CKD

SM-372301-A

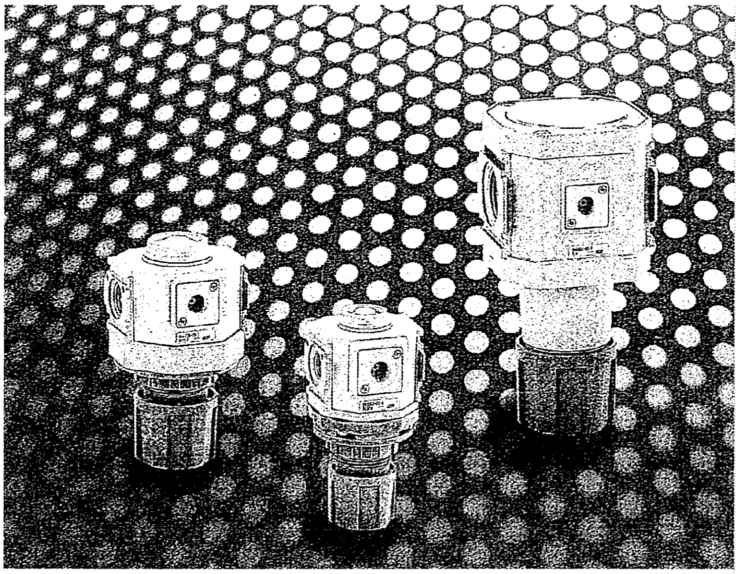
INSTRUCTION MANUAL

OIL PROHIBITED REGULATOR

RN3000

RN4000

RN8000



● Please read this instruction manual carefully before using this product, particularly the section describing safety.

● Retain this instruction manual with the product for further consultation whenever necessary.

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To pre-
vent such accidents, **read this operation manual carefully for proper operation.**

Observe the cautions on handling described in this manual, as well as the following instructions:

⚠ DANGER :

Failure to pay attention to DANGER notices may cause a situation that results in a fatality or serious injury and that requires urgent addressing.

⚠ WARNING :

Failure to pay attention to WARNING notices may result in a fatality or serious injury.

⚠ CAUTION :

Failure to pay attention to WARNING notices may result in injury or damage to equipment or facilities.

※1)ISO 4414 :Pneumatic fluid power・・・Recommendations for the application of equipment to transmission and control systems.

※2)JIS B 8370:General rule for pneumatic systems

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OIL PROHIBITED REGULATOR

RN Series

REVISION 2009. 07. 02

1. Unpacking

⚠ CAUTION	To prevent foreign matter from entering the inside of the product, do not unpack the product immediately before starting the piping.

- Make sure that the model number indicated on the product is matched with that you have ordered.
- Check the exterior of the product for damage.

2. Installation

2. 1 Installation environment

⚠ CAUTION	1) Avoid installing this product in direct sunlight. 2) Avoid installing where vibration or impact is present. 3) Large drainage Install the air dryer and separator before the air filter. If there is a large drainage from the compressor, hot and highly humid air could shorten the device life or result in corrosion. 4) Water-lubricated compressor circuit. Make sure that chlorine-based substances, etc., do not enter compressed air.

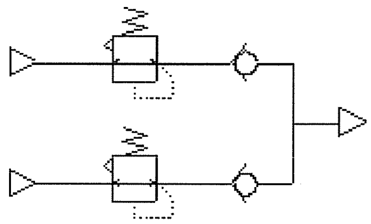
Do not install the product in a place listed below.

- ·The ambient temperature is beyond a range of 5°C ～ 60°C.
- ·The air may be frozen.
- ·The water drop or coolant is splashed onto the product.
- ·The humidity is high and the temperature changes largely, causing dew condensation.
- ·Sea breeze or seawater is splashed onto the product.
- ·Corrosive gas, or fluid chemical exists.

