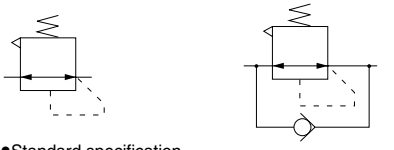
REGULATORS

RN650, RN651, RN652, RN900, RN902

Symbols



- Standard specification
- Low pressure specification
- Built-in check valve specification

Specifications

Item \ Series	650 series			900 series	
Type	Standard	Low pressure	Built-in check mechanism	Standard	Built-in check mechanism
Model	**RN650**	**RN651**	**RN652**	**RN900**	**RN902**
Media	Air or non-corrosive gas				
Port size Rc	3/4, 1				
Pressure setting range MPa [psi.]	0.05～0.83 [7～120]	0.05～0.25 [7～36]	0.05～0.83 [7～120]		
Max. operating pressure MPa [psi.]	0.97 [141]				
Proof pressure MPa [psi.]	1.47 [213]				
Operating temperature range °C [°F]	5～60 {41～140]				
Pressure gauge connection port Rc	1/4 (2 places)				
Construction	Relieving type				
Max. processed flow rate[Note] ℓ/min [ft³/min] (ANR)	2500 [88]	1500 [53]	2500 [88]	8000 [282]	
Lubrication	Not required				
Mass kg [lb.]	0.53 [1.17]			1.26 [2.78]	
Materials: Body	Aluminum die-casting				
Materials: Bonnet	Polyacetal			Aluminum die-casting	
Materials: Knob	ABS			PBT	
Materials: Diaphragm	Synthetic rubber with layer cloth				
Standard attachments: Bracket	Standard attachments				
Standard attachments: Mounting ring	Standard attachments				
Embedded pressure gauge: Pressure indicator range MPa [psi.]	1 [145]				
Embedded pressure gauge: Max. operating pressure MPa [psi.]	0.95 [138]				
Embedded pressure gauge: Operating temperature range °C [°F]	5～60 [41～140]				
Embedded pressure gauge: Materials: Bourdon tube	Brass tube				
Embedded pressure gauge: Materials: Cover (case)	PPS				
Digital pressure gauge with built-in sensor: Rated pressure range MPa [psi.]	0～1.000 [0～145]				
Digital pressure gauge with built-in sensor: Setting pressure range MPa [psi.]	0～1.000 [0～145]				
Digital pressure gauge with built-in sensor: Materials: Case	ABS				

Note: This is the maximum processed flow rate when the air primary pressure is 0.69MPa [100psi.] and the secondary setting pressure is 0.5MPa [73psi.].

Order Codes

RN — [ ] — [ ] — [ ] — [ ] — [ ]

Regulator

Body model / Port size

Body model	Rc3/4	Rc1	
650	**06**	**08**	Standard specification
900	**06**	**08**	Standard specification
651	**06**	**08**	Low pressure specification
652	**06**	**08**	Built-in check mechanism specification
902	**06**	**08**	Built-in check mechanism specification

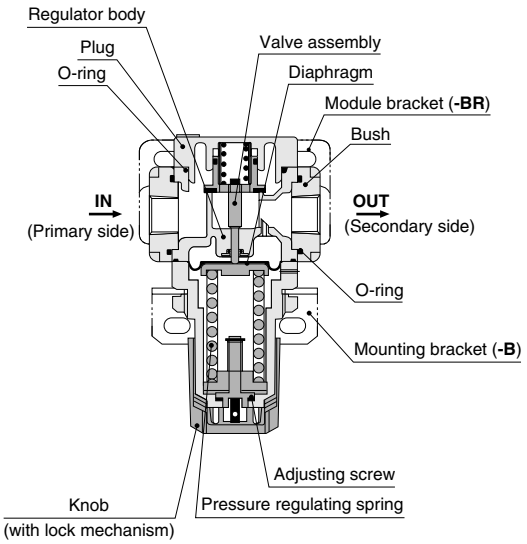
Non-ion specification
Blank — Standard specification
NCU — Non-ion specification

