**Precision Regulator**

**Reduced by Up to approx. 90%**

<table>
<thead>
<tr>
<th>NoIR</th>
<th>Current model</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or less</td>
<td>4.4</td>
<td>IR1000-A/IR2000-A</td>
</tr>
<tr>
<td>1 or less</td>
<td>11.5</td>
<td>IR3000-A</td>
</tr>
</tbody>
</table>

* Compared with the current IR1000/2000/3000

**Up to approx. twice**

<table>
<thead>
<tr>
<th>NoIR</th>
<th>Current model</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>720</td>
<td>320</td>
<td>IR1000-A</td>
</tr>
<tr>
<td>1900</td>
<td>940</td>
<td>IR2000-A</td>
</tr>
</tbody>
</table>

* Compared with the current IR1000/2000

**Reduced by up to approx. 27%**

<table>
<thead>
<tr>
<th>NoIR</th>
<th>Current model</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.13</td>
<td>0.14</td>
<td>IR1000-A</td>
</tr>
<tr>
<td>0.23</td>
<td>0.30</td>
<td>IR2000-A</td>
</tr>
<tr>
<td>0.47</td>
<td>0.64</td>
<td>IR3000-A</td>
</tr>
</tbody>
</table>

* Compared with the current IR1000/2000/3000

**Sensitivity: 0.2%** (Full span)
**Repeatability: ±0.5%** (Full span)

**Space saving**

New structure without fixed throttle does not require a mist separator.

**Reduced by 71 mm**

**Precision Regulator**

**Digital pressure switch standardized**

**Series** IR1000-A/2000-A/3000-A

CAT.ES60-22A
Reduction in air consumption

Air consumption is reduced with a new original structure.

With this new original structure, running costs are reduced.

No fixed throttle in the new design.

* Poor quality of air may cause operation failure. Select a model that is suitable for the desired air cleanliness by referring to "Air Preparation Equipment Model Selection Guide" (Best Pneumatics No. 5) for air quality.

Flow rate: Up to approx. twice

(Compared to the current SMC product) [L/min(ANR)]

<table>
<thead>
<tr>
<th>Series</th>
<th>Current model</th>
<th>New model</th>
</tr>
</thead>
<tbody>
<tr>
<td>720</td>
<td>320 IR1000-A</td>
<td>91% reduction 117000 yen reduction</td>
</tr>
<tr>
<td>1900</td>
<td>940 IR2000-A</td>
<td>77% reduction 38000 yen reduction</td>
</tr>
</tbody>
</table>

Supply pressure: 0.7 MPa

New Comparison between IR3000-A and the current IR3000

New Comparison between IR1000-A/IR2000-A and the current IR1000/IR2000

Calculation conditions: Electric power cost: 1.55 yen/m³
[Work model] Working hours: 6000 h (250 days/year)
Supply pressure: 1.0 MPa Set pressure: 0.2 MPa

Annual cost reduction effect

New IR Current model

Released into atmosphere ≤1 L

Current model

Released into atmosphere ≤4 to 11 L

New IR1010-A

Supply pressure: 0.7 MPa

New Annual cost of power consumed by compressor [1000 yen/year]

Units used

Comparison between IR3000-A and the current IR3000

When 20 units are used

117000 yen reduction

91% reduction

Comparison between IR1000-A/IR2000-A and the current IR1000/IR2000

When 20 units are used

38000 yen reduction

77% reduction

New IR1010-A

Supply pressure: 0.7 MPa

Flow rate [L/min (ANR)]

Current model R1010

Approx. twice

New IR1010-A

Supply pressure: 0.7 MPa

Flow rate [L/min (ANR)]

Current model R1010

Approx. twice
Exhaust (EXH) directions can be selected. (Series IR3000-A)

**New** Bottom and front exhaust added.

**Weight**
Reduced by up to approx. **27%**

<table>
<thead>
<tr>
<th>IR</th>
<th>Current model</th>
<th>Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.13</td>
<td>0.14</td>
<td>IR1000-A</td>
</tr>
<tr>
<td>0.23</td>
<td>0.30</td>
<td>IR2000-A</td>
</tr>
<tr>
<td>0.47</td>
<td>0.64</td>
<td>IR3000-A</td>
</tr>
</tbody>
</table>