2. 2 Installation

⚠ CAUTION

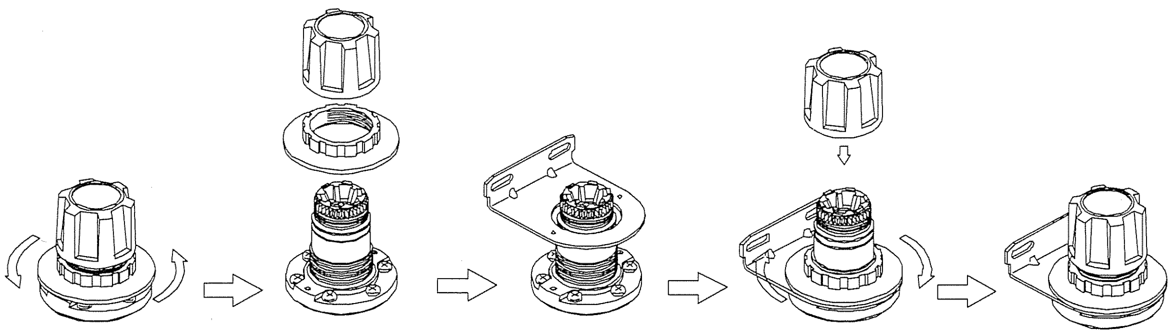
1) Do not move or swing the product with the pressure regulation knob kept held.
2) When connecting the products in parallel as shown below, do not close the secondary circuit. If the close circuit is required, always put a check valve on each secondary side.



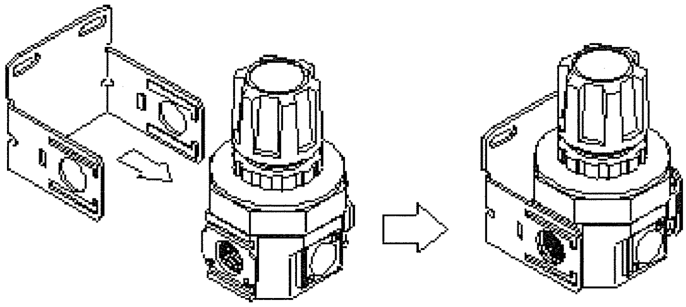
3) Allow a clearance for maintenance.
4) Pressure gauge
   Repeated and sudden increases and decreases in pressure and pressure pulsation must be avcided because it could adversely affect pressure gauge life. Either ease pressure fluctuation in the circuit or check with CKD so that a pressure gauge with cushioning screw is prepared. Applying pressure exceeding the pressure range could damage the pressure gauge.

■The product is installed in any mounting direction.

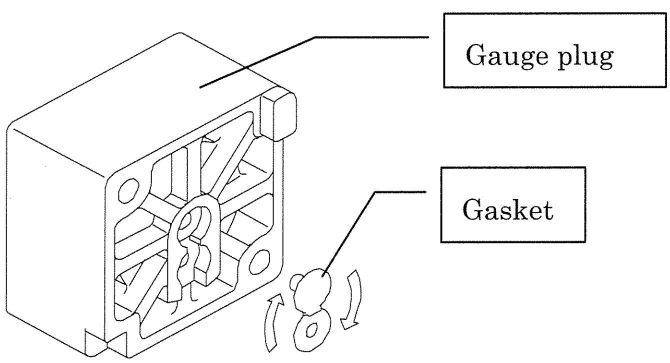
■Incase of using L shape bracket (optionally accompanied), refer to the figures below for attaching the bracket. (8000 series are excluded)
Same principle applys for panel mounting.



■In case of making use of the C type bracket "B" (optional), mount the regulator onto the C type bracket first, prior to screwing a piece of pipe into body of regulator. After aligning side grooves of body of regulator to the ridges on both sides of the C type bracket, push slide the bracket forcibly along the groove as per illustrated in Fig.



