Electro-Pneumatic Regulator
Electronic Vacuum Regulator

- Stepless control of air pressure proportional to an electrical signal
- Added Fieldbus compliant specifications to Series ITV1000/2000/3000!
- Reduced wiring
- Applicable Fieldbus protocols
  - CC-Link
  - DeviceNet
  - PROFINET

- Added RS-232C specification to serial communications!
- Compact/lightweight (Integrated communication parts)
  - Weight: 350 g \(^{\text{Note 1}}\) (ITV1000)
  - Power consumption: 4 W \(^{\text{Note 1}}\) or less

\(^{\text{Note 1}}\) Value for communications type. (PROFIBUS DP)

**Electro-Pneumatic Regulators**

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum flow rate</th>
<th>Set pressure</th>
<th>Supply pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV0000</td>
<td>6 L/min (ANR)</td>
<td>0.6 MPa</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>ITV1000</td>
<td>200 L/min (ANR)</td>
<td>0.6 MPa</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>ITV2000</td>
<td>1500 L/min (ANR)</td>
<td>0.6 MPa</td>
<td>1.0 MPa</td>
</tr>
<tr>
<td>ITV3000</td>
<td>4000 L/min (ANR)</td>
<td>0.6 MPa</td>
<td>1.0 MPa</td>
</tr>
</tbody>
</table>

**Electronic Vacuum Regulators**

<table>
<thead>
<tr>
<th>Series</th>
<th>Maximum flow rate</th>
<th>Set pressure</th>
<th>Supply pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV209</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**New**
- Built-in communication board, so no converter needed.
- Added Fieldbus compliant specifications to Series ITV1000/2000/3000!
- Stepless control of air pressure proportional to an electrical signal

**Note 2)** ITV1000. Dimensions in parentheses () are for the CC-Link or PROFIBUS DP.

**Added RS-232C specification to serial communications!**

**New**
- Added RS-232C specification to serial communications!
- Added Fieldbus compliant specifications to Series ITV1000/2000/3000!
- Stepless control of air pressure proportional to an electrical signal

**New**
- Built-in communication board, so no converter needed.
- Added Fieldbus compliant specifications to Series ITV1000/2000/3000!
- Stepless control of air pressure proportional to an electrical signal
Compact Electro-Pneumatic Regulator Series: ITV0000
Compact Vacuum Regulator Series: ITV009

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.

- **Features**
  - Compact 15 mm
  - Lightweight 100 g
  - With a simplified high-density circuit board design, an extremely compact size has been achieved.

---

Electro-Pneumatic Regulator Series: ITV1000/2000/3000
Electronic Vacuum Regulator Series: ITV209

- **Added Fieldbus compliant specifications**
  - Series ITV1000/2000/3000!
  - **Reduced wiring**
    - Applicable Fieldbus protocols
  - **New**
    - Added RS-232C specification to serial communications!

- **Sensitivity**: Within 0.2% (F.S.)
- **Linearity**: Within ±1% (F.S.)
- **Hysteresis**: Within 0.5% (F.S.)
- **IP65**
- **Cable connections in 2 directions**
- **Grease-free specification** (Series ITV1000)

---

**Model** | **Pressure range** | **Power supply/voltage** | **Input signal** | **Output signal** | **Option**
--- | --- | --- | --- | --- | ---
ITV001 | 0.1 MPa | 24 VDC | 4 to 20 mA DC | Analog output | Cable connectors
ITV003 | 0.5 MPa | 24 VDC | 4 to 20 mA DC | 0 to 10 VDC | Right angle type
ITV005 | 0.9 MPa | 12 VDC | 0 to 5 V DC | 0 to 10 VDC | Brackets
ITV009 | –100 kPa | | | | Flat bracket

- **Equivalent to IP65**
- **Linearity**: Within ±1% (F.S.)
- **Hysteresis**: Within 0.5% (F.S.)
- **Repeatability**: Within ±0.5% (F.S.)
- **High-speed response time**: 0.1 sec (Without load)
- **High stability**
  - Sensitivity within 0.2% (F.S.)

