

KOGANEI

Air Treatment

COMPACT FR Series

INSTRUCTION MANUAL Ver.1.0

Handling Instructions and Precautions



Mounting and piping

1. While any mounting direction is acceptable, be careful to avoid directly applying strong shocks or vibrations to the body.

2. Pressure gauge connection port tightening torque

Since the body is made of plastic, ensure that the tightening torque for the pressure gauge connection port (Rc1/8) remains within the figures shown below, and always use sealing tape.

The recommended tightening torque for Rc1/8 fitting of 686~886N·cm [5.06~6.54ft·lb] will damage the body.

MAX.150N·cm [13.3in·lb]

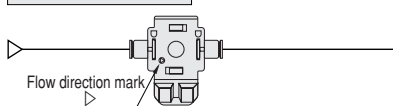
When mounting the pressure gauge, always use a wrench on the hexagonal section to tighten, and take care to avoid applying force on the gauge section. Moreover, if not mounting a pressure gauge to the pressure gauge connection port, use a plug wound sealing tape round it to block with the specified tightening torque.

3. When connecting piping to single units of the Compact FR Series, ensure that the piping matches the flow direction mark (▷). The flow marks are located as shown in the figure below.

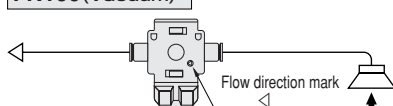
● For filters

The piping direction differs in accordance with using pressure or vacuum. Follow the figures below when piping.

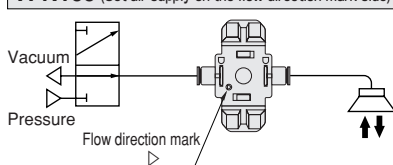
FN100(Pressure)



FN100(Vacuum)

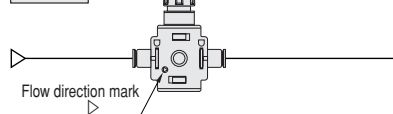


VFN100 (Set air supply on the flow direction mark side)



● For side piping regulators and filter regulators, the flow direction mark (▷) is located as shown in the figure below.

RN1



4. When mounting single units of the Compact FR Series, use either the body mounting holes or brackets (optional). Mounting rings (optional) can also be used for panel mounting. The mounting hole for mounting on panels, etc., is ϕ 18.5 [0.728in.].

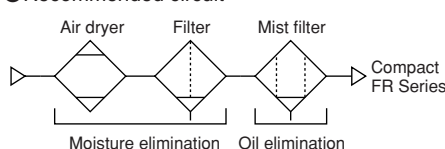
5. For regulators, connect the piping so that the air supply side is connected to the IN port, and the actuator side is connected to the OUT port.

Cautions: 1. The product cannot be used with the IN and OUT port piping connections reversed.

2. Avoid mounting that blocks the relief holes. Blocked relief holes will hinder pressure regulating.

6. As filters in the Compact FR Series are provided for the purpose of eliminating solid contents, always eliminate any moisture or oil before operation. To remove collected liquid is not possible.

● Recommended circuit



7. The Compact FR Series cannot be disassembled or reassembled. If a filter element reaches the end of its operating life, replace the product with a new unit.

8. Cracks or scratches on the air filter's bowl or body can lead to damage. Replace with a new unit.

9. Connecting and disconnecting tubes

For tube connection, insert a tube as far as contacting with the tube stopper, and pull it to check the connection.

For tube disconnection, push the tube against the tube stopper, then push the release ring and at the same time pull the tube out.

10. Usable tubes

Use either a nylon tube or urethane tube. Use tubes with an outer diameter tolerance within $\pm 0.1\text{mm}$ [$\pm 0.004\text{in.}$] of the nominal diameter for nylon tubes, and within $\pm 0.15\text{mm}$ [$\pm 0.006\text{in.}$] for urethane tubes, and allowance of out-of-ellipticity (difference between long diameter and short diameter) is 0.2mm [0.008in.] or less.

Cautions: 1. Only use tubes without scratch on the outer surface. When scratch has been made during repeated use, cut off the scratched section.

2. Do not bend the tube excessively near the fittings. The minimum bending radius for nylon tubes is as shown in the table below.

mm [in.]	
Tube size	Minimum bending radius
$\phi 4$ [0.157], 1/8	20 [0.79]
$\phi 6$ [0.236], 1/4	30 [1.18]

11. Use sufficient size tubes for piping to the IN port of the manifold regulators, and to supply air from the IN ports on both manifold ends is recommended.



Pressure regulating

1. Do not set the pressure to exceed the setting pressure ranges. It could damage the regulator or cause a sudden rise in secondary pressure (up to the same pressure as the primary pressure).

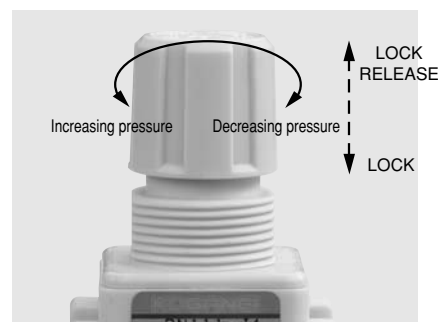
2. Set the pressure in the increasing pressure direction, while checking with the pressure gauge. Setting the pressure in the decreasing pressure direction can result in inaccurate pressure setting.

3. Maintain the primary pressure so that it has enough margin to the set pressure.

4. If the secondary pressure exceeds the set pressure for some reason, design the safety circuit and equipment to prevent damage to devices and personal injury.

5. Firmly pull out the knob for pressure regulating. Turning it to the right (clockwise direction) increases the pressure, while turning it to the left (counterclockwise direction) decreases the pressure. After regulating pressure, push the knob back into the body and lock it in place.

When regulating the pressure, rotating the knob excessively in pressure increasing or decreasing direction, knob's inner center section might deform and it would cause hard regulating. The knob is fixed to the bonnet by snap hook, accordingly applying excessive axial force to the knob when releasing the lock could cause it to disengage. Re-snap hook for use, in the case.



