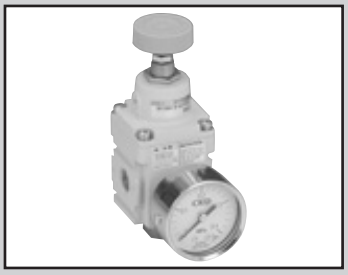
Precision regulator

Pressure adjustment device

CONTENTS



Precision regulator

RP1000 Series

● Port size: Rc1/4

JIS symbol

RoHS CAD

Specifications

Descriptions		RP1000-8-02-P70	RP1000-8-04-P70	RP1000-8-07-P70
Working fluid		Compressed clean air (refer to recommended air circuit on Intro 3)		
Max. working pressure	MPa	1.0		
Min. working pressure	MPa	Set pressure +0.1 (*1)		
Proof pressure	MPa	1.5		
Ambient temperature/fluid temperature	°C	-5 to 50 (no freezing)		
Set pressure range	MPa	0.003 to 0.2	0.005 to 0.4	0.005 to 0.7
Sensitivity		Within 0.1% of full scale		
Repeatability		Within ±0.5% of full scale		
Air consumption *2	ℓ/min (ANR)	1.3 or less		3.4 or less
Port size		Rc1/4		
Pressure gauge port size		Rc1/8		
Weight	g	250		

*1: Flow rate of the secondary side is to be zero. For PR1000-8-04, if the set pressure is 0.3 MPa and over, increase +0.2 MPa in the set pressure.
*2: The primary pressure is to be 0.7 MPa. Air is released to atmosphere normally.

How to order

RP1000 – 8 – 02 – P70 – GX49B3
(A) (B) (C) (D)

Model
RP1000:
Precision regulator

(A) Port size		(B) Set pressure range		(C) Clean room specifications		(D) Other attachments	
8	Rc1/4	**02**	MAX. 0.2 MPa		Structure	**Blank**	Without attachment
		04	MAX. 0.4 MPa	**P70**	Exhaust treatment	**GX49 *1**	Pressure gauge
		07	MAX. 0.7 MPa			**GY49**	Pressure gauge
						B3	L bracket
						E1	Fitting (for vent holes)

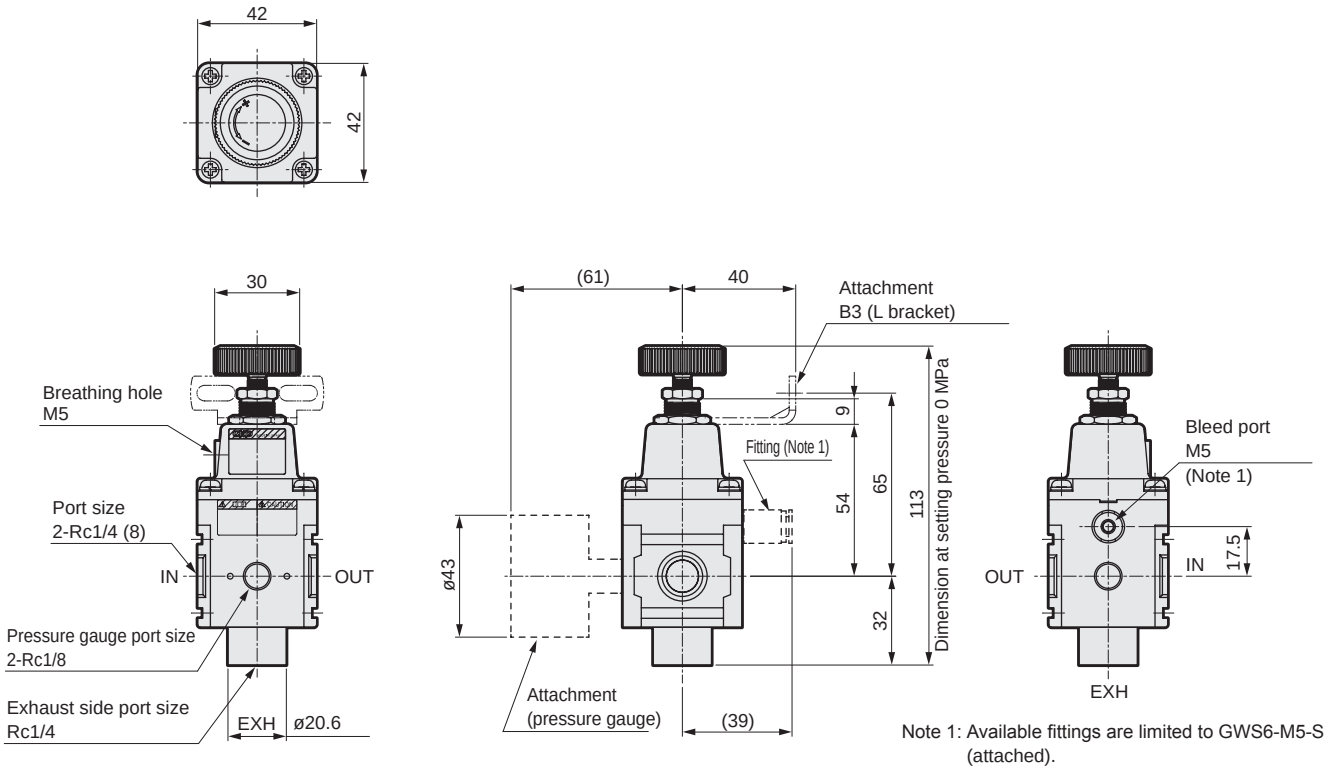
*1: "GX49" contains brass.
*2: A pressure gauge and a bracket are attached.
*3: A pressure gauge as same pressure range as the regulator is attached.
*4: One R1/8 plug is attached to the product.
*5: One GWS6-M5-S is attached to the product.

