CKD

SM-372149-A

INSTRUCTION MANUAL

MIDDLE PRESSYRE TYPE REGULATOR

RM Serise

- 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 prevent 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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MIDDLE PRESSURE TYPE REGULATOR

RM Series

REVISION 2006,10,2

1. Unpacking

CAUTION

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

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

2. Installation

2. 1 Installation environment

CAUTION

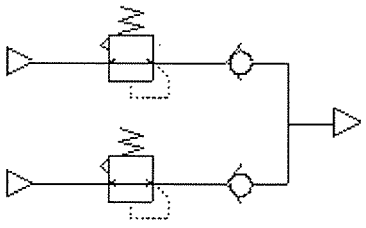
Do not install the product in a place listed below.
Where:

1) The ambient temperature is beyond a range of − 5°C ～ 60°C.
2) The air may be frozen.
3) Excessive vibration or impact exists.
4) The water drop or coolant is splashed onto the product.
5) The humidity is high and the temperature changes largely, causing dew condensation.
6) Sea breeze or seawater is splashed onto the product.
7) Corrosive gas, or fluid chemical exists.
8) The product is exposed to the direct sunlight.

2. 2 Installation

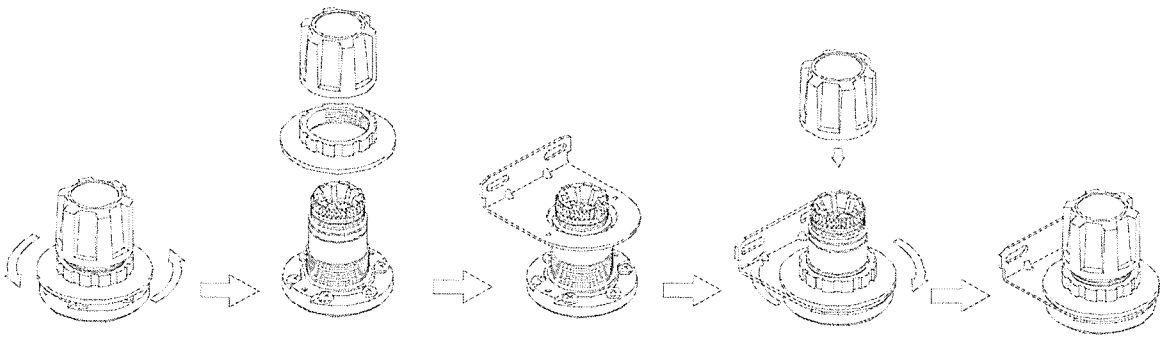
CAUTION

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.

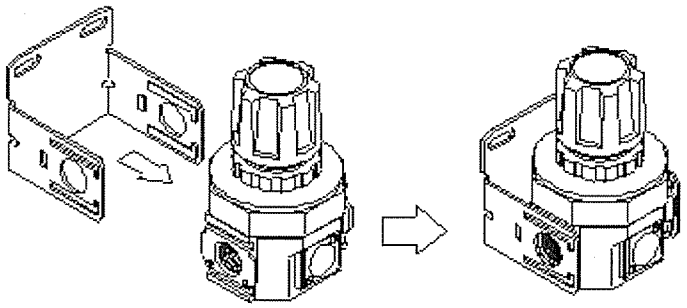


3) Allow a clearance for maintenance.

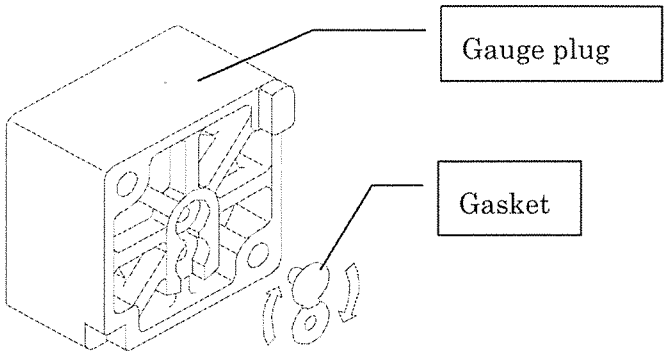
1) Incase of using L shape bracket (optionally accompanied), refer to the figures below for attaching the bracket.
Same principle applys for panel mounting.



2) 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.



3) 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.
Aply 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.