■In case of attaching a general pressure gauge to the gauge plug remove the gauge plug and invert the gasket on the rear.
The gauge plug is threaded with Rc1/4 screw thread.
Apply turning torque of pressure gauge 15N・m or less. To take gauge plug off, remove fourmo-unting screws using a cross cut tip screw driver(Nominal No.1).
Applicable tighte-ning torque of screw is 0.5N・m.



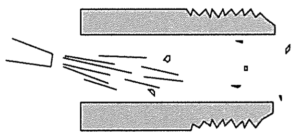
2. 3 Piping

⚠ CAUTION

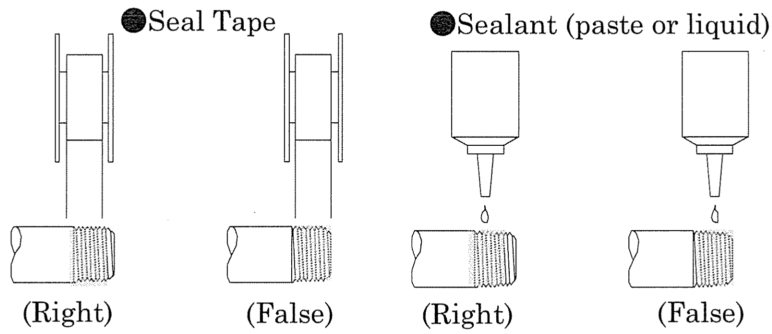
1) Flush the air piping to be used sufficiently before connecting the filter to it.
If dust or sealant enters the inside of the pipe during piping work ,this may cause the product performance down.
2) Confirm the flow direction indicated with the arrow and correctly connect the product. Installation in the reverse direction will shorten the product life.
3) Make sure that foreign matters do not enter when screwing the pipes or joints.
If dust or sealant enters the inside of the pipe during piping work, This may cause the product performance down.
4) Pipe screw-in torque
Make sure that excessive torque is applied on the body and piping when Piping.

Model	Max. torque N・m
RN3000	30
RN4000	30
RN8000	70

■Flush air into the pipe to blow out foreign substances and chips before piping.

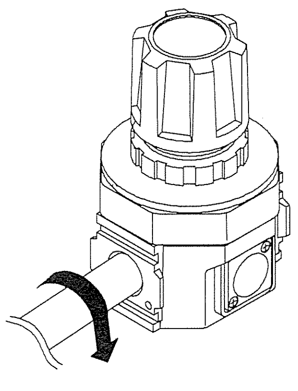


■Apply seal tape or sealant two pitches thread off from pipe tip and carefully keep its residual from falling into pipes or equipment.



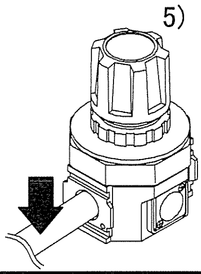
■When connecting the piping, tighten it using a proper tightening torque.
Avoid applying too much torque to the body or the piping.

Connection port size	tightening torque N・m
Rc1/8	3～5
Rc1/4	6～8
Rc3/8	13～15
Rc1/2	16～18
Rc3/4	19～40
Rc1	41～70



⚠ WARNING

1) Always operate the product within its specifications.
2) This product is manufactured as a general industrial machinery component. Do not use this product for medical relation, equipment, a circuit about the human life.
3) If the output pressure exceeding the set pressure value of the regulator may cause the secondary unit to break or malfunction, always install an appropriate safety unit.
4) There are cases when the regulator cannot be used for secondary for secondary side sealing circuits or balance circuits. Consult CKD for these types of applications.
5) Piping load torque
   Make sure that piping load or torque is not applied on the body or piping.



