Electro-Pneumatic Regulator/Electronic Vacuum Regulator

**ITV Series**

- Stepless control of air pressure proportional to an electrical signal
- ITV1000/2000/3000 series are compatible with various input specifications, including serial communications.

### Applicable Fieldbus protocols

- CC-Link
- DeviceNet
- PROFIBUS DP

### Serial communications specifications

- RS-232C specification to serial communications is standardized.

### Compact/lightweight (Integrated communication parts)

- Weight: 350 g (ITV1000)

### Power consumption: 4 W (ITV1000) or less

**Note 1** Value for communications type. (PROFIBUS DP)

### Electronic Vacuum Regulators

#### ITV009 Series

- Maximum flow rate: 1500 L/min (ANR)
- Set pressure: 0.6 MPa
- Supply pressure: 1.0 MPa

#### ITV209 Series

- Maximum flow rate: 4000 L/min (ANR)
- Set pressure: 0.6 MPa
- Supply pressure: 1.0 MPa

**Note 2** ITV1000. Dimensions in parentheses () are for the CC-Link or PROFIBUS DP.
Compact Electro-Pneumatic Regulator **ITV0000 Series**

Compact Vacuum Regulator **ITV009 Series**

**Compact 15 mm**
With a simplified high-density circuit board design, an extremely compact size has been achieved.

**Lightweight 100 g**

Realizes space-saving and reduction of weight for manifold use.
Stations can easily be increased or decreased due to DIN rail mount design.

**Cable connectors**
- Straight type and right angle type are available.

**Built-in One-touch fittings**
**With error indication LED**

**Brackets**
- Flat and L-brackets are available.

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**Electro-Pneumatic Regulator **ITV1000/2000/3000 Series**

Electronic Vacuum Regulator **ITV209 Series**

Serial communications specifications to **ITV1000/2000/3000 series** are standardized.

- **Reduced wiring**

Applicable Fieldbus protocols
- CC-Link
- DeviceNet
- PROFINET
- RS-232C specification to serial communications is standardized.

- **Sensitivity**: 0.2% F.S. or less
- **Linearity**: ±1% F.S. or less
- **Hysteresis**: 0.5% F.S. or less
- **IP65**
- **Cable connections in 2 directions**

---

**Application examples**

- **Multi-stage control to analog control**
- **Electrostatic coating control**

---

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure range</th>
<th>Input signal</th>
<th>Output signal</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV001</td>
<td>0.1 MPa</td>
<td>4 to 20 mA DC</td>
<td>Analog output</td>
<td>• Cable connectors</td>
</tr>
<tr>
<td>ITV003</td>
<td>0.5 MPa</td>
<td>0 to 20 mA DC</td>
<td>1 to 5 VDC</td>
<td>Right angle type</td>
</tr>
<tr>
<td>ITV005</td>
<td>0.9 MPa</td>
<td>0 to 5 VDC</td>
<td></td>
<td>• Brackets</td>
</tr>
<tr>
<td>ITV009</td>
<td>-100 kPa</td>
<td>0 to 10 VDC</td>
<td></td>
<td>Flat bracket</td>
</tr>
</tbody>
</table>

---

**Equivalent to IP65**
**Linearity**: ±1% F.S. or less
**Hysteresis**: 0.5% F.S. or less
**Repeatability**: ±0.5% F.S. or less
**High-speed response time**: 0.1 sec (Without load)

*(Note) This is not a guaranteed value as it depends on the operating environment.*

**High stability**
- Sensitivity 0.2% F.S. or less

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**Cable connectors**
- Straight type and right angle type are available.

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**Built-in One-touch fittings**
**With error indication LED**

**Brackets**
- Flat and L-brackets are available.

---

**Application examples**

- **Multi-stage control to analog control**
- **Electrostatic coating control**

---

**Sensitivity**: 0.2% F.S. or less
**Linearity**: ±1% F.S. or less
**Hysteresis**: 0.5% F.S. or less
**IP65**

**Cable connections in 2 directions**

---

**Grease-free specification (ITV1000 series)**
## Electro-Pneumatic Regulator
### Electronic Vacuum Regulator

- **ITV Series**

  - **Stepless control of air pressure proportional to an electrical signal.**

<table>
<thead>
<tr>
<th>Series</th>
<th>Model</th>
<th>Set pressure range</th>
<th>Input signal</th>
<th>Port size</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITV0000 Series</strong></td>
<td>ITV001</td>
<td>0.001 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC (Sink type) Current type: 0 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td>Built-in One-touch fittings Metric size: ø4 Inch size: ø5/32</td>
<td>896</td>
</tr>
<tr>
<td></td>
<td>ITV003</td>
<td>0.001 to 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ITV005</td>
<td>0.001 to 0.9 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITV1000 Series</strong></td>
<td>ITV101</td>
<td>0.005 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC (Sink type) Current type: 0 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC Sub-module Port size: 1/8, 1/4</td>
<td></td>
<td>904</td>
</tr>
<tr>
<td></td>
<td>ITV103</td>
<td>0.005 to 0.5 MPa</td>
<td></td>
<td>1/8, 1/4</td>
<td>904</td>
</tr>
<tr>
<td></td>
<td>ITV105</td>
<td>0.005 to 0.9 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITV2000 Series</strong></td>
<td>ITV201</td>
<td>0.005 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC (Sink type) Current type: 0 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC Preset input (4 points/16 points) 10 bit digital input CC-Link compatible DeviceNet™ compatible PROFIBUS DP compatible RS-232C communication</td>
<td>1/4, 3/8</td>
<td>904</td>
</tr>
<tr>
<td></td>
<td>ITV203</td>
<td>0.005 to 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ITV205</td>
<td>0.005 to 0.9 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITV3000 Series</strong></td>
<td>ITV301</td>
<td>0.005 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC Preset input (4 points/16 points) 10 bit digital input CC-Link compatible DeviceNet™ compatible PROFIBUS DP compatible RS-232C communication</td>
<td>1/4, 3/8, 1/2</td>
<td>904</td>
</tr>
<tr>
<td></td>
<td>ITV303</td>
<td>0.005 to 0.5 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ITV305</td>
<td>0.005 to 0.9 MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITV009 Series</strong></td>
<td>ITV009</td>
<td>–1 to –100 kPa</td>
<td>Current type: 4 to 20 mA DC (Sink type) Current type: 0 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC Preset input (4 points/16 points) 10 bit digital input CC-Link compatible DeviceNet™ compatible PROFIBUS DP compatible RS-232C communication</td>
<td>Built-in One-touch fittings Metric size: ø4 Inch size: ø5/32</td>
<td>928</td>
</tr>
<tr>
<td><strong>ITV209 Series</strong></td>
<td>ITV209</td>
<td>–1.3 to –80 kPa</td>
<td>Current type: 4 to 20 mA DC (Sink type) Current type: 0 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC Preset input (4 points/16 points) 10 bit digital input CC-Link compatible DeviceNet™ compatible PROFIBUS DP compatible RS-232C communication</td>
<td>1/4</td>
<td>935</td>
</tr>
</tbody>
</table>
# Compact Electro-Pneumatic Regulator

## How to Order

### For single unit and single unit for manifold

<table>
<thead>
<tr>
<th>Pressure range</th>
<th>Power supply voltage</th>
<th>Input signal</th>
<th>Built-in One-touch fittings type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 MPa</td>
<td>24 VDC ±10%</td>
<td>0</td>
<td>Metric size (Light gray)</td>
</tr>
<tr>
<td>0.5 MPa</td>
<td>24 VDC ±10%</td>
<td>1</td>
<td>Inch size (Orange)</td>
</tr>
<tr>
<td>0.9 MPa</td>
<td>12 to 15 VDC</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Cable connector (Option)

- **N**: Without cable connector
- **S**: Straight type 3 m
- **L**: Right angle type 2 m

### Bracket/Option for single unit only

- **B**: Flat Bracket
- **C**: L-bracket

### Base type

- **Nil**: For single unit
- **M**: For manifolds

## How to Order Manifold Assembly (Example)

- **IITV00-02-0**
- **n**

### Stations

<table>
<thead>
<tr>
<th>Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>02</td>
</tr>
<tr>
<td>03</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>

### One-touch fitting size for supply/exhaust parts (End plate)

- **Nil**: ø6 (Light gray)
- **U**: ø1/4" (Orange)

### Option

If a DIN rail longer than the specified stations is required, specify the applicable stations in two digits. (Maximum 10 stations)

- **Example**: IITV00-05-07

### Note

- A DIN rail with the length specified by the number of stations is attached to the manifold. For dimensions of the DIN rail, refer to the external dimensions.

---

*Example: Due to the common supply/exhaust feature, note that different pressure range combinations are not available.

- **IITV00-03**—1 set (Manifold part no.)
- **IITV0030-3MS**—2 sets (Electro-pneumatic regulator part no. 1, 2 stations)
- **IITV0030-3ML**—1 set (Electro-pneumatic regulator part no. 3 stations)

- Indicate part numbers in order starting from the first station on the D side.

- Note: Combination with having different pressure ranges is not available due to common supply/exhaust features.

- The asterisk (*) specifies mounting. Add an asterisk (*) at the beginning of electro-pneumatic regulator part numbers to be mounted.*
Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV001</th>
<th>ITV003</th>
<th>ITV005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum supply pressure</td>
<td>0.2 MPa</td>
<td>0.2 MPa</td>
<td>0.2 MPa</td>
</tr>
<tr>
<td>Maximum supply pressure</td>
<td>1.0 MPa</td>
<td>1.0 MPa</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>0.001 to 0.1 MPa</td>
<td>0.001 to 0.5 MPa</td>
<td>0.001 to 0.9 MPa</td>
</tr>
<tr>
<td>Power supply Voltage</td>
<td>24 VDC ±10%, 12 to 15 VDC</td>
<td>24 VDC ±10%, 12 to 15 VDC</td>
<td>24 VDC ±10%, 12 to 15 VDC</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Power supply voltage 24 VDC type: 0.12 A or less</td>
<td>Power supply voltage 24 VDC type: 0.12 A or less</td>
<td>Power supply voltage 24 VDC type: 0.12 A or less</td>
</tr>
<tr>
<td>Input signal Voltage type</td>
<td>0 to 5 VDC</td>
<td>0 to 5 VDC</td>
<td>0 to 5 VDC</td>
</tr>
<tr>
<td>Current type</td>
<td>4 to 20 mA DC, 0 to 20 mA DC (Sink type)</td>
<td>4 to 20 mA DC, 0 to 20 mA DC (Sink type)</td>
<td>4 to 20 mA DC, 0 to 20 mA DC (Sink type)</td>
</tr>
<tr>
<td>Input impedance</td>
<td>Approx. 10 kΩ</td>
<td>Approx. 250 Ω</td>
<td>Approx. 250 Ω</td>
</tr>
<tr>
<td>Output impedance Voltage type</td>
<td>1 to 5 VDC (Output impedance: Approx. 1 kΩ)</td>
<td>1 to 5 VDC (Output impedance: Approx. 1 kΩ)</td>
<td>1 to 5 VDC (Output impedance: Approx. 1 kΩ)</td>
</tr>
<tr>
<td>Current type</td>
<td>Approx. 250 Ω</td>
<td>Approx. 250 Ω</td>
<td>Approx. 250 Ω</td>
</tr>
<tr>
<td>Output signal Analog output</td>
<td>±1% F.S. or less</td>
<td>±1% F.S. or less</td>
<td>±1% F.S. or less</td>
</tr>
<tr>
<td>Linearity</td>
<td>±0.5% F.S. or less</td>
<td>±0.5% F.S. or less</td>
<td>±0.5% F.S. or less</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>±0.2% F.S. or less</td>
<td>±0.2% F.S. or less</td>
<td>±0.2% F.S. or less</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.12% F.S./°C or less</td>
<td>±0.12% F.S./°C or less</td>
<td>±0.12% F.S./°C or less</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0 to 50°C (No condensation)</td>
<td>0 to 50°C (No condensation)</td>
<td>0 to 50°C (No condensation)</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>Equivalent to IP65 *</td>
<td>Equivalent to IP65 *</td>
<td>Equivalent to IP65 *</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0 to 50°C (No condensation)</td>
<td>0 to 50°C (No condensation)</td>
<td>0 to 50°C (No condensation)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>Built-in One-touch fittings</td>
<td>Built-in One-touch fittings</td>
<td>Built-in One-touch fittings</td>
</tr>
<tr>
<td>Connection type</td>
<td>For single unit</td>
<td>For single unit</td>
<td>For single unit</td>
</tr>
<tr>
<td>Connection size</td>
<td>Metric size</td>
<td>Metric size</td>
<td>Metric size</td>
</tr>
<tr>
<td></td>
<td>Inch size</td>
<td>Inch size</td>
<td>Inch size</td>
</tr>
<tr>
<td></td>
<td>Ø4</td>
<td>Ø5/32&quot;</td>
<td>Ø4</td>
</tr>
<tr>
<td></td>
<td>Ø5/32&quot;</td>
<td>Ø4</td>
<td>Ø5/32&quot;</td>
</tr>
<tr>
<td>Weight</td>
<td>100 g or less (without option)</td>
<td>100 g or less (without option)</td>
<td>100 g or less (without option)</td>
</tr>
</tbody>
</table>

Note 1) Indicates the weight of a single unit.
For ITV00-n
Total weight (g) Stations (n) x 100 + 130 (Weight of end block A, B assembly) + Weight (g) of DIN rail
Note 2) When there is a downstream flow consumption, pressure may become unstable depending on piping conditions.
Note 3) When the input signal is at 0%, the exhaust solenoid valve is controlled to reduce the outlet pressure to zero. For this reason, a noise may be generated. This noise is normal and does not indicate a fault.
Note 4) When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than 100 kΩ, the analog output monitor accuracy of ±6% F.S. or less may not be available. The product with the accuracy of within ±6% is supplied upon your request. Output pressure remains unaffected.