Discrete attachment model No.

Model No.	Discrete attachment model No.
RP1000-8-02-P70-GX49	G49D-6-P02-P70
RP1000-8-04-P70-GX49	G49D-6-P04-P70
RP1000-8-07-P70-GX49	G49D-6-P10-P70
RP1000-8-02-P70-GY49	G49D-6-P02-P94
RP1000-8-04-P70-GY49	G49D-6-P04-P94
RP1000-8-07-P70-GY49	G49D-6-P10-P94
RP1000-8-{02/04/07}-P70-B3	B131-P70
RP1000-8-{02/04/07}-P70-E1	R4000-E1-P70

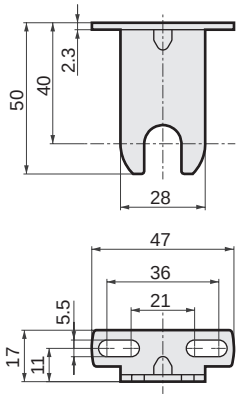
Dimensions

● RP1000-P70

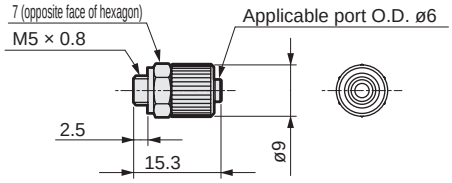


Note 1: Available fittings are limited to GWS6-M5-S (attached).
When using, pay attention not to prevent fitting, pressure gauge, and bracket from interference.

