

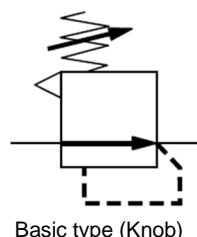


ORIGINAL INSTRUCTIONS

Instruction Manual

Precision Regulator

Series IR1000-A / IR2000-A / IR3000-A



Basic type (Knob)

The intended use of this product is to regulate the air pressure precisely in the pneumatic circuit.

1 Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution", "Warning" or "Danger". They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC^{*)}, and other safety regulations.

- *¹⁾ ISO 4414: Pneumatic fluid power - - General rules relating to systems.
- ISO 4413: Hydraulic fluid power - - General rules relating to systems.
- IEC 60204-1: Safety of machinery - -Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Manipulating industrial robots -Safety.etc.

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Refer to product catalogues, Operation Manual and Handling Precautions for SMC Products for additional information.
- Keep this manual in a safe place for future reference.

	Caution	Caution indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Warning	Warning indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Danger	Danger indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Warning

- Always ensure compliance with relevant safety laws and standards. All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.

2 Specifications

2.1 Standard Specifications

Model	Basic type (Knob)		
	IR10 0-A	IR20 0-A	IR30 -A
Fluid	Air		
Proof pressure	1.5 MPa		
Max. supply pressure	1.0 MPa		
Min. supply pressure ^{Note 1)}	Set pressure + 0.05 MPa		Set pressure + 0.1 MPa
Set pressure range	IR1000-A: 0.005 to 0.2 MPa	IR2000-A: 0.005 to 0.2 MPa	IR300 -A: 0.01 to 0.2 MPa
	IR1010-A: 0.01 to 0.4 MPa	IR2010-A: 0.01 to 0.4 MPa	IR301 -A: 0.01 to 0.4 MPa

2 Specifications – continued

	IR1020-A:	IR2020-A:	IR302 -A:
Set pressure range	0.01 to 0.8 MPa	0.01 to 0.8 MPa	0.01 to 0.8 MPa
Sensitivity	Within 0.2% of full span		
Repeatability ^{Note 2)}	Within ±0.5% of full span		
Air consumption ^{Note 3)}	1 L/min (ANR) or less		
Port size	1/8	1/4	1/4, 3/8, 1/2
Pressure gauge port	1/8 (2 locations)		
Ambient and fluid temperature	-5 to +60 °C (No freezing)		
Weight ^{Note 4)}	0.13 kg	0.23 kg	0.47 kg
Flow rate	Refer to catalogue		
Lubrication	Not required		
Filtration	5 µm filtration or smaller		

Table 1

Notes:

- Note 1) When there is no flow rate on the outlet.
- Note 2) Other characteristics such as aging deterioration and temperature characteristics are not included.
- Note 3) Measuring conditions: supply pressure 1.0 MPa, set pressure 0.2 MPa.
- Note 4) Without accessories.

3 Installation

3.1 Installation

Warning

- Do not install the product unless the safety instructions have been read and understood.

3.2 Environment

Warning

- Do not use in an environment where corrosive gases, chemicals, salt water or steam are present.
- Do not use in an explosive atmosphere.
- Do not expose to direct sunlight. Use a suitable protective cover.
- Do not install in a location subject to vibration or impact.
- Do not mount in a location exposed to radiant heat.

- In locations where there is contact with water drop-lets, oil, dust or weld spatter etc., implement suitable protective measures.
- Do not use in high humidity environment where condensation can occur.

3.3 Piping

Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1.5 to 2 threads exposed on the end of the pipe/fitting.
- Screw piping together with the recommended proper torque while holding the side with the female threads. Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive. Furthermore, if the side with the female threads is not held while tightening, excessive force will be applied directly to piping brackets etc. and may cause damage or other problems.

Recommended Proper Torque [N·m]

Connection thread	1/8	1/4	3/8	1/2 ^{Note)}
Torque	7 to 9	12 to 14	22 to 24	28 to 30

Table 2

Note: Tightening force for connecting to the EXH port of IR30□¹-A is 8 to 10 N·m.

3.4 Lubrication

Caution

- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- When a lubricator is used at the supply side of the product, it can cause malfunctions. Do not use a lubricator at the supply side of the product. If lubrication is required for terminal devices, connect a lubricator on the output side of the regulator.

3 Installation – continued

3.5 Air Supply

Warning

- Please consult with SMC when using the product in applications other than compressed air.
- Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt or corrosive gases, etc., as this can cause damage or malfunction.
- If condensate in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensate to enter the outlet side. This will cause a malfunction of pneumatic equipment. When removing drain is difficult, use of a filter with an auto drain is recommended.