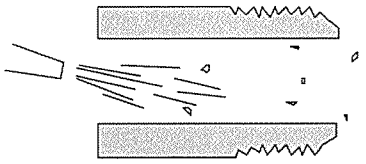
2. 3 Piping

CAUTION

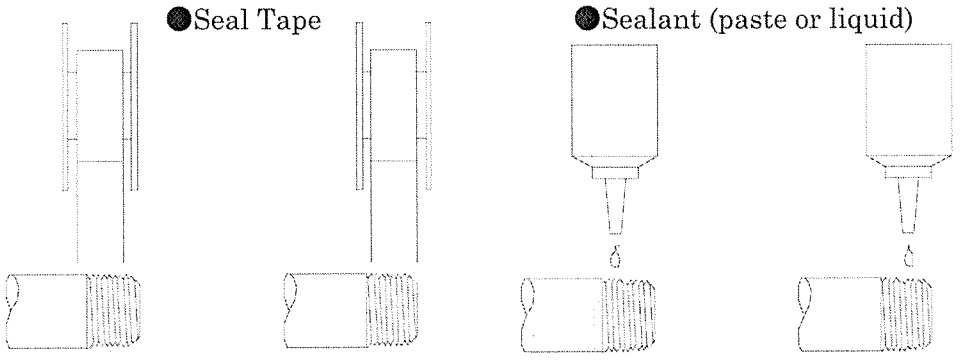
1) Flush the air piping to be used sufficiently before connecting the filter to it.
   If dust or sealant enters the inside of the pipe during piping work ,this may cause the product performance down.
2) Confirm the flow direction indicated with the arrow and correctly connect the product. Installation 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
RM3000	30
RM4000	30

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



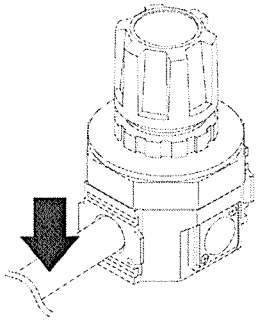
2) Apply seal tape or sealant two pitches thread off from pipe tip and carefully keep its residual from falling into pipes or equipment.



3) Before connecting the piping, always check the IN and OUT markings shown on the product.

WARNING

1) Always operate the product within its specifications.
2) 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.
3) 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.
4) Piping load torque
   Make sure that piping load or torque is not applied on the body or piping.



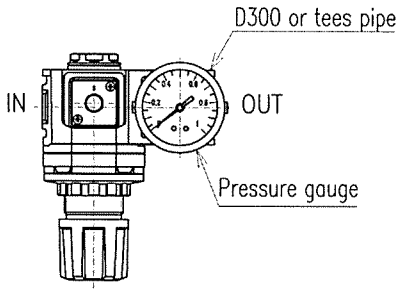
Model	Max. torque N·m
RM3000	50
RM4000	50

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) Set secondary side pressure of the regulator to 85% or less of the primary side, or else the pressure drop could increase.
3) 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.
4) Adjust the pressure in the pressure rise direction.
   The pressure cannot be set correctly if it is adjusted in the downward direction.
   When the pressure-adjusting knob is turned to the right, the secondary pressure will rise, and when turned to the left, the pressure will drop.
   The pressure may not drop depending on how the non-relief type is used.
5) Pulsations may occur depending on the working conditions and piping conditions.
   If pulsations occur, lower the primary pressure.
6) If the secondary side is not using the non-relief type, the pressure cannot be reduced.
7) Lock the pressure adjustment knob after adjusting the pressure.

1) A pressure higher than the primary pressure cannot be set.
2) Pull the pressure adjustment knob to unlock it. Push the pressure adjustment knob in to lock it.
3) Manually operate the pressure adjustment knob. Use of tools, etc., may result in damage.
4) The set pressure may deviate slightly when the pressure adjustment knob is locked.

5) 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.