General precautions

1. Before piping, always thoroughly blow off (use compressed air) the tubing. Entering metal chips, sealing tape, rust, etc., generated during plumbing could result in air leaks or other defective operation.

2. Use air for the media. For the use of any other media, consult us.

3. The product cannot be used when the media or ambient atmosphere contains any of the substances listed below. Organic solvents, phosphate ester type hydraulic oil, sulphur dioxide, chlorine gas, or acids, etc.

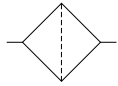
4. If using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use something to cover and protect the unit.

FILTERS

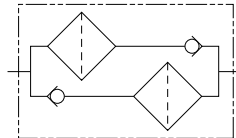
Air Filters for Pressure and Vacuum
Special Purpose Filters for Vacuum and Vacuum Breaking

Symbols

●FN100



●VFN100



Order Codes

 100 - -

Mounting specification
Blank : No bracket
B : With bracket

Fitting specification

J4 : ϕ 4mm [0.157in.]

J6 : ϕ 6mm [0.236in.]

J1/8 : 1/8in. tube

J1/4 : 1/4in. tube

FN : Air filters for pressure and vacuum

VFN : Special purpose filters for vacuum and vacuum breaking

●Order code for bracket only

B-RN100

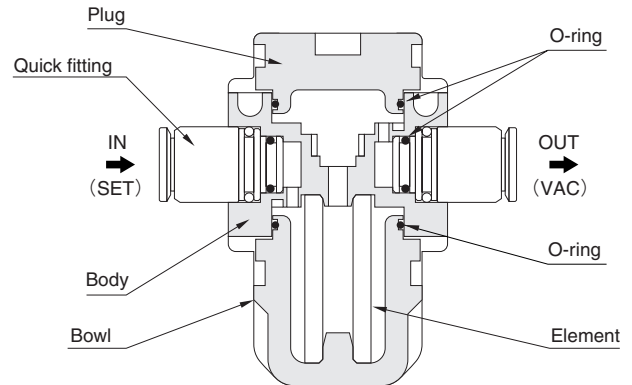
Specifications

Item		Model	FN100-□	VFN100-□
Media			Air	
Piping connection fitting			ϕ 4mm [0.157in.], ϕ 6mm [0.236in.], 1/8in. or 1/4in.	
Filtration		μ m	5	
Operating pressure range		MPa [psi.]	-0.1~1 [-14.5~145]	
Proof pressure		MPa [psi.]	1.5 [218]	
Operating temperature range (atmosphere and media)		°C [°F]	5~50 [41~122]	
Mass	g [oz]	Body	34 [1.20]	35 [1.23]
		Option	Bracket : 5.5 [0.194]	
Materials		Body	Plastic	
		Plug	Plastic	
		Bowl	Nylon	
		O-ring	Synthetic rubber	
		Check valve	—	Synthetic rubber
		Element	PVF	

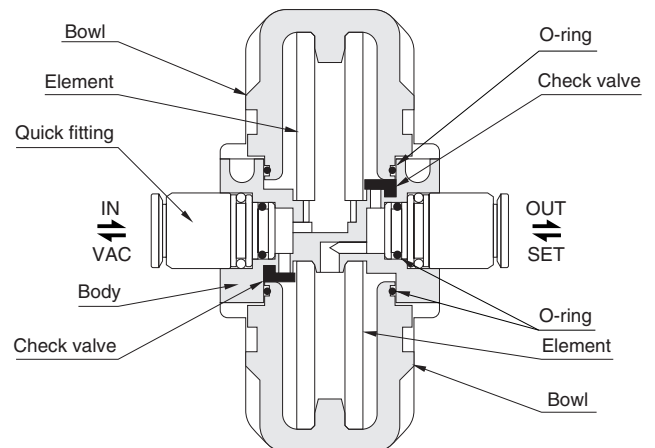


Inner Construction

FN100

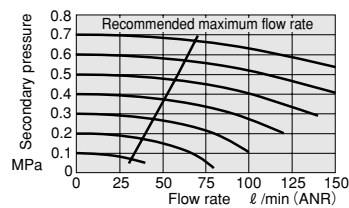


VFN100

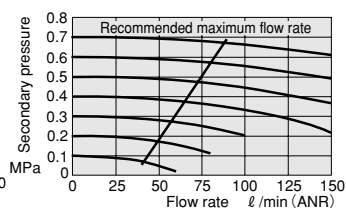


Flow Rate Characteristics

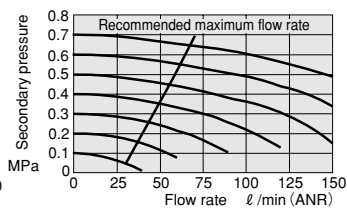
FN100-J4, J1/8 (pressure)



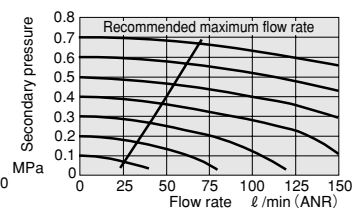
FN100-J6, J1/4 (pressure)



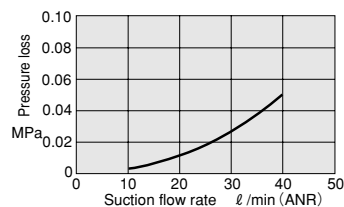
VFN100-J4, J1/8 (pressure)



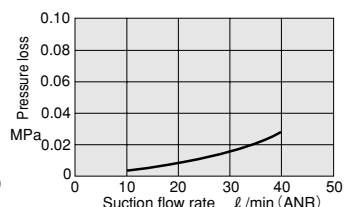
VFN100-J6, J1/4 (pressure)



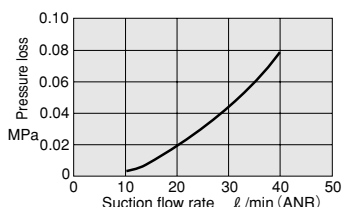
FN100-J4, J1/8 (vacuum)