Model	Max. torque N･m
RN3000	50
RN4000	50
RN8000	100

⚠ CAUTION

1) Check the working circuit and working fluid.
   Malfunctions could occur if fluids containing solids, or fluids not within the specifications are passed.
   Connect a filter to the primary side of the product to prevent solid matters from entering.
2) Pulsations may occur depending on the working conditions and piping conditions.
   If pulsations occur, lower the primary pressure.
3) Consult with CKD if material restriction apply (copper–based, silicon–based, halogen– based materials not permissible (fluorine, chlorine, oxalic– based)). An oxalic– acid– based cleaning agent is used to clean parts in some cases.
4) When the primary pressure is released, the secondary pressure will flow to the primary side.
   If faults occur in other devices when the fluids on the secondary side flow to the primary side, provide a circuit to maintain the pressure.
5) Set secondary side pressure of the regulator to 85% or less of the primary side, or else the pressure drop could increase.
6) Pressure and flow characteristics and relief start pressure may be less than the standard regulator (R3000 series, etc.).
   Depending on the use, such as when backpressure rises, set pressure may increase 0.2MPa. It is recommended to use a pressure gauge compatible with set pressure + 0.2MPa.
7) When used in applications where primary pressure is 0.7MPa or more, keep the difference in primary and set pressure with 0.4MPa.
   Pulsation could occur if the difference in pressures is high or if secondary piping is large. If so, lower primary side pressure or restrict the secondary line. If pulsation continues, contact CKD.

■Secondary side pressure adjustment

It unlocks the adjusting knob when it is pulled fully up. Turning the knob to the direction of H marking on the top of the knob raises the secondary pressure higher while it lowers when the knob is turned toward L. After setting secondary pressure, push the knob down to have it locked.

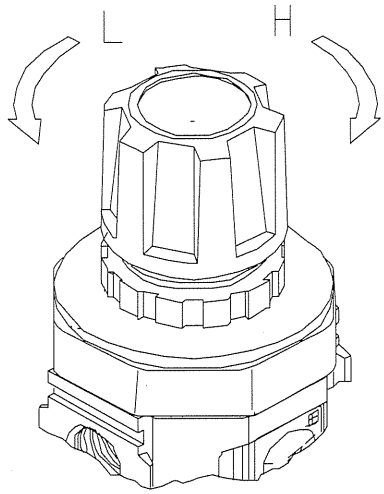
Pull the pressure adjustment knob and release the lock before setting the regulator pressure. The regulator could be damaged if the pressure is set without releasing the lock.

Adjust the pressure in the pressure rise direction.

The pressure cannot be set correctly if it is adjusted in the downward direction.

If the secondary side is not using the non-relief type, the pressure cannot be reduced.

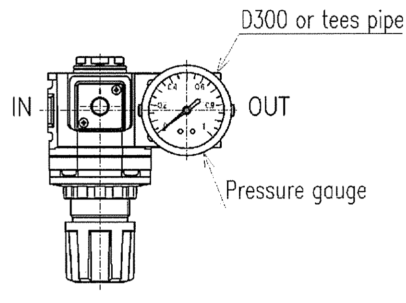
Lock the pressure adjustment knob after adjusting the pressure.



1) Pull the pressure adjustment knob to unlock it. Push the pressure adjustment knob in to lock it.
2) Manually operate the pressure adjustment knob. Use of tools, etc., may result in damage.
3) The set pressure may deviate slightly when the pressure adjustment knob is locked.
4) When the primary pressure is released, the secondary pressure will flow to the primary side. However, if a backpressure is applied, it may not flow to the primary side.

■If low-dust generation and cleanliness higher than the oil-free regulator and required, use the clean regulator RC2000 series.

■When using this unit for a large flow rate air blow, etc. install a pressure gauge as shown below so that the secondary pressure can be measured accurately.



4. Maintenance

4. 1 Inspection

1) Daily inspection

- Before operating the product, it is recommended to inspect the set pressure using a pressure gauge.

2) Periodic inspection

- To operate the product in its optimal operating state, carry out the periodic inspection normally once every six months.
- Inspect the set pressure using a pressure gauge.
- Check that no leak occurs in the piping.