**Hexagon panel nut mounting**
* Interchangeable with the current SMC product

**Digital pressure switch**
Standardized

**Sensitivity:** **0.2%** (Full span)
**Repeatability:** **±0.5%** (Full span)

**Pressure gauge**

**New IR can be used between a cylinder and solenoid valve.**

**Note:** The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.

**Mounting is interchangeable with the current SMC model.**
Application Examples

**Constant fluid pressure**
- Since there is a large effective area for supply and exhaust pressure, setting can be done quickly.

**Balance and drive**
- Accurate balance pressure setting
- Limits pressure fluctuation when driving a cylinder, maintaining excellent static and dynamic balance.

**Accurate pressure setting**
- Sensitivity within 0.2% F.S. (Full Span)
- Tension control
- Adapts to the cylinder's piston displacement, maintaining a constant pressure.

**Multistage control of pressing force for workpiece**
- (Wrapping machine)
- Contact pressure control
- Adapts to the cylinder's piston displacement, maintaining a constant pressure.

**Leak test circuit**

**Residual pressure relief**
- Ex.) Backflow from the tank
- Residual pressure is exhausted by relief function.

**Usage between a cylinder and solenoid valve**
- Ex.) Between a cylinder and solenoid valve
- It can be used between a cylinder and solenoid valve.
### Series Variations

<table>
<thead>
<tr>
<th>Series</th>
<th>Basic Type</th>
<th>Model</th>
<th>Set pressure range (MPa)</th>
<th>Port size</th>
</tr>
</thead>
<tbody>
<tr>
<td>IR1000-A</td>
<td>(Knob)</td>
<td>IR1000-A</td>
<td>0.005 to 0.2</td>
<td>1/8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IR1010-A</td>
<td>0.01 to 0.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IR1020-A</td>
<td>0.01 to 0.8</td>
<td></td>
</tr>
<tr>
<td>IR2000-A</td>
<td></td>
<td>IR2000-A</td>
<td>0.005 to 0.2</td>
<td>1/4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IR2010-A</td>
<td>0.01 to 0.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IR2020-A</td>
<td>0.01 to 0.8</td>
<td></td>
</tr>
<tr>
<td>IR3000-A</td>
<td></td>
<td>IR3000-A</td>
<td>0.01 to 0.2</td>
<td>1/4, 3/8, 1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>IR3010-A</td>
<td>0.01 to 0.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IR3020-A</td>
<td>0.01 to 0.8</td>
<td></td>
</tr>
</tbody>
</table>

Outlet pressure is less affected by fluctuation of inlet pressure. New IR offers consistent pressure control.

Note) The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.
### Precision Regulator

Series IR1000-A/2000-A/3000-A

#### Standard Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>IR1000-A</th>
<th>IR2000-A</th>
<th>IR3000-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Air</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.5 MPa</td>
<td>1.5 MPa</td>
<td>1.5 MPa</td>
</tr>
<tr>
<td>Max. supply pressure</td>
<td>1.0 MPa</td>
<td>1.0 MPa</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>Min. supply pressure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set pressure range</td>
<td>IR1000-A: 0.005 to 0.2 MPa</td>
<td>IR2000-A: 0.005 to 0.2 MPa</td>
<td>IR3000-A: 0.01 to 0.2 MPa</td>
</tr>
<tr>
<td>IR1010-A: 0.01 to 0.4 MPa</td>
<td>IR2010-A: 0.01 to 0.4 MPa</td>
<td>IR3010-A: 0.01 to 0.4 MPa</td>
<td></td>
</tr>
<tr>
<td>IR1020-A: 0.01 to 0.8 MPa</td>
<td>IR2020-A: 0.01 to 0.8 MPa</td>
<td>IR3020-A: 0.01 to 0.8 MPa</td>
<td></td>
</tr>
<tr>
<td>Sensitivity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air consumption</td>
<td>1 L/min (ANR) or less</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Accessories (Option)/Part No.