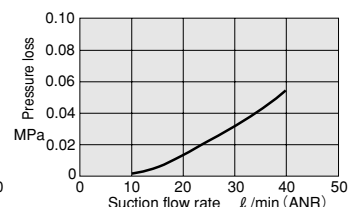
FN100-J6, J1/4 (vacuum)



VFN100-J4, J1/8 (vacuum)



VFN100-J6, J1/4 (vacuum)



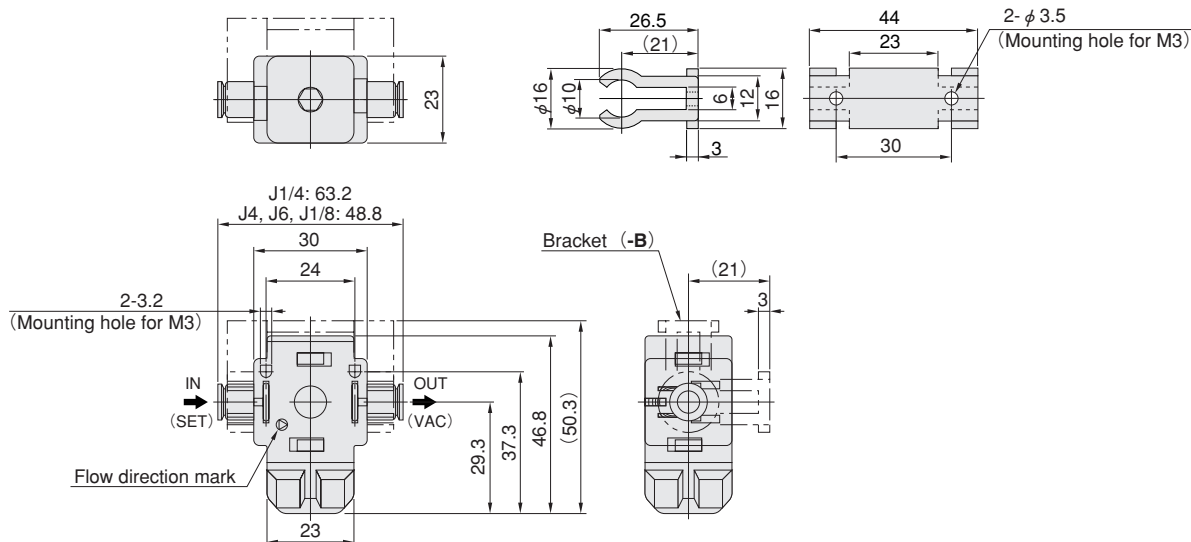
1MPa = 145psi. 1 l/min = 0.0353ft³/min.

Dimensions of Filters (mm)

FN100

●Bracket (-B)

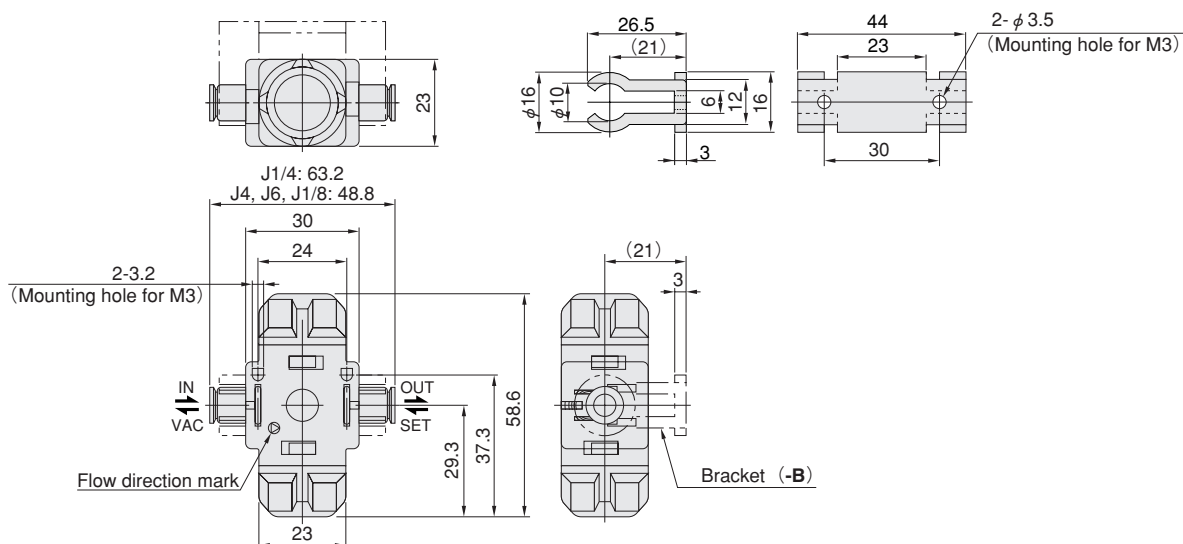
CAD Fn100



VFN100

●Bracket (-B)

CAD Vn100



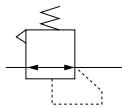
REGULATORS

Side Piping Regulators Bottom Piping Regulators

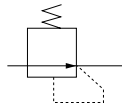


Symbols

●Relief specifications



●Non-relief specifications



Remark: The regulator of the Compact FR Series operates in the same way as the type with built-in check mechanism. When the regulator's primary pressure is discharged, the secondary pressure is discharged to the primary side. However, if the secondary pressure has been pressurized by an air cylinder, etc., to a pressure higher than the set pressure, discharging the secondary pressure may become difficult.