4. 2 Disassembly and assembly

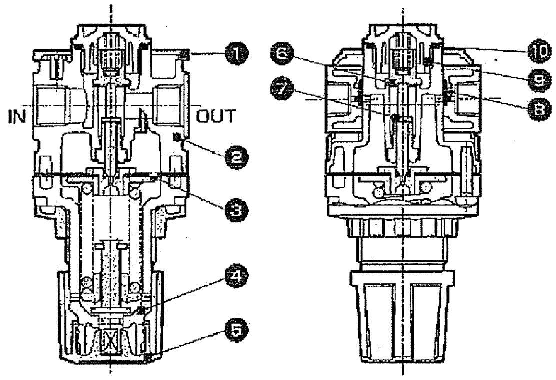
⚠ CAUTION	1) Before starting the maintenance work, turn OFF the power, shut down the supply pressure, and make sure that no residual pressure remains. 2) Do not disassemble or modify the product.

5. Troubleshooting

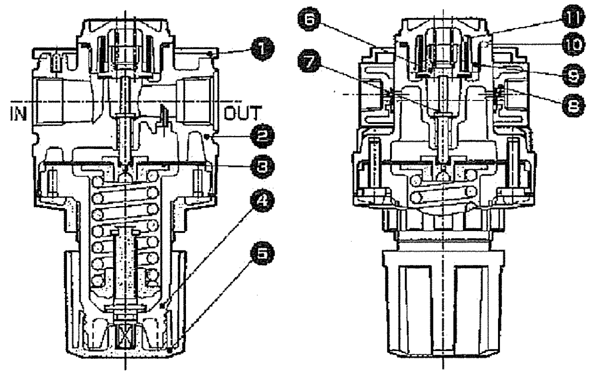
Trouble symptom	Cause	Remedy
Air leaks from the bottom of the knob	IN and OUT ports are connected reversibly.	Correct the mounting direction.
Pressure does not increase.	Primary pressure is insufficient.	Check the primary pressure.
	Primary piping is too long or throttled.	Make the primary piping shorter or the piping size larger.
	Needle on the pressure gauge does not move.	Replace the pressure gauge with a new one.
The pressure does not drop.	Backpressure is applied to the regulator.	Check if the system has any problem.
	There is no relief with the non-relief type.	Replace the product.
Leaks start from the cover. The set pressure rises abnormally.	Dust is sticking to the valve. Diaphragm is broken.	Replace the parts.
Secondary pressure pulsates.	Pulsation may occur depending on the piping conditions and usage methods.	Lower the primary pressure or restrict the piping.

6. Internal structure

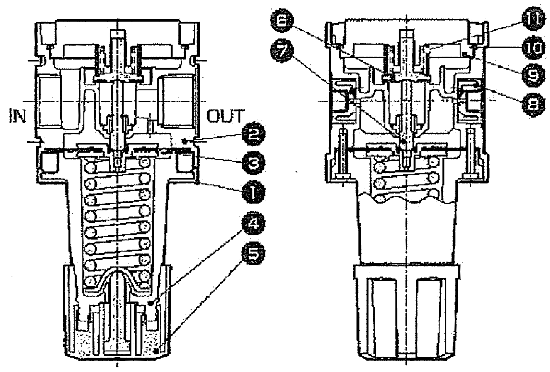
● RN3000



● RN4000



● RN8000



Part No.	Part name	Material		
		RN3000	RN4000	RN8000
1	Plate cover	ABS		
2	Body	ADC		
3	Diaphragm assembly	ZDC、NBR		
4	Cover	PBT		ADC
5	Knob	POM		
6	Valve	Al、HNBR		SUS、HNBR
7	Stem	Al		SUS
8	Gauge plug assembly	PA、NBR、SWRM		
9	Bottom cap	POM		Al
10	Bottom O-ring	FKM		
11	Bottom rubber	—	HNBR	