L bracket
・B131-P70
Weight: 29 g
・Material: steel, nickel plate processing

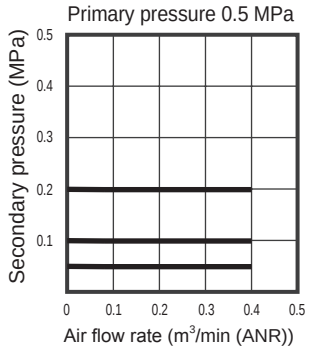


Fitting
・R4000-E1-P70
・Material: brass, nickel plate processing

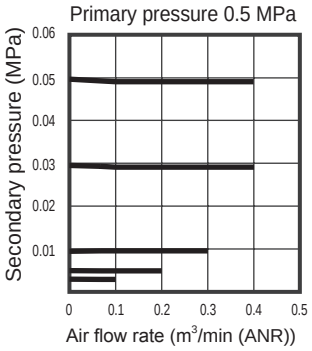


Flow characteristics

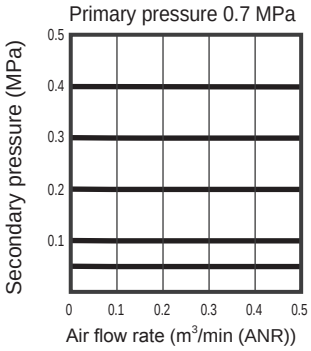
● RP1000-8-02



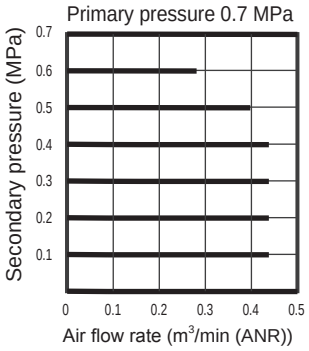
● RP1000-8-02
(Flow characteristics at low pressure)



● RP1000-8-04

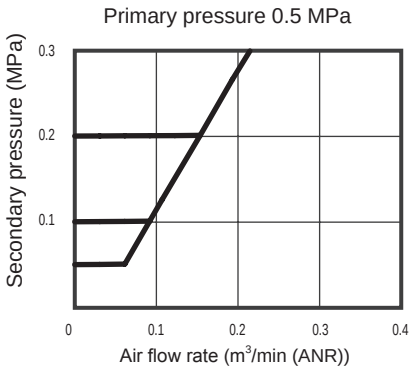


● RP1000-8-07

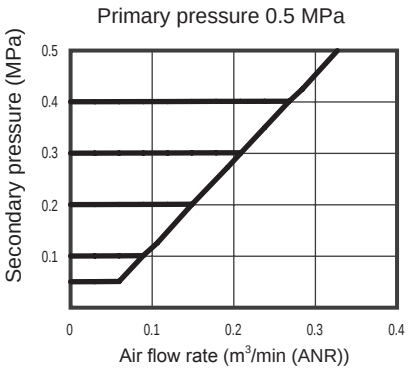


Relief flow characteristics

● RP1000-8-02



● RP1000-8-04



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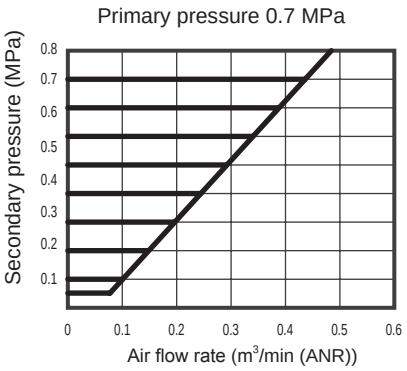
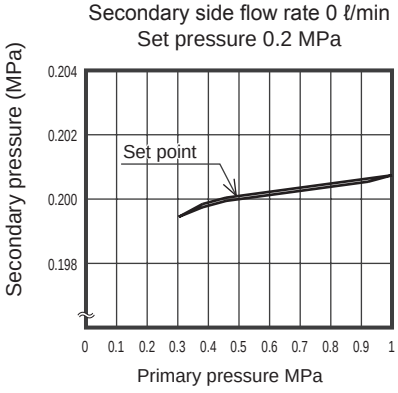
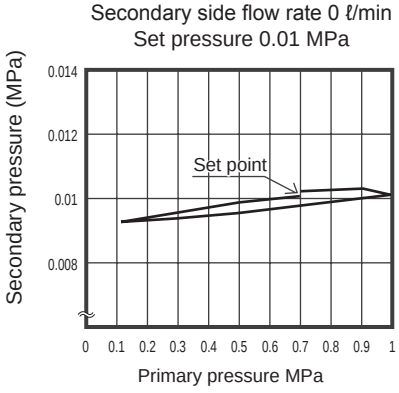
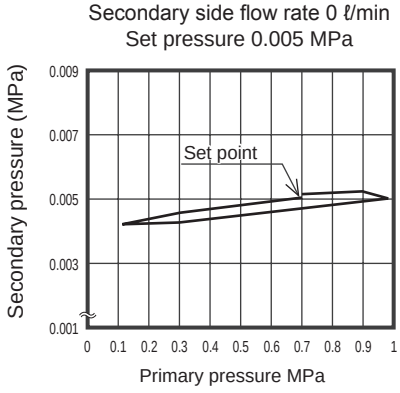