Order Codes

●Side piping regulator

RN - - -

Fitting specification
J4 : ϕ 4mm [0.157in.]
J6 : ϕ 6mm [0.236in.]
J1/8 : 1/8in. tube
J1/4 : 1/4in. tube

Mounting specification
Blank : No bracket
 (no mounting ring)
B : With bracket
 (no mounting ring)
R : With mounting ring
 (no bracket)

Pressure gauge specification
Blank : No pressure gauge
GD18 : With pressure gauge

Pressure and relief specification
100 : 0.7MPa [102psi.] relief specification
101 : 0.25MPa [36psi.] relief specification
110 : 0.7MPa [102psi.] non-relief specification
111 : 0.25MPa [36psi.] non-relief specification

●Bottom piping regulator

RDN - - -

Fitting specification
J4 : ϕ 4mm [0.157in.]
J6 : ϕ 6mm [0.236in.]
J1/8 : 1/8in. tube
J1/4 : 1/4in. tube

Mounting specification
Blank : No mounting ring
R : With mounting ring

Pressure gauge specification
Blank : No pressure gauge
GD18 : With pressure gauge

Pressure and relief specification
100 : 0.7MPa [102psi.] relief specification
101 : 0.25MPa [36psi.] relief specification
110 : 0.7MPa [102psi.] non-relief specification
111 : 0.25MPa [36psi.] non-relief specification

●Order code for bracket only

B-RN100

●Order code for pressure gauge only

G1-18D

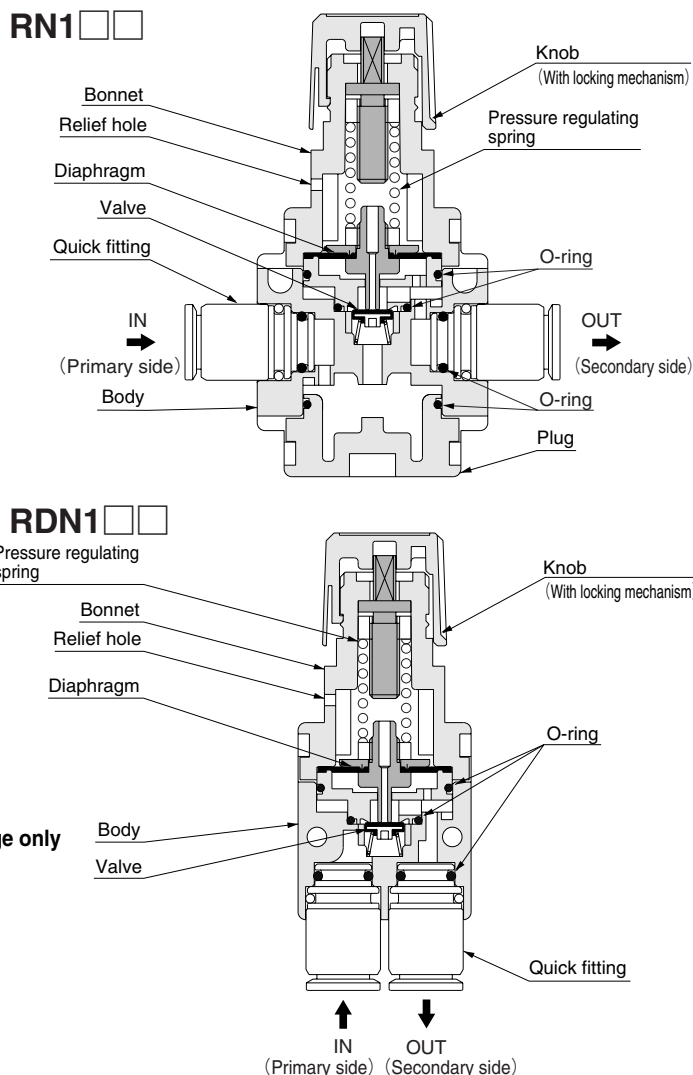
●Order code for mounting ring only

R-RN100

Specifications

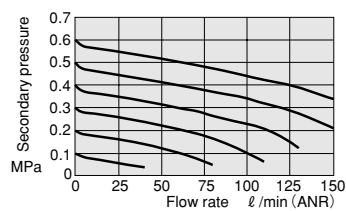
		Model	Standard		Low pressure	
			RN100	RDN100	RN101	RDN101
Item			RN110	RDN110	RN111	RDN111
Media			Air			
Piping connection fitting			φ 4mm [0.157in.], φ 6mm [0.236in.], 1/8in. or 1/4in.			
Pressure setting range		MPa [psi.]	0.05~0.7 [7~102]		0.05~0.25 [7~36]	
Maximum operating pressure		MPa [psi.]	1 [145]			
Proof pressure		MPa [psi.]	1.5 [218]			
Operating temperature range (atmosphere and media) °C [°F]			5~50 [41~122]			
Lubrication			Prohibited			
Mass	g [oz]	Body	41 [1.45]	33 [1.16]	41 [1.45]	33 [1.16]
		Option	Pressure gauge: 15 [0.53], Mounting ring: 1.2 [0.042], Bracket: 5.5 [0.194]			
Materials		Body	Plastic			
		Bonnet	Plastic			
		Plug	Plastic	—	Plastic	—
		Diaphragm	Synthetic rubber			
		O-ring	Synthetic rubber			
		Valve	Synthetic rubber and aluminum alloy			
	Regulating spring	Piano wire (zinc plated)				

Inner Construction

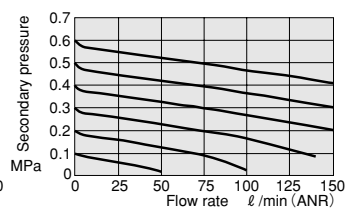


Flow Rate Characteristics

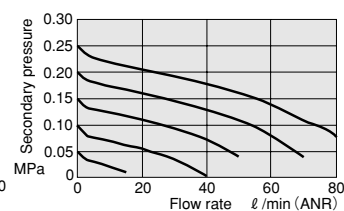
RN1□0-J4, J1/8
RDN1□0-J4, J1/8



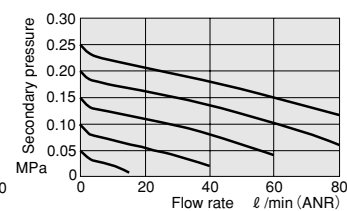
RN1□0-J6, J1/4
RDN1□0-J6, J1/4



RN1□1-J4, J1/8
RDN1□1-J4, J1/8



RN1□1-J6, J1/4
RDN1□1-J6, J1/4

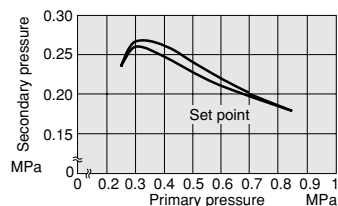


1MPa = 145psi. 1 l/min = 0.0353ft³/min.