7. Product specifications and how to order

7. 1 Product specifications

Item		RN3000	RN4000	RN8000
Working media		Compressed air		
Max. working pressure	MPa	0. 8 (In case of option L: 0. 5)		
Proof pressure	MPa	1. 5		
Working temperature range	℃	5～60		
Set pressure range	MPa	Set pressure range is no code: 0. 05～0. 7 Set pressure range is L : 0. 05～0. 3		
Pipe size (IN·OUT)	Rc	1／4, 3／8	1／4, 3／8, 1／2	3／4, 1
Mass	kg	0. 5	0. 7	1. 9
Standard specifications		Fluid passage section: Oil-prohibited, nut for panel mount		Fluid passage section: Oil-prohibited

7. 2 How to order

RN3000 - 8 - L T - B W

① Model

②Port size

③Option

④ Attachment

Item	Symbol	Descriptions	RN3000	RN4000	RN8000
②Port size					
	8	1/4	●	●	
	10	3/8	●	●	
	15	1/2		●	
	20	3/4			●
	25	1			●
③Option Note2 Note3 Note4					
Pressure range	Blank	0.05 to 0.7MPa	●	●	●
	L	0.05 to 0.3MPa	●	●	●
Relief	N	Nonrelief type	●	●	●
Pressure gauge	T	Without pressure gauge(assembled with gauge port sealed)	●	●	●
	T8	Pressure gauge attacheed(assembled with gauge port open)	●	●	●
Flow derection	Blank	Standard flow(left→right)	●	●	●
	X1	Reverse(right→left)	●	●	●
④ Attachment					
	Blank	No attachments	●	●	●
	BW	C type bracket	●	●	●
	B3W Note5	L type bracket	●	●	
	GX59	Pressure gauge : G59D-8-P10-P70 Note1	●	●	●
	GY59	Pressure gauge : G59D-8-P10-P94	●	●	●

Note 1 : This is a brass option and attachment. Other options and attachments do not use copper-based materials.

Note 2 : When selecting options for several items, indicate selection in order from above.

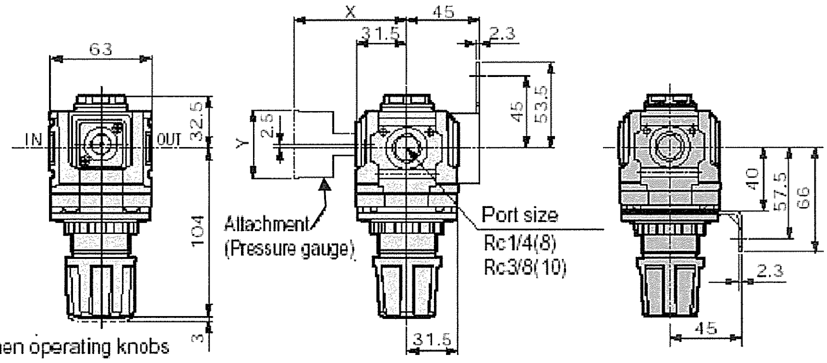
Note 3 : The low-pressure pressure gauge (0 to 0.4MPa)is used when "L" is selected for the pressure range option.

Note 4 : When "T" or "T8" is selected, the gauge plug rather then the pressure gauge is assembled. The gauge port is Rc1/4.

Note 5 : Refer to Section 2.Regyulator , in '⚠ PRECAUTIONS For Installation and Adjustment' (page 249) for details on mounting the L-type bracket.