<table>
<thead>
<tr>
<th>Description</th>
<th>IR1000-A</th>
<th>IR2000-A</th>
<th>IR3000-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracket assembly</td>
<td>IR10P-501AS</td>
<td>IR20P-501AS</td>
<td>IR30P-501AS</td>
</tr>
<tr>
<td>Hexagon panel nut</td>
<td>IR10P-600S</td>
<td>IR20P-600S</td>
<td>IR30P-600S</td>
</tr>
<tr>
<td>Round type pressure gauge</td>
<td>G33-2-□01</td>
<td>G43-2-□01</td>
<td>G43-2-□01</td>
</tr>
<tr>
<td>0.2 MPa setting</td>
<td>G33-4-□01</td>
<td>G43-4-□01</td>
<td>G43-4-□01</td>
</tr>
<tr>
<td>0.4 MPa setting</td>
<td>G33-10-□01</td>
<td>G43-10-□01</td>
<td>G43-10-□01</td>
</tr>
<tr>
<td>Digital pressure switch</td>
<td>ISE30A-□01-N-ML</td>
<td>ISE30A-□01-P-ML</td>
<td>ISE30A-□01-C-ML</td>
</tr>
<tr>
<td>0.8 MPa setting</td>
<td>ISE30A-□01-D-ML</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Modular Products and Accessories

<table>
<thead>
<tr>
<th>Applicable products and accessories</th>
<th>Series IR1000-A</th>
<th>Series IR2000-A</th>
<th>Series IR3000-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filter</td>
<td>AF20-A</td>
<td>AF30-A</td>
<td>AF40-A</td>
</tr>
<tr>
<td>Spacer</td>
<td>Y200-T-A</td>
<td>Y300-T-A</td>
<td>Y400-T-A</td>
</tr>
<tr>
<td>Spacer with bracket</td>
<td>Y200T-T-A</td>
<td>Y300T-T-A</td>
<td>Y400T-T-A</td>
</tr>
</tbody>
</table>

Refer to the WEB catalog for details of the modular applicable products and accessories. The former modular and mounting brackets can be used.

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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: −5 to 50°C for the products with the digital pressure switch

Note 5: Without accessories

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---
### Precision Regulator Series IR1000-A/2000-A/3000-A

#### How to Order

**Symbol Description**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.005 to 0.2 MPa</td>
</tr>
<tr>
<td>1</td>
<td>0.01 to 0.2 MPa</td>
</tr>
<tr>
<td>2</td>
<td>0.01 to 0.4 MPa</td>
</tr>
<tr>
<td>+</td>
<td>0.01 to 0.8 MPa</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Bottom exhaust</td>
</tr>
<tr>
<td>1</td>
<td>Front exhaust</td>
</tr>
<tr>
<td>2</td>
<td>Rear exhaust</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Rc</td>
</tr>
<tr>
<td>N</td>
<td>NPT</td>
</tr>
<tr>
<td>F</td>
<td>G</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>1/8</td>
</tr>
<tr>
<td>02</td>
<td>1/4</td>
</tr>
<tr>
<td>03</td>
<td>3/8</td>
</tr>
<tr>
<td>04</td>
<td>1/2</td>
</tr>
</tbody>
</table>

**Option Note 1:** Options are shipped together with the product, but not assembled. B and H cannot be selected at the same time. The current bracket cannot be used for this product.

**Option Note 2:** Assembly of a bracket and set nuts.

**Option Note 3:** See pressure unit table below.

**Option Note 4:** For pipe thread type: NPT

**Option Note 5:** For options: EA, EB, EC, ED

**Option Note 6:** According to the new Measurement Law, only the SI unit type is provided for use in Japan.

- **Body size:**
  - 1
  - 2
  - 3

- **Set pressure range:**
  - 0
  - 1
  - 2
  - +

- **Exhaust direction:**
  - 0
  - 1
  - 2

- **Pipe thread type:**
  - Nil
  - Rc
  - NPT
  - G

- **Port size:**
  - 01: 1/8
  - 02: 1/4
  - 03: 3/8
  - 04: 1/2

- **Mounting:**
  - Nil: Without mounting option
  - B (Note 3): With bracket
  - H: With hexagon panel nut (for panel mount)

