CKD

SM－868457-A

INSTRUCTION MANUAL

SMALL DIRECT ACTING PRECISION REGULATOR

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- 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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1. Unpacking

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.
3) When the instruction manual supplied with the product thoroughly read this manual as well as that before starting operation.

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

2. Installation

2. 1 Installation environment

1) When ambient temperature exceeds range of 5 to 60° c.
2) The air may be frozen.
3) The water drop or coolant is splashed onto the product.
4) Corrosive gas, or fluid chemical exists.
5) An atmosphere where spatter could scatter.
6) Where the product is exposed to direct sun lay and when sea breeze or seawater or water contacts to the product.
7) The humidity is high and the temperature changes largely, causing dew condensation.
8) An environment where ozone generated.
9) Excessive vibration or impact exists.

> ⚠ **WARNING** Avoid using products in an atmosphere where vibration or impact is applied, chemicals or inorganic chemicals are contained in compressed air, or where they could lead to the product damage and accidents.

2. 2 Piping

1) Connect the piping so that air will flow in the direction of the arrow marked on the regulator piping block.
2) Install a 5 μ m air filter in the IN port of the regulator.
3) Install a pressure gauge in the gauge port. If a pressure gauge is not used, install a pipe plug instead.
4) Flush the pneumatic piping completely before connection.

5) Applicable piping tubes.

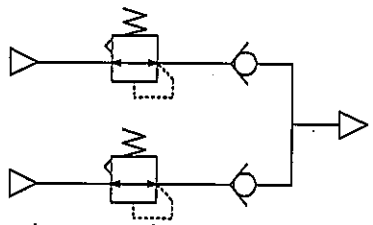
A push in joint is used in connection. Tube coming off or air leakage could occur depending with outer diameter precision, wall thickness or hardness of piping tube. Use CKD specified tube.

Tube	Outer diameter	Outer diameter tolerance	Inner diameter	Minimum bending radius
Soft nylon F-1500series	φ4	±0.1	φ2.5	10
	φ6		φ4	20
Urethane U-9500series	φ4	+0.1 -0.15	φ2	10
	φ6		φ4	20
Urethane NUseries	φ4	±0.1	φ2.5	8
	φ6		φ4.5	15

6) For tube used with push in joint, cut the tube to right angle by the dedicating tool, insert certainly, check dose not dislocate before starting use. When mounting or dismounting a tube, press the release ring equally, while not twisting, then pull out the tube.

⚠ 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) When piping, do not apply excessive force to the product.
   When installing the product and piping, do not apply the product tension, compression, bending, moment cased by the tube.
4) 4) 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.



5) When installing a pressure gauge, screw the gauge into using a wrench on across flats of square section. If another section is used on, air leakage or damage may be caused.

2. 3 Installation

1) Fasten the regulator using M4 screws with a plan washer. Tighten the screws to 2N•m or less.
2) To use an optional panel mount "P ", drill a ϕ 19 diameter mounting hole.
   Remove the knob of the mount by turning it counterclockwise as shown in Figure 1, and insert the regulator in the panel.
   If the screw comes off when the knob is removed, insert the screw in the knob or cover as shown in figure2, and push the knob into the cover until a "click" is heard.
3) Install the regulator as close to the intended pneumatic unit as possible.
4) When disassembling the regulator, secure enough space for disassembly.