Pressure characteristics

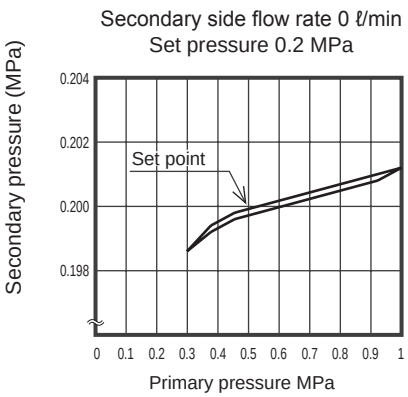
● RP1000-8-02

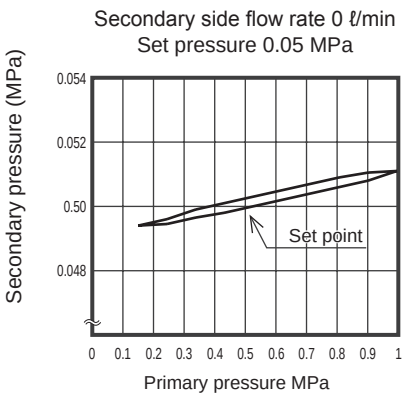




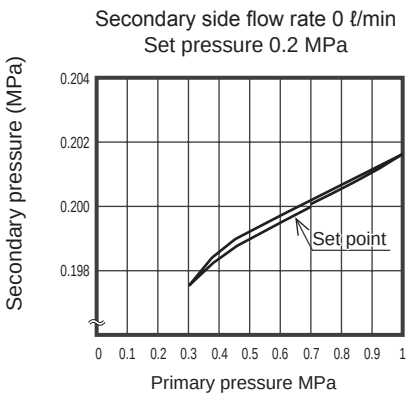


● RP1000-8-04



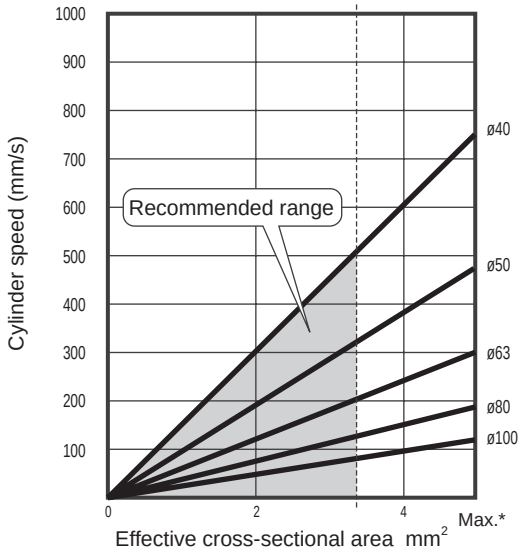


● RP1000-8-07



Cylinder speed range of RP1000

RP1000-8 cylinder table



This cylinder table shows available range according to air supply/exhaust flow rate of precision regulator and required consumption flow rate at cylinder PUSH/PULL.

------- Recommended cylinder line
(70% of max. flow rate is recommended)
* Max. cylinder line
(Cylinder directly installed)

Precision regulator

RP2000 Series

● Port size: Rc1/4 Rc3/8

JIS symbol

RoHS CAD

Specifications

Descriptions		RP2000-8-08-P70	RP2000-10-08-P70
Working fluid		Compressed clean air (refer to recommended air circuit)	
Max. working pressure	MPa	1.0	
Min. working pressure	MPa	Set pressure +0.1 (*1)	
Proof pressure	MPa	1.5	
Ambient temperature/fluid temperature	°C	-5 to 50 (no freezing)	
Set pressure range	MPa	0.03 to 0.85	
Sensitivity		Within 0.2% of full scale	
Repeatability		Within ±0.5% of full scale	
Air consumption	ℓ/min (ANR)	5 or less *2	
Port size		Rc1/4	Rc3/8
Exhaust side port size		Rc3/8	
Pressure gauge port size		Rc1/8	
Weight	g	470	

*1: Flow rate of the secondary side is to be zero.
*2: Conditions where the primary pressure is 0.7 MPa and set pressure is 0.3 MPa. Consumed air is normally released to the atmosphere from the bleed port and EXH port. So, air consumption is the total of consumption volume released from the bleed port and EXH port. Air is released at 1 ℓ/min (ANR) or less from EXH port.