- **Pressure gauge:**
  - Nil: Without pressure gauge
  - G: Round type pressure gauge
  - EA: NPN open collector 1 output
  - EB: PNP open collector 1 output
  - EC: NPN open collector 1 output + Analog voltage output
  - ED: NPN open collector 1 output + Analog current output

- **Flow direction:**
  - Nil: Flow direction: Left to right
  - R: Flow direction: Right to left

- **Knob:**
  - Nil: Upward
  - V: Downward

- **Pressure unit:**
  - Nil: Name plate and pressure gauge in imperial units: MPa
  - Z: Name plate and pressure gauge in imperial units: psi
  - ZA: Digital pressure switch: With unit conversion function

Note 1: Options are shipped together with the product, but not assembled. B and H cannot be selected at the same time. The current bracket cannot be used for this product.

Note 2: Assembly of a bracket and set nuts.

Note 3: See pressure unit table below.

<table>
<thead>
<tr>
<th>Pipe thread type</th>
<th>Name plate in imperial units</th>
<th>Pressure gauge in imperial units</th>
<th>Sales Note 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Rc</td>
<td>MPa</td>
<td>Japan, Overseas</td>
</tr>
<tr>
<td>NPT</td>
<td>G</td>
<td>MPa</td>
<td></td>
</tr>
<tr>
<td>Z (Note 4)</td>
<td>Rc</td>
<td>—</td>
<td>Only overseas</td>
</tr>
<tr>
<td>NPT</td>
<td>G</td>
<td>psi</td>
<td></td>
</tr>
<tr>
<td>ZA (Note 5)</td>
<td>Rc</td>
<td>—</td>
<td>Only overseas</td>
</tr>
</tbody>
</table>

Note 4: For pipe thread type: NPT

Note 5: For options: EA, EB, EC, ED

Note 6: According to the new Measurement Law, only the SI unit type is provided for use in Japan.
Series **IR1000-A/2000-A/3000-A**

Series IR1000-A

* The data shown below are representative values, and are not guaranteed.

### Flow-rate Characteristics

<table>
<thead>
<tr>
<th>IR1020-01-A</th>
<th>Supply pressure: 0.7 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Graph" /></td>
<td></td>
</tr>
</tbody>
</table>

### Relief Characteristics

<table>
<thead>
<tr>
<th>IR1020-01-A</th>
<th>Back pressure: 0.7 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image2" alt="Graph" /></td>
<td></td>
</tr>
</tbody>
</table>

### Pressure Characteristics

| IR1000-A | Supply pressure: 0.3 to 1.0 MPa  
Set pressure: 0.2 MPa  
Flow rate: 0 L/min (ANR) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image3" alt="Graph" /></td>
<td></td>
</tr>
</tbody>
</table>

| IR1020-A | Supply pressure: 0.3 to 1.0 MPa  
Set pressure: 0.2 MPa  
Flow rate: 0 L/min (ANR) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Graph" /></td>
<td></td>
</tr>
</tbody>
</table>

| IR1010-A | Supply pressure: 0.3 to 1.0 MPa  
Set pressure: 0.2 MPa  
Flow rate: 0 L/min (ANR) |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image5" alt="Graph" /></td>
<td></td>
</tr>
</tbody>
</table>
## Flow-rate Characteristics

<table>
<thead>
<tr>
<th>IR2020-02-A</th>
<th>Supply pressure: 0.7 MPa</th>
</tr>
</thead>
</table>

![Flow-rate Characteristics Graph](image)

## Relief Characteristics

<table>
<thead>
<tr>
<th>IR2020-02-A</th>
<th>Back pressure: 0.7 MPa</th>
</tr>
</thead>
</table>

![Relief Characteristics Graph](image)

## Pressure Characteristics

<table>
<thead>
<tr>
<th>Supply pressure: 0.3 to 1.0 MPa</th>
<th>Set pressure: 0.2 MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow rate: 0 L/min (ANR)</td>
<td></td>
</tr>
</tbody>
</table>

### IR2000-A

![Pressure Characteristics Graph](image)

### IR2010-A

![Pressure Characteristics Graph](image)

### IR2020-A

![Pressure Characteristics Graph](image)

---

* The data shown below are representative values, and are not guaranteed.
Series IR1000-A/2000-A/3000-A

**Series IR3000-A**

* The data shown below are representative values, and are not guaranteed.