---

**Application examples**

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

---

Features 1
## Electro-Pneumatic Regulator

### Electronic Vacuum Regulator

#### Series ITV

- **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>Series ITV0000</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV001</td>
<td></td>
<td>0.001 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC 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>1</td>
</tr>
<tr>
<td>ITV003</td>
<td></td>
<td>0.001 to 0.5 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV005</td>
<td></td>
<td>0.001 to 0.9 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Series ITV1000</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>ITV101</td>
<td></td>
<td>0.005 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td>1/8, 1/4</td>
<td></td>
</tr>
<tr>
<td>ITV103</td>
<td></td>
<td>0.005 to 0.5 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV105</td>
<td></td>
<td>0.005 to 0.9 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Series ITV2000</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>ITV201</td>
<td></td>
<td>0.005 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td>1/4, 3/8</td>
<td></td>
</tr>
<tr>
<td>ITV203</td>
<td></td>
<td>0.005 to 0.5 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV205</td>
<td></td>
<td>0.005 to 0.9 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Series ITV3000</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>ITV301</td>
<td></td>
<td>0.005 to 0.1 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td>1/4, 3/8, 1/2</td>
<td></td>
</tr>
<tr>
<td>ITV303</td>
<td></td>
<td>0.005 to 0.5 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV305</td>
<td></td>
<td>0.005 to 0.9 MPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Series ITV009</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>27</td>
</tr>
<tr>
<td>ITV009</td>
<td></td>
<td>–1 to –100 kPa</td>
<td>Current type: 4 to 20 mA DC Current type: 0 to 20 mA DC 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></td>
</tr>
<tr>
<td><strong>Series ITV209</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34</td>
</tr>
<tr>
<td>ITV209</td>
<td></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</td>
<td>1/4</td>
<td></td>
</tr>
</tbody>
</table>

- **New CC-Link compatible**
- **New DeviceNet™ compatible**
- **New PROFIBUS DP compatible**
- **New RS-232C communication**

[Features 2]
# Compact Electro-Pneumatic Regulator Series ITV0000

## How to Order

### For single unit and single unit for manifold

#### Pressure range

<table>
<thead>
<tr>
<th>Number</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.1 MPa</td>
</tr>
<tr>
<td>3</td>
<td>0.5 MPa</td>
</tr>
<tr>
<td>5</td>
<td>0.9 MPa</td>
</tr>
</tbody>
</table>

#### Power supply voltage

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>24 VDC ±10%</td>
</tr>
<tr>
<td>1</td>
<td>12 to 15 VDC</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>SUP</th>
<th>OUT</th>
<th>EXH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U</td>
<td>ø4</td>
<td>ø5/32&quot;</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbol</th>
<th>SUP</th>
<th>OUT</th>
<th>EXH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>ø6</td>
<td>ø4</td>
<td>ø6</td>
</tr>
<tr>
<td>U</td>
<td>ø1/4&quot;</td>
<td>ø5/32&quot;</td>
<td>ø1/4&quot;</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

### Input signal

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Current type 4 to 20 mA DC</td>
</tr>
<tr>
<td>1</td>
<td>Current type 0 to 20 mA DC</td>
</tr>
<tr>
<td>2</td>
<td>Voltage type 0 to 5 VDC</td>
</tr>
<tr>
<td>3</td>
<td>Voltage type 0 to 10 VDC</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>ø6 (Light gray)</td>
</tr>
<tr>
<td>U</td>
<td>ø1/4&quot; (Orange)</td>
</tr>
</tbody>
</table>

### How to Order Manifold Assembly (Example)

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

Example:

- IITV00-03········ 1 set (Manifold part no.)
- *ITV0030-3MS······2 sets (Electro-pneumatic regulator part no. (1, 2 stations))
- *ITV0030-3ML······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.