* When using under the conditions equivalent to IP65, connect the fitting or tube to the breathing hole prior to use. (For details, refer to "Specific Product Precautions 1" on page 941.)

Accessories (Option)

**Bracket**
- Flat bracket assembly (includes 2 mounting screws) P39800022
- L-bracket assembly (includes 2 mounting screws) P39800023

**Cable connector**
- Straight type M8-4DSX3MG4
- Right angle type P398000-501-2

Tightening torque when assembling is 0.3 N-m.
Working Principle

When the input signal rises, the air supply solenoid valve ① turns ON. Due to this, part of the supply pressure passes through the air supply solenoid valve ① and changes to output pressure. This output pressure feeds back to the control circuit ④ via the pressure sensor ③. Here, pressure corrections continue until output pressure becomes proportional to the input signal, enabling output pressure that is proportional to the input signal.
**ITV001 Series**

**Linearity, Hyteresis**

![Graph showing linearity and hysteresis for ITV001 Series](image1)

**Pressure Characteristics**

![Graph showing pressure characteristics for ITV001 Series](image2)

**Flow Rate Characteristics**

![Graph showing flow rate characteristics for ITV001 Series](image3)

**ITV003 Series**

**Linearity, Hyteresis**

![Graph showing linearity and hysteresis for ITV003 Series](image4)

**Pressure Characteristics**

![Graph showing pressure characteristics for ITV003 Series](image5)

**Flow Rate Characteristics**

![Graph showing flow rate characteristics for ITV003 Series](image6)
**ITV0000 Series**

**ITV005 Series**

**Linearity, Hysteresis**

<table>
<thead>
<tr>
<th>Input signal (% F.S.)</th>
<th>Output deviation factor (% F.S.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>25</td>
<td>-0.8</td>
</tr>
<tr>
<td>50</td>
<td>-0.6</td>
</tr>
<tr>
<td>75</td>
<td>0.2</td>
</tr>
<tr>
<td>100</td>
<td>0.4</td>
</tr>
</tbody>
</table>

**Pressure Characteristics**

Set pressure: 0.45 MPa

<table>
<thead>
<tr>
<th>Supply pressure (MPa)</th>
<th>Output deviation factor (% F.S.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4</td>
<td>-1</td>
</tr>
<tr>
<td>0.6</td>
<td>-0.5</td>
</tr>
<tr>
<td>0.8</td>
<td>0.5</td>
</tr>
<tr>
<td>1.0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Flow Rate Characteristics**

Supply pressure: 1.0 MPa

<table>
<thead>
<tr>
<th>Set pressure (kPa)</th>
<th>Flow rate (L/min (ANR))</th>
</tr>
</thead>
<tbody>
<tr>
<td>100kPa</td>
<td>0</td>
</tr>
<tr>
<td>200kPa</td>
<td>1</td>
</tr>
<tr>
<td>300kPa</td>
<td>2</td>
</tr>
<tr>
<td>400kPa</td>
<td>3</td>
</tr>
<tr>
<td>500kPa</td>
<td>4</td>
</tr>
<tr>
<td>600kPa</td>
<td>5</td>
</tr>
<tr>
<td>700kPa</td>
<td>6</td>
</tr>
<tr>
<td>800kPa</td>
<td>7</td>
</tr>
<tr>
<td>900kPa</td>
<td>8</td>
</tr>
<tr>
<td>1000kPa</td>
<td>9</td>
</tr>
</tbody>
</table>

**Repeatability**

With 50% of signal input

<table>
<thead>
<tr>
<th>Count</th>
<th>Output deviation factor (% F.S.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>2</td>
<td>0.5</td>
</tr>
<tr>
<td>3</td>
<td>0.5</td>
</tr>
<tr>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>5</td>
<td>0.5</td>
</tr>
</tbody>
</table>
Compact Electro-Pneumatic Regulator *ITV0000 Series*

**Dimensions**

### For Single Unit

For Single Unit

**Note:** When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use.

(For details, refer to "Specific Product Precautions 1" on page 941.)

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV003</td>
<td>SUP</td>
<td>OUT</td>
<td>EXH</td>
</tr>
</tbody>
</table>

**Port Location**

- **Note:**
  - Single Unit: Dimensions
  - SUP port (ø4, ø5/32")
  - EXH port (ø4, ø5/32")

- **Body**
  - 2 x ø3.5 Mounting hole
  - Flange bracket (Option)
  - Flat bracket (Option)

- **L-bracket**
  - (Option)
  - M8 x 1
  - Cable connection thread

- **Breathing hole**
  - (M3 x 0.5)

- **Minimum bending radius 80 (30.9)3515**

- **Cable connector (4 cores)**
  - Straight type (Option)
  - Right angle type (Option)

- **Cable connector (4 cores)**
  - Straight type (Option)

- **Note:**
  - When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use.
  - (For details, refer to "Specific Product Precautions 1" on page 941.)
**Dimensions**

**Single unit for manifold**

Note) When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use. (For details, refer to “Specific Product Precautions 1” on page 941.)

Note) For dimensions of the cable connector, refer to single unit on page 901.
Compact Electro-Pneumatic Regulator  **ITV0000 Series**

**Dimensions**

### Manifold

**Port Location**

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV003</td>
<td>SUP</td>
<td>OUT</td>
<td>EXH</td>
</tr>
</tbody>
</table>

Note) Stations are counted starting from the D side.

**Manifold stations**

<table>
<thead>
<tr>
<th>Stations n</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>165</td>
<td>180</td>
</tr>
<tr>
<td>L2</td>
<td>110.5</td>
<td>123</td>
<td>148</td>
<td>160.5</td>
<td>173</td>
<td>185.5</td>
<td>198</td>
<td>223</td>
<td>235.5</td>
</tr>
</tbody>
</table>

**Weight of DIN rail (g)**

<table>
<thead>
<tr>
<th></th>
<th>20</th>
<th>22</th>
<th>27</th>
<th>29</th>
<th>31</th>
<th>34</th>
<th>36</th>
<th>41</th>
<th>43</th>
</tr>
</thead>
</table>

Note) For dimensions of the cable connector, refer to single unit on page 901.

Note) When using under the conditions equivalent to IP65, connect the fittings or tubing to the breathing hole prior to use.

(For details, refer to "Specific Product Precautions 1" on page 941.)
**Electro-Pneumatic Regulator**

**ITV1000/2000/3000 Series**

---

### How to Order

#### Model

- **1**: 1000 type
- **2**: 2000 type
- **3**: 3000 type

#### Pressure range

- **1**: 0.1 MPa
- **2**: 0.5 MPa
- **3**: 0.9 MPa

#### Power supply voltage

- **0**: 24 VDC
- **1**: 12 to 15 VDC

### Input signal/Communication model

- **0**: Current type 4 to 20 mA DC (Sink type)
- **1**: Current type 0 to 20 mA DC (Sink type)
- **2**: Voltage type 0 to 5 VDC
- **3**: Voltage type 0 to 10 VDC
- **40**: 4 points preset input
- **52**: 16 points preset input (Switch output/NPN output)
- **53**: 16 points preset input (Switch output/PNP output)
- **60**: 10 bit digital input

#### Monitor output

- **1**: Analog output 1 to 5 VDC
- **2**: Switch output/NPN output
- **3**: Switch output/PNP output
- **4**: Analog output 4 to 20 mA DC (Sink type)

#### Thread type

- **Nil**: Without thread
- **Rc**: NPT
- **N**: NPT
- **T**: NPTF
- **F**: G

#### Pressure display unit

- **Nil**: None

#### Cable connector type

- **S**: Straight type 3 m
- **L**: Right angle type 3 m
- **N**: Without cable connector

#### Bracket

- **Nil**: Without bracket
- **B**: Flat bracket
- **C**: L-bracket

#### Port size

<table>
<thead>
<tr>
<th><strong>1</strong></th>
<th>1/8 (1000 type)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2</strong></td>
<td>1/4 (1000, 2000, 3000 type)</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>3/8 (2000, 3000 type)</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>1/2 (3000 type)</td>
</tr>
</tbody>
</table>

---

**Made to Order Specifications**

- For overseas sales (SI units are to be used inside Japan), for the communication models, CC, DE, PR and RC, only “Nil” is available as it does not have a pressure display.

- For 10 bit digital input, right angle type cannot be selected.

- Even when a cable connector is selected, communication cable is not included in the communication models, CC, DE, PR, and RC. Please order it separately. Refer to the below.

### Application

<table>
<thead>
<tr>
<th>Application</th>
<th>Communication cable part number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC-Link compatibility</td>
<td>PCA-1567720 (Socket type)</td>
<td>Dedicated Bus adapter supplied with the product.</td>
</tr>
<tr>
<td></td>
<td>PCA-1567717 (Plug type)</td>
<td></td>
</tr>
<tr>
<td>DeviceNet™ compatibility</td>
<td>PCA-1557633 (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
<tr>
<td></td>
<td>PCA-1557646 (Plug type)</td>
<td></td>
</tr>
<tr>
<td>PROFIBUS DP compatibility</td>
<td>PCA-1557688 (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
<tr>
<td></td>
<td>PCA-1557691 (Plug type)</td>
<td></td>
</tr>
</tbody>
</table>

---

*(Bracket is included.)*

---

(Refer to M8/M12 connector in Best Pneumatics No.1-1 for details) or order the product certified for the respective protocol (with M12 connector) separately.

---

*Note)* Communication models (CC, DE PR, RC), 16 points preset input and 10 bit digital input are available only for 24 VDC.

*Note)* Under Japan's new Measurement Act, this is only for overseas sales (SI units are to be used inside Japan). For the communication models, CC, DE, PR and RC, only “Nil” is available as it does not have a pressure display.

*Note)* Even when a cable connector is selected, communication cable is not included in the communication models, CC, DE, PR, and RC. Please order it separately. Refer to the below.

---

For communication cables, use the parts listed below or order the product certified for the respective protocol (with M12 connector) separately.
Electro-Pneumatic Regulator **ITV1000/2000/3000 Series**

### Standard Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV101</th>
<th>ITV103</th>
<th>ITV105</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated pressure</strong></td>
<td>Note 4) The insulation between the electrical signal of the communication system and ITV power supply.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum supply pressure</strong></td>
<td>Set pressure &lt;0.1 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Set pressure range</strong> (Note 1)</td>
<td>0.005 to 0.1 MPa, 0.005 to 0.5 MPa, 0.005 to 0.9 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>Voltage: 24 VDC ± 10%, 12 to 15 VDC Current consumption: Power supply voltage 24 VDC type: 0.12 A or less (Note 9) Power supply voltage 12 VDC type: 0.18 A or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input signal</strong> (Note 9)</td>
<td>Voltage type: 4 to 20 mA DC, 0 to 20 mA DC (Sink type) Input type: Current type (Note 4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input impedance</strong></td>
<td>Current type: 250 Ω or less (Note 8) Voltage type: Approx. 6.5 kΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output signal (monitor output)</strong> (Note 3)</td>
<td>Analog output: 1 to 5 VDC (Output impedance: Approx. 1 kΩ) 4 to 20 mA DC (Sink type) (Output impedance: 250 Ω or less) Switch output: Power supply voltage 24 VDC type: Approx. 4.7 kΩ Power supply voltage 12 VDC type: Approx. 2.0 kΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature characteristics</strong></td>
<td>±0.12% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.5% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
<td>±0.2% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hysteresis</strong></td>
<td>0.5% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td>±0.5% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>0.2% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output pressure</strong></td>
<td>±0.12% F.S., ±1 digit or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Minimum unit</strong></td>
<td>±0.5% F.S. or less</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient and fluid temperature</strong></td>
<td>0 to 50°C (No condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>IP65</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong> (Note 10)</td>
<td>ITV10</td>
<td>Approx. 250 g (without options) ITV20</td>
<td>Approx. 350 g (without options) ITV30</td>
</tr>
</tbody>
</table>

Note 1) Please refer to Figure 1 for the relationship between set pressure and input. Because the maximum set pressure differs for each pressure display, refer to page 945.

Note 2) 2-wire type 4 to 20 mA DC is not available. Power supply voltage (24 VDC or 12 to 15 VDC) is required.

Note 3) Select either analog output or switch output. Further, when switch output is selected, select either NPN open collector output or PNP output.

When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than 100 kΩ, input impedance varies depending on the input current. This is 350 Ω or less for an input current of 20 mA DC.

Note 4) Adjustment of numerical values such as the zero/span adjustment or preset input type is set based on the minimum units for output pressure display (e.g., 0.001 to 0.500 MPa). Note that the unit cannot be changed.

Note 5) The minimum unit for 0.9 MPa (130 psi) types is 1 psi.

Note 6) Value for the state with no over current circuit included. If an allowance is provided for an over current circuit, the input impedance varies depending on the input current. This is 350 Ω or less for an input current of 20 mA DC.

Note 7) The above characteristics are confined to the static state. When air is consumed on the output side, the pressure may fluctuate.

Note 8) The ITV1000 series is a Grease-free specification (Wetted parts).

Note 9) Refer to the table below for communication specifications.

Note 10) Add 50 g for digital input type, 70 g for 16 bits preset input type respectively.