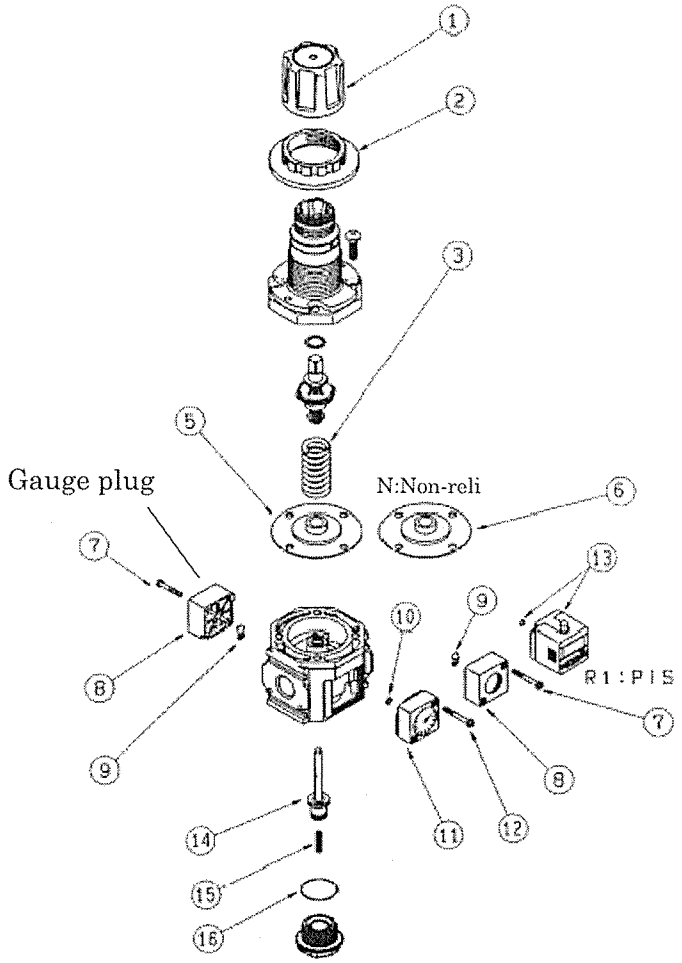
2) Periodic inspection

- 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.

Before disassembling, make sure that no air pressure is exerted on the regulator. Refer to the disassembly diagram of the regulator when disassembling. Be careful of tighten screws as install.