---

**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></th>
<th>ITV001</th>
<th>ITV003</th>
<th>ITV005</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Minimum supply pressure</strong></td>
<td>Set pressure +0.1 MPa</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum supply pressure</strong></td>
<td>0.2 MPa</td>
<td>1.0 MPa</td>
<td></td>
</tr>
<tr>
<td><strong>Set pressure range</strong></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><strong>Maximum flow rate</strong></td>
<td>3.5 l/min (ANR) (Supply pressure: 0.2 MPa)</td>
<td>6 l/min (ANR) (Supply pressure: 0.8 MPa)</td>
<td>6 l/min (ANR) (Supply pressure: 0.8 MPa)</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>Voltage: 24 VDC ±10%, 12 to 15 VDC</td>
<td>Current consumption: Power supply voltage 24 VDC type: 0.12 A or less</td>
<td>Power supply voltage 12 to 15 VDC type: 0.18 A or less</td>
</tr>
<tr>
<td><strong>Input signal</strong></td>
<td>Voltage type: 0 to 5 VDC, 0 to 10 VDC</td>
<td>Current type: 4 to 20 mA DC, 0 to 20 mA DC</td>
<td></td>
</tr>
<tr>
<td><strong>Input impedance</strong></td>
<td>Voltage type: Approximately 10 kΩ</td>
<td>Current type: Approximately 250 Ω</td>
<td></td>
</tr>
<tr>
<td><strong>Output signal</strong></td>
<td>Analog output: 1 to 5 VDC (Load impedance: 1 kΩ or more)</td>
<td>Output accuracy: Within ±1% (Full span)</td>
<td></td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
<td>Within ±1% (Full span)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hysteresis</strong></td>
<td>Within 0.5% (Full span)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>Within ±0.5% (Full span)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td>Within 0.2% (Full span)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature characteristics</strong></td>
<td>Within ±1.2% (Full span) / °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature range</strong></td>
<td>0 to 50 °C (No condensation)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>Equivalent to IP65</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection type</strong></td>
<td>Built-in One-touch fittings</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection size</strong></td>
<td>For single unit Metric size: ø1/4&quot; Z, ø5/32&quot; X, ø6, ø4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inch size: 1/2&quot;, 3/16&quot;, ø5/32&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manifold Metric size: ø1/4&quot;, ø6, ø4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inch size: 1/2&quot;, 3/16&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight (Note 1)</strong></td>
<td>100 g or less (without option)</td>
<td></td>
<td></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 power is turned on, a noise may be generated. This noise is normal and does not indicate a fault.

* 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 back page 2)

### 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
  - ELWIKA-KV4408 PVC025 2M

Tightening torque when assembling is 0.3 N·m.
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.
Series ITV0000

Series ITV005

**Linearity, Hysteresis**

![Graph showing linearity and hysteresis with input signal (% F.S.) vs. output deviation factor (% F.S.)](image)

**Repeatability**

![Graph showing repeatability with output deviation factor (% F.S.) vs. count](image)

**Pressure Characteristics**

Set pressure: 0.45 MPa

![Graph showing pressure characteristics with supply pressure (MPa) vs. output deviation factor (% F.S.)](image)

**Flow Characteristics**

Supply pressure: 1.0 MPa

![Graph showing flow characteristics with set pressure (kPa) vs. flow rate (l/min ANR)](image)


Compact Electro-Pneumatic Regulator *Series ITV0000*

**Dimensions**

**For Single Unit**

![Diagram of dimensions and port location with notes on breathing hole connections and port locations]

---

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: 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 back page 2)

---

Note) Breathing hole (M3 x 0.5)

OUT port

(ø4, ø5/32")

---

Minimum bending radius 80

---

Cable connector (4-wire)

Straight type (Option)

Cable connector (4-wire)

Right angle type (Option)
Dimensions

Single unit for manifold

Note) For dimensions of the cable connector, refer to single unit on page 6.
Compact Electro-Pneumatic Regulator  **Series ITV0000**

## 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>ITV00 1/5</td>
<td>SUP</td>
<td>OUT</td>
<td>EXH</td>
</tr>
</tbody>
</table>

Note) Stations are counted starting from the D side.

**Dimensions in inch are noted in parentheses.**

**SUP** port

ø6, ø1/4"

**EXH** port

ø6, ø1/4"

**OUT** port

ø4, ø5/32"

3.7

3 (6)

Note) For dimensions of the cable connector, refer to single unit on page 6.