### Communication Specifications (CC, DE, PR, RC)

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV100</th>
<th>ITV200</th>
<th>ITV300</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symbol</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Serial-communications model</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output pressure</strong></td>
<td>0 to 0.005 MPa, 0 to 1.0 MPa</td>
<td>0 to 0.2 MPa, 0 to 1.0 MPa</td>
<td>0 to 0.2 MPa, 0 to 1.0 MPa</td>
</tr>
<tr>
<td><strong>Input signal (% F.S.)</strong></td>
<td>This range is outside of the control (output)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1. Input/output characteristics chart**

**Note 1)** Please refer to Figure 1 for the relationship between set pressure and input. Because the maximum set pressure differs for each pressure display, refer to page 945.

**Note 2)** 2-wire type 4 to 20 mA DC is not available. Power supply voltage (24 VDC or 12 to 15 VDC) is required.

**Note 3)** Select either analog output or switch output.

Further, when switch output is selected, select either NPN open collector output or PNP output.

When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than 100 kΩ, input impedance varies depending on the input current. This is 350 Ω or less for an input current of 20 mA DC.

**Note 4)** Adjustment of numerical values such as the zero/span adjustment or preset input type is set based on the minimum units for output pressure display (e.g., 0.001 to 0.500 MPa). Note that the unit cannot be changed.

**Note 5)** The minimum unit for 0.9 MPa (130 psi) types is 1 psi.

**Note 6)** Value for the state with no over current circuit included. If an allowance is provided for an over current circuit, the input impedance varies depending on the input current. This is 350 Ω or less for an input current of 20 mA DC.

**Note 7)** The above characteristics are confined to the static state. When air is consumed on the output side, the pressure may fluctuate.

**Note 8)** The ITV1000 series is a Grease-free specification (Wetted parts).

**Note 9)** Refer to the table below for communication specifications.

**Note 10)** Add 50 g for digital input type, 70 g for 16 bits preset input type respectively.
ITV1000/2000/3000 Series

Modular Products and Accessory Combinations

<table>
<thead>
<tr>
<th>Applicable products and accessories</th>
<th>Applicable model</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat bracket</td>
<td>AF30-A</td>
<td>L-bracket</td>
<td>P398010-600</td>
</tr>
<tr>
<td>Mist separator</td>
<td>AFM30-A</td>
<td>L-bracket</td>
<td>P398020-600</td>
</tr>
<tr>
<td>L-bracket</td>
<td>B310L-A</td>
<td>L-bracket</td>
<td>P398010-601</td>
</tr>
<tr>
<td>Spacer</td>
<td>Y30-A</td>
<td>L-bracket</td>
<td>P398020-601</td>
</tr>
<tr>
<td>Spacer with L-bracket (2)</td>
<td>Y30L-A</td>
<td>L-bracket</td>
<td>P398020-601</td>
</tr>
<tr>
<td>Spacer with T-bracket</td>
<td>—</td>
<td>L-bracket</td>
<td>P398020-601</td>
</tr>
</tbody>
</table>

Note 1) For the 10-bit digital type, there is no right angle type cable connector.
Note 2) Even when “with cable connector” is selected the communication cable is not included in the communication model (CC, DE, PR). Please order separately.

Accessories (Option)/Part No.

**Bracket**

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV10□□</td>
<td>Flat bracket assembly (including mounting screws)</td>
<td>P398010-600</td>
</tr>
<tr>
<td>ITV20□□, 30□□</td>
<td>Flat bracket assembly (including mounting screws)</td>
<td>P398020-600</td>
</tr>
<tr>
<td>ITV30□□</td>
<td>Flat bracket assembly (including mounting screws)</td>
<td>P398010-601</td>
</tr>
</tbody>
</table>

**Cable connector**

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current type</td>
<td>Cable connector (4 cores)</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>Voltage type</td>
<td>Cable connector (4 cores)</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>4 points preset input</td>
<td>Straight type 3 m</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>16 points preset input</td>
<td>Right angle type 3 m</td>
<td>P398020-501-3</td>
</tr>
<tr>
<td>Signal cable (5 cores)</td>
<td>Straight type 3 m</td>
<td>P398020-502-3</td>
</tr>
<tr>
<td>10 bit digital input</td>
<td>Right angle type 3 m</td>
<td>P398020-503-3</td>
</tr>
<tr>
<td>CC-Link</td>
<td>Power cable (4 cores)</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>PROFIBUS DP</td>
<td>Power cable (4 cores)</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>DeviceNet™</td>
<td>Power cable (4 cores)</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>RS-232C</td>
<td>Communication cables connector (5 cores)</td>
<td>P398020-502-3</td>
</tr>
<tr>
<td></td>
<td>Right angle type 3 m</td>
<td>P398020-503-3</td>
</tr>
</tbody>
</table>

Note 1) For the 10-bit digital type, there is no right angle type cable connector.
Note 2) Even when “with cable connector” is selected the communication cable is not included in the communication model (CC, DE, PR). Please order separately.

**Bus adapter**

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC-Link</td>
<td>Bus adapter (Bus adapter supplied with the product.)</td>
<td>EX9-ACY00-MJ</td>
</tr>
</tbody>
</table>

**Dimensions**

**Flat bracket**

<table>
<thead>
<tr>
<th>Model</th>
<th>Bracket tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV1000</td>
<td>0.76 ± 0.05 N·m</td>
</tr>
<tr>
<td>ITV2000/3000</td>
<td>1.5 ± 0.05 N·m</td>
</tr>
</tbody>
</table>

**L-bracket**

Note 1) Manifolds are compatible with 2 to 8 stations. Consult with SMC for 9 stations or more.
Note 2) Products without symbols are also compatible. Consult with SMC separately.
Note 3) Compliant with CE marking
Working Principles

When the input signal rises, the air supply solenoid valve ① turns ON, and the exhaust solenoid valve ② turns OFF. Therefore, supply pressure passes through the air supply solenoid valve ① and is applied to the pilot chamber ③. The pressure in the pilot chamber ③ increases and operates on the upper surface of the diaphragm ④. As a result, the air supply valve ⑤ linked to the diaphragm ④ opens, and a portion of the supply pressure becomes output pressure.

This output pressure feeds back to the control circuit ⑧ via the pressure sensor ⑦. Here, a correct operation functions until the output pressure is proportional to the input signal, making it possible to always obtain output pressure proportional to the input signal.

Working Principle Diagram
ITV1000/2000/3000 Series

ITV101 Series

**Linearity**

**Hysteresis**

**Repeatability**

**Pressure characteristics**  
Set pressure: 0.05 MPa

**Flow rate characteristics**  
Supply pressure: 0.2 MPa

**Relief flow characteristics**  
Supply pressure: 0.2 MPa

ITV201 Series

**Linearity**

**Hysteresis**

**Repeatability**

**Pressure characteristics**  
Set pressure: 0.05 MPa

**Flow rate characteristics**  
Supply pressure: 0.2 MPa

**Relief flow characteristics**  
Supply pressure: 0.2 MPa
**ITV1000/2000/3000 Series**

**ITV103 Series**

**Linearity**

Set pressure (MPa) vs. Input signal (%F.S.)

**Hysteresis**

Output deviation factor (%F.S.) vs. Input signal (%F.S.)

**Repeatability**

Output deviation factor (%F.S.) vs. Repetition

**Pressure characteristics**

Set pressure: 0.2 MPa

**Flow rate characteristics**

Supply pressure: 0.7 MPa

**Relief flow characteristics**

Supply pressure: 0.7 MPa

---

**ITV203 Series**

**Linearity**

Set pressure (MPa) vs. Input signal (%F.S.)

**Hysteresis**

Output deviation factor (%F.S.) vs. Input signal (%F.S.)

**Repeatability**

Output deviation factor (%F.S.) vs. Repetition

**Pressure characteristics**

Set pressure: 0.2 MPa

**Flow rate characteristics**

Supply pressure: 0.7 MPa

**Relief flow characteristics**

Supply pressure: 0.7 MPa
Electro-Pneumatic Regulator *ITV1000/2000/3000* Series

### ITV303 Series

**Linearity**

![Linearity Graph](#)

- **Set pressure (MPa)**
- **Input signal (%F.S.)**

**Hysteresis**

![Hysteresis Graph](#)

- **Output deviation factor (%F.S.)**
- **Input signal (%F.S.)**

**Repeatability**

![Repeatability Graph](#)

- **Output deviation factor (%F.S.)**
- **Repetition**

**Pressure characteristics**

- **Set pressure: 0.2 MPa**
- **Supply pressure (MPa)**
- **Output deviation factor (%F.S.)**

**Flow rate characteristics**

- **Supply pressure: 0.7 MPa**
- **Flow rate (L/min (ANR))**
- **Set pressure (MPa)**

**Relief flow characteristics**

- **Supply pressure: 0.7 MPa**
- **Flow rate (L/min (ANR))**
- **Set pressure (MPa)**

---

**Electro-Pneumatic Regulator**

- **ITV1000/2000/3000 Series**
- **ARJ**
- **AR425 to 935**
- **ARX**
- **ARM**
- **ARP**
- **IR**
- **IRV**
- **VEX**
- **SRH**
- **SRP**
- **SRF**
- **ITV**
- **IC**
- **ITVH**
- **ITVX**
- **PVQ**
- **VY1**
- **VBA**
- **VBAT**
- **AP100**

---

911
**ITV1000/2000/3000 Series**

### ITV105 Series

**Linearity**

- Set pressure: 0.4 MPa

**Hysteresis**

- Set point: 0.4 MPa

**Repeatability**

- Set point: 0.4 MPa

**Pressure characteristics**

- Supply pressure: 0.4 MPa

**Flow rate characteristics**

- Supply pressure: 1.0 MPa

**Relief flow characteristics**

- Supply pressure: 1.0 MPa

### ITV205 Series

**Linearity**

- Set pressure: 0.4 MPa

**Hysteresis**

- Set point: 0.4 MPa

**Repeatability**

- Set point: 0.4 MPa

**Pressure characteristics**

- Supply pressure: 0.4 MPa

**Flow rate characteristics**

- Supply pressure: 1.0 MPa

**Relief flow characteristics**

- Supply pressure: 1.0 MPa
**ITV305 Series**

**Linearity**
- Set pressure: 0.4 MPa

**Hysteresis**
- Supply pressure: 1.0 MPa

**Repeatability**
- Supply pressure: 1.0 MPa

**Pressure characteristics**
- Set pressure: 0.4 MPa

**Flow rate characteristics**
- Supply pressure: 1.0 MPa

**Relief flow characteristics**
- Supply pressure: 1.0 MPa
### ITV1000/2000/3000 Series

#### Construction

**ITV1000**

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>2</td>
<td>Cover</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>3</td>
<td>Valve guide</td>
<td>Resin</td>
</tr>
<tr>
<td>4</td>
<td>Diaphragm assembly</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>5</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
<td>6</td>
<td>Bowl assembly</td>
<td>Silicone rubber</td>
</tr>
<tr>
<td>7</td>
<td>Sub-plate</td>
<td>Resin</td>
</tr>
<tr>
<td>8</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
<td>9</td>
<td>Control circuit assembly</td>
<td>—</td>
</tr>
<tr>
<td>10</td>
<td>Bumper</td>
<td>NBR</td>
</tr>
<tr>
<td>11</td>
<td>Valve</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>12</td>
<td>Guide retainer</td>
<td>Aluminum alloy</td>
</tr>
<tr>
<td>13</td>
<td>Solenoid valve</td>
<td>—</td>
</tr>
<tr>
<td>14</td>
<td>O-ring</td>
<td>HNBR</td>
</tr>
<tr>
<td>15</td>
<td>Round head phillips screw</td>
<td>Steel</td>
</tr>
<tr>
<td>16</td>
<td>Flat washer</td>
<td>Stainless steel</td>
</tr>
</tbody>
</table>

*Parts in contact with fluid are indicated with a mark ◆.*

---

### ITV2000

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
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</tr>
<tr>
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</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>5</td>
<td>Valve (Supply valve)</td>
<td>HNBR/Brass</td>
</tr>
<tr>
<td>6</td>
<td>Valve (Exhaust valve)</td>
<td>HNBR/Brass</td>
</tr>
<tr>
<td>7</td>
<td>Valve spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>8</td>
<td>Valve spring</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>9</td>
<td>Diaphragm assembly</td>
<td>Stainless steel</td>
</tr>
<tr>
<td>10</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
<td>11</td>
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</tr>
<tr>
<td>12</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>13</td>
<td>Cotter</td>
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</tr>
<tr>
<td>14</td>
<td>Wear ring</td>
<td>Resin</td>
</tr>
<tr>
<td>15</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
<td>16</td>
<td>Bowl assembly</td>
<td>Resin</td>
</tr>
<tr>
<td>17</td>
<td>Sub-plate</td>
<td>Silicone rubber</td>
</tr>
<tr>
<td>18</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
<td>19</td>
<td>Control circuit assembly</td>
<td>—</td>
</tr>
<tr>
<td>20</td>
<td>Solenoid valve</td>
<td>—</td>
</tr>
<tr>
<td>21</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>22</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>23</td>
<td>Round head phillips screw</td>
<td>Steel</td>
</tr>
</tbody>
</table>

*Parts in contact with fluid are indicated with a mark ◆.*
## Construction

### ITV3000

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
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<tbody>
<tr>
<td>1</td>
<td>Cover</td>
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<td>Body</td>
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</tr>
<tr>
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<td>Intermediate body</td>
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<td>Diaphragm assembly</td>
<td>Weather resistant NBR</td>
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<td></td>
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<td>Rolled sheet steel</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Steel</td>
</tr>
<tr>
<td>7</td>
<td>Valve (Supply valve)</td>
<td>HNBR/Brass</td>
</tr>
<tr>
<td>8</td>
<td>Valve (Exhaust valve)</td>
<td>HNBR/Brass</td>
</tr>
<tr>
<td>9</td>
<td>Valve spring</td>
<td>Stainless steel</td>
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<tr>
<td>10</td>
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<td>NBR</td>
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<td>11</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
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<td>Brass</td>
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<tr>
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<td>O-ring retainer</td>
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<tr>
<td>14</td>
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<td>NBR</td>
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<tr>
<td>15</td>
<td>Bowl assembly</td>
<td>Resin</td>
</tr>
<tr>
<td>16</td>
<td>Sub-plate</td>
<td>Silicone rubber</td>
</tr>
<tr>
<td>17</td>
<td>Seal</td>
<td>NBR</td>
</tr>
<tr>
<td>18</td>
<td>Control circuit assembly</td>
<td>—</td>
</tr>
<tr>
<td>19</td>
<td>Solenoid valve</td>
<td>—</td>
</tr>
<tr>
<td>20</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>21</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>22</td>
<td>O-ring</td>
<td>NBR</td>
</tr>
<tr>
<td>23</td>
<td>Round head Phillips screw</td>
<td>Steel</td>
</tr>
</tbody>
</table>

* Parts in contact with fluid are indicated with a mark ◆.
### ITV1000/2000/3000 Series

#### Dimensions

**ITV10□□**

**Flat bracket**

Note: Do not attempt to rotate, as the cable connector does not turn.