Pressure gauge specification
Blank — No pressure gauge
G1A — 1MPa [145psi.] specification, ϕ 40 pressure gauge[Note1]
G1B — 1MPa [145psi.] specification, □30 Embedded pressure gauge (only for 900 series)[Note2]
G3 — 0.3MPa [44psi.] specification, ϕ 40 pressure gauge (only for 650 series)[Note1]
GS1A — 1MPa [145psi.] specification, □50 Pressure gauge with built-in switch, lead wire type for DC24V[Note1]
GS1B — 1MPa [145psi.] specification, □50 Pressure gauge with built-in switch, lead wire type for AC100V, AC200V[Note1]
GS1C — 1MPa [145psi.] specification, □50 Pressure gauge with built-in switch, with DIN connector for DC24V[Note1]
GS1D — 1MPa [145psi.] specification, □50 Pressure gauge with built-in switch, with DIN connector for AC100V, AC200V[Note1]
GS2 — 1MPa [145psi.] specification, □30 Digital pressure gauge with built-in sensor, (only for 900 series)[Note2]

Bracket specification[Note3]
Blank — Mounting bracket
BR — Bracket module (only for 900 series)
BM — Module for supporting piping (only for 900 series)

Notes: 1. For the specifications, order codes, and dimensions of the pressure gauge and the pressure gauge with built-in switch, see p.172 and 183.
2. If a non-ion specification is selected, note that **-G1B** and **-GS2** cannot be selected.
3. For the bracket and module order codes and specifications, see p.147～152.

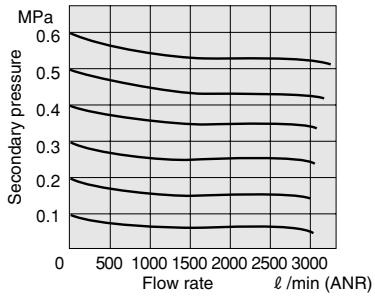
Inner Construction



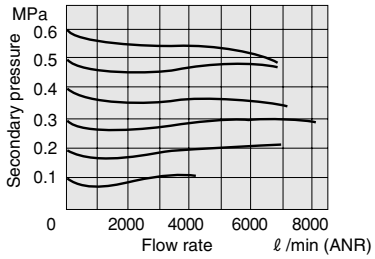
Flow Rate Characteristics

● Standard and built-in check mechanism specifications

RN650
RN652

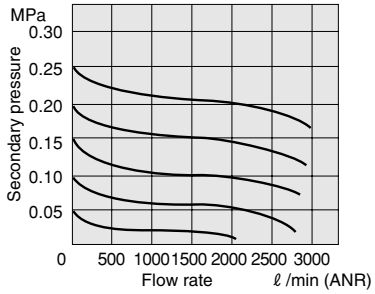


RN900
RN902



● Low pressure specification

RN651

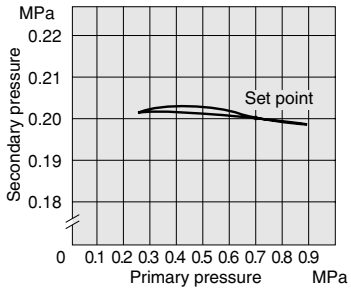


Remark: Graphs show flow rate characteristics when the primary pressure is at 0.7MPa [102psi.]. 1 ℓ/min = 0.0353ft³/min.

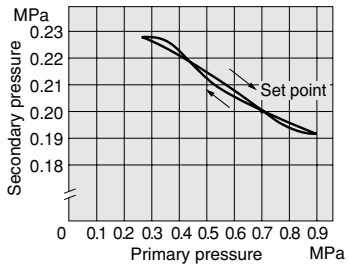
Pressure Characteristics

● Standard and built-in check mechanism specifications

RN650
RN652

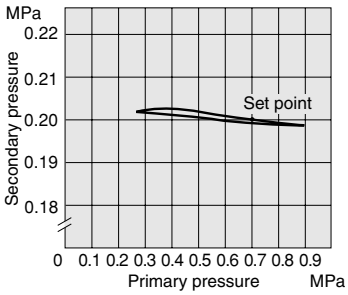


RN900
RN902



● Low pressure specification

RN651



1MPa = 145psi.