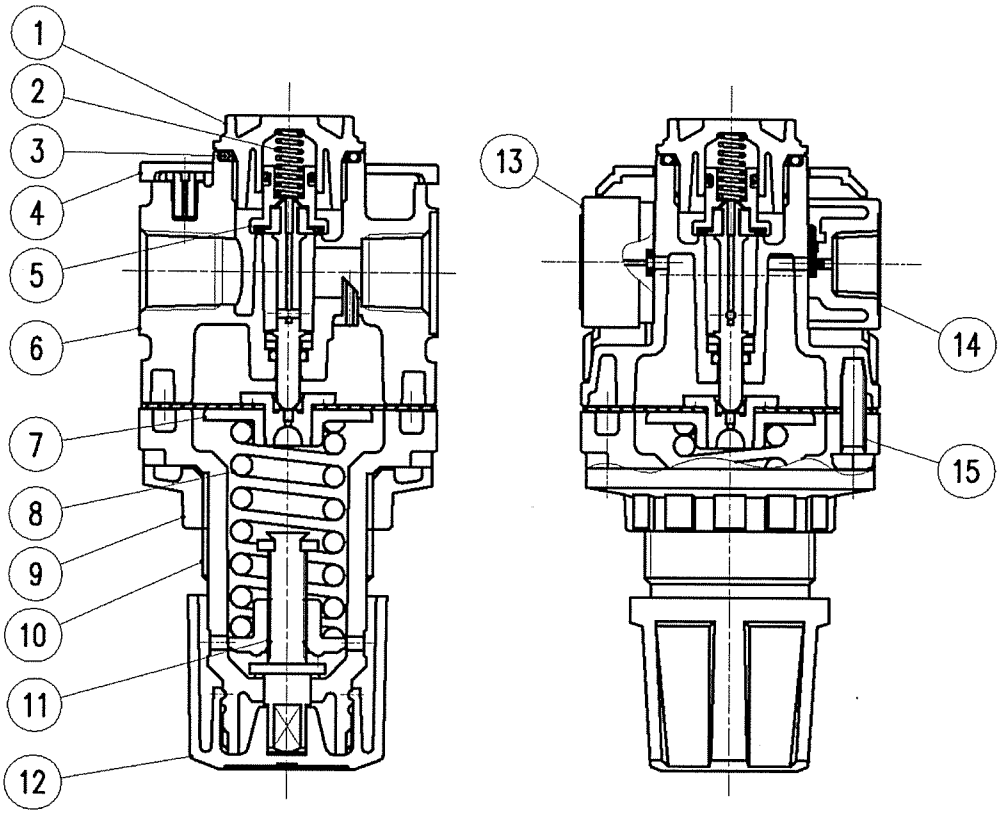
4. 2 Disassembly and assembly

Part name	Model		Parts no.
	RM3000	RM4000	
Repair kits	R3000-KIT	RM4000-KIT	5,14,15,16
Repair kits (Non-relief type)	R3000-KIT-N	R4000-KIT-N	6,14,15,16
Diaphragm assembly	R3000-DIAPHRAGM-ASSY	R4000-DIAPHRAGM-ASSY	5
Diaphragm assembly (Non-relief type)	R3000-DIAPHRAGM-ASSY-N	R4000-DIAPHRAGM-ASSY-N	6
Valve assembly	R3000-VALVE-ASSY	R4000-VALVE-ASSY	14,15,16
Gauge assembly	G401-P10	G401-P10	10,11,12
Gauge plug assembly	R3000-G-PLUG	R3000-G-PLUG	7,8,9

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.	Switch to a relief type.
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



Part No.	Part name	Material
1	Bottom plug	ADC
2	Spring	SUS
3	O-ring	NBR
4	Plate cover	ABS
5	Valve assembly	Al、NBR、POM
6	Body assembly	ADC
7	Diaphragm assembly	ZDC、NBR
8	Spring	SWP
9	Mounting nut	POM
10	Cover	PBT
11	Pressure adjust screw assembly	S35C、S30C、POM
12	Knob	POM
13	Pressure gauge assembly	PBT、NBR、PC、POM、SWRM、Brass
14	Gauge plug assembly	PA、SWRM
15	Screw	SWRM

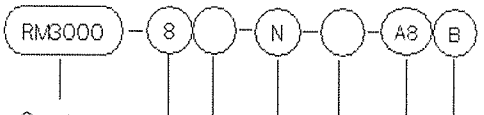
7. Product specifications and how to order

7. 1 Product specifications

Descriptions	RM3000	RM4000
Working fliid	Compressed air	
Max. working pressure MPa	1.6	
Withstanding pressure MPa	2.4	
Working temperature ˚C	-5～60 (to be unfrozen.) Note1	
Set pressurerange MPa	0.05～0.85	
Relfe	With relief mechanism	
Port size Rc、NPT、G	1/4and3/8(use an adaptor for 1/2)	1/4、3/8and1/2(use an adaptor for3/4)
Product mass kg	0.45	0.7
Standard accessories	Pressure gauge,nut for panel mount	

Note1 :Pressure switch with display PPD assembly "R1" is working temperture range is 5 to 50˚C.