**L-bracket**
### Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)

#### 16 points preset input

- **M12 x 1**
  - Signal cable connection thread (Plug type)
  - Power cable connection thread (Plug type)
- **M3 x 0.5**
  - Solenoid valve EXH

#### 10 bit digital input

- **HIROSE ELECTRIC CO., LTD. Made RP13A-12RB-13PA (71)**
- **Digital pressure display**
- **(ø14.3)**

#### CC-Link/ITV1000-0-CC

- **OUT M12 x 1**
  - Communication cable connection thread (Socket type)
- **IN M12 x 1**
  - Communication cable connection thread (Plug type)
- **M3 x 0.5**
  - Solenoid valve EXH

#### DeviceNet™/ITV1000-0-DE

- **M12 x 1**
  - Communication cable connection thread (Plug type)
- **M3 x 0.5**
  - Solenoid valve EXH

#### PROFIBUS DP/ITV1000-0-PR

- **M12 x 1**
  - Communication cable connection thread (Socket type)
- **M12 x 1**
  - Power cable connection thread (Plug type)
- **M3 x 0.5**
  - Solenoid valve EXH

#### RS-232C/ITV1000-0-RC

- **M12 x 1**
  - Communication cable connection thread (Plug type)
- **M3 x 0.5**
  - Solenoid valve EXH

- **Dimensions not shown are same as on page 916.**

### With power cable connector

- **ITV1000-0-DE common dimensions**

Note: Order communication cable (other than 16 points, RS-232C) separately. (Refer to page 904.)

Note) Do not attempt to rotate, as the cable connector does not turn.
**ITV1000/2000/3000 Series**

**Dimensions**

**ITV20□□**

**Flat bracket**

Note: Do not attempt to rotate, as the cable connector does not turn.

Right angle type (4 cores)
Cable connector 3 m

Straight type (4 cores)
Cable connector 3 m

**L-bracket**

Digital pressure display

M12 x 1
Cable connection thread (Plug type)

M5 x 0.8
Solenoid valve
EXH

2 x 1/4, 3/8 (Rc, NPT, NPTF, G)
SUP port, OUT port

4 x ø7
1/4 (Rc, NPT, NPTF, G)
EXH port

4 x M5 x 0.8 thread depth 6 mm

Flat bracket assembly
P398020-600 (Option)

Solenoid
valve
EXH

Solenoid
valve
EXH

1/4 (Rc, NPT, NPTF, G)
EXH port

2 x 1/4, 3/8 (Rc, NPT, NPTF, G)
SUP port, OUT port

Digital pressure display

M12 x 1
Cable connection thread (Plug type)

M5 x 0.8
Solenoid valve
EXH

2 x 1/4, 3/8 (Rc, NPT, NPTF, G)
SUP port, OUT port

4 x M5 x 0.8 thread depth 6 mm

Flat bracket assembly
P398020-600 (Option)
**Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)**

**16 points preset input**
- M12 x 1 Signal cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- Digital pressure display
- M5 x 0.8 Solenoid valve EXH

**10 bit digital input**
- HIROSE ELECTRIC CO., LTD. Made RP13A-12RB-13PA (71)
- EXH (3)

**CC-Link/ITV20□0-CC**
- M12 x 1 Power cable connection thread (Plug type)
- IN M12 x 1 Communication cable connection thread (Plug type)
- OUT M12 x 1 Communication cable connection thread (Plug type)
- BUS adapter
- M5 x 0.8 Solenoid valve EXH

**DeviceNet™/ITV20□0-DE**
- M12 x 1 Communication cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- BUS adapter
- M5 x 0.8 Solenoid valve EXH

**PROFIBUS DP/ITV20□0-PR**
- M12 x 1 Communication cable connection thread (Socket type)
- M12 x 1 Power cable connection thread (Plug type)
- M5 x 0.8 Solenoid valve EXH

**RS-232C/ITV20□0-RC**
- M12 x 1 Communication cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- M5 x 0.8 Solenoid valve EXH

+ Dimensions not shown are same as on page 918.

**With power cable connector**

- **ITV20□0-□** common dimensions

Note) Order communication cable (other than 16 points, RS-232C) separately. (Refer to page 904.)

Note) Do not attempt to rotate, as the cable connector does not turn.
**ITV1000/2000/3000 Series**

**Dimensions**

**ITV30**

**Flat bracket**

Note: Do not attempt to rotate, as the cable connector does not turn.

- Right angle type (4 cores)
  - Cable connector 3 m

- Straight type (4 cores)
  - Cable connector 3 m

**Digital pressure display**

- M12 x 1
  - Cable connection thread (Plug type)

- M5 x 0.8
  - Solenoid valve EXH

**Flat bracket assembly**

- P398020-600 (Option)

**L-bracket**

- 4 x ø7
  - Mounting hole

- 4 x M5 x 0.8 thread depth 6 mm

**L-bracket assembly**

- P398020-601 (Option)

**MTV30**

**Flat bracket**

- SUP port, OUT port

- SUP port

- EXH (3)

**Digital pressure display**

- Flat bracket assembly
  - P398020-600 (Option)

- M12 x 1
  - Cable connection thread (Plug type)

- M5 x 0.8
  - Solenoid valve EXH

**Flat bracket**

- 4 x ø7
  - Mounting hole

**L-bracket**

- 4 x ø7
  - Mounting hole

- 4 x M5 x 0.8 thread depth 6 mm

**L-bracket assembly**

- P398020-601 (Option)
Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)

**16 points preset input**

- **CC-Link/ITV30□-CC**
  - M12 x 1
  - Power cable connection thread (Plug type)
  - Digital pressure display
  - M5 x 0.8
  - Solenoid valve EXH

- **PROFIBUS DP/ITV30□-PR**
  - M12 x 1
  - Communication cable connection thread (Socket type)
  - M5 x 0.8
  - Solenoid valve EXH

- **DeviceNet™/ITV30□-DE**
  - M12 x 1
  - Power cable connection thread (Plug type)
  - Digital pressure display
  - M5 x 0.8
  - Solenoid valve EXH

- **RS-232C/ITV30□-RC**
  - M12 x 1
  - Communication cable connection thread (Plug type)
  - M5 x 0.8
  - Solenoid valve EXH

**10 bit digital input**

- HIROSE ELECTRIC CO., LTD. Made
  - RP13A-12RB-13PA (71)

**Note**

Dimensions not shown are same as on page 920.

With power cable connector

- **ITV30□-CC**
  - Common dimensions

Note) Order communication cable (other than 16 points, RS-232C) separately. (Refer to page 904.)

Note) Do not attempt to rotate, as the cable connector does not turn.
1 Reverse Type

In compliance with input, inverse proportional pressure is displayed.

- ITV10 [ ] — [ ] — X102
- ITV20 [ ] — [ ] — X102
- ITV30 [ ] — [ ] — X102

2 High Pressure Type (SUP 1.2 MPa, OUT 1.0 MPa)

- ITV10 [ ] — [ ] — X224
- ITV20 [ ] — [ ] — X224
- ITV30 [ ] — [ ] — X224

Note 1) For preset input type, digital input type and communication models, consult SMC for availability.

3 Set Pressure Range 1 to 100 kPa

- ITV10 [1] — [ ] — X25
- ITV20 [1] — [ ] — X25

Note 1) For preset input type, digital input type and communication models, consult SMC for availability.
## 4 High-Speed Response Time Type

Pressure response with no load is approx. 0.1 sec.  
Note 1) This is not a guaranteed value as it depends on the operating environment.  
Note 2) When the input signal is at 0%, the exhaust solenoid valve is controlled to reduce the outlet pressure to zero. For this reason, a noise may be generated. This noise is normal and does not indicate a fault.  
Note 3) When operating for the first time, be sure that the power supply voltage and supply pressure are appropriate in relation to the operating environment and conditions.  
Note 4) For this product, by conducting the procedure described below (steps A to D), the parameters compatible with the power supply voltage and supply pressure in use can be obtained.  
If the desired output pressure values cannot be reached due to fluctuations in the operating conditions, etc., perform this operation.

A) Change the power supply voltage in use by ±0.4 VDC or more.  
B) After inputting the supply pressure used on the inlet side of the ITV, adjust the input signal as described below.  
   (0% → 100% ~ 0%) (Change it gradually, waiting 10 s or more between each adjustment.)  
   * Please contact SMC if difficulty inputting signals occurs.  
C) Change the power supply voltage according to the operating conditions/requirements, and repeat step B.  
D) Input the power supply voltage and a 0% signal, and retain for 6 minutes or more. (Supply pressure is not required.)  
When re-obtaining the parameters, we recommend operating with the air sealed in the piping in order to reliably reach the set pressure. In addition, if item A) above cannot be carried out, it is possible to conduct an "Initialize" operation as described in the operation manual in order to reset the parameters of the product to those set at the time of shipment. When conducting an "Initialize" operation, the min. set pressure (F_1) and the max. set pressure (F_2) will be reset.

### Model

<table>
<thead>
<tr>
<th></th>
<th>1000 type</th>
<th>2000 type</th>
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<tbody>
<tr>
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</tr>
<tr>
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### Pressure range

<table>
<thead>
<tr>
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<th>0.1 MPa</th>
<th>0.5 MPa</th>
<th>0.9 MPa</th>
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</table>

### Power supply voltage

<table>
<thead>
<tr>
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<th>12 to 15 VDC</th>
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### Input signal

<table>
<thead>
<tr>
<th></th>
<th>Current type 4 to 20 mA DC (Sink type)</th>
<th>Current type 0 to 20 mA DC (Sink type)</th>
<th>Voltage type 0 to 5 VDC</th>
<th>Voltage type 0 to 10 VDC</th>
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</tr>
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<td></td>
<td></td>
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</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Monitor output

<table>
<thead>
<tr>
<th></th>
<th>Analog output 1 to 5 VDC</th>
<th>Switch output/NPN output</th>
<th>Switch output/PNP output</th>
<th>Analog output 4 to 20 mA DC (Sink type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>4</td>
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### Thread type

<table>
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<tr>
<th></th>
<th>Rc</th>
<th>NPT</th>
<th>NPTF</th>
<th>G</th>
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</table>

### Pressure display unit

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<th>kgf/cm²</th>
<th>bar</th>
<th>psi</th>
<th>kPa</th>
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<td>3</td>
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### Cable connector type

<table>
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<th>Straight type 3 m</th>
<th>Right angle type 3 m</th>
<th>Without cable connector</th>
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<tbody>
<tr>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Bracket

<table>
<thead>
<tr>
<th></th>
<th>Without bracket</th>
<th>Flat bracket</th>
<th>L-bracket</th>
</tr>
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<tbody>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Bracket is included.

* Under Japan’s new Measurement Act, this is only for overseas sales (SI units are to be used inside Japan).

---

**ITV 2010-012S-X88**

**Pressure display unit**

- Nil
- MPa
- kgf/cm²
- bar
- psi
- kPa

**Pressure range**

- 0.1 MPa
- 0.5 MPa
- 0.9 MPa

**Power supply voltage**

- 24 VDC
- 12 to 15 VDC

**Input signal**

- Current type 4 to 20 mA DC (Sink type)
- Current type 0 to 20 mA DC (Sink type)
- Voltage type 0 to 5 VDC
- Voltage type 0 to 10 VDC

**Monitor output**

- Analog output 1 to 5 VDC
- Switch output/NPN output
- Switch output/PNP output
- Analog output 4 to 20 mA DC (Sink type)

**Thread type**

- Rc
- NPT
- NPTF
- G

Please contact SMC for detailed dimensions, specifications and lead times.
5 Manifold Specifications (Except ITV3000 series)

2 through 8 station manifold.