System Upgrade Using a Regulator with Built-in Check Mechanism

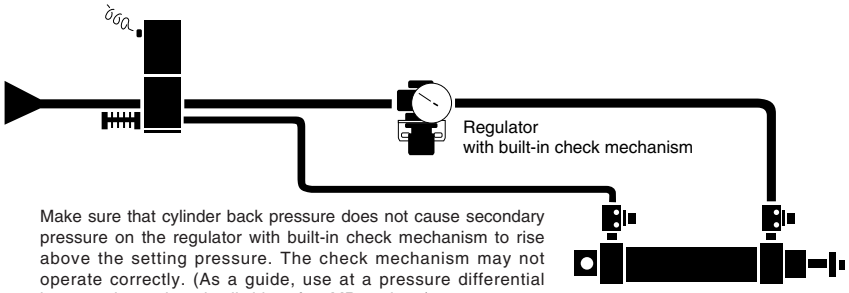
The regulator with built-in check mechanism is equipped with a built-in check valve that opens up when the primary pressure falls off, causing the pressure balance to collapse and simultaneously opening up the main valve to relieve the secondary pressure to the primary side.

Changing push side and pull side thrust

The thrust on an air cylinder's push side and pull side can be changed easily. Cylinders can be operated at low pressure on the side where thrust is not required, allowing reduction of air consumption.

Example: More thrust on push side, less thrust on pull side

Push side air pressure: 0.5MPa
Pull side air pressure: 0.3MPa



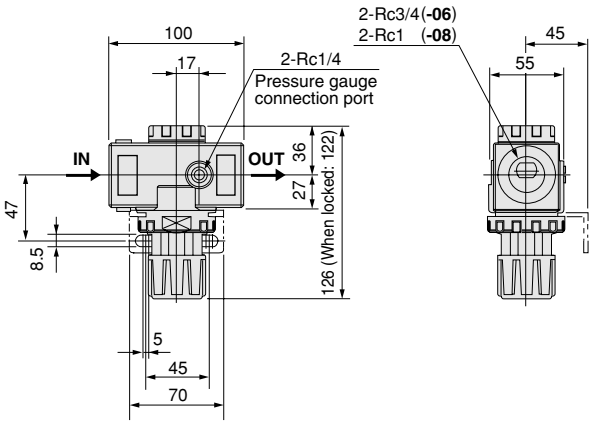
Make sure that cylinder back pressure does not cause secondary pressure on the regulator with built-in check mechanism to rise above the setting pressure. The check mechanism may not operate correctly. (As a guide, use at a pressure differential between the push and pull sides of 0.3MPa or less.)

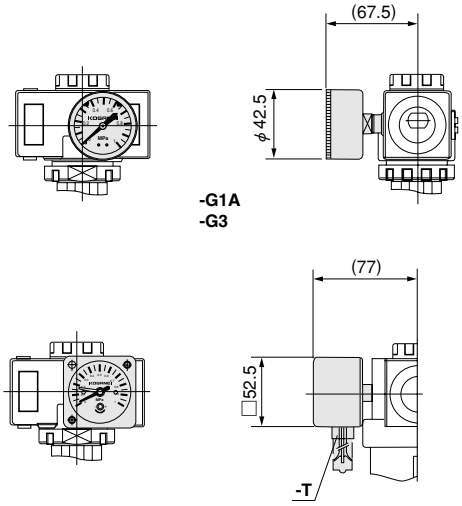
Dimensions of Regulators (mm)