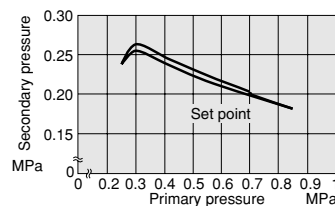
Pressure Characteristics

Remark: Graphs show the flow rate when the primary pressure is constant at 0.7MPa [102psi.].

RN1□0
RDN1□0



RN1□1
RDN1□1

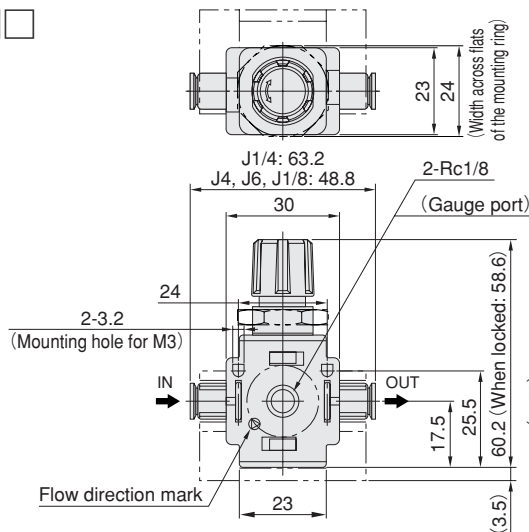


1MPa = 145psi.

Dimensions of Regulators (mm)

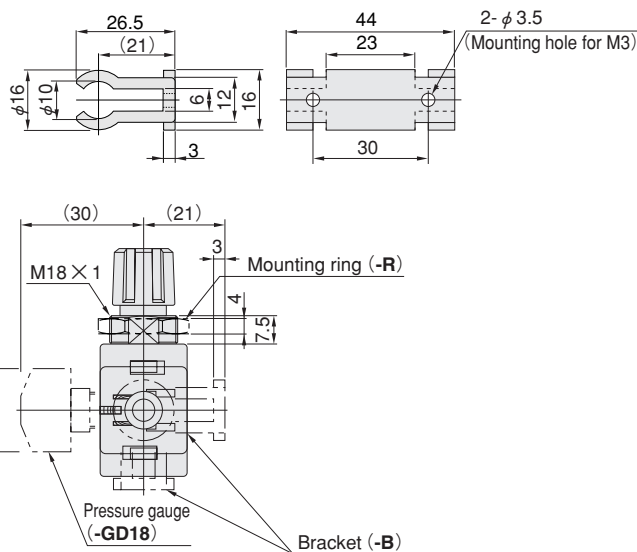
Side piping regulator

RN1□□



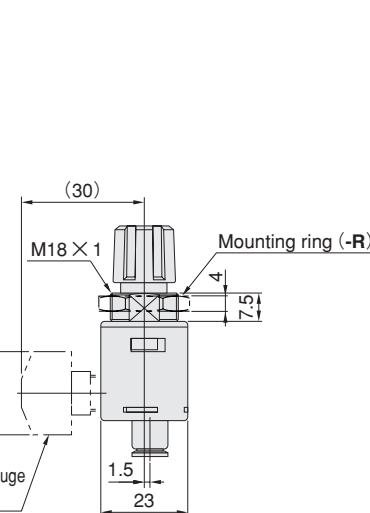
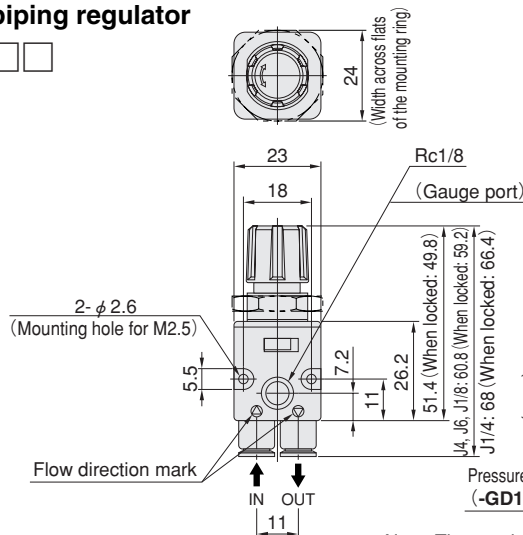
Bracket (-B)

Rn100



Bottom piping regulator

RDN1□□



Rdn100

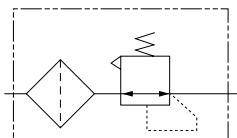
Note: The required mounting hole when the regulator is installed to a panel, etc., is φ 18.5 [0.728in.].