How to Order Manifolds

<table>
<thead>
<tr>
<th>Model</th>
<th>02</th>
<th>03</th>
<th>04</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV1000, 2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUT port size</td>
<td>1/4</td>
<td>3/8</td>
<td></td>
</tr>
<tr>
<td>Connection thread type</td>
<td>Nil</td>
<td>Rc</td>
<td>NPT</td>
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</tbody>
</table>

How to Order for Manifold Mounted

<table>
<thead>
<tr>
<th>Model</th>
<th>02</th>
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</tr>
</thead>
<tbody>
<tr>
<td>ITV1000-02-3</td>
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<td></td>
</tr>
<tr>
<td>ITV2000-02-3</td>
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<td></td>
</tr>
</tbody>
</table>

Note 1) □ in part number is the same model no. for the standard products.
Note 2) For communication models, consult SMC for availability.
Note 3) The thread type is Rc only.
Note 4) For ITV1000 series, the port size is 1/8 only.
Note 5) For ITV2000 series, the port size is 1/4 only.
Note 6) The bracket accessory cannot be selected.
Note 7) Not applicable to ITV3000 series

How to Order Manifold Assemblies

Example

Electro-pneumatic regulator
ITV1030-311S-X26

Blanking plate assembly
P398020-13

Electro-pneumatic regulator
ITV2050-212S-X26

Note) Refer to the table below for possible mixed combinations.

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV101</th>
<th>ITV103</th>
<th>ITV105</th>
<th>ITV201</th>
<th>ITV203</th>
<th>ITV205</th>
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<tbody>
<tr>
<td>ITV101</td>
<td>○</td>
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<td>ITV103</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>○</td>
</tr>
</tbody>
</table>

Note 1) Electro-pneumatic regulators are counted starting from station 1 on the left side with the OUT ports in front.
Note 2) The port sizes for mounted electro-pneumatic regulators is Rc 1/8 (ITV1000), Rc 1/4 (ITV2000) only.
Note 3) When there is a large number of stations, use piping with the largest possible inside diameter for the supply side, such as steel piping.
Note 4) The use of the straight type cable connector is recommended. To mount right angle type, be certain to check that no possible interference occurs.
Note 5) When mounting a blanking plate and the regulator with different pressure sets, please inform SMC of the order of a manifold station beside a purchase order.

IITV20-02-3 ..................1 set (3 station manifold base part no.)
#IITV1030-311S-X26 ............1 set (Electro-pneumatic regulator part no.) Note 2)
#P398020-13 ..................1 set (Blanking plate assembly part no.)
#ITV2050-212S-X26 .............1 set (Electro-pneumatic regulator part no.) Note 2)

The □ is the symbol for mounting. Add the □ symbol at the beginning of part numbers for electro-pneumatic regulators, etc. to be mounted on the base.
### Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum supply pressure</td>
<td>Set pressure +0.1 MPa</td>
</tr>
<tr>
<td>Maximum supply pressure</td>
<td>1.0 MPa (Pressure range 0.1 MPa type: 0.2 MPa)</td>
</tr>
<tr>
<td>Proof pressure</td>
<td>1.5 MPa (Pressure range 0.1 MPa type: 0.3 MPa)</td>
</tr>
<tr>
<td>(Supply side)</td>
<td>1 MPa (Pressure range 0.1 MPa type: 0.2 MPa)</td>
</tr>
<tr>
<td>(Output side)</td>
<td></td>
</tr>
<tr>
<td>Set pressure range</td>
<td>1: 0.005 to 0.1 MPa, 3: 0.005 to 0.5 MPa, 5: 0.005 to 0.9 MPa</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>0: 24 VDC ±10%, 1: 12 to 15 VDC</td>
</tr>
<tr>
<td>Current consumption</td>
<td>0.12 A or less (24 VDC ±10% type)</td>
</tr>
<tr>
<td></td>
<td>0.18 A or less (12 to 15 VDC type)</td>
</tr>
<tr>
<td>Input signal</td>
<td>0: 4 to 20 mA, 1: 0 to 20 mA, 2: 0 to 5 VDC, 3: 0 to 10 VDC</td>
</tr>
<tr>
<td>Input impedance</td>
<td>Voltage type: Approx. 6.5 kΩ, Current type: 250 Ω or less</td>
</tr>
<tr>
<td>Output signal</td>
<td>Analog output: 1 to 5 VDC/4 to 20 mA DC, Switch output (PNP/PNP)</td>
</tr>
<tr>
<td>Linearity</td>
<td>±0.5% F.S. or less</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.5% F.S. or less</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.5% F.S. or less</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0.2% F.S. or less</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±0.12% F.S./°C or less</td>
</tr>
<tr>
<td>Output pressure display</td>
<td>Accuracy</td>
</tr>
<tr>
<td>Minimum unit</td>
<td>MPa: 0.001, kgf/cm²: 0.01, bar: 0.01, psi: 0.1, kPa: 1</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>0 to 50°C (No condensation)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP65</td>
</tr>
<tr>
<td>Weight</td>
<td>ITV1000/2000/3000 Series: Approx. 250 g, ITV2000/3000 Series: Approx. 350 g, ITV3000/3000 Series: Approx. 645 g (without brackets)</td>
</tr>
</tbody>
</table>

The above characteristics (specifications) are confined to the static state. When air is consumed on the output side, the pressure may fluctuate.
### Specifications

<table>
<thead>
<tr>
<th>Fluid</th>
<th>Air</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum supply pressure</td>
<td>Set pressure +0.1 MPa</td>
</tr>
<tr>
<td>Maximum supply pressure</td>
<td>1.0 MPa (Pressure range 0.1 MPa type: 0.2 MPa)</td>
</tr>
<tr>
<td>Proof pressure (Supply side)</td>
<td>1.5 MPa (Pressure range 0.1 MPa type: 0.3 MPa)</td>
</tr>
<tr>
<td>Proof pressure (Output side)</td>
<td>1 MPa (Pressure range 0.1 MPa type: 0.2 MPa)</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>1: 0.005 to 0.1 MPa, 3: 0.005 to 0.5 MPa, 5: 0.005 to 0.9 MPa</td>
</tr>
<tr>
<td>Power supply voltage</td>
<td>0: 24 VDC ±10%, 1: 12 to 15 VDC</td>
</tr>
<tr>
<td>Current consumption</td>
<td>0.12 A or less (24 VDC ±10% type)</td>
</tr>
<tr>
<td>0.18 A or less (12 to 15 VDC type)</td>
<td></td>
</tr>
<tr>
<td>Input signal</td>
<td>0: 4 to 20 mA, 1: 0 to 20 mA, 2: 0 to 5 VDC, 3: 0 to 10 VDC</td>
</tr>
<tr>
<td>Input impedance</td>
<td>Voltage type: Approx. 6.5 kΩ, Current type: 250 Ω or less</td>
</tr>
<tr>
<td>Output signal</td>
<td>Alarm output (NPN/PNP)</td>
</tr>
<tr>
<td>Linearity</td>
<td>±1.0% F.S. or less</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>0.5% F.S. or less</td>
</tr>
<tr>
<td>Repeatability</td>
<td>±0.5% F.S. or less</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0.2% F.S. or less</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>±0.12% F.S./°C or less</td>
</tr>
<tr>
<td>Output pressure display accuracy</td>
<td>±2% F.S. or ±1 digit or less</td>
</tr>
<tr>
<td>Minimum unit</td>
<td>MPa: 0.001, kgf/cm²: 0.01, bar: 0.01, psi: 0.1, kPa: 1</td>
</tr>
<tr>
<td>Ambient and fluid temperature</td>
<td>0 to 50°C (No condensation)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP65</td>
</tr>
<tr>
<td>Weight</td>
<td>ITV1000: Approx. 250 g, ITV2000: Approx. 350 g, ITV3000: Approx. 645 g (without brackets)</td>
</tr>
</tbody>
</table>

Note: Under Japan’s new Measurement Act, this is only for overseas sales (SI units are to be used inside Japan).
Compact Vacuum Regulator

**ITV009 Series**

**How to Order**

For single unit and single unit for manifold

**ITV000 9 0 - 3 N**

- **Pressure range**: 9 ~100 kPa
- **Power supply voltage**:
  - 0: 24 VDC ±10%
  - 1: 12 to 15 VDC
- **Input signal**:
  - 0: Current type 4 to 20 mA DC (Sink type)
  - 1: Current type 0 to 20 mA DC (Sink type)
  - 2: Voltage type 0 to 5 VDC
  - 3: Voltage type 0 to 10 VDC
- **Built-in One-touch fittings type**
  - For single unit:
    - **Symbol**
      - N: Metric size (Light gray)
      - U: Inch size (Orange)
    - **One-touch fitting size for supply/ exhaust parts (End plate)**
      - N: Ø6 (Light gray)
      - U: Ø1/4" (Orange)
  - For manifold:
    - **Symbol**
      - N: Metric size (Light gray)
      - U: Inch size (Orange)
    - **One-touch fitting size for supply/ exhaust parts (End plate)**
      - N: Ø6 (Light gray)
      - U: Ø1/4" (Orange)

- **Cable connector (Option)**
  - N: Without cable connector
  - S: Straight type 3 m
  - L: Right angle type 2 m

- **Bracket/Option for single unit only**
  - B: Flat bracket
  - C: L-bracket

- **Base type**
  - N: For single unit
  - M: For manifolds

**Manifold**

**IIITV00-02**

- **Stations**
  - 02: 2 stations
  - 03: 3 stations
  - 10: 10 stations
- **Option**
  - If a DIN rail longer than the specified stations is required, specify the applicable stations in two digits.
  - (Maximum 10 stations)
  - Example: IIITV00-05-07

**How to Order Manifold Assembly (Example)**

Indicate the part numbers of electro-pneumatic regulators to be mounted below the manifold part number.

**Example**

Due to the common supply/exhaust feature, note that different pressure range combinations are not available.

- **ITV0009-03** (Manifold part no.)
  - 0: 1 set (Vacuum regulator part no. (1, 2 stations))
  - 3: 1 set (Vacuum regulator part no. (3 stations))

Indicate part numbers in order starting from the first station on the D side.

Note) Combination with having different pressure ranges is not available due to common supply/exhaust features.

The asterisk (*) specifies mounting. Add an asterisk (*) at the beginning of electro-pneumatic regulator part numbers to be mounted.

**Note**

A DIN rail with the length specified by the number of stations is attached to the manifold. For dimensions of the DIN rail, refer to the external dimensions.
## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV09 Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum supply pressure</td>
<td>Set pressure –1 kPa</td>
</tr>
<tr>
<td>Maximum supply pressure</td>
<td>–101 kPa</td>
</tr>
<tr>
<td>Set pressure range</td>
<td>–1 to –100 kPa</td>
</tr>
</tbody>
</table>

### Power supply
- Voltage: 24 VDC ±10%, 12 to 15 VDC
- Current consumption: Power supply voltage 24 VDC type: 0.12 A or less, Power supply voltage 12 to 15 VDC type: 0.18 A or less

### Input signal
- Voltage type: 0 to 5 VDC, 0 to 10 VDC
- Current type: 4 to 20 mA DC, 0 to 20 mA DC (Sink type)

### Input impedance
- Voltage type: Approx. 10 kΩ
- Current type: Approx. 250 Ω

### Output signal (Note 4)
- Analog output: 1 to 5 VDC (Output impedance: Approx. 1 kΩ)
- Output accuracy: ±6% F.S. or less

### Linearity
- ±1% F.S. or less

### Hysteresis
- ±0.5% F.S. or less

### Repeatability
- ±0.5% F.S. or less

### Sensitivity
- ±0.2% F.S. or less

### Temperature characteristics
- ±0.12% F.S./°C or less

### Operating temperature range
- 0 to 50°C (No condensation)

### Enclosure
- IP65 equivalent *

### Connection type
- Built-in One-touch fittings

### Connection size
- For single unit
  - Metric size: Ø4
  - Inch size: Ø5/32”
- Manifold
  - Metric size: Ø6, Ø4
  - Inch size: Ø1/4”, Ø5/32”

### Weight (Note 1)
- 100 g or less (without option)

---

**Note 1)** Indicates the weight of a single unit.
For ITV00-n
- Total weight (g) = Stations (n) x 100 + 130 (Weight of end block A, B assembly) + Weight (g) of DIN rail

**Note 2)** When there is a downstream flow consumption, pressure may become unstable depending on piping conditions.

**Note 3)** When the power is turned on, a noise may be generated. This noise is normal and does not indicate a fault.

**Note 4)** When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than 100 kΩ, the analog output monitor accuracy of ±6% F.S. or less may not be available.
- The product with the accuracy of within ±6% is supplied upon your request.
- Output pressure remains unaffected.

* When using under the conditions equivalent to IP65, connect the fitting or tube to the breathing hole prior to use. (For details, refer to “Specific Product Precautions 1” on page 941.)

---

## Accessories (Option)

### Bracket
- Flat bracket assembly (including 2 mounting screws)
  P39800022
- L-bracket assembly (including 2 mounting screws)
  P39800023

### Cable connector
- Straight type
  M8-4DSX3MG4
- Right angle type
  P398000-501-2

Tightening torque when assembling is 0.3 N-m.
Working Principle

When the input signal rises, the vacuum pressure solenoid valve ① turns ON. Due to this, part of the vacuum pressure (VAC.) passes through the vacuum pressure solenoid valve ① and changes to a vacuum pressure. This vacuum pressure feeds back to the control circuit ④ via the pressure sensor ③. Here, the vacuum pressure solenoid valve and the atmospheric pressure solenoid valve work alternately to make continuous pressure corrections until vacuum pressure becomes proportional to the input signal, thus, supplying vacuum pressure that is consistently proportional to the input signal.