●RN650
●RN651
●RN652

●Optional pressure gauges

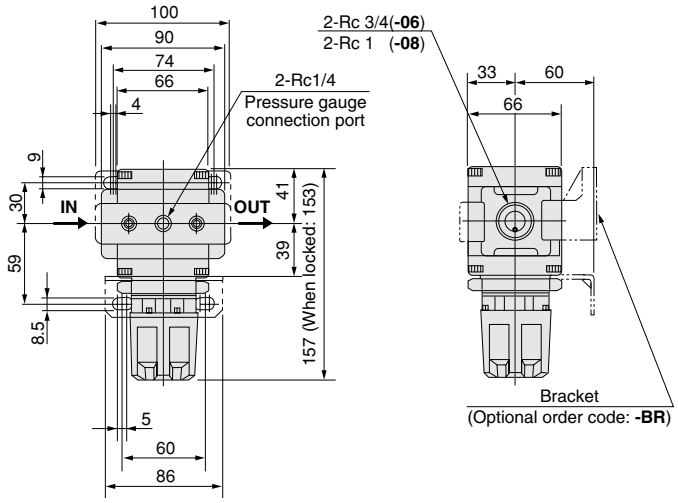
RN650



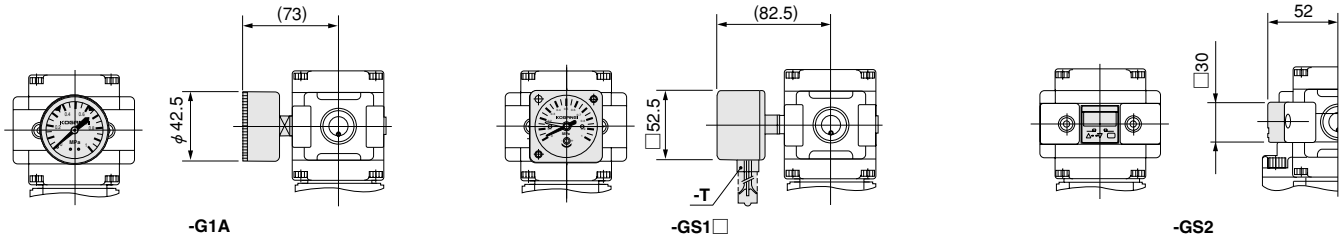


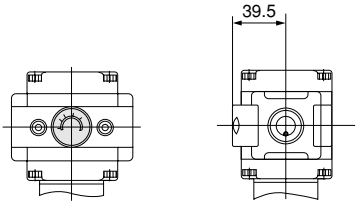
●RN900
●RN902

RN900



●Optional pressure gauges





MODULES AND ADAPTERS








Order Codes

8— □ □ □

Port size Rc[Note]
3/4, 1
6 **8** — 650, 900

Module and adapter
F — F module
ND — D module for bracket-combined use
T — T module
DT — T module for bracket-combined use
R — R module (For regulator only)
M — Piping supporting type M module (For regulator only)
S — S adapter
DS — S adapter module

Body size
65 — For 650 series
90 — For 900 series

Note: Port size selection is not allowed for F module (**F**), D module for bracket-combined use (**ND**), R module (**R**), and piping supporting type M module (**M**).

Model List

Modules and adapters / Body size	F module **F** (For modules only)	D module **ND** (Brackets for combined use)	T module **T** (Branch piping)	T module **DT** (Brackets for combined use with branch piping)
65	**8-65F** ● Applicable model FN650 RN650, RN651, RN652 LN650, LN651 FN900, FN901 LN900, LN901, LN902	**8-65ND** ● Applicable model CN650, CY650, CN750 FN650 RN650, RN651, RN652 LN650, LN651 FN900, FN901, LN900, LN901, LN902	**8-65T** ● Applicable model FN650 RN650, RN651, RN652 LN650, LN651 FN900, FN901 LN900, LN901, LN902	**8-65DT** ● Applicable model FN650 RN650, RN651, RN652 LN650, LN651 FN900, FN901 LN900, LN901, LN902
90		**8-90ND** ● Applicable model CZ650 MF800, MF1000 MMF600, MMF800		**8-90DT** ● Applicable model MF800, MF1000 MMF600, MMF800

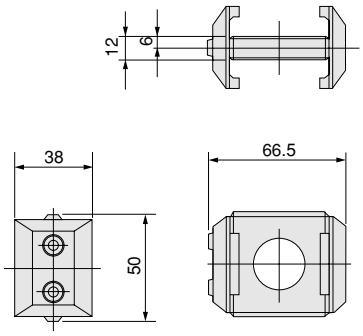
Modules and adapters / Body size	R module **R** (For regulator only)	M module **M** (For supporting regulator piping only)	S adapter **S** (Port connection)	S adapter **DS** (Brackets for combined use with piping connection)
65	—	—	**8-65S** ● Applicable model FN650 RN650, RN651, RN652 LN650, LN651 FN900, FN901 LN900, LN901, LN902	**8-65DS** ● Applicable model FN650 RN650, RN651, RN652 LN650, LN651 FN900, FN901 LN900, LN901, LN902
90	**8-90R** ● Applicable model CN900 CY900 CZ900 RN900, RN902	**8-90M** ● Applicable model RN900, RN902		**8-90DS** ● Applicable model MF800, MF1000 MMF600, MMF800

Remark: The applicable models shown in the tables are typical examples. For details, see p.125.