FILTER REGULATORS

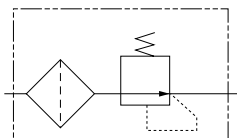


Symbols

●Relief specification



●Non-relief specification



Order Codes

FRN		-		-		-	
	Fitting specification			Mounting specification			
	J4 : ϕ 4mm [0.157in.]			Blank : No bracket			
	J6 : ϕ 6mm [0.236in.]			(no mounting ring)			
	J1/8 : 1/8in. tube			B : With bracket			
	J1/4 : 1/4in. tube			(no mounting ring)			
				R : With mounting ring			
				(no bracket)			
				Pressure gauge specification			
				Blank : No pressure gauge			
				GD18 : With pressure gauge			
	Pressure and relief specification						
	100 : 0.7MPa [102psi.] relief specification						
	101 : 0.25MPa [36psi.] relief specification						
	110 : 0.7MPa [102psi.] non-relief specification						
	111 : 0.25MPa [36psi.] non-relief specification						

●Order code for bracket only

B-RN100

●Order code for mounting ring only

R-RN100

●Order code for pressure gauge only

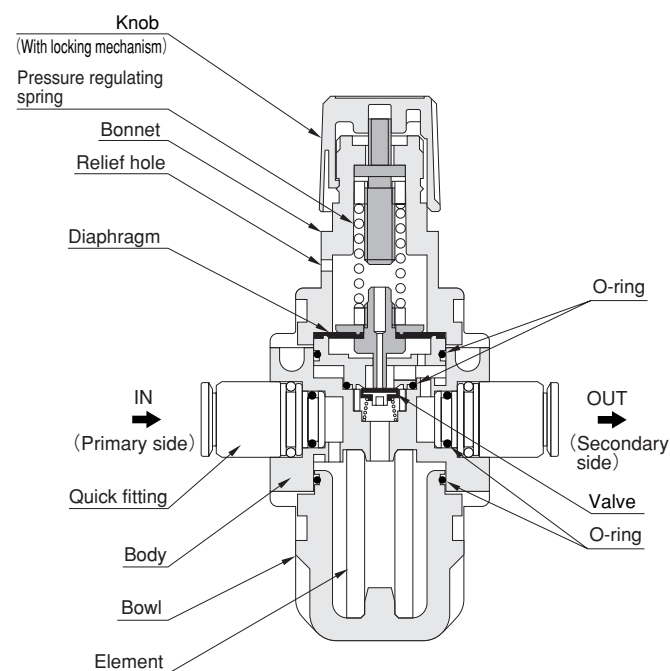
G1-18D

Specifications

		Model	Standard	Low pressure
			FRN100	FRN101
Item			FRN110	FRN111
Media			Air	
Piping connection fitting			φ 4mm [0.157in.], φ 6mm [0.236in.], 1/8in. or 1/4in.	
Pressure setting range MPa [psi.]			0.05~0.7 [7~102]	0.05~0.25 [7~36]
Maximum operating pressure MPa [psi.]			1 [145]	
Proof pressure MPa [psi.]			1.5 [218]	
Operating temperature range (atmosphere and media) °C [°F]			5~50 [41~122]	
Lubrication			Prohibited	
Mass	g [oz]	Body	42 [1.48]	
		Option	Pressure gauge: 15 [0.53], Mounting ring: 1.2 [0.042], Bracket: 5.5 [0.194]	
Filtration		μ m	5	
Materials		Body	Plastic	
		Bonnet	Plastic	
		Bowl	Nylon	
		Diaphragm	Synthetic rubber	
		O-ring	Synthetic rubber	
		Valve	Synthetic rubber and aluminum alloy	
		Element	PVF	
		Regulating spring	Piano wire (zinc plated)	

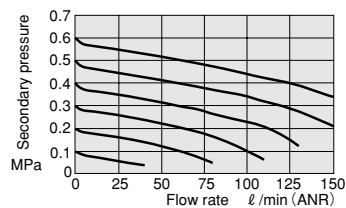
Inner Construction

FRN1□□

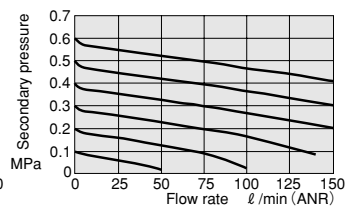


Flow Rate Characteristics

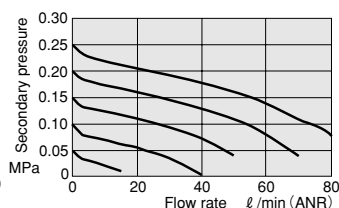
FRN1□0-J4, J1/8



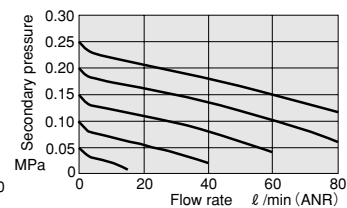
FRN1□0-J6, J1/4



FRN1□1-J4, J1/8



FRN1□1-J6, J1/4

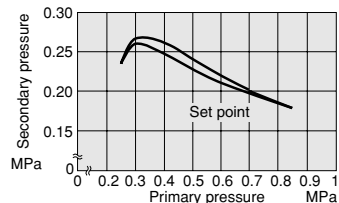


1MPa = 145psi. 1 l/min = 0.0353ft³/min.

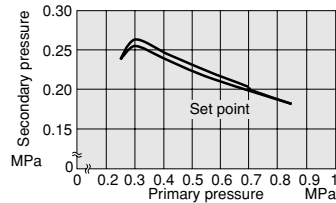
Remark: Graphs show the flow rate when the primary pressure is constant at 0.7MPa [102psi].