Working Principle Diagram

Block Diagram
Compact Vacuum Regulator ITV009 Series

**ITV009 Series**

**Linearity, Hyteresis**

- Output deviation factor (% F.S.) vs. Input signal (% F.S.)
- With 50% of signal input

**Repeatability**

- Output deviation factor (% F.S.) vs. Count
- With 50% of signal input

**Pressure Characteristics**

- Set pressure: –10 kPa
- Output deviation factor (% F.S.) vs. Supply pressure (kPa)

**Flow Rate Characteristics**

- Set pressure (kPa) vs. Flow rate (L/min (ANR))
- Flow rate characteristics for different set pressures

---

**Product Codes**

- ARJ
- AR425 to 935
- ARX
- AMR
- ARM
- ARP
- IR
- IRV
- VEX
- SRH
- SRP
- SRF
- ITV
- IC
- ITVH
- ITVX
- PVQ
- VY1
- VBA
- VBAT
- AP100
**Dimensions**

**For Single Unit**

![Diagram of Single Unit Dimensions]

**Port Location**

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV009 VAC OUT ATM</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note) When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use. (For details, refer to “Specific Product Precautions 1” on page 941.)
Dimensions

Single unit for manifold

Note) When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use.
(For details, refer to “Specific Product Precautions 1” on page 941.)

Note) For dimensions of the cable connector, refer to single unit on page 932.
**Dimensions**

**Manifold**

![Manifold Diagram]

**Port Location**

<table>
<thead>
<tr>
<th>No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV009</td>
<td>VAC</td>
<td>OUT</td>
<td>ATM</td>
</tr>
</tbody>
</table>

Note) Stations are counted starting from the D side.

**Port Location Diagram**

- **Dimensions in inch are noted in parentheses.**
- **VAC** port (ø6, ø1/4"
- **ATM** port (ø6, ø1/4"
- **OUT** port (ø4, ø5/32"
- **Breathing hole** (M3 x 0.5)

**Note**) For dimensions of the cable connector, refer to single unit on page 932.

**Table**

<table>
<thead>
<tr>
<th>Manifold stations n</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>60</td>
<td>75</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>135</td>
<td>150</td>
<td>165</td>
<td>180</td>
</tr>
<tr>
<td>L2</td>
<td>110.5</td>
<td>123</td>
<td>148</td>
<td>160.5</td>
<td>173</td>
<td>185.5</td>
<td>198</td>
<td>223</td>
<td>235.5</td>
</tr>
</tbody>
</table>

**Weight of DIN rail (g)**

<table>
<thead>
<tr>
<th></th>
<th>20</th>
<th>22</th>
<th>27</th>
<th>29</th>
<th>31</th>
<th>34</th>
<th>36</th>
<th>41</th>
<th>43</th>
</tr>
</thead>
</table>

**Note**) When using under the conditions equivalent to IP65, connect the fittings or tubing to the breathing hole prior to use.

(For details, refer to "Specific Product Precautions 1" on page 941.)
## Electronic Vacuum Regulator
### ITV2090/2091 Series

**Input signal/Communication model**
- **0** Current type 4 to 20 mA DC (Sink type)
- **1** Current type 0 to 20 mA DC (Sink type)
- **2** Voltage type 0 to 5 VDC
- **3** Voltage type 0 to 10 VDC
- **40** 4 points preset input
- **52** 16 points preset input (Switch output/NPN output)
- **53** 16 points preset input (Switch output/PNP output)
- **60** 10 bit digital input
- **CC** CC-Link
- **DE** DeviceNet™
- **PR** PROFIBUS DP
- **RC** RS-232C communication

**Pressure range**
- **9** –1.3 to –80 kPa

**Power supply voltage**
- **0** 24 VDC
- **1** 12 to 15 VDC

**Monitor output**
- **1** Analog output 1 to 5 VDC
- **2** Switch output/NPN output
- **3** Switch output/PNP output
- **4** Analog output 4 to 20 mA DC (Sink type)

**Pressure display unit**
- **5** kPa

**Cable connector type**
- **S** Straight type 3 m
- **L** Right angle type 3 m
- **N** Without cable connector

**Bracket**
- **Nil** Without bracket
- **B** Flat bracket
- **C** L-bracket

**Thread type**
- **Nil**
- **N** NPT
- **T** NPTF
- **F** G

### How to Order

**ITV 209 0 0 1 2 S 5**

**Application**
- **CC-Link compatibility**
  - **PCA-1567720** (Socket type)
  - **PCA-1567717** (Plug type)
- **DeviceNet™ compatibility**
  - **PCA-1557633** (Socket type)
  - **PCA-1557646** (Plug type)
- **PROFIBUS DP compatibility**
  - **PCA-1557688** (Socket type)
  - **PCA-1557691** (Plug type)

**Communication cable part number**
- **PCA-1567720** (Socket type)
- **PCA-1567717** (Plug type)
- **PCA-1557633** (Socket type)
- **PCA-1557646** (Plug type)
- **PCA-1557688** (Socket type)
- **PCA-1557691** (Plug type)

**Notes**
- For the communication models, CC, DE, PR and RC, only "Nil" is available as it does not have a pressure display.
- Even when a cable connector is selected, communication cable is not included in the communication models, CC, DE and PR. Please order it separately. Refer to the below.
- For 10 bit digital input, right angle type cannot be selected.
- For communications cables, use the parts listed below (refer to M8/M12 connector in Best Pneumatics No.1-1 for details) or order the product certified for the respective protocol (with M12 connector) separately.

### For communications cables, use the parts listed below

<table>
<thead>
<tr>
<th>Application</th>
<th>Communication cable part number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC-Link</td>
<td><strong>PCA-1567720</strong> (Socket type)</td>
<td>Dedicated Bus adapter supplied with the product.</td>
</tr>
<tr>
<td><strong>PCA-1567717</strong> (Plug type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DeviceNet™</td>
<td><strong>PCA-1557633</strong> (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
<tr>
<td><strong>PCA-1557646</strong> (Plug type)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROFIBUS DP</td>
<td><strong>PCA-1557688</strong> (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
<tr>
<td><strong>PCA-1557691</strong> (Plug type)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Piping/Wiring Diagram

Power supply and input signal (VDC, mA DC)

Vacuum pump, Ejector

Data Sheet

Standards Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV2090</th>
<th>ITV2091</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum supply vacuum pressure</td>
<td>Set pressure –13.3 kPa</td>
<td></td>
</tr>
<tr>
<td>Maximum supply vacuum pressure</td>
<td>–101 kPa</td>
<td></td>
</tr>
<tr>
<td>Set pressure range</td>
<td>–1.3 to –80 kPa</td>
<td></td>
</tr>
<tr>
<td>Power supply</td>
<td>Voltage</td>
<td>24 VDC ±10%</td>
</tr>
<tr>
<td></td>
<td>Current consumption</td>
<td>Power supply voltage 24 VDC type: 0.12 A or less</td>
</tr>
<tr>
<td>Input signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note 2</td>
<td>4 to 20 mA DC, 0 to 20 mA DC (Sink type)</td>
</tr>
<tr>
<td></td>
<td>Voltage type</td>
<td>0 to 5 VDC, 0 to 10 VDC</td>
</tr>
<tr>
<td></td>
<td>Preset input</td>
<td>4 points (Negative common), 16 points (No common polarity)</td>
</tr>
<tr>
<td></td>
<td>Digital input</td>
<td>10 bit (Parallel)</td>
</tr>
<tr>
<td>Input impedance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note 2</td>
<td>Power supply voltage 24 VDC type: Approx. 4.7 kΩ 12 to 15 VDC type: Approx. 2.0 kΩ</td>
</tr>
<tr>
<td></td>
<td>Preset input</td>
<td>Power supply voltage 24 VDC type: Approx. 4.7 kΩ 12 to 15 VDC type: Approx. 2.0 kΩ</td>
</tr>
<tr>
<td></td>
<td>Digital input</td>
<td>Approx. 4.7 kΩ</td>
</tr>
<tr>
<td>Output signal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Note 4</td>
<td>1 to 5 VDC (Output impedance: Approx. 1 kΩ) 4 to 20 mA DC (Sink type) (Output impedance: 250 Ω or less)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output accuracy ± 6% F. S. or less</td>
</tr>
<tr>
<td></td>
<td>Switch output</td>
<td>NPN open collector output: Max. 30 V, 80 mA PNP open collector output: Max. 80 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Linearity</td>
<td>± 1% F. S. or less</td>
</tr>
<tr>
<td></td>
<td>Hysteresis</td>
<td>± 0.5% F. S. or less</td>
</tr>
<tr>
<td></td>
<td>Repeatability</td>
<td>± 0.2% F. S. or less</td>
</tr>
<tr>
<td></td>
<td>Sensitivity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Temperature characteristics</td>
<td>± 0.12% F. S./°C or less</td>
</tr>
<tr>
<td></td>
<td>Output pressure display</td>
<td>± 2% F. S. ± 1 digit or less</td>
</tr>
<tr>
<td></td>
<td>Units</td>
<td>kPa ± 0.5% (full span)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minimum display: 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambient and fluid temperature</td>
<td>IP65</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>390 g</td>
<td></td>
</tr>
</tbody>
</table>

Note 1) The minimum supply vacuum pressure should be 13.3 kPa less than the maximum vacuum pressure setting value.
Note 2) 4 to 20 mA DC is not possible with the 2-wire type. Power supply voltage (24 VDC or 12 to 15 VDC) is required.
Note 3) Value for the state with no over current circuit included. If an allowable current is provided for the over current circuit, the input impedance varies depending on the input power supply. This is 350 Ω or less for an input current of 20 mA DC.
When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than 100 kΩ, the analog output monitor accuracy of within ±6% (full span) may not be available. The product with the accuracy of within ±6% is supplied upon your request. Output pressure remains unaffected.
Note 4) Either analog output or switch output must be selected. Furthermore, when switch output is selected, either NPN output or PNP output must be also selected. Use caution that the preset input type is not equipped with an output signal function.
Note 5) The product characteristics are confined to the static state.
Pressure may fluctuate when air is consumed at the output side.
Note 7) Refer to the table below for communication specifications.
Note 8) Add 50 g for digital input type, 70 g for 16 points preset input type respectively.

Communication Specifications (CC, DE, PR, RC)

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV2090</th>
<th>ITV2091</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>CC-Link</td>
<td>PROFIBUS DP</td>
</tr>
<tr>
<td>Version</td>
<td>Ver. 1.10</td>
<td>Volume1 (Edition3.8), Volume3 (Edition1.5)</td>
</tr>
<tr>
<td>Communication speed</td>
<td>156 k/625 k 2.5 M/5 M/10 M bps</td>
<td>125 k/250 k/500 k bps</td>
</tr>
<tr>
<td>I/O occupation area (input/output data)</td>
<td>—</td>
<td>EDS</td>
</tr>
<tr>
<td>Communication data resolution</td>
<td>4 word/4 word, 32 bit/32 bit (per station, remote device station)</td>
<td>16 bit/16 bit</td>
</tr>
<tr>
<td>Fail safe</td>
<td>HOLD (Switch setting)</td>
<td>HOLD/CLEAR (Switch setting)</td>
</tr>
<tr>
<td>Electric insulation</td>
<td>In insulation</td>
<td>Insulation</td>
</tr>
<tr>
<td>Terminating resistor</td>
<td>Built into the product (Switch setting)</td>
<td>Not built into the product</td>
</tr>
<tr>
<td>Current consumption</td>
<td>0.16 A or less 0.14 A or less 0.16 A or less 0.12 A or less</td>
<td>0.12 A or less</td>
</tr>
<tr>
<td>Weight</td>
<td>ITV2090 470 460 490 460</td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Note that version information is subject to change.
Note 2) Configuration files can be downloaded from the operation manual page on SMC’s website: http://www.smcworld.com
Note 3) The output HOLD value when a CC-Link communications error occurs can be set based on the bit area data.
Note 4) The insulation between the electrical signal of the communication system and ITV power supply.

936
When the input signal increases, the vacuum pressure solenoid valve ① turns ON, and the atmospheric pressure solenoid valve ② turns OFF. Because of this, VAC. and the pilot chamber ③ are connected, the pressure in the pilot chamber ③ becomes negative and acts on the top of the diaphragm ④. As a result, the vacuum pressure valve ⑤ which is linked to the diaphragm ④ opens, VAC. and OUT. are connected, and the set pressure becomes negative. This negative pressure feeds back to the control circuit ⑥ via the pressure sensor ⑦. Then, a correct operation works until a vacuum pressure proportional to the input signal is reached, and a vacuum pressure is obtained which is always proportional to the input signal.

**Block Diagram**

---

**ITV29** Series

**Linearity**

- **Pressure Characteristics**
  - Set pressure: −20 kPa

- **Flow Rate Characteristics**
  - Supply vacuum pressure: −100 kPa

**Hysteresis**

- **Output deviation factor (% F.S.)**

**Repeatability**

- **Output deviation factor (% F.S.)**

**Flow rate characteristics measurement conditions**

- Exhaust flow rate of the vacuum pump used for measurement: 500 L/min (ANR)
- Inlet vacuum pressure: −100 kPa
  (When outlet flow rate is 0 L/min (ANR))
- Maximum flow rate: 132 L/min (ANR)
  (With inlet vacuum pressure at −39 kPa)
**ITV209 Series**

### Dimensions

**ITV209 □**

**Flat bracket**

Note) Do not attempt to rotate the cable connector, as it does not turn.