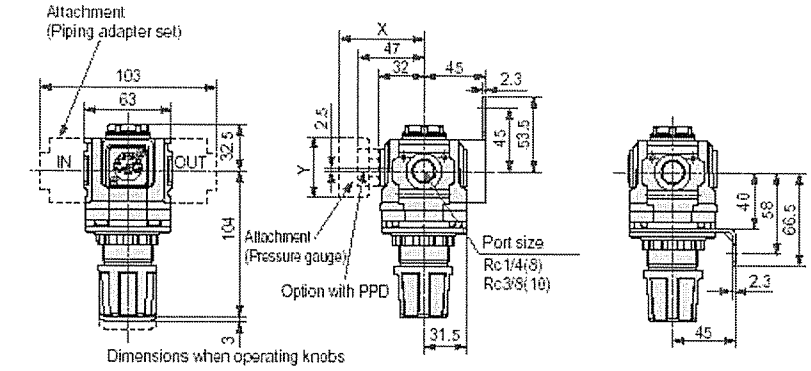
7. 2 How to order



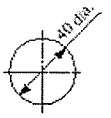
Symbol		Descriptions	①Model RM3000	①Model RM4000
②Port size				
8		1/4	●	●
10		3/8	●	●
15		1/2		●
③Pipe size type				
Blank		Rc	●	●
N		NPT	●	●
G		G	●	●
④Option				
Relief	Blank	With relief mechanism	●	●
	N	Non-relief type	●	●
Pressure gauge	Blank	With standard pressure gauge (G401)	●	●
	T	Without pressure gauge (gauge port is assembled in sealed state.)	●	●
	T8	Round shaped pressure gauge attached (gauge port is assembled in open state.)	●	●
	R1	Pressure switch with display PPD assembly	●	●
X1		IN/OUT reverse flow (right→left)	●	●
⑤Unit				
Blank		MPa(Rc)	●	●
J1		MPa(NPT、G)	●	●
⑥Piping adapter sets (attached)				
Blank		No attached	●	●
A8※		1/4	●	●
A10※		3/8	●	●
A15※		1/2	●	●
A20※		3/4		●
※Pipe size type				
Blank		Rc	●	●
N		NPT	●	●
G		G	●	●
⑦Attachment (attached)				
Blank		No attached	●	●
B		C type bracket	●	●
B3		L type bracket	●	●
G49P		Pressure gauge : G49D-8-P10	●	●
G59P		Pressure gauge : G59D-8-P10	●	●
G40P		Pressure gauge : G40D-8-P10	●	●
G50P		Pressure gauge : G50D-8-P10	●	●
G41P		Pressure gauge : G41D-8-P10	●	●

7. 3 Outside dimensions

●RM3000

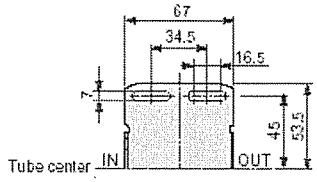


Panel cut dimension

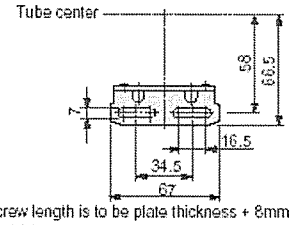


Panel plate thickness: Max. 7mm

Attachment (C type bracket)



Attachment (L type bracket)

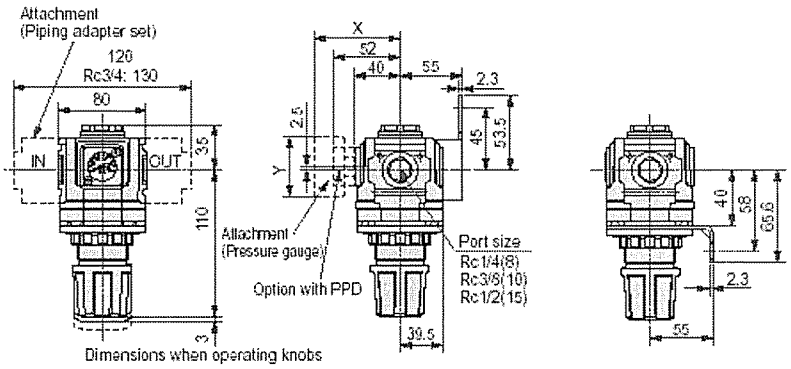


Note 1: Non-rotating fixing can be done by M4 screw. Screw length is to be plate thickness + 8mm or less, and can be screwed in without female thread machining.

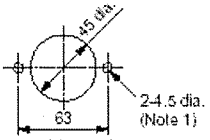
Pressure gauge attached option dimensions table

Attached pressure gauge	X	Y
G49P	(69)	43.5 dia.
G59P	(74)	52 dia.
G40P	(70.5)	42.5 dia.
G50P	(71.5)	52.5 dia.
G41P	(70)	42 dia.

●RM 4 000

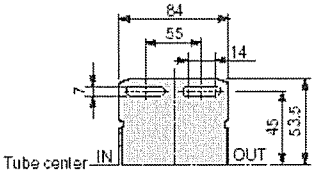


Panel cut dimension

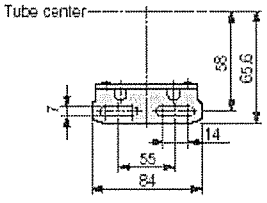


Panel plate thickness: Max. 7mm

Attachment (C type bracket)



Attachment (L type bracket)



Note 1: Non-rotating fixing can be done by M4 screw. Screw length is to be plate thickness + 8mm or less, and can be screwed in without female thread machining.

Pressure gauge attached option dimensions table

Attached pressure gauge	X	Y
G49P	(74)	43.5 dia.
G59P	(79)	52 dia.
G40P	(75.5)	42.5 dia.
G50P	(76.5)	52.5 dia.
G41P	(75)	42 dia.