Dimensions of F Module (mm)

● **8-65F**

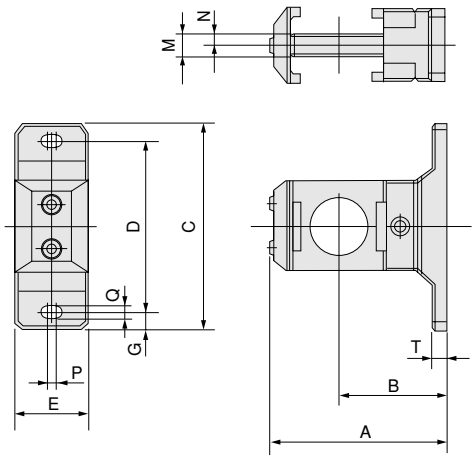
Frl_mod□



Dimensions of D Module for Bracket-combined Use (mm)

● **8-65ND**
● **8-90ND**

Frl_mod□

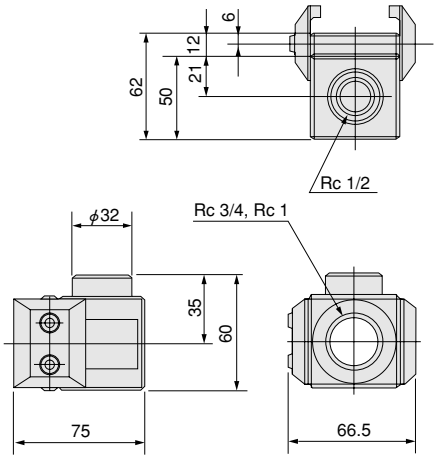


Model	A	B	C	D	E	G	M	N	P	Q	T
8-65ND	94	60	110	90	38	10	12	6	4	9	8
8-90ND	111	77	110	90	38	10	12	6	4	9	7

Dimensions of T Module (mm)

● **8-65T**□

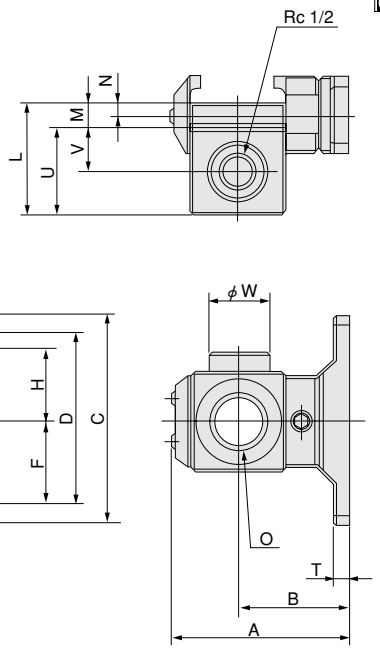
Frl_mod□



Dimensions of T Module for Bracket-combined Use (mm)

● 8-65DT□
● 8-90DT□

CAD Frl_mod□

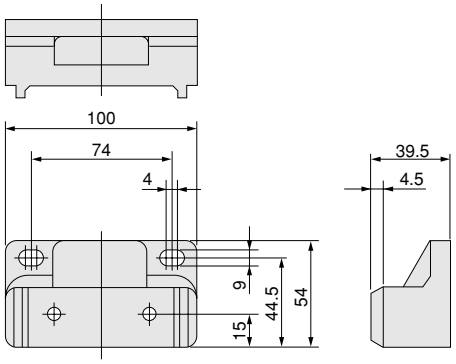


Model	A	B	C	D	E	F	H	J	L	M	N	O	P	Q	T	U	V	φW
8-65DT	94	60	110	90	38	45	35	75	62	12	6	Rc3/4 Rc1	4	9	8	50	21	32
8-90DT	111	77	110	90	38	45	35	75	62	12	6	Rc3/4 Rc1	4	9	7	50	21	32