**Weight of DIN rail (g)**

<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>
<tr>
<td>Weight of DIN rail (g)</td>
<td>20</td>
<td>22</td>
<td>27</td>
<td>29</td>
<td>31</td>
<td>34</td>
<td>36</td>
<td>41</td>
<td>43</td>
</tr>
</tbody>
</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 back page 2).
**Electro-Pneumatic Regulator**

**Series ITV1000/2000/3000**

### How to Order

<table>
<thead>
<tr>
<th>Model</th>
<th>3</th>
<th>0</th>
<th>1</th>
<th>0</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1000 type</td>
<td>2</td>
<td>2000 type</td>
<td>3</td>
<td>3000 type</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Pressure range

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>0.1 MPa</th>
<th>3</th>
<th>0.5 MPa</th>
<th>5</th>
<th>0.9 MPa</th>
</tr>
</thead>
</table>

### Power supply voltage

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>24 VDC</th>
<th>1</th>
<th>12 to 15 VDC</th>
</tr>
</thead>
</table>

### Input signal/Communication model

<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>Current type 4 to 20 mA DC (Sink type)</th>
<th>1</th>
<th>Current type 0 to 20 mA DC (Sink type)</th>
<th>2</th>
<th>Voltage type 0 to 5 VDC</th>
<th>3</th>
<th>Voltage type 0 to 10 VDC</th>
<th>40</th>
<th>Preset input</th>
<th>CC</th>
<th>CC-Link</th>
<th>DN</th>
<th>DeviceNet™</th>
<th>PR</th>
<th>PROFIBUS DP</th>
<th>RC</th>
<th>RS-232C communication</th>
</tr>
</thead>
</table>

### Monitor output

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>Analog output 1 to 5 VDC</th>
<th>2</th>
<th>Switch output/NPN output</th>
<th>3</th>
<th>Switch output/PNP output</th>
<th>4</th>
<th>Analog output 4 to 20 mA DC (Sink type)</th>
</tr>
</thead>
</table>

### Thread type

<table>
<thead>
<tr>
<th></th>
<th>Nil</th>
<th>Rc</th>
<th>N</th>
<th>NPT</th>
<th>T</th>
<th>NPTF</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
</table>

### Pressure display unit

<table>
<thead>
<tr>
<th></th>
<th>Nil</th>
<th>MPa</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>kPa</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>bar</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>psi</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>kPa</td>
<td></td>
</tr>
</tbody>
</table>

### Cable connector type

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

### Bracket

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

### Port size

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

For communication cables, use the parts listed below (refer to the catalog [M8/M12 Connector] CAT.ES100-73 for details) or order the product certified for the respective protocol (with M12 connector) separately.

<table>
<thead>
<tr>
<th>Application</th>
<th>Communication cable part number</th>
<th>Remarks</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>DeviceNet™ compatibility</td>
<td>PCA-1557633 (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
<tr>
<td>PROFIBUS DP compatibility</td>
<td>PCA-1557688 (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
</tbody>
</table>

Note) Communication models (CC, DN, PR, RC) are available only for 24 VDC.

Note) Communication models CC, DN, PR and RC, only "Nil" is available as it does not have a pressure display.

Note) CE compliant

**CE compliant**

<table>
<thead>
<tr>
<th>Nil</th>
<th>Q</th>
<th>CE compliant</th>
</tr>
</thead>
</table>

Note) Refer to pages 11, 25, and 26 for information on CE compliant made to order products.

For detailed information on models for CE, refer to SMC’s website.

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, DN, PR and RC, only “Nil” is available as it does not have a pressure display.

Note) Order communication cable (other than RS-232C) separately. See below.

Note) Made to Order Specifications Refer to pages 11, 25, and 26 for details.

For communication cables, use the parts listed below (refer to the catalog [M8/M12 Connector] CAT.ES100-73 for details) or order the product certified for the respective protocol (with M12 connector) separately.
### Standard Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV101</th>
<th>ITV103</th>
<th>ITV105</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>0.005 to 0.1 MPa</td>
<td>0.005 to 0.5 MPa</td>
<td>0.005 to 0.9 MPa</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

**Input signal**
- Current type: 4 to 20 mA DC, 0 to 20 mA DC (Sink type)
- Voltage type: 0 to 5 VDC, 0 to 10 VDC
- Preset input: 4 points (Negative common)

**Input impedance**
- Current type: 250 Ω or less
- Voltage type: Approx. 6.5 kΩ
- Preset input: Power supply voltage 24 VDC type: Approx. 4.7 kΩ