How to order

RP2000 – 8 (A) – 08 (B) – P70 (C) – GX49B (D)

Model
RP2000:
Precision regulator

Ⓐ Port size		Ⓑ Set pressure range		Ⓒ Clean room specifications		Ⓓ Other attachments	
8	Rc1/4	**08**	MAX. 0.85 MPa		Structure	**Blank**	Without attachment
10	Rc3/8			**P70**	Exhaust treatment	**GX49 *1**	Pressure gauge
						GY49	Pressure gauge
						B	C bracket
						E1	Fitting (for vent holes)

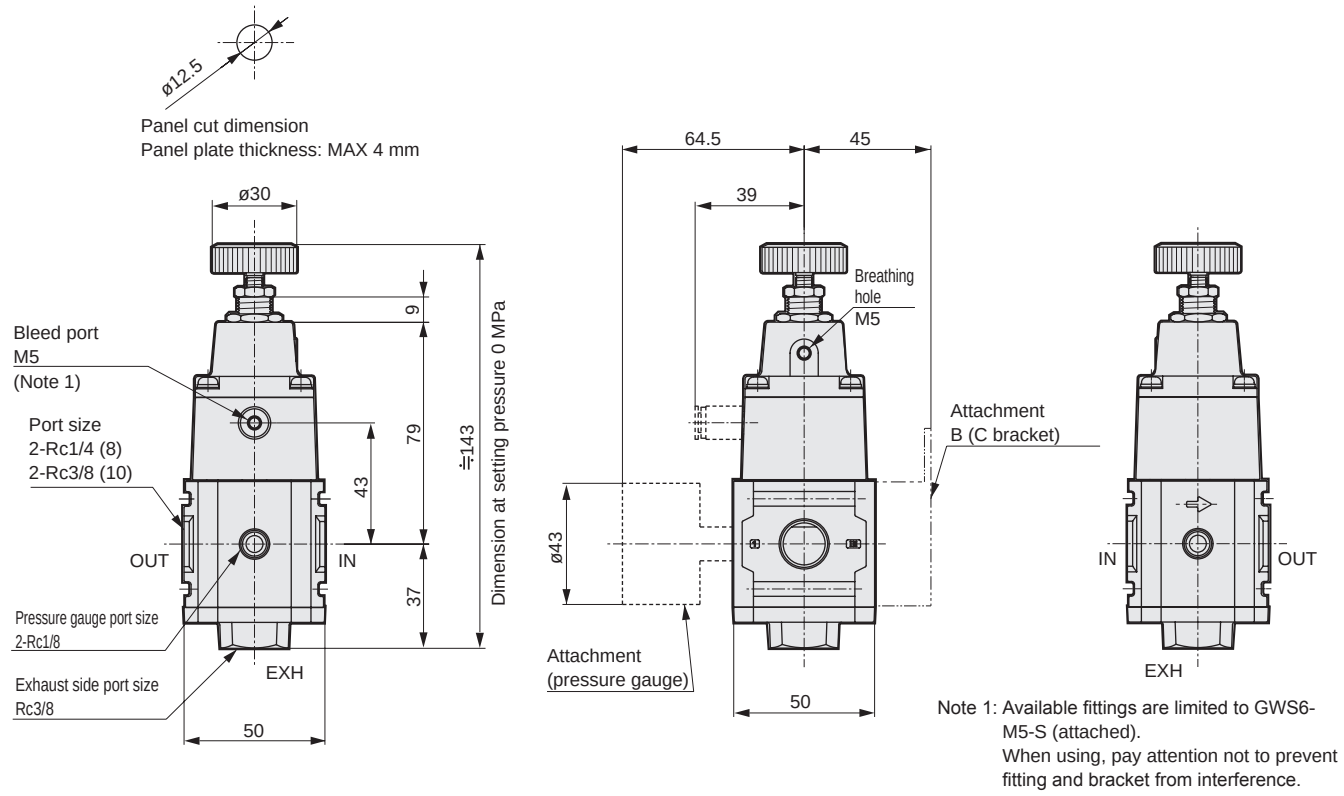
*1: "GX49" contains brass.
*2: If the port size Rc1/2 is required, use a piping adaptor set (model No.: A400-15-P70).
*3: Attachment is attached.
*4: The piping adaptor set and C bracket cannot be used together.
*5: One R1/8 plug is attached to the product.
*6: One GWS6-M5-S is attached to the product.