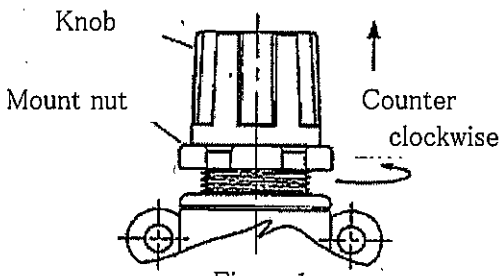


Figure 1

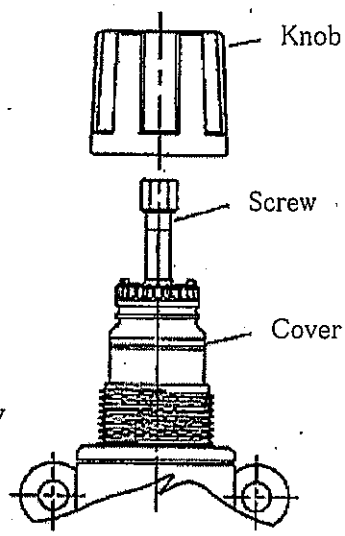
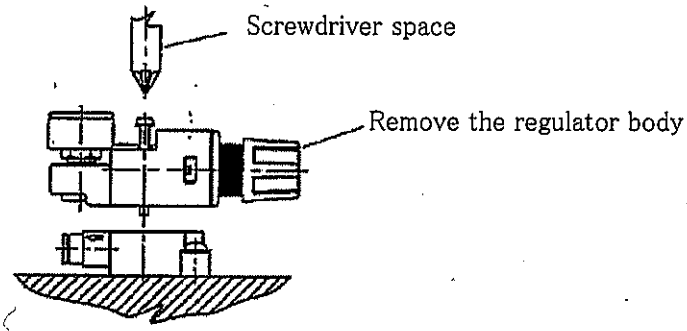


Figure 2



WARNING When installing the product, certainly tighten with the installation nut or the bracket set screw. The pressure may cause the product vibration, and an accident.

3. Operation

3. 1 Precautions

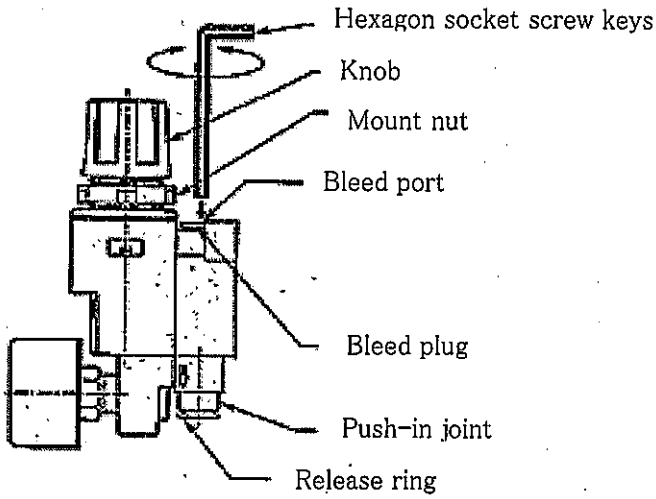
1) Check the primary pressure before setting the pressure.
2) Pressure higher then the primary pressure can not be set.
3) Pull the pressure adjustment knob to unlock it. Push the pressure adjustment knob in to lock it.
4) Release the lock, turn the pressure adjustment knob clockwise to increase secondary pressure, and counter clockwise to lower pressure. After adjusting pressure, fix the adjustment knob.

The set pressure may deviate slightly, when the pressure adjustment knob is locked.

5) Keep the pressure difference between the primary and secondary sides to 0.1～0.7MPa or less.

6) Air constantly leaks from the constant bleed port. This is necessary for precise pressure control, so do not plug the hole.

7) Turn the setscrew realized adjusting the constant bleed flow in the constant bleed port. The constant bleed flow increase in proportion to the set pressure. But this flow can decrease in 0.1 MPa or less. Increase constant bleed flow in low pressure area enables increase the set pressure sensitivity. The constant bleed flow is set 1.5 L/min (ANR) primary. Adjust the flow to insert the hexagon socket screw keys in the constant bleed port. After pressure setting, check does not increase. When setting the constant bleed, do not turn the setscrew completely. The pressure may be not able to adjust, and result in damage.



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.

CAUTION

1) Set secondary side pressure of the regulator to 0.1 MPa or less of the primary side, or else the pressure drop could increase.
2) 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.
3) Pulsations may occur, depending on the working conditions and piping conditions even if a pressure difference between the primary pressure and the secondary pressure to within 0.7 MPa. In this case, lower the

primary pressure. Consult with CKD if pulsations or oscillating sound oscillating sound may still does not cease.

4) When pressure setting, confirm the set pressure to change directional control valve. Failure to observe this obstructs could result in set pressure change greatly.

5) If the regulator is repeatedly ON and OFF with the directional control valve on the primary side, the set pressure may change greatly. Thus, the directional control valve should be installed on the secondary side.

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

RJB500 realized disassembling of the regulator body and piping block set, piping block, pressure gauge.