Pressure Characteristics

FRN1□0



FRN1□1

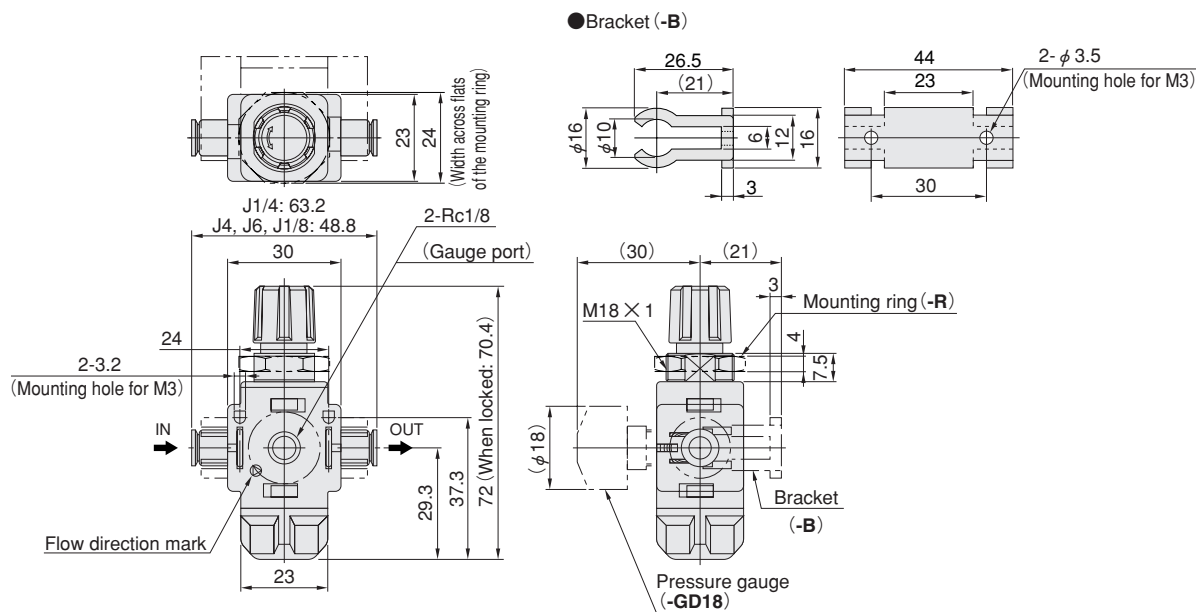


1MPa = 145psi.

Dimensions of Filter Regulators (mm)

FRN1□□

Frn100



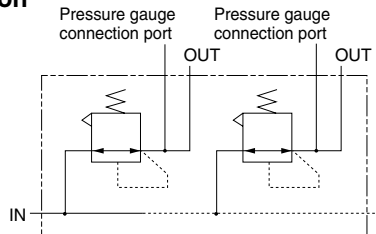
Note: The required mounting hole when the regulator is installed to a panel, etc., is φ 18.5 [0.728in.].

MANIFOLD REGULATORS

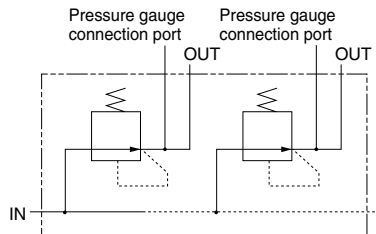


Symbols

●Relief specification

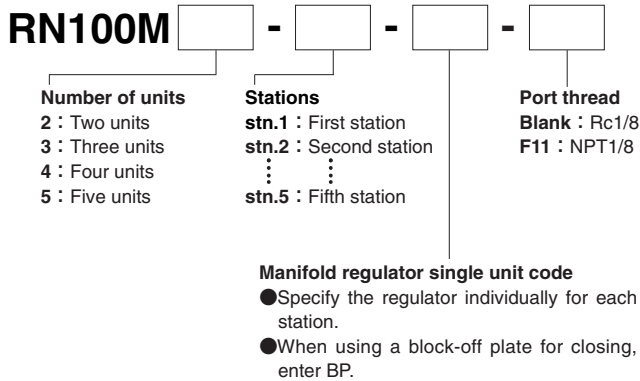


●Non-relief specification

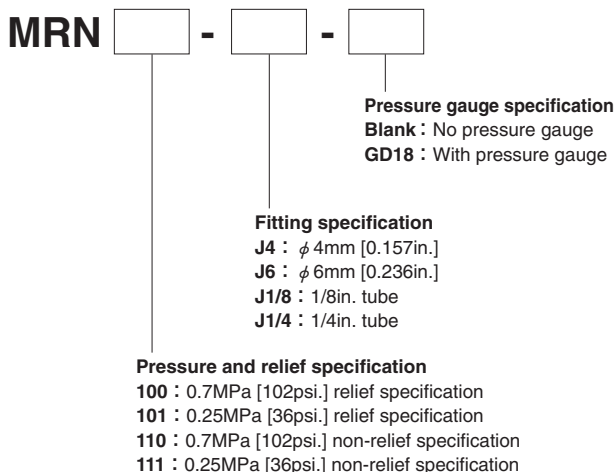


Order Codes

●Manifold regulator



●Manifold regulator single unit



Specifications

Item	Model	Standard	Low pressure
		MRN100	MRN101
		MRN110	MRN111
Media		Air	
Port size		IN : Rc1/8 or NPT1/8, OUT : ϕ 4mm [0.157in.], ϕ 6mm [0.236in.], 1/8in. or 1/4in.	
Pressure setting range	MPa [psi.]	0.05~0.7 [7~102]	0.05~0.25 [7~36]
Maximum operating pressure	MPa [psi.]	1 [145]	
Proof pressure	MPa [psi.]	1.5 [218]	
Operating temperature range (atmosphere and media)	°C [°F]	5~50 [41~122]	
Lubrication		Prohibited	
Mass (single unit)	Body	33 [1.16]	
	Pressure gauge	15 [0.53]	
Manifold body material		Aluminum alloy	

Remark: The basic inner construction and major parts materials are the same as for RDN. See p.107.

Mass

g [oz]				
Model	Manifold mass calculation method (n=Number of units 2~5)	Mounted regulator per unit MRN1 [] []	Pressure gauge/unit (Optional) GD18	Block-off plate
RN100M []	$(23 \times n) + 21$ $[(0.81 \times n) + 0.74]$	33 [1.16]	15 [0.53]	5.5 [0.194]

- Order code for block-off plate only
(one block-off plate, two mounting screws, one O-ring)