Discrete attachment model No.

Attachment code	Discrete attachment model No.
GX49	G49D-6-P10-P70
GY49	G49D-6-P10-P94
B	B220-P70
E1	R4000-E1-P70

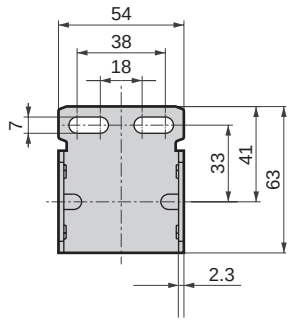
Dimensions

● RP2000-P70

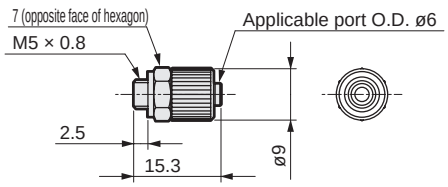


Note 1: Available fittings are limited to GWS6-M5-S (attached).
When using, pay attention not to prevent fitting and bracket from interference.

C bracket
・B220-P70
Weight: 150 g
・Material: steel, zinc plate processing

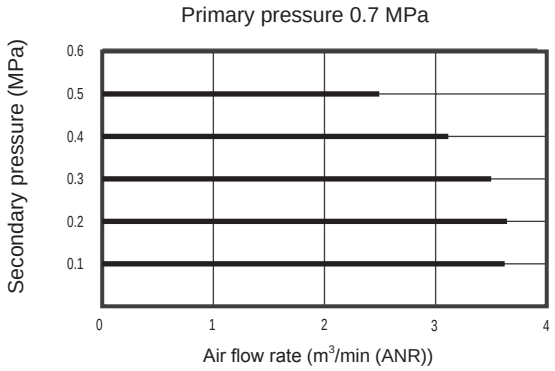


Fitting
・R4000-E1-P70
・Material: brass, nickel plate processing

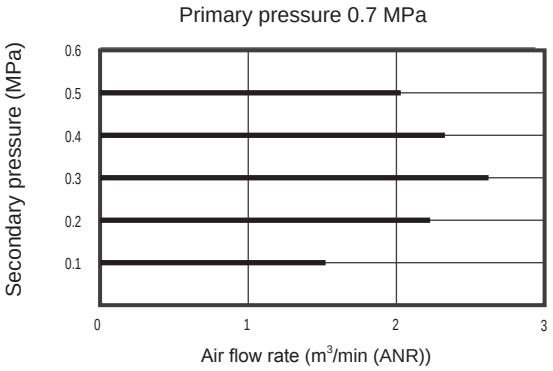


Flow characteristics

● RP2000-10-08-P70

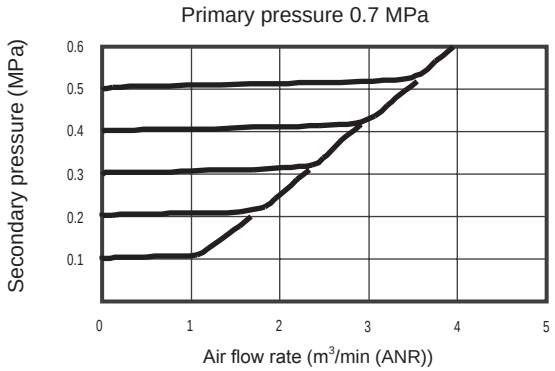


● RP2000-8-08-P70

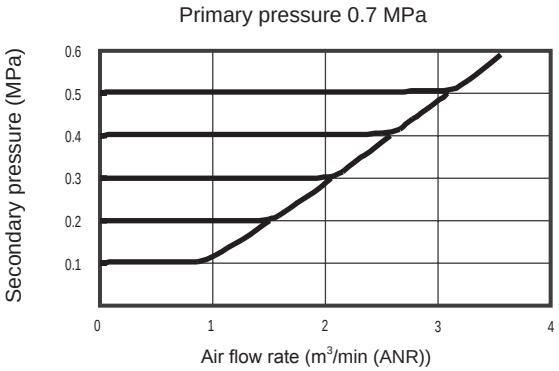


Relief flow characteristics

● RP2000-10-08-P70

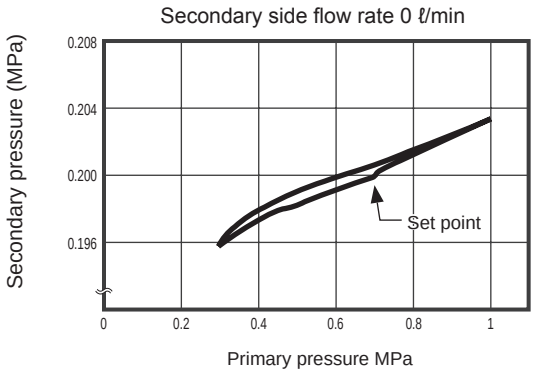


● RP2000-8-08-P70



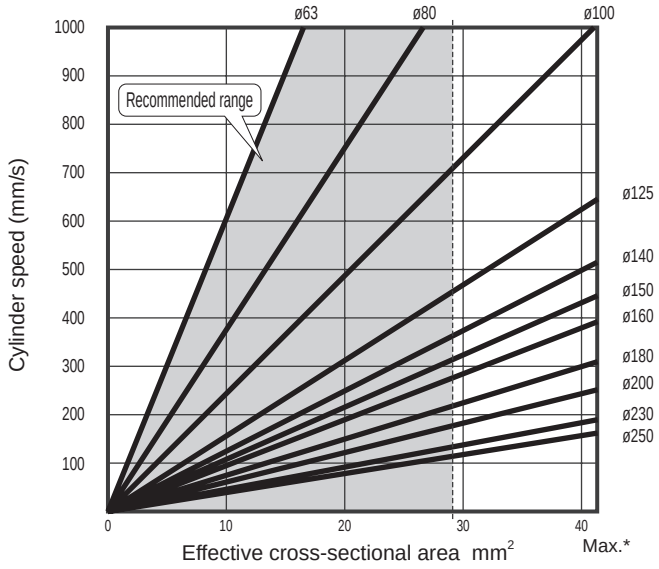
Pressure characteristics

● RP2000-*-08-P70



Cylinder speed range of RP2000

RP2000-10 cylinder table



This cylinder table shows available range according to air supply/exhaust flow rate of precision regulator and required consumption flow rate at cylinder PUSH/PULL.

------- Recommended cylinder line
(70% of max. flow rate is recommended)
* Max. cylinder line
(Cylinder directly installed)

Safety Precautions

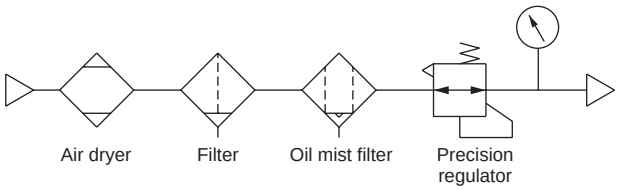
Always read this section before use.
Refer to pages 764, 765 for pneumatic components general precautions.

Precision regulator RP1000/2000 Series

Design & selection

WARNING

- Use this product in accordance with the specifications range.
- Working fluid must be clean air from which solids, water and oil have been sufficiently removed using a dryer, filter and oil mist filter. Never supply oiled air.
  When secondary pressure, etc., is turned OFF, air on the secondary side will pass through the regulator and be discharged from the EXH port. Thus, if secondary piping or inface of the load side is dirty, performance is adversely affected so characteristics will deteriorate. Keep the inface of pipes clean.



- O-ring grooves for module connection are provided on the OUT face of each product. Select piping that can be sealed with the O-ring groove diameter or less.