Dimensions of R Module (For Regulator Only) (mm)

● 8-90R

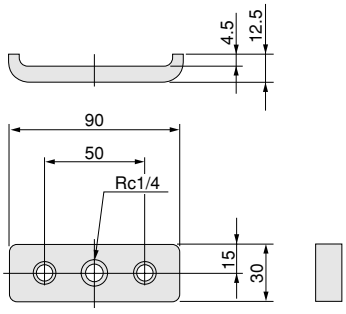
CAD Frl_mod6



Dimensions of Piping Supporting Type M Module (mm)

● 8-90M

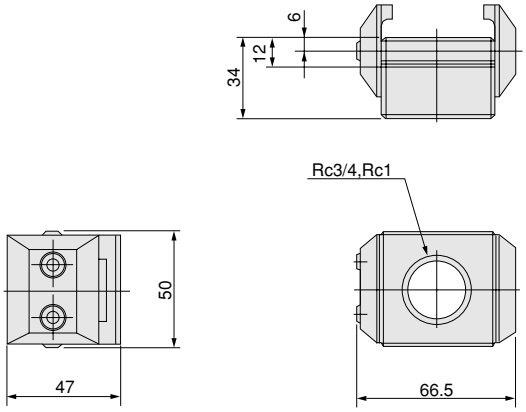
CAD Frl_mod6



Dimensions of S Adapter (mm)

● **8-65S□**

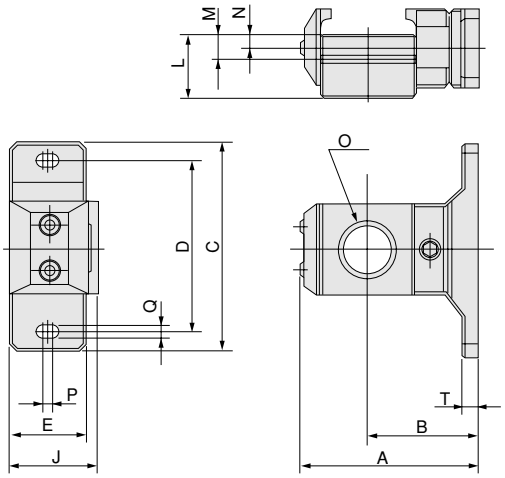
Frl_mod5



Dimensions of S Adapter Module (mm)

● **8-65DS□**
● **8-90DS□**

Frl_mod□



Model	A	B	C	D	E	J	L	M	N	O	P	Q	T
8-65DS	94	60	110	90	38	47	34	12	6	Rc3/4 Rc1	4	9	8
8-90DS	111	77	110	90	38	47	34	12	6	Rc3/4 Rc1	4	9	7

BRACKETS

Bracket Models and Applicable Component

Component type		Bracket model	Remark
Air filters	**FN650**	**8-65B**[Note]	Piping supporting type, optional
	FN900	**8-90A**	Body supporting type, optional
Mist filters	**MF800**	**8-80A**	Body supporting type, optional
	MF1000		
Micro mist filters	**MMF600**	**8-80A**	Body supporting type, optional
	MMF800		
Regulators	**RN650**	**8-65**	Standard
	RN900	**8-90**	
Lubricators	**LN650**	**8-65B**[Note]	Piping supporting type, optional
	LN900	**8-90A**	Body supporting type, optional

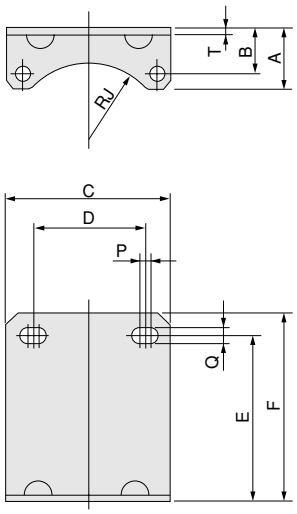
Note: Pipe supporting type brackets (8-65B) are sold in a set of two brackets.