### Flow-rate Characteristics

**IR3020-04-A**  
Supply pressure: 0.7 MPa

![Flow-rate Characteristics Graph](graph1)

### Relief Characteristics

**IR3020-04-A**  
Back pressure: 0.7 MPa

![Relief Characteristics Graph](graph2)

### Pressure Characteristics

**IR3000-A**  
Supply pressure: 0.3 to 1.0 MPa  
Set pressure: 0.2 MPa  
Flow rate: 0 L/min (ANR)

![Pressure Characteristics Graph](graph3)

**IR3010-A**  
Supply pressure: 0.3 to 1.0 MPa  
Set pressure: 0.2 MPa  
Flow rate: 0 L/min (ANR)

![Pressure Characteristics Graph](graph4)

**IR3020-A**  
Supply pressure: 0.3 to 1.0 MPa  
Set pressure: 0.2 MPa  
Flow rate: 0 L/min (ANR)

![Pressure Characteristics Graph](graph5)

"Series IR1000-A/2000-A/3000-A"
Construction

Basic type (Knob): IR20□0-A

Working principle
When the knob is rotated, the flapper is pushed through the spring, and a gap is generated between the nozzle and flapper. The supply pressure flows to the inlet passes through the path between the nozzle and flapper and acts on the supply diaphragm as nozzle back pressure. The force generated by the diaphragm pushes down the valve, and the supply pressure flows to the outlet. The discharged air pressure acts on the exhaust diaphragm, and counteracts against the force generated by the supply diaphragm. The air pressure acts on the nozzle diaphragm at the same time, and counteracts against the compression force of the spring to adjust the set pressure. When the set pressure increases too much, the nozzle diaphragm is pushed up, and a gap is generated between the flapper and nozzle diaphragm after the flapper is closed. The balance of the supply diaphragm and exhaust diaphragm is lost when the nozzle back pressure flows into the atmosphere. The exhaust valve is open after the valve is closed, and excess pressure on the outlet is released to the air. Due to this pilot mechanism, fine pressure variations are detected and precise pressure adjustment is possible.

Component Parts

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bonnet</td>
<td>Aluminum die-casted</td>
</tr>
<tr>
<td>2</td>
<td>Nozzle diaphragm assembly</td>
<td>Aluminum, Weather resistant NBR</td>
</tr>
<tr>
<td>3</td>
<td>Seal</td>
<td>HNBR</td>
</tr>
<tr>
<td>4</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
<td>5</td>
<td>Diaphragm spacer</td>
<td>Polyacetal</td>
</tr>
<tr>
<td>6</td>
<td>Supply diaphragm</td>
<td>Weather resistant NBR</td>
</tr>
<tr>
<td>7</td>
<td>Exhaust diaphragm assembly</td>
<td>Steel, Aluminum, Weather resistant NBR</td>
</tr>
<tr>
<td>8</td>
<td>Valve assembly</td>
<td>Stainless steel, Aluminum, HNBR</td>
</tr>
<tr>
<td>9</td>
<td>Body</td>
<td>Aluminum die-casted</td>
</tr>
</tbody>
</table>

Precision Regulator  
Series IR1000-A/2000-A/3000-A
Series **IR1000-A/2000-A/3000-A**

**Construction**

Basic type (Knob): IR10□-0-A

Basic type (Knob): IR30□-0-A

Basic type (Knob): IR30□-1-A
**Precision Regulator Series IR1000-A/2000-A/3000-A**

**Dimensions**

**Basic type (Knob): IR10□0-01□-A**

When connecting to the EXH port, contact your SMC sales representative separately.