Series	RP1000	RP2000
groove diameter	ø17.6	ø25.4

CAUTION

- Keep the pressure difference between the primary and secondary sides to 0.1 MPa and over. Note that, for RP1000-8-04, if the set pressure is 0.3 MPa and over, keep the pressure difference at 0.2 MPa and over.
  (Precautions for RP1000)
  When using under conditioned with a small pressure difference between the primary and secondary sides, the secondary pressure could pulsate. In this case, decrease the pressure setting (high pressure → low pressure). Another method is to set the primary pressure to an extremely high level or to somewhat lower the setting pressure, and restrict the secondary side line. Consult with CKD if the pulsation still does not cease. When using with low friction cylinder having constant leak, secondary pressure may pulsate depending on working conditions. In this case, restrict the secondary side line and decrease the pressure setting (high pressure → low pressure) to attenuate pulsation. Contact CKD if the pulsation still does not cease.

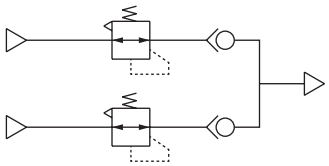
  (Precautions for RP2000)
  If the pressure difference between primary and secondary sides is large and secondary side piping is large, secondary pressure could pulsate during low flow. In this case, set the primary side to the secondary side pressure +0.1 to 0.2 MPa or restrict the secondary side line.
  Contact CKD if the pulsation still does not cease.
- If the regulator is repeatedly turned ON and OFF with the directional switching valve on the primary side, the set pressure may change greatly. Thus, the directional switching valve should be installed on the secondary side.
- Install a safety device where an output pressure exceeding the regulator's set pressure value could result in damage or faulty operation of secondary side devices.
- Do not operate the pressure adjustment knob while the primary side is released to the atmosphere as performance could deteriorate.

Mounting / Installation / adjustment

CAUTION

- Open the package in a clean room.
  The products are wrapped in an antistatic sheet before packaged in a box. If you install the product in a clean room, we recommend you to take it out of the box outside the clean room before you bring it in and to open the package in the clean room.
- Check IN and OUT indications indicating the air inlet and outlet before connecting. Reverse connection could result in improper operation. If connected reversely, malfunction may be caused.
- Do not move or swing the product holding the adjustment knob on the regulator.
- Avoid installing this product where vibration and impact are present.
- Sufficiently flush air pipes before connecting the regulator.
- Check that sealing tape is not caught when piping.

■ When using regulator in parallel as shown below, do not use the secondary side as a closed circuit. If a closed circuit is required, set a check valve at the secondary side.



■ Install the regulator so that the EXH is not plugged.

■ When installing on a panel, completely loosen and remove the pressure adjustment knob, insert the body into the ø12.5 panel hole, and fix it to the panel with the panel mounting nut. Then, turn the pressure adjustment knob to attach it to the body. Panel mounting nut recommended tightening torque 2 to 3 N·m

(Precautions for RP2000)

If the product is installed with panel mount nut in a horizontal direction, the panel mount nut could be damaged by the product weight and vibration.

■ Use proper torque to tighten the pipes when connecting them.

- To prevent air leak and to protect threads from damage.
- First tighten the screw by hand to prevent threads from being damaged, then use a tool.

(Recommended values)

Port thread	Tightening torque N·m
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15

When using

⚠CAUTION

■ Working air quality

- Use only compressed air. Air containing corrosive gases, fluids or chemicals could result in improper pressure adjustment due to body damage or rubber deterioration.

■ Environment conditions

- Avoid using the regulator in the following environment.
- Place where the ambient temperature exceeds -5 to 50˚C.
- Where air freezes.
- Where water drip and cutting lubricant contact to the product.
- Highly humid places where dew condenses due to temperature fluctuations.
- Where sea breeze or salt water could come in contact.
- If there is atmosphere containing corrosive gas, liquid or chemical material.
- Where the product is exposed to direct sunlight.
- With the precision regulator RP1000, the set pressure fluctuates by approx. 0.12 kPa/˚C. The pressure tends to drop when the temperature rises.

■ Precautions

- Air constantly leaks from the bleed port. This is necessary for precise pressure control, so do not plug the hole.
- Check primary pressure before setting pressure.
- Do not set a pressure higher than primary pressure.
- Turn the pressure adjustment knob clockwise to increase secondary pressure, and counterclockwise to lower pressure.
- Pressure is set in the depressurizing direction (high pressure → low pressure), so a highly precise setting can be made.
- After adjusting pressure, tighten the lock nut, and then fix the knob.
- As the precision regulator RP1000 exhaust valve is sealed with metal, a small amount of air may leak from the secondary side.