Dimensions of Brackets (mm)

■ For air filters, mist filters, micro mist filters, and lubricators

● **8-80A**

● **8-90A**

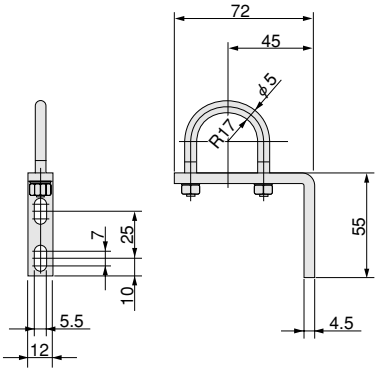


Model	A	B	C	D	E	F	RJ	P	Q	T	Applicable model
8-80A	50	32	108	80	70	80	47	5	8.5	3.2	**MF800, MF1000, MMF600, MMF800**
8-90A	31	23	88	62	90	100	42	5	8.5	3.2	**FN900, FN901, LN900, LN901, LN902**

■ For air filters and lubricators

● **8-65B** Note

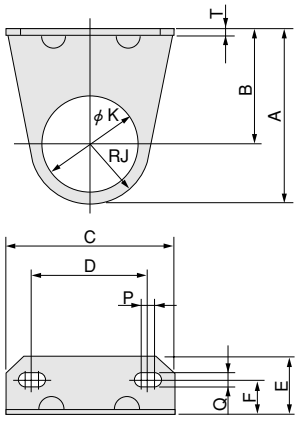
Note: Pipe supporting type brackets (8-65B) are sold in a set of two brackets.



■ For regulators

● **8-65**

● **8-90**



Model	A	B	C	D	E	F	RJ	ϕ K	P	Q	T	Applicable model
8-65	72.5	45	70	45	30	20	27.5	45	5	8.5	3.2	**RN650, RN651, RN652**
8-90	91	60	86	60	30	20	31	52.5	5	8.5	3.2	**RN900, RN902**

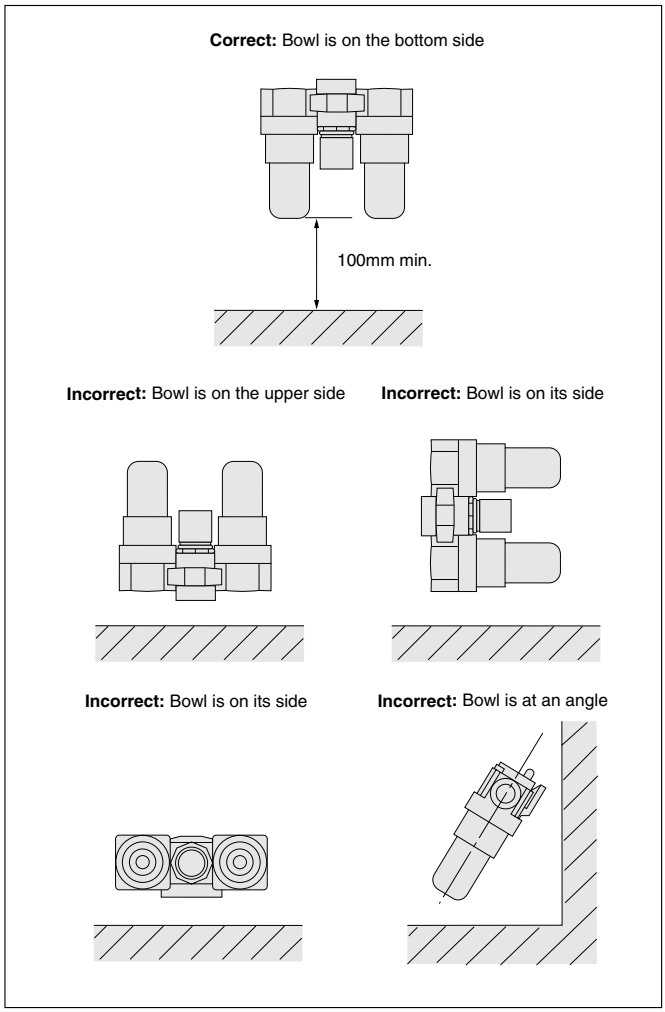
F.R.L. Combinations

Installation location

1. Install in locations where the ambient temperature is between 5～60°C [41～140°F].
2. The product cannot be used when the media or the ambient atmosphere contains any of the substances listed below.
   Organic solvents, phosphate ester type hydraulic oil, sulphur dioxide, chlorine gas, acids, or alkali, etc.
3. Avoid installation in locations subject to vibrations greater than 9.8m/s² [1G].