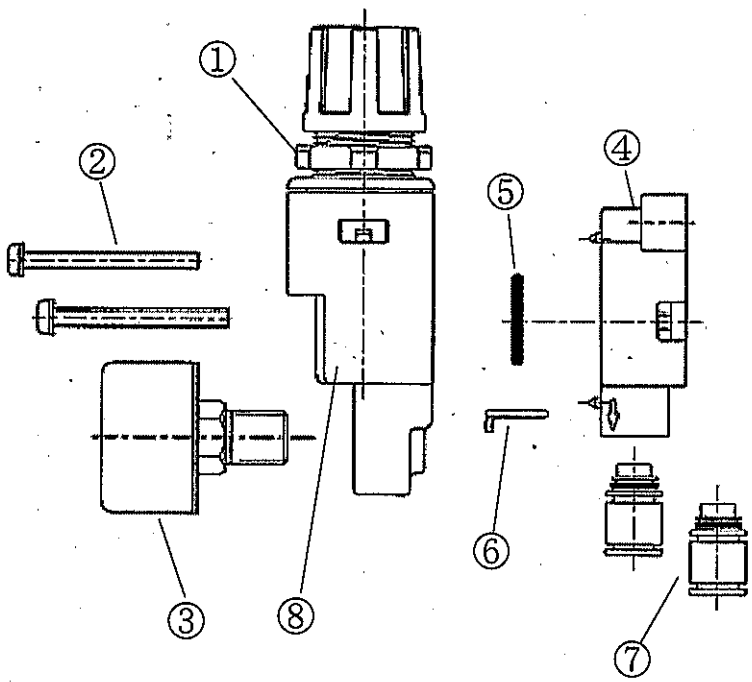
Before disassembling, make sure that no air pressure is exerted on the regulator. Refer to the disassembly diagram of the regulator when disassembling. Be careful of tighten screws as install.

Tightening torque of screw.

①Mount nut 3N・m or less

②Set screw 0.8N・m or less

③Pressure gauge 3.5N・m or less

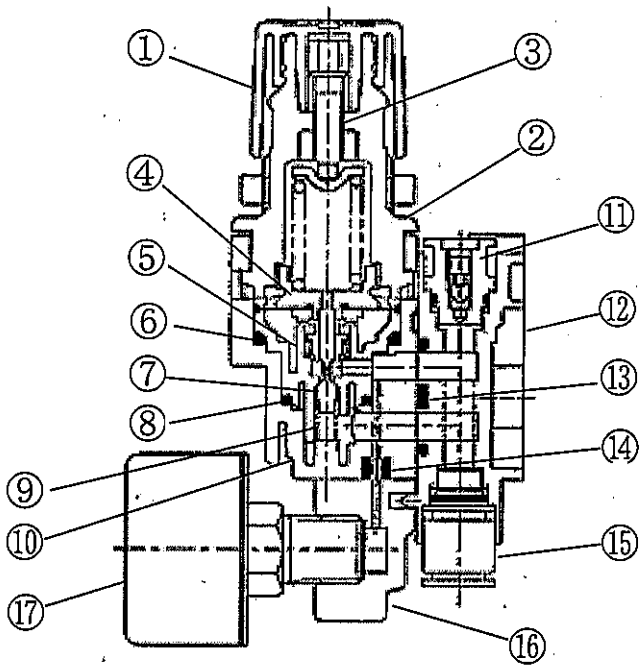


⑧Do not disassemble or modify the regulator body. Applications may be not satisfied, when assembled. Consult with CKD for disassembling.

5. Troubleshooting

Trouble symptom	Cause	Remedy
When the primary pressure is applied, air may leak from under the pressure adjustment knob.	IN and OUT port 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.
Air may leak from under the pressure adjustment knob, and the set pressure rises abnormally.	Dust is sticking to the valve Diaphragm is broken.	Replace the product.
Secondary pressure pulsates or sounds of oscillation.	Pulsates or sounds of oscillation may occur depending on the piping conditions and usage methods.	Lower the primary pressure.
Air leaks from the push-in joint.	The tube is not inserted completely.	Confirm whether the tube is inserted completely