**Output signal**
- Analog output: 1 to 5 VDC (Load impedance: 1 kΩ or more)
- 4 to 20 mA DC (Sink type) (Load impedance: 250 Ω or less)
- Output accuracy within ±6% (Full span)

**Switch output**
- NPN open collector output: Max. 30 V, 80 mA
- PNP open collector output: Max. 80 mA

**Linearity**
- Within ±1% (Full span)

**Hysteresis**
- Within 0.5% (Full span)

**Repeatability**
- Within ±0.5% (Full span)

**Sensitivity**
- Within 0.2% (Full span)

**Temperature characteristics**
- Within ±0.12% (Full span)°C

**Output pressure display**
- Accuracy: ±2% F.S. ± 1 digit
- Minimum unit: MPa: 0.001, kgf/cm²: 0.01, bar: 0.01, psi: 0.1

**Ambient and fluid temperature**
- 0 to 50°C (No condensation)

**Enclosure**
- IP65

**Weight**
- Approx. 250 g (without options)
- Approx. 350 g (without options)
- Approx. 645 g (without options)

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

<table>
<thead>
<tr>
<th>Protocol</th>
<th>ITV_0_0_0-CC</th>
<th>ITV_0_0_0-DN</th>
<th>ITV_0_0_0-PR</th>
<th>ITV_0_0_0-RC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>Ver.1.10</td>
<td>Release 2.0</td>
<td>DP-V0</td>
<td>—</td>
</tr>
<tr>
<td>Communication speed</td>
<td>156 k/625 k</td>
<td>125 k/250 k/500 k bps</td>
<td>9.6 k/19.2 k/45.45 k/93.75 k/187.5 k/500 k/1.5 M/3 M/6 M/12 M bps</td>
<td>9.6 kbps</td>
</tr>
<tr>
<td>Configuration file</td>
<td>—</td>
<td>EDS</td>
<td>GSD</td>
<td>—</td>
</tr>
<tr>
<td>I/O occupation area (input/output data)</td>
<td>4 word/4 word, 32 bit/32 bit (per station, remote device station)</td>
<td>16 bit/16 bit</td>
<td>16 bit/16 bit</td>
<td>—</td>
</tr>
<tr>
<td>Communication data resolution</td>
<td>12 bit (4096 resolution)</td>
<td>12 bit (4096 resolution)</td>
<td>12 bit (4096 resolution)</td>
<td>10 bit (1024 resolution)</td>
</tr>
<tr>
<td>Fail safe HOLD/CLEAR</td>
<td>HOLD/CLEAR (Switch setting)</td>
<td>CLEAR</td>
<td>HOLD</td>
<td></td>
</tr>
<tr>
<td>Electric insulation</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Terminating resistor</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</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 display pressure, refer to back page 6.

**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 output or PNP output.

**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. 0.01 to 0.50 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:** For communication models, the maximum current consumption is 0.16 A or less.

**Note 9:** For communication models, add roughly 80 g to the weight (100 g for the PROFIBUS DP).

**Note 10:** The ITV1000 series is a Grease-free specification (Wetted parts).

---

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

---

**Table 1.**

<table>
<thead>
<tr>
<th>Model</th>
<th>Protocol</th>
<th>Version</th>
<th>Communication speed</th>
<th>Configuration file</th>
<th>I/O occupation area (input/output data)</th>
<th>Communication data resolution</th>
<th>Fail safe</th>
<th>Electric insulation</th>
<th>Terminating resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV1000</td>
<td>CC-Link</td>
<td>Ver.1.10</td>
<td>156 k/625 k</td>
<td>—</td>
<td>4 word/4 word, 32 bit/32 bit (per station, remote device station)</td>
<td>12 bit (4096 resolution)</td>
<td>HOLD/CLEAR (Switch setting)</td>
<td>No</td>
<td>—</td>
</tr>
<tr>
<td>ITV2000</td>
<td>DeviceNet™</td>
<td>Release 2.0</td>
<td>125 k/250 k/500 k bps</td>
<td>EDS</td>
<td>16 bit/16 bit</td>
<td>12 bit (4096 resolution)</td>
<td>HOLD/CLEAR (Switch setting)</td>
<td>No</td>
<td>—</td>
</tr>
<tr>
<td>ITV3000</td>
<td>—</td>
<td>—</td>
<td>156 k/625 k</td>
<td>EDS</td>
<td>4 word/4 word, 32 bit/32 bit (per station, remote device station)</td>
<td>12 bit (4096 resolution)</td>
<td>HOLD/CLEAR (Switch setting)</td>
<td>No</td>
<td>—</td>
</tr>
</tbody>
</table>