Mounting method

Mount in a vertical position, with the piping connections on the top and the bowl on the bottom.
(If using regulators as single units, any mounting direction is acceptable.)
Leave enough space underneath the bowl to allow easy access for draining collected liquid, and replacement of the filter element.



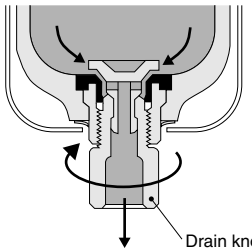
Notes: 1. Do not perform any machining on the body of the unit before or during mounting work. Its functions could be damaged.
2. Use air for the media.
3. Do not allow operating pressure to exceed a maximum of 0.97MPa [141psi.].
4. If using in locations subject to dripping water, dripping oil, etc., or to large amounts of dust, use something to cover and protect the unit.

Air Filter and Lubricator

Drain cock

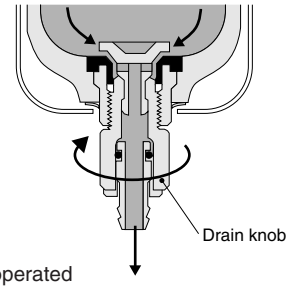
●Screw type
(Air filter Standard
Lubricator Order code: **-D**)

Rotating the drain knob to the left opens the drain port, and the collected liquid is expelled.



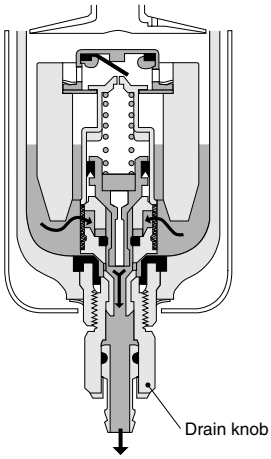
●With fitting
(Air filter Order code: **-F1**
Lubricator Order code: **-F2**)

Rotating the drain knob to the left opens the drain port, and the collected liquid is expelled.



Caution: The drain knob should be operated using fingertips.

●Auto drain type
(Air filter Order code: **-A**)
When a certain volume of collected liquid has accumulated, or when the pressure inside the bowl has fallen to less than 0.02MPa [3psi.], the collected liquid is automatically expelled. The collected liquid may also be expelled manually by turning the drain knob to the left.



1. In the auto drain, air is exhausted from the drain port until the supply pressure reaches 0.15MPa [22psi.]. This is normal, and even rotating the drain knob in this situation will not prevent the air from bleeding out.
   (If the time required for the supply pressure to rise to 0.15MPa [22psi.] seems too long, consult us.)
2. The drain knob should be operated using fingertips.
3. If attaching a tube to the fitting, use a nylon tube with inner diameter of 6mm [0.236in.]. Do not let the tube bend in the area near the fitting connection.
4. The fitting can be rotated freely in any direction. As a result, the tube does not need to be removed even when manually draining the collected liquid.

When placing orders for replacement of pressure gauges, see the table below.

Model	Optional order code	Sold separately	Module sold separately
650 750	**G1A**	**G1-40**	—
	GS1A	**GS1-50-DL**	
	GS1B	**GS1-50-AL**	
	GS1C	**GS1-50-DL-T**	
	GS1D	**GS1-50-AL-T**	
900	**G1A**	**G1-40**	**8-90M** (with bolt)
	GS1A	**GS1-50-DL**	
	GS1B	**GS1-50-AL**	
	GS1C	**GS1-50-DL-T**	
	GS1D	**GSS1-50-AL-T**	

Remark: If switching between **G1A** and **GS1□**, module (**8-90M**) is not required.