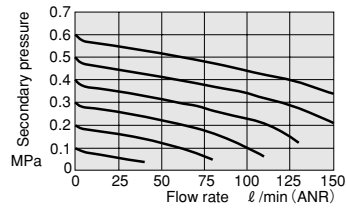
BP-RN100M

- Order code for pressure gauge only

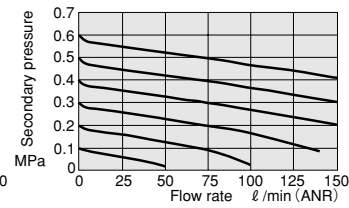
G1-18D

Flow Rate Characteristics

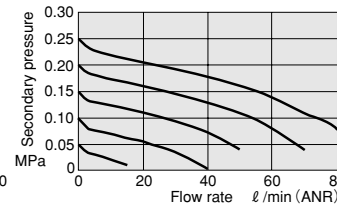
MRN1□0-J4, J1/8



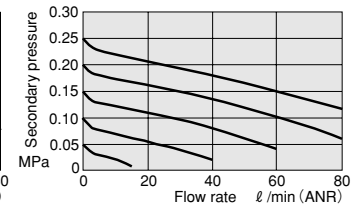
MRN1□0-J6, J1/4



MRN1□1-J4, J1/8



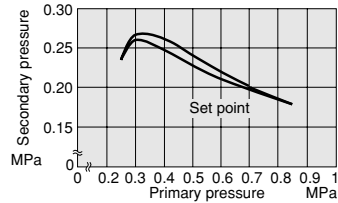
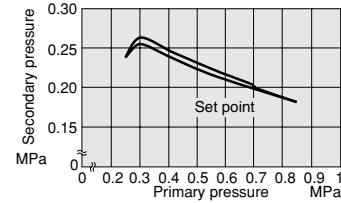
MRN11-J6, J1/4



1MPa = 145psi. 1 ℓ/min = 0.0353ft.³/min.

Remark: Graphs show the flow rate when the primary pressure is constant at 0.7MPa [102psi].

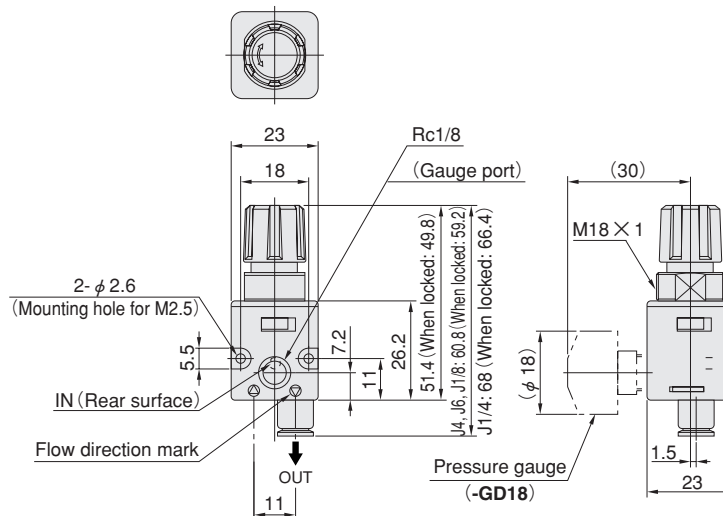
Pressure Characteristics

MRN1 0MRN1 1

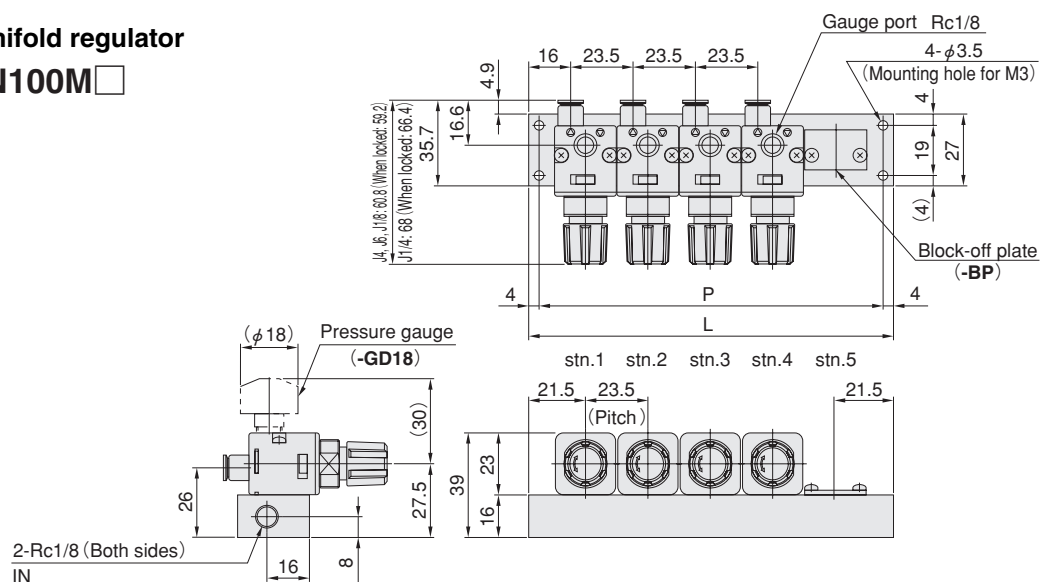
1MPa = 145psi.

Dimensions of Manifold Regulators (mm)

●Manifold regulator single unit

MRN1 

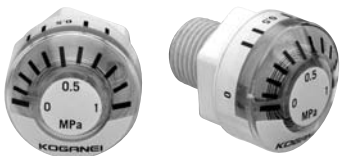
●Manifold regulator

RN100M ☐

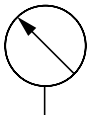
Number of units	P	L
2	58.5	66.5
3	82	90
4	105.5	113.5
5	129	137

COMPACT PRESSURE GAUGE

G1-18D



Symbol



Order Code

G1-18D

Specifications

Item	Model	G1-18D
Media		Air
Port size		R1/8
Pressure indication range	MPa [psi.]	0~1.0 [0~145]
Accuracy		F.S.±5%
Outer diameter	mm [in.]	φ 18 [0.71]
Maximum operating pressure	MPa [psi.]	0.93 [135]
Mass	g [oz]	15 [0.53]
Material		Zinc die-casting

Dimensions of Compact Pressure Gauge (mm)

G1-18D