---

**Table 2.**

<table>
<thead>
<tr>
<th>Model</th>
<th>Protocol</th>
<th>Version</th>
<th>Communication speed</th>
<th>Configuration file</th>
<th>I/O occupation area (input/output data)</th>
<th>Communication data resolution</th>
<th>Fail safe</th>
<th>Electric insulation</th>
<th>Terminating resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV105</td>
<td>PROFIBUS DP</td>
<td>DP-V0</td>
<td>9.6 k/19.2 k/45.45 k/93.75 k/187.5 k/500 k/1.5 M/3 M/6 M/12 M bps</td>
<td>GSD</td>
<td>16 bit/16 bit</td>
<td>12 bit (4096 resolution)</td>
<td>CLEAR</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>ITV205</td>
<td>RS-232C</td>
<td>—</td>
<td>9.6 kbps</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>HOLD</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>ITV305</td>
<td>—</td>
<td>—</td>
<td>9.6 kbps</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
### Specifications

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Applicable model</th>
</tr>
</thead>
<tbody>
<tr>
<td>N02</td>
<td>ITV20/L50482/L50482</td>
</tr>
<tr>
<td>N03</td>
<td>ITV20/L50482/L50482</td>
</tr>
<tr>
<td>N04</td>
<td>ITV20/L50482/L50482</td>
</tr>
<tr>
<td>F02</td>
<td>ITV30/L50482/L50482</td>
</tr>
<tr>
<td>F03</td>
<td>ITV30/L50482/L50482</td>
</tr>
<tr>
<td>F04</td>
<td>ITV30/L50482/L50482</td>
</tr>
</tbody>
</table>

### Accessories (Option)/Part No.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat bracket assembly (including mounting screws)</td>
<td>KT-ITV-F1 (P398020-500-3)</td>
</tr>
<tr>
<td>L-bracket assembly (including mounting screws)</td>
<td>KT-ITV-L1 (P398020-501-3)</td>
</tr>
<tr>
<td>Power cable connector</td>
<td>Straight type 3 m (P398020-504-3 for DeviceNet™)</td>
</tr>
<tr>
<td></td>
<td>Right angle type 3 m (P398020-505-3 for DeviceNet™)</td>
</tr>
<tr>
<td>Bus adapter (CC-Link model only)</td>
<td>EX9-ACY00-MJ</td>
</tr>
</tbody>
</table>

### Accessories

- **Air filter**: X156
- **Mist separator**: X224
- **L-bracket**: X157
- **Spacer**: X227
- **Spacer with L-bracket (3 + 4)**: X228
- **Spacer with T-bracket**: X229

### Made to Order

(Refer to pages 25 and 26 for details.)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>X81</td>
<td>Not compliant 16 points preset input type</td>
</tr>
<tr>
<td>X156</td>
<td>Compliant Digital input type</td>
</tr>
<tr>
<td>X93</td>
<td>Not compliant Connection Rc 1/4</td>
</tr>
<tr>
<td>X102</td>
<td>Not compliant Connection Rc 3/8</td>
</tr>
<tr>
<td>X211</td>
<td>Not compliant Connection Rc 1/2</td>
</tr>
<tr>
<td>X333</td>
<td>Not compliant Connection G 1/4</td>
</tr>
<tr>
<td>X334</td>
<td>Not compliant Connection G 3/8</td>
</tr>
<tr>
<td>X345</td>
<td>Not compliant Connection G 1/2</td>
</tr>
</tbody>
</table>

### Note

- Manifolds are compatible with 2 to 8 stations. Consult with SMC for 9 stations or more.
- Products without symbols are also compatible. Consult with SMC separately.
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

Block diagram
Series **ITV1000/2000/3000**

### Series ITV101

**Linearity**

![Linearity Graph](image)