**With digital pressure switch: IR10□0-01□E□-A**
Series IR1000-A/2000-A/3000-A

Dimensions

Basic type (Knob): IR20□0-02□-A

When connecting to the EXH port, contact your SMC sales representative separately.

With digital pressure switch: IR20□0-02□E□-A
Dimensions

Basic type (Knob): IR30□□0-□□-□□-□□-□□

With digital pressure switch: IR30□□0-□□□-□□-□□-□□
Series IR1000-A/2000-A/3000-A

Dimensions

Basic type (Knob): IR30□□□□-0□□-A

With digital pressure switch: IR30□□□□-0□□□□□-A


### Warning

1. **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., causing damage or other problems.

2. **Wrapping of sealant tape**

   When screwing piping or fittings into ports, ensure that metal chips from the pipe threads or sealing material do not enter the piping. Also, when the sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

### Caution

1. **Preparation before piping**

   Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. **Do not allow twisting or bending moment to be applied other than the weight of the equipment.**

   Provide separate support for external piping, as damage may otherwise occur.

3. **Piping materials without flexibility such as steel tube piping are prone to be effected by excess moment load and vibration from the piping side.** Use flexible tubing in between to avoid such an effect.

### Operating Environment

1. **Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.**

2. **Do not operate in locations where vibration or impact occurs.**

3. **In locations which receive direct sunlight, provide a protective cover, etc.**

4. **In locations near heat sources, block off any radiated heat.**

5. **In locations where there is contact with spatter from water, oil or solder, etc., implement suitable protective measures.**

### Air Supply

1. **Please consult with SMC when using the product in applications other than compressed air.**

2. **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.**

3. **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

1. **Condensate or dust, etc. in the supply pressure line can cause malfunctions.** In addition to an air filter (SMC Series AF, etc.), please use a mist separator (SMC Series AM, AFM) depending on the conditions.

   Refer to “Air Preparation Equipment Model Selection Guide” (Best Pneumatics No. 5) for air quality.

2. **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.

---

### Recommended Proper Torque

<table>
<thead>
<tr>
<th>Connection thread</th>
<th>1/8</th>
<th>1/4</th>
<th>3/8</th>
<th>1/2</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque</td>
<td>7 to 9</td>
<td>12 to 14</td>
<td>22 to 24</td>
<td>28 to 30</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Torque for connecting to the EXH port of IR300□-A is 8 to 10 N·m.*
**Warning**

1. When the product is removed for maintenance, reduce the set pressure to “0” and shut off the supply pressure completely beforehand.
2. When a pressure gauge is to be mounted, remove the plug after reducing the set pressure to “0”.
3. 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**

1. 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.

**Operation**

5. 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.
6. 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.
7. 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.
8. 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.
9. The capacity of the output side is large, and when used for the purpose of a relief function, the exhaust sound will be loud when being relieved. Therefore, operate with a silencer (SMC Series AN, etc.) mounted on the exhaust port (EXH port). When using the IR1000-A and 2000-A series, contact your SMC sales representative.
10. When installing a pressure gauge to the product, do not apply pressure more than the maximum display pressure. This will cause a malfunction.

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**Recommended Proper Torque (N·m)**

<table>
<thead>
<tr>
<th>Set nut (for bracket)</th>
<th>IR10-A</th>
<th>IR20-A</th>
<th>IR30-A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.0±0.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hexagon panel nut (for knob type only)</th>
<th>IR10-A</th>
<th>IR20-A</th>
<th>IR30-A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.5±0.5</td>
<td></td>
<td></td>
</tr>
</tbody>
</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.
**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)*1, and other safety regulations.

![Safety Instructions]

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**Caution:** Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

**Warning:** Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

**Danger:** Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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**Warning**

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

   Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions and other safety regulations.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

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**Caution**

1. The product is provided for use in manufacturing industries.

   The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

   If anything is unclear, contact your nearest sales branch.

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**Limited warranty and Disclaimer/Compliance Requirements**

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

**Limited warranty and Disclaimer**

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.

   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

   A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

   Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

**Compliance Requirements**

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

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**Caution**

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

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**Safety Instructions** Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.