**L-bracket**

- **Digital pressure display**
- **M12 x 1**
  - Cable connection thread (Plug type)
- **M5 x 0.8**
  - Air introduction port
- **Flat bracket assembly**
  - 4 x M5 x 0.8 thread depth 6 mm
- **L-bracket assembly**
  - P398020-601 (Option)
  - 2 x 1/4 (Rc, NPT, NPTF, G) ATM, port, OUT port

**Dimensions**

- Right angle type (4 cores)
  - Cable connector 3 m
- Straight type (4 cores)
  - Cable connector 3 m

**Dimensions**

- 100 x 84 x 50 mm
- 52 x 40 mm

**Specifications**

- **VAC. port**
- **ATM. port, OUT port**
- **Vacuum pressure**

**Related Parts**

- **Flat bracket assembly**
  - P398020-600 (Option)
- **L-bracket assembly**
  - P398020-601 (Option)
Electronic Vacuum Regulator \textbf{ITV209\textsuperscript{\textregistered} Series}

**Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet\textsuperscript{\textregistered}, PROFIBUS DP and RS-232C)**

**16 points preset input**

- M12 x 1 Signal cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- Digital pressure display
- M5 x 0.8 Air introduction port
- Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet\textsuperscript{\textregistered}, PROFIBUS DP and RS-232C)

**10 bit digital input**

- M12 x 1 Power cable connection thread (Plug type)
- HIROSE ELECTRIC CO., LTD. Made RP13A-12RB-13PA (71)
- Digital pressure display
- M5 x 0.8 Air introduction port

**CC-Link/ITV2090-CC**

- IN M12 x 1 Communication cable connection thread (Plug type)
- OUT M12 x 1 Communication cable connection thread (Plug type)
- Air introduction port
- Dimensions not shown are same as on page 938.

**DeviceNet\textsuperscript{\textregistered}/ITV2090-DE**

- M12 x 1 Power cable connection thread (Plug type)
- M12 x 1 Communication cable connection thread (Plug type)
- Air introduction port
- Dimensions not shown are same as on page 938.

**PROFIBUS DP/ITV2090-PR**

- M12 x 1 Communication cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- Air introduction port
- Dimensions not shown are same as on page 938.

**RS-232C/ITV2090-RC**

- M12 x 1 Communication cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- Air introduction port
- Dimensions not shown are same as on page 938.

**With power cable connector**

- **ITV2090-** common dimensions

Note) Order communication cable (other than 16 points, RS-232C) separately. (Refer to page 904.)

Note) Do not attempt to rotate the cable connector, as it does not turn.
## Accessories (Option)/Part No.

### [Bracket]

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat bracket assembly (including mounting screws)</td>
<td>P398020-600</td>
</tr>
<tr>
<td>L-bracket assembly (including mounting screws)</td>
<td>P398020-601</td>
</tr>
</tbody>
</table>

### [Cable connector]

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current type</td>
<td>Cable connector (4 cores)</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>Voltage type</td>
<td>Straight type 3 m</td>
<td></td>
</tr>
<tr>
<td>4 points preset input</td>
<td>Right angle type 3 m</td>
<td></td>
</tr>
<tr>
<td>16 points preset input</td>
<td>Power cable (4 cores)</td>
<td>P398020-501-3</td>
</tr>
<tr>
<td></td>
<td>Straight type 3 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Right angle type 3 m</td>
<td></td>
</tr>
<tr>
<td>10 bit digital input</td>
<td>Signal cable (5 cores)</td>
<td>P398020-502-3</td>
</tr>
<tr>
<td></td>
<td>Straight type 3 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Right angle type 3 m</td>
<td></td>
</tr>
<tr>
<td>CC-Link</td>
<td>Cable connector (13 cores)</td>
<td>INI-398-0-99</td>
</tr>
<tr>
<td>PROFIBUS DP</td>
<td>Power cable (4 cores)</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>DeviceNet™</td>
<td>Straight type 3 m</td>
<td></td>
</tr>
<tr>
<td>RS-232C</td>
<td>Right angle type 3 m</td>
<td></td>
</tr>
<tr>
<td>Communication cables</td>
<td>Power cable (4 cores)</td>
<td>P398020-501-3</td>
</tr>
<tr>
<td>connector (5 cores)</td>
<td>Straight type 3 m</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Right angle type 3 m</td>
<td></td>
</tr>
</tbody>
</table>

Note 1) For the 10-bit digital type, there is no right angle type cable connector.
Note 2) Even when "with cable connector" is selected the communication cable is not included in the communication model (CC, DE, PR). Please order separately.

### [Bus adapter]

<table>
<thead>
<tr>
<th>Applicable model</th>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC-Link</td>
<td>Bus adapter (Bus adapter supplied with the product.)</td>
<td>EX9-ACY00-MJ</td>
</tr>
</tbody>
</table>

### Dimensions

#### Flat bracket

![Flat bracket diagram]

#### L-bracket

![L-bracket diagram]

### Bracket tightening torque

<table>
<thead>
<tr>
<th>Model</th>
<th>Bracket tightening torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV1000</td>
<td>0.76 ± 0.05 N·m</td>
</tr>
<tr>
<td>ITV2000/3000</td>
<td>1.5 ± 0.05 N·m</td>
</tr>
</tbody>
</table>
**ITV0000/1000/2000/3000 Series**

**Specific Product Precautions 1**

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 387 to 391 for Common Precautions.

---

### ITV0000/009 Series Precautions

**Air Supply**

**Caution**

1. Install an air filter near this product on the supply side. Select a filtration degree of 5 μm or less.
2. Compressed air containing large amounts of drainage can cause malfunction of this product and other pneumatic equipment. As a countermeasure, install an aftercooler, air dryer or Drain Catch, etc.
3. If large amounts of carbon dust are generated by the compressor, it can accumulate inside this product and cause malfunction.

For details on the above compressed air quality, refer to SMC’s “Air Preparation Systems”.

**Wiring**

**Caution**

Connect the cable to the connector on the body with the wiring arranged as shown below. Proceed carefully, as incorrect wiring can cause damage. Further, use DC power with sufficient capacity and a low ripple.

- **Brown**
- **Blue**
- **White**
- **Black**

2: (White) 4: (Black) 1: (Brown) 3: (Blue)

**Wiring Diagrams**

**Current signal type**

- **Vs:** Power Supply 24 VDC ±10%
- **A:** Input signals 12 to 15 VDC 4 to 20 mA DC 0 to 20 mA DC

**Voltage signal type**

- **Vs:** Power Supply 24 VDC ±10%
- **Vin:** Input signals 12 to 15 VDC 0 to 5 VDC 0 to 10 VDC

**Monitor output wiring diagram**

**Analog output, voltage type**

- **Brown**
- **Blue**
- **White**
- **Black**

---

### Handling

**Caution**

1. Do not use a lubricator on the supply side of this product, as this can cause malfunction. When lubrication of terminal equipment is necessary, connect a lubricator on the output side of this equipment.
2. If electric power is shut off while pressure is being applied, pressure will be retained on the output side.
3. If power to this product is cut off due to a power failure, etc. when it is in a controlled state, output pressure will be retained temporarily. Handle carefully when operating with output pressure released to the atmosphere, as air will continue to flow out.
4. If supply pressure to this product is interrupted while the power is still on, the internal solenoid valve will continue to operate and a humming noise may be generated. Since the life of the product may be shortened, shut off the power supply also when supply pressure is shut off.
5. This product is adjusted for each specification at the time of shipment from the factory. Avoid careless disassembly or removal of parts, as this can lead to malfunction.
6. The optional cable connector is a 4 wire type. When the monitor output (analog output or switch output) is not being used, keep it from touching the other wires as this can cause malfunction.
7. Please note that the right angle cable does not rotate and is limited to only one entry direction.
8. Take the following steps to avoid malfunction due to noise.
   1) Remove power supply noise during operation by installing a line filter, etc. in the AC power line.
   2) For avoiding the influence of noise or static electricity, install this product and its wiring as far as possible from strong electric fields such as those of motors and power lines, etc.
   3) Be sure to implement protective measures against load surge for induction loads (solenoid valves, relays, etc.).
9. The product characteristics are confined to the static state. When air is consumed on the output side, and especially used in the system with large leakage, pressure cannot approach the set pressure and the service life is drastically shortened with a humming noise of the solenoid valve.
10. For details on the handling of this product, refer to the operation manual which is included with the product.
11. In locations where the body is exposed to water, dust, etc., there is a possibility that moisture or dust could enter the body through the breathing hole. Mount a fitting and tube (M-3AU-3 fitting and TIU01m-mm tube recommended) onto the breathing hole and run the tube to a location not exposed to moisture or dust, etc.

---

**Note:** A right angle type cable is also available. The entry direction for the right angle type connector is to downwards (SUP port side). Never turn the connector as it is not designed to turn. Using force to turn the connector will damage the connector coupling.

---

**Monitor output wire color**

- **Brown**
- **Blue**
- **White**
- **Black**

---

**Vin:** Input signals 0 to 5 VDC

**Vs:** Power Supply 24 VDC ±10%

---

**ARM**

**IR**

**ARJ**

---

**AP100**

---

**SRH**

---

**SRP**

---

**SRF**

---

**IC**

---

**VPO**

---

**VY1**

---

**VBA**

---

**VBAT**

---

**ITV**

---
### Handling

**Caution**

12. If this product will be used in a sealed environment, such as inside an inspection box, a ventilation fan should be installed to ensure adequate ventilation as this product can generate heat in some operating conditions. When the power is turned on, a noise may be generated as a means of checking the operating condition of the solenoid valve. This noise is normal and does not indicate a fault.

13. Each product needs to be powered by one power supply unit.

   The wiring of this product has the same common between the GND for power and the signals; there is a possibility that a wrong current occurs and prevents a proper operation if one power supply unit controls multiple electro-pneumatic regulators.

14. This product does not have a shut-off valve function. If air pressure is supplied without electric power being applied, output pressure may increase to the pressure equivalent of the supply pressure. Operate the system to shut off the supply pressure when not operating the product.

15. For this product, by conducting the procedure described below (steps A to D), the parameters compatible with the power supply voltage and supply pressure in use can be obtained.

   If the desired output pressure values cannot be reached due to fluctuations in the operating conditions, etc., perform this operation.

   A) Change the power supply voltage in use by ±0.4 VDC or more.

   B) After inputting the supply pressure used on the inlet side of the ITV, adjust the input signal as described below.

      (0% $\rightarrow$ 100% $\rightarrow$ 0%) (Change it gradually, waiting 10 s or more between each adjustment.)

      - Please contact SMC if difficulty inputting signals occurs.

   C) Change the power supply voltage according to the operating conditions/requirements, and repeat step B.

   D) Input the power supply voltage and a 0% signal, and retain for 6 minutes or more. (Supply pressure is not required.)

While conducting the procedure stated above, noise may be generated by the solenoid valve. However, this does not affect the obtainment of the parameters. In addition, be sure to conduct the procedure with the air sealed in the piping.

### Return of Product

**Warning**

If the product to be returned is contaminated or is possibly contaminated with substances that are harmful to humans, for safety reasons, please contact SMC beforehand and then employ a specialist cleaning company to decontaminate the product. After the decontamination prescribed above has been carried out, submit a Product Return Request Sheet or the Detoxification/Decontamination Certificate to SMC and await SMC’s approval and further instructions before attempting to return the item.

Please refer to the International Chemical Safety Cards (ICSC) for a list of harmful substances.

If you have any further questions, please don’t hesitate to contact your SMC sales representative.
1. Screw piping together with the recommended proper torque while holding the side that has 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. Do not allow twisting or bending moment to be applied other than the weight of the equipment itself. Provide separate support for external piping, as damage may otherwise occur.

3. Since excessive moment loads and the propagation of vibrations, etc. can easily result from inflexible piping made of materials such as steel, avoid these problems by using flexible tubing for intermediate connections.

**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. If chips, sealing material or other debris enter into this product, the solenoid valve may buzz, or the outlet pressure may not be output normally.

2. Winding of sealant tape

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping. Also, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

---

**Warning**

1. Do not operate in locations having an atmosphere of corrosive gases, chemicals, sea water, or where there will be contact with the same.

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

**Caution**

1. In locations where the body is exposed to water, steam, dust, etc., there is a possibility that moisture or dust could enter the body through the EXH (solenoid) ports, thereby causing problems.

2. To overcome this, simply install tubing to each port, using the fittings, and extend the tubing so that the other end is at a location where no water splash, etc. occurs. Make sure not to bend, or block the I.D. of the tubing as this will have a detrimental affect on the pressure control.

3. Do not operate in locations where vibration or impact occurs.

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

5. In locations near heat sources, block off any radiated heat.

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

**Air Supply**

**Warning**

1. Type of fluids

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

2. Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause malfunction.

**Caution**

1. Install an air filter near this product on the supply side. Select a filtration degree of 5 µm or less.

2. Compressed air containing large amounts of drainage can cause malfunction of this product and other pneumatic equipment. As a countermeasure, install an aftercooler, air dryer or Drain Catch, etc.

3. If large amounts of carbon dust are generated by the compressor, it can accumulate inside this product and cause malfunction. For details on the above compressed air quality, refer to SMC’s “Air Preparation Systems”.

---

**Recommended proper torque:** N.m

<table>
<thead>
<tr>
<th>Connection thread</th>
<th>1/8</th>
<th>1/4</th>
<th>3/8</th>
<th>1/2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Torque</td>
<td>3 to 5</td>
<td>8 to 12</td>
<td>15 to 20</td>
<td>20 to 25</td>
</tr>
</tbody>
</table>
ITV0000/1000/2000/3000 Series
Specific Product Precautions 3

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 387 to 391 for Common Precautions.