6. Internal structure



Part No.	Part name	Material
1	Knob	POM
2	Cover	PA66
3	Pressure adjust screw	STEEL
4	Diaphragm assembly	POM、H-NBR、CR
5	Valve guide	POM、SUS304、C3604(Nickel coating)
6	O-ring	FKM
7	Valve	SUS303
8	O-ring	FKM
9	Spring	SUS304
10	Body	PA66
11	Bleed plug assembly	PA66、SUS304、NBR
12	Piping block assembly	PA66、STEEL
13	Body packing	NBR
14	Packing	NBR
15	Push-in joint	
16	Gauge plug	PA66
17	Pressure gauge	

7. Product specifications and how to order

7. 1 Product specifications

Item		RJB500
Working media		Compressed air
Max. working pressure MPa		1.0
Proof pressure MPa		1.5
Working temperature range °C		5～60
Set pressure range MPa		0.02～0.5 (0.01～0.2) (Note 1)
Sensibility MPa		0.001 (Lock sensibility 0.004)
Air consumption L/min(ANR)		1.5 (Note 2)
Pipe size	IN-OUT	Push-in joint : φ4 φ6
	Gauge	Rc1/8
Mass g		90

Note 1 : ( ) is for low pressure.
Note 2 : At set pressure 0.1MPa

7. 2 How to order

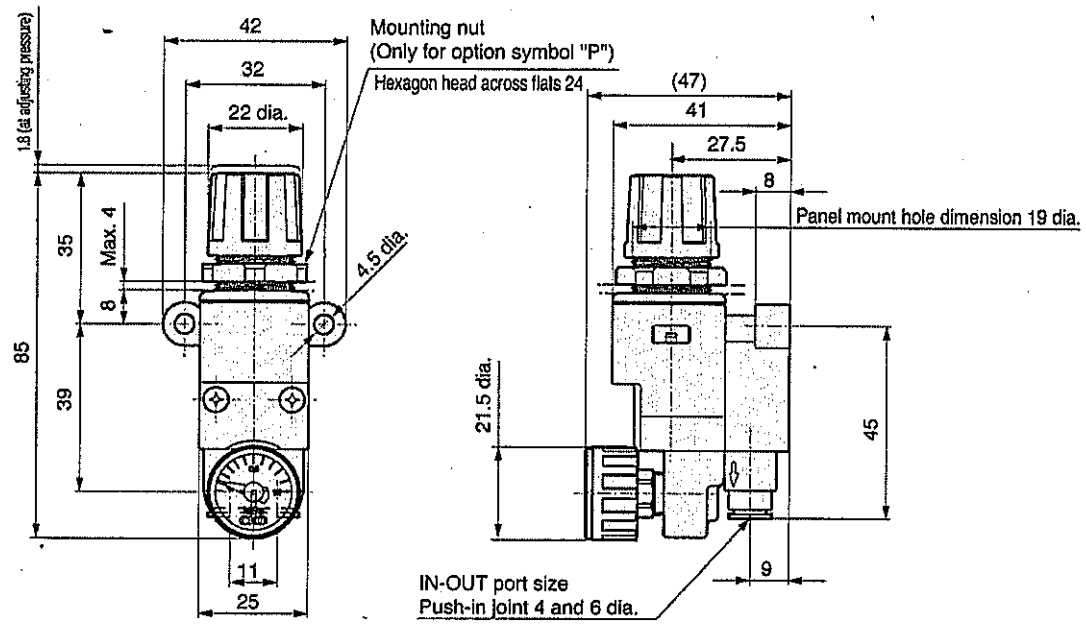
RJB500 – SSC6 – P

Model code	Pipe size				Option	
RJB500	Direction	IN	S	Straight	No code	Standard products Note 1
			L	Elbow	L	For low pressure Note 2
		OUT	S	Straight	P	Panel mount Note 3
			L	Elbow	T	Without pressure gauge
	Pipe size		C4	φ4	LT	Without pressure gauge
			C6	φ6		

Note 1 : 0 to 1.0MPa pressure gauge is provided as standard.
Note 2 : 0 to 0.4MPa pressure gauge is provided as standard.
Note 3 :For panel installation, indicate option symbol "P".

7. 3 Outside dimensions

・RB500 axial piping



・RB500 elbows piping