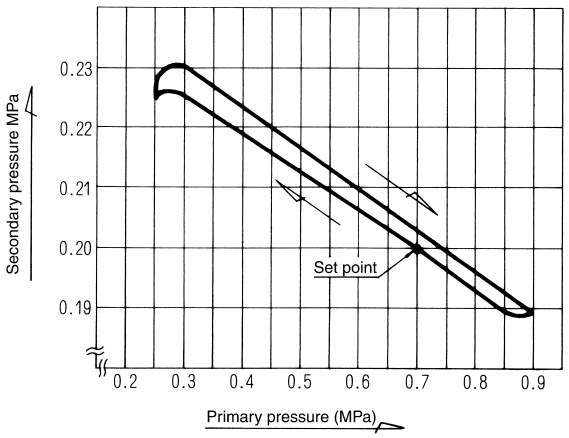


● 2619-2C-L-P80/P90/P94



Pressure characteristics

● 2619-*-P80/P90/P94



Pressure gauge

G49D/G59D Series

● Port size: R1/8, R1/4

JIS symbol 

RoHS CAD

Specifications

Descriptions		G49D-P70/P9*	G59D-P70/P9*
Working fluid		Compressed air, N2	
Fluid temperature ˚C		5 to 60	
Ambient temperature ˚C		5 to 60	
Precision Note 1		Full scale ±3% (at 5 to 35˚C)	
Shape		DT type (rear side screw, stock section 4 square)	
Display section dia.		ø43	ø52
Material	Bourdon tube	P90, P94: SUS316 P70: Brass	
	Stock	P90, P94: SUS14 (SUS316 or equivalent) P70: Brass (nickel plating)	
	Housing	Steel (chrome plating)	
	Lens	Glass	
Pressure range MPa		0 to 0.2 0 to 0.4 0 to 1.0	
Port size R		1/8	1/4
Weight g		90	140

Note 1: Display precision proof temperature is 20±15˚C.

How to order

G49D - 6 - P04 - P90

Ⓐ Model no.
Ⓑ Port size
Ⓒ Pressure display
Ⓓ Clean room specifications

Symbol	Descriptions
Ⓐ Model no.	
G49D	
G59D	
Ⓑ Port size *Note 2	
6	R1/8 (only G49D)
8	R1/4 (only G59D)
Ⓒ Pressure display (MPa) *Note 1	
P02	0 to 0.2
P04	0 to 0.4
P10	0 to 1.0

Ⓓ Clean room specifications

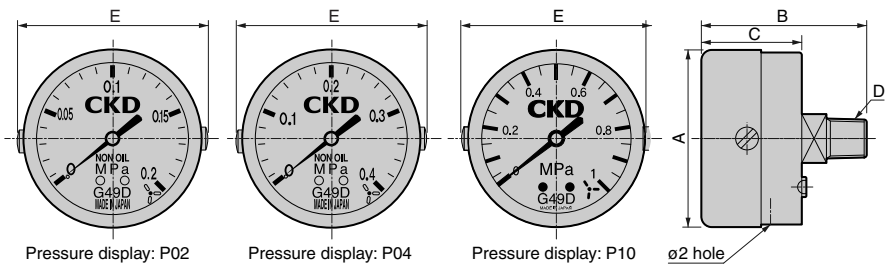
	Material	Oil-prohibition specifications	Assembly	Package
P70	Brass (nickel plating)	Oil-, water-prohibited	General environment	Clean package
P90	Stainless steel	Oil-, water-prohibited	Clean assembly	Clean package
P94	Stainless steel	Oil-, water-prohibited	General environment	Clean package

Use of copper-, silicon-, and halogen-based material (fluorine, chlorine, or bromine) is not acceptable and restricted for P94.

⚠ Note on model no. selection

Note 1: Displays other than a MPa display are custom order.
Note 2: NPT thread is available as custom order.

Dimensions



Pressure display: P02 | Pressure display: P04 | Pressure display: P10

Model no.	A	B	C	D	E
G49D-6-P02/P04/P10-P70	ø43	43.5	27.5	R1/8	46.5
G59D-8-P02/P04/P10-P70	ø52	50.5	28.5	R1/4	55.5
G49D-6-P02/P04/P10-P90/P94	ø43	43.5	27.5	R1/8	46.5
G59D-8-P02/P04/P10-P90/P94	ø52	50.5	26.5	R1/4	55.5