**Hysteresis**

![Hysteresis Graph](image)

**Repeatability**

![Repeatability Graph](image)

**Pressure characteristics** Set pressure: 0.05 MPa

![Pressure Characteristics Graph](image)

**Flow characteristics** Supply pressure: 0.2 MPa

![Flow Characteristics Graph](image)

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

![Relief Flow Characteristics Graph](image)

### Series ITV201

**Linearity**

![Linearity Graph](image)

**Hysteresis**

![Hysteresis Graph](image)

**Repeatability**

![Repeatability Graph](image)

**Pressure characteristics** Set pressure: 0.05 MPa

![Pressure Characteristics Graph](image)

**Flow characteristics** Supply pressure: 0.2 MPa

![Flow Characteristics Graph](image)

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

![Relief Flow Characteristics Graph](image)
Series ITV301

Linearity

Pressure characteristics  Set pressure: 0.05 MPa

Flow characteristics  Supply pressure: 0.2 MPa

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

Series ITV103

**Linearity**

![Linearity Graph](Image)

**Pressure characteristics**
- Set pressure: 0.2 MPa
- Supply pressure: 0.7 MPa

**Hysteresis**

![Hysteresis Graph](Image)

**Flow characteristics**
- Supply pressure: 0.7 MPa

**Repeatability**

![Repeatability Graph](Image)

**Relief flow characteristics**
- Supply pressure: 0.7 MPa

---

Series ITV203

**Linearity**

![Linearity Graph](Image)

**Pressure characteristics**
- Set pressure: 0.2 MPa
- Supply pressure: 0.7 MPa

**Hysteresis**

![Hysteresis Graph](Image)

**Flow characteristics**
- Supply pressure: 0.7 MPa

**Repeatability**

![Repeatability Graph](Image)

**Relief flow characteristics**
- Supply pressure: 0.7 MPa

---
### Linearity

- **Set pressure (MPa)**
  - 0
  - 0.1
  - 0.2
  - 0.3
  - 0.4
  - 0.5
  - 0.6
  - 0.7
  - 0.8
- **Input signal (%F.S.)**
  - 0
  - 25
  - 50
  - 75
  - 100

### Hysteresis

- **Output deviation factor (%F.S.)**
  - -1.0
  - -0.5
  - 0.0
  - 0.5
  - 1.0
- **Input signal (%F.S.)**
  - 0
  - 25
  - 50
  - 75
  - 100

### Repeatability

- **Output deviation factor (%F.S.)**
  - -1.0
  - -0.5
  - 0.0
  - 0.5
  - 1.0
- **Repetition**
  - 0
  - 2
  - 4
  - 6
  - 8
  - 10

### Pressure characteristics

- **Set pressure**: 0.2 MPa

### Flow characteristics

- **Supply pressure**: 0.7 MPa

### Relief flow characteristics

- **Supply pressure**: 0.7 MPa

---

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

**Series ITV303**
Series ITV1000/2000/3000

Series ITV105

Linearity  
Pressure characteristics  Set pressure: 0.4 MPa

Hysteresis  
Flow characteristics  Supply pressure: 1.0 MPa

Repeatability  
Relief flow characteristics  Supply pressure: 1.0 MPa

Series ITV205

Linearity  
Pressure characteristics  Set pressure: 0.4 MPa

Hysteresis  
Flow characteristics  Supply pressure: 1.0 MPa

Repeatability  
Relief flow characteristics  Supply pressure: 1.0 MPa
Electro-Pneumatic Regulator *Series ITV1000/2000/3000*

**Series ITV305**

**Linearity**

![Linearity Graph](image)

**Hysteresis**

![Hysteresis Graph](image)

**Repeatability**

![Repeatability Graph](image)

**Pressure characteristics**  Set pressure: 0.4 MPa

![Pressure Characteristics Graph](image)

**Flow characteristics**  Supply pressure: 1.0 MPa

![Flow Characteristics Graph](image)

**Relief flow characteristics**  Supply pressure: 1.0 MPa

![Relief Flow Characteristics Graph](image)
Dimensions

ITV10□□
Flat bracket

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

Dimensions

Solenoid valve
EXH

100
84
50
33
53
25
45
22
2.3
50
33
15
40
13.5
40
12
71
12.5
Rc 1/8
Exhaust port
EXH (3)
2 x Rc 1/8, 1/4
SUP port, OUT port