ITV1000/2000/3000/209 Series Precautions

Danger

1. Do not use a lubricator on the supply side of this product, as this can cause malfunction. When lubrication of terminal equipment is necessary, connect a lubricator on the output side of this equipment.

2. If electric power is shut off while pressure is being applied, pressure will be retained on the output side. However, this output pressure is held only temporarily and is not guaranteed. If exhausting of this pressure is desired, shut off the power after reducing the set pressure, and discharge the air using a residual pressure exhaust valve, etc.

3. If power to this product is cut off due to a power failure, etc. when it is in a controlled state, output pressure will be retained temporarily. Handle carefully when operating with output pressure released to the atmosphere, as air will continue to flow out.

4. If supply pressure to this product is interrupted while the power is still on, the internal solenoid valve will continue to operate and a humming noise may be generated. Since the life of the product may be shortened, shut off the power supply also when supply pressure is shut off.

5. The setting side pressure cannot be completely released from this product in the range below 0.005 MPa (or –1.3 kPa for Vacuum models). In cases where the pressure needs to be reduced completely to 0 MPa, install a 3 port valve, etc. on the setting side to discharge the residual pressure.

6. This product is adjusted for each specification at the time of shipment from the factory. Avoid careless disassembly or removal of parts, as this can lead to malfunction.

7. The optional cable connector is a 4-wire type. When the monitor output (analog output or switch output) is not being used, keep it from touching the other wires as this can cause malfunction.

8. When connecting the cable to this product, turn the lock ring of the cable. If a portion other than the lock ring of the cable is turned, it may damage the connector on the body. Turn the lock ring by hand without using a tool.

9. The right angle cable does not rotate and is limited to only one entry direction. If the right angle cable is rotated forcibly, the cable may be broken or damaged, or may damage the connector on the body.

10. Take the following steps to avoid malfunction due to noise.

   1) Remove power supply noise during operation by installing a line filter, etc. in the AC power line.
   2) For avoiding the influence of noise or static electricity, install this product and its wiring as far as possible from strong electric fields such as those of motors and power lines, etc.
   3) Be sure to implement protective measures against load surge for induction loads (solenoid valves, relays, etc.).

11. Due to the large volume of the output side, a loud exhaust noise will be produced when being used for the purpose of a relief function. Therefore, install a silencer (SMC AN20 or AN40 series) on the exhaust port (EXH port). The port sizes are Rc 1/8, Rc 1/4 and Rc 1/2.

12. Specifications on pages 905 and 936 is in case of static environment. Pressure may fluctuate when air is consumed at the output side.

13. For details on the handling of this product, refer to the operation manual which is included with the product.

14. This product does not have a shut-off valve function. If air pressure is supplied without electric power being applied, output pressure may increase to the pressure equivalent of the supply pressure. Operate the system to shut off the supply pressure when not operating the product.

15. The solenoid valves built into this product are consumables. Perform periodic maintenance in environments where the solenoid valves are operated at a high frequency. The parts can be replaced with a solenoid valve assembly. Please contact SMC for the part number.
Design and Selection

Caution

1. Use the following UL approved products for DC power supply combinations.
   (1) Limited voltage current circuit in accordance with UL 508.
       A circuit in which power is supplied by the secondary coil of a transformer that meets the following conditions.
       • Maximum voltage (with no load): 30 Vrms (42.4 V peak) or less
       • Maximum current: (1) 8 A or less (including when short circuited) (2) limited by circuit protector (such as fuse) with the following ratings.

<table>
<thead>
<tr>
<th>No load voltage (V peak)</th>
<th>Max. current rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 20 [V]</td>
<td>5.0</td>
</tr>
<tr>
<td>Over 20 and 30 or less [V]</td>
<td>100 Peak voltage</td>
</tr>
</tbody>
</table>

(2) A circuit (class 2 circuit) with maximum 30 Vrms (42.4 V peak) or less, and a power supply consisting of a class 2 power supply unit confirming to UL1310, or a class 2 transformer confirming to UL1585.

2. Operate these products only within the specified voltage.
   Using voltages beyond the specified levels could cause faults or malfunctions.

3. Use 0 V as the baseline for the power supplied to the unit for output, control and input.

4. Each product needs to be powered by one power supply unit.
   The wiring of this product has the same common between the GND for power and the signals; there is a possibility that a wrong current occurs and prevents a proper operation if one power supply unit controls multiple electro-pneumatic regulators.

5. Consult SMC for the usage when the downstream side is released to atmosphere.
   This product is a pressure controller. The downstream side being released to atmosphere makes the inlet valve full open, allowing a large amount of atmosphere flow into the body. Consult SMC for the appropriate usage when you use the product under such condition since the product may not meet the specification or the life of the product may be shortened.
**Caution**

Connect the cable to the connector on the body with the wiring arranged as shown below. Proceed carefully, as incorrect wiring can cause damage. Further, use DC power with sufficient capacity and a low ripple.

Note 1) The indicated wire colors are when a cable connector made by SMC is used. Note 2) The cable is also available in a right angle type. (Communication cable: straight type only)

![Wiring diagram](image)

**Wiring diagram**

### Current signal type / Voltage signal type

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>CC-Link DeviceNet™ PROFIBUS DP</th>
<th>Signal connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>Power supply</td>
</tr>
<tr>
<td>2</td>
<td>White</td>
<td>Input signal</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
<td>GND (COMMON)</td>
</tr>
<tr>
<td>4</td>
<td>Black</td>
<td>Monitor output</td>
</tr>
</tbody>
</table>

### Preset input type

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>CC-Link DeviceNet™ PROFIBUS DP</th>
<th>Signal connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>Power supply</td>
</tr>
<tr>
<td>2</td>
<td>White</td>
<td>Input signal 1</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
<td>GND (COMMON)</td>
</tr>
<tr>
<td>4</td>
<td>Black</td>
<td>Input signal 2</td>
</tr>
</tbody>
</table>

### Power supply connector

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>CC-Link DeviceNet™ PROFIBUS DP</th>
<th>Signal connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brown</td>
<td>Power supply</td>
</tr>
<tr>
<td>2</td>
<td>White</td>
<td>FG</td>
</tr>
<tr>
<td>3</td>
<td>Blue</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>Black</td>
<td>No connection</td>
</tr>
</tbody>
</table>

Note 1) The indicated wire colors are when a cable connector made by SMC is used. Note 2) The cable is also available in a right angle type. (Communication cable: straight type only)

A right angle type connector is attached facing left (towards the SUP port). On communication models, the connector faces backwards (towards the EXH port). Do not attempt to rotate, as the connector does not turn.

Note 3) Perform the wiring so that no electric potential difference occurs between GND of the power supply and GND of the communication section. If any electric potential difference occurs, this may cause the internal parts to burn out.

- **Trademark Information**
  - DeviceNet™ is a trademark of ODVA.

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**ITV0000/1000/2000/3000 Series Specific Product Precautions 4**

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 387 to 391 for Common Precautions.
### ITV1000/2000/3000/209 Series Precautions

#### Wiring

**Monitor output wiring diagram**

- Analog output: Voltage type
  - Brown: Power
  - Blue: Signal
  - White: Communication
  - Black: Load

- Analog output: Current type (Sink type)
  - Brown: Power
  - Blue: Signal
  - White: Communication
  - Black: Load

- Switch output: NPN type
  - Brown: Load
  - Blue: Signal
  - White: Communication
  - Black: Power

- Switch output: PNP type
  - Brown: Load
  - Blue: Signal
  - White: Communication
  - Black: Power

*When 80 mA DC or more is applied, detecting device for overcurrent starts activating and then emits an error signal. (Error number “S”)*

#### Set Pressure Range

The set pressure range, by unit of standard measured pressure, is shown in the table below.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Set pressure range</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPa</td>
<td>0.005 to 0.1</td>
</tr>
<tr>
<td></td>
<td>0.005 to 0.5</td>
</tr>
<tr>
<td></td>
<td>0.005 to 0.9</td>
</tr>
<tr>
<td>kgf/cm²</td>
<td>0.05 to 1</td>
</tr>
<tr>
<td></td>
<td>0.05 to 5</td>
</tr>
<tr>
<td></td>
<td>0.05 to 9</td>
</tr>
<tr>
<td>bar</td>
<td>0.7 to 15</td>
</tr>
<tr>
<td></td>
<td>0.7 to 70</td>
</tr>
<tr>
<td></td>
<td>0.7 to 130</td>
</tr>
<tr>
<td>psi</td>
<td>7 to 15</td>
</tr>
<tr>
<td></td>
<td>7 to 70</td>
</tr>
<tr>
<td></td>
<td>7 to 130</td>
</tr>
<tr>
<td>kPa</td>
<td>5 to 100</td>
</tr>
<tr>
<td></td>
<td>5 to 500</td>
</tr>
<tr>
<td></td>
<td>5 to 900</td>
</tr>
<tr>
<td></td>
<td>–1.3 to –80</td>
</tr>
</tbody>
</table>

#### CE Marking

- **ITV0000 Series**
  - Model: ITV0000-□-Q
  - Ferrite core necessity: Unnecessary
  - Recommended power supply cable:
    - M8-4DSX3MG4 (Straight type)
    - P398000-501-2 (Right angle type)

  Note: Recommended power supply cable length is 3 m. (P398000-501-2 is 2 m.) If any other length is desired, please consult with SMC.

- **ITV1000/2000/3000 Series**
  - Model: ITV□□□
  - Ferrite core necessity:
    - Power: P398020-500-3 (Straight type)
    - P398020-501-3 (Right angle type)
    - Signal: P398020-502-3 (Straight type)
    - P398020-503-3 (Right angle type)

  Note: Recommended power supply cable length is 3 m. If any other length is desired, please consult with SMC.

#### Return of Product

**Warning**

If the product to be returned is contaminated or is possibly contaminated with substances that are harmful to humans, for safety reasons, please contact SMC beforehand and then employ a specialist cleaning company to decontaminate the product. After the decontamination prescribed above has been carried out, submit a Product Return Request Sheet or the Detoxification/Decontamination Certificate to SMC and await SMC’s approval and further instructions before attempting to return the item.

Please refer to the International Chemical Safety Cards (ICSC) for a list of harmful substances.

If you have any further questions, please don’t hesitate to contact your SMC sales representative.
ITV09/209 Series Precautions

Handling

⚠️ Caution

1. Connect the vacuum pump to the port, which is labeled “VAC”.
2. Pressure adjustment changes from “atmospheric pressure to vacuum pressure” when the input signal is increased, and from “vacuum pressure to atmospheric pressure” when the input signal is decreased.
3. When adjusting the vacuum pressure, be careful not to block the atmospheric pressure inlet port labeled “ATM”.
4. Since this product is designed exclusively for use with negative pressure, be careful not to apply positive pressure in error.
5. In cases where the vacuum pump being used has a relatively small capacity, or the piping has a small inside diameter, etc., large variations in the set pressure (the range of pressure variation when changing from no flow to flow state) may appear. In this situation, the vacuum pump or the piping, etc. should be changed. In cases where it is not practical to change the vacuum pump, install a capacity tank (volume depending on the operating conditions) on the VAC side.
6. The vacuum pressure response time after a change in the input signal is influenced by the internal volume on the setting side (including piping). Since the capacity of the vacuum pump also influences the response time, give careful consideration to these points before operation.
7. If the electric power is shut off when in a control state, the pressure on the setting side will go into a holding condition. However, this setting side pressure will be held only temporarily and is not guaranteed. In addition, when atmospheric pressure is desired, shut off the power after reducing the set pressure, and then introduce atmospheric pressure by using a vacuum release valve, etc.
8. If the power for this product is cut off by a power failure, etc. when it is in a controlled state, the setting side pressure will be held temporarily. Further, if operated without sealing the setting side so that atmospheric air is sucked in, handle with care as air will continue to be sucked in.
9. If the VAC side pressure to this product is interrupted while the power is still on, the internal solenoid valve will continue to operate and may cause a humming noise. Since this may shorten the life of the product, be sure to shut off the power when the VAC side pressure is shut off.
10. The setting side pressure cannot be completely released from this product in the range below –1.3 kPa. In cases where the pressure needs to be reduced completely to 0 kPa, install a 3 port valve, etc. on the setting side to discharge the residual pressure.
11. This product is adjusted for each specification at the factory before shipment. Avoid careless disassembly or removal of parts, as this can cause failure.

Warning

If the product to be returned is contaminated or is possibly contaminated with substances that are harmful to humans, for safety reasons, please contact SMC beforehand and then employ a specialist cleaning company to decontaminate the product. After the decontamination prescribed above has been carried out, submit a Product Return Request Sheet or the Detoxification/Decontamination Certificate to SMC and await SMC’s approval and further instructions before attempting to return the item. Please refer to the International Chemical Safety Cards (ICSC) for a list of harmful substances.

If you have any further questions, please don’t hesitate to contact your SMC sales representative.

Return of Product

12. The optional cable connector is a 4-wire type. When the monitor output (analog output, switch output) is not being used, keep it from touching the other wires, as this can cause malfunction.
13. Use caution that the right angle cable does not rotate and is limited to only one entry direction.
14. Take the following steps to avoid malfunction due to noise.
   1) Eliminate power supply noise during operation by installing a line filter, etc. in the AC power line.
   2) For avoiding the influence of noise or static electricity, install this product and its wiring as far as possible from strong electric fields such as those of motors and power lines, etc.
   3) Make sure to take protective measures against load surge for an induction load (solenoid valves, relays, etc.).
15. Refer to the operation manual included with the product for details on its handling.

Refer to back page 50 for Safety Instructions and pages 387 to 391 for Common Precautions.

Special Product Precautions 6