Caution

- Condensate or dust, etc. in the supply pressure line can cause malfunctions. In addition to an air filter (SMC AF series, etc.) please use a mist separator (SMC AM, AFM series) depending on the conditions. Refer to "Air Preparation Equipment Model Selection Guide" (refer to catalogue) for air quality.

3.6 Handling

Caution

- When the precision regulator with pressure gauge is used, do not apply impact to the product by dropping it, etc. during transportation or installation. This may cause misalignment of the pressure gauge pointer.

3.7 Mounting / Operation

Caution

- Do not use a precision regulator outside the range of its specifications as this can cause failure (refer to section 2).
- When mounting is performed, make connections while confirming port indications.

- When mounting the bracket or tightening the hexagon panel nut on the panel, tighten them to the recommended proper torque. Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Recommended Proper Torque [N·m]

Set nut (for bracket)

IR10□0-A	IR20□0-A	IR30□□-A
2.0 ±0.2		

Table 3

Hexagon panel nut (for knob type only)

IR10□0-A	IR20□0-A	IR30□□-A
3.5 ±0.5		

Table 4

- After pressure adjustment, be sure to tighten the lock nut. When tightening the nut, tighten so that the knob does not move due to friction caused by tightening.
- When pressure is applied to the inlet of a regulator, make sure that the output is connected to the circuit. Air blow occurs from the outlet and it depends on the operating conditions.
- The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust with the knob.
- If the directional control valve (solenoid valve, mechanical valve, etc.) is mounted and ON-OFF is repeated for a long time, the set pressure may vary. If the setting value varies, adjust with the knob.
- There may be pulsation or noise depending on the pressure conditions, piping conditions and ambient environment. In this case, it is possible to improve the problem by changing the pressure conditions and piping conditions. If the problem is not improved, contact your SMC sales representative.

3 Installation – continued

- The capacity of the output side is large, and when used for a relief function, the exhaust sound will be loud when being relieved. Therefore, operate with a silencer (SMC AN series, etc.) mounted on the exhaust port (EXH port). For IR1000-A and IR2000-A, there is no connection thread on the exhaust port. Please consult your SMC sales representative.
- When installing a pressure gauge to the product, do not apply pressure more than the maximum display pressure. This will cause a malfunction.
- When using a precision regulator between a solenoid valve and cylinder, caution should be taken regarding the following points.
 - The residual pressure of the cylinder will be exhausted from the regulator's exhaust port. Depending on the conditions, partial backflow may occur.
 - When holding pressure at the intermediate position of a closed centre solenoid valve, due to reduced pilot pressure the pressure inside the cylinder will not be able to be held because the regulator will perform an exhaust operation. If it is necessary for the pressure inside the cylinder to be held, please consider using in combination with a separate shut-off valve.
 - When releasing pressure at the intermediate position of an exhaust centre solenoid valve, depending on the conditions, vacuum pressure may remain inside the cylinder. If the introduction of atmospheric pressure is required, please consider using in combination with a separate atmospheric pressure introduction valve.

4 How to Order

Refer to catalogue for 'How to Order' information.

5 Outline Dimensions (mm)

Refer to catalogue for outline dimensions.

6 Maintenance

General Maintenance

Warning

- Before performing maintenance, turn off the power supply, reduce the set pressure to "0" and be sure to cut off the supply pressure. Confirm that the air is released to atmosphere.
- When a pressure gauge is to be mounted, remove the plug after reducing the set pressure to "0".
- When using the regulator between a solenoid valve and an actuator, check the pressure gauge periodically. Sudden pressure fluctuations may shorten the durability of the pressure gauge. A digital pressure gauge is recommended for such situation or as deemed necessary.

Caution

- Not following proper maintenance procedures could cause the product to malfunction and lead to equipment damage.
- If handled improperly, compressed air can be dangerous. Maintenance of pneumatic systems should be performed only by qualified personnel.
- After installation and maintenance, apply operating pressure and power to the equipment and perform appropriate functional and leakage tests to make sure the equipment is installed correctly.
- If any electrical connections are disturbed during maintenance, ensure they are reconnected correctly and safety checks are carried out as required to ensure continued compliance with applicable national regulations.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.
- Check periodically adjustment of the regulators.

7 Limitations of Use

Limited warranty and Disclaimer/Compliance Requirements

Refer to Handling Precautions for SMC Products.

Warning

- The system designer should determine the effect of the possible failure states on the system.
- Regulator is not to be used as a pressure relief valve, apply additional measure to relieve large volume of pressurised air.

8 Contacts

Refer to www.smcworld.com for contacts.

SMC Corporation

URL : [http// www.smcworld.com](http://www.smcworld.com) (Global) [http// www.smceu.com](http://www.smceu.com) (Europe)
SMC Corporation, Akihabara UDX15F, 4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101
0021

Specifications are subject to change without prior notice from the manufacturer.

© 2018 SMC Corporation All Rights Reserved.

Template DKP50047-F-085H