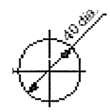
7. 3 Outside dimensions

●RN3000



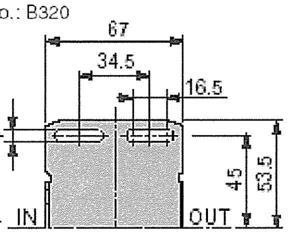
Dimensions when operating knobs

Panel cut dimension



Panel plate thickness: Max. 7mm

Attachment (C type bracket)
C type bracket (-BW)
Part model No.: B320



Tube center

Attachment (L type bracket)
L type bracket (-B3W)
Part model No.: B330

Tube center

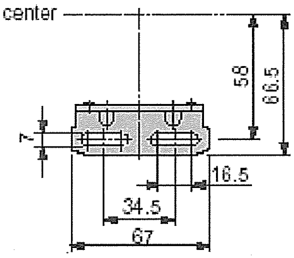
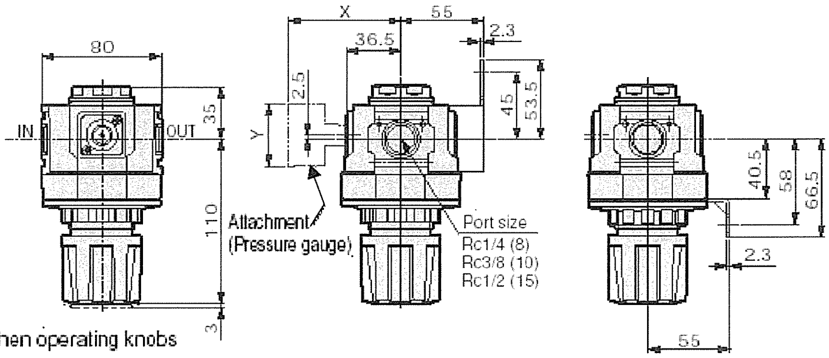


Table of optional pressure gauge dimensions

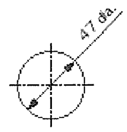
Pressure gauge	X	Y
GX59	76.5	52 dia.
GY59	79	52 dia.

●RN 4 000



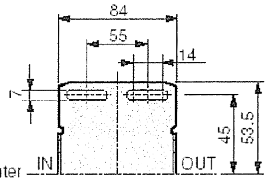
Dimensions when operating knobs

Panel cut dimension



Panel plate thickness: Max. 7mm

Attachment (C type bracket)
C type bracket (-BW)
Part model No.: B420



Tube center

Attachment (L type bracket)
L type bracket(-B3W)
Part model No.: B430

Tube center

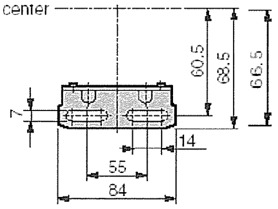
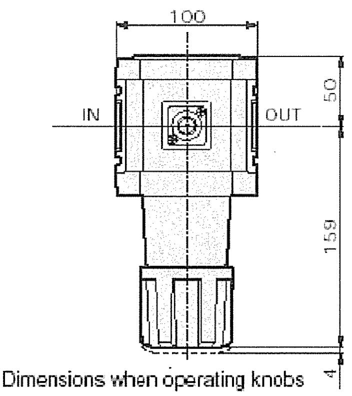
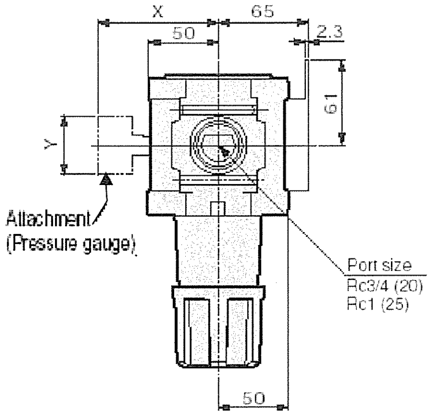


Table of optional pressure gauge dimensions

Pressure gauge	X	Y
GX59	81.5	52 dia.
GY59	84	52 dia.

●RN8000





Attachment (C type bracket)
C type bracket (-BW)
Part model No.: B820

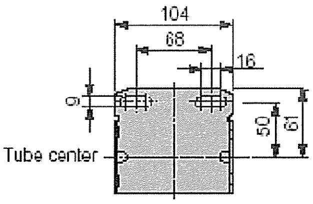


Table of optional pressure gauge dimensions

Pressure gauge	X	Y
GX59	91.5	52 dia.
GY59	94	52 dia.