Flat bracket assembly
KT-ITV-F1
(Option)

Solenoid valve
EXH

M3 x 0.5
Sup
(1)
OUT (2)
4 x M4 x 0.7 thread depth 6 mm through

M12 x 1
Connector (Plug type)

Rc 1/8
Exhaust port

Exhaust port
2 x Rc 1/8, 1/4
SUP port, OUT port

L-bracket assembly
KT-ITV-L1
(Option)

L-bracket

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

Dimensions

Series ITV1000/2000/3000
Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)

**CC-Link/ITV10□-0-CC**
- M12 x 1 Communication cable connection thread (Socket type)
- M12 x 1 Power cable connection thread (Plug type)
- BUS adapter
- M3 x 0.5 Solenoid valve EXH
- 2 x Rc 1/8, 1/4 SUP port, OUT port

**DeviceNet™/ITV10□-0-DN**
- M12 x 1 Communication cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- M3 x 0.5 Solenoid valve EXH
- 2 x Rc 1/8, 1/4 SUP port, OUT port

**PROFIBUS DP/ITV10□-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
- 2 x Rc 1/8, 1/4 SUP port, OUT port

**RS-232C/ITV10□-0-RC**
- M12 x 1 Communication cable connection thread (Plug type)
- M12 x 1 Power cable connection thread (Plug type)
- M3 x 0.5 Solenoid valve EXH
- 2 x Rc 1/8, 1/4 SUP port, OUT port

With power cable connector *ITV10□-0-* common dimensions

Note) Order communication cable (other than RS-232C) separately. (Refer to page 9.)

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

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

Dimensions

ITV20□□
Flat bracket

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

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

Straight type (4-wire)
Cable connector 3 m

M12 x 1
Connector (Plug type)

M5 x 0.8
Solenoid valve EXH

SUP (1)
19
OUT (2)
15

4 x M5 x 0.8 thread depth 6 mm through

Exhaust port
2 x Rc 1/4, 3/8
SUP port, OUT port

4 x ø7
Mounting hole

4 x R3.5
L-bracket assembly KT-ITV-L2 (Option)

10
L-bracket assembly KT-ITV-F2 (Option)

25
15

2.3
36
45

L-bracket

Series ITV1000/2000/3000

Flat bracket

Dimensions

ITV20□□

100
84
50
40
24

52

12.5

13.5

19

10

36

11

93

12

Solenoid valve EXH

M5 x 0.8

Solenoid valve EXH

Rc 1/4

Exhaust port

SUP port, OUT port

4 x M5 x 0.8 thread depth 6 mm through

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

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

Straight type (4-wire)
Cable connector 3 m

M12 x 1
Connector (Plug type)

M5 x 0.8
Solenoid valve EXH

SUP (1)
19
OUT (2)
15

4 x M5 x 0.8 thread depth 6 mm through

Exhaust port
2 x Rc 1/4, 3/8
SUP port, OUT port

4 x ø7
Mounting hole

4 x R3.5
L-bracket assembly KT-ITV-L2 (Option)

10
L-bracket assembly KT-ITV-F2 (Option)

2.3
36
45

L-bracket

Series ITV1000/2000/3000

Flat bracket

Dimensions

ITV20□□
Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)

**CC-Link/ITV20□0-CC**
- M12 x 1: Communication cable connection thread (Socket type)
- M12 x 1: Power cable connection thread (Plug type)

**DeviceNet™/ITV20□0-DN**
- M12 x 1: Communication cable connection thread (Plug type)
- M12 x 1: Power cable connection thread (Plug type)

**PROFIBUS DP/ITV20□0-PR**
- M12 x 1: Communication cable connection thread (Socket type)
- M12 x 1: Power cable connection thread (Plug type)

**RS-232C/ITV20□0-RC**
- M12 x 1: Communication cable connection thread (Plug type)
- M12 x 1: Power cable connection thread (Plug type)

* Dimensions not shown are as on page 21.

With power cable connector *ITV20□0-□ common dimensions

Note) Order communication cable (other than RS-232C) separately. (Refer to page 9.)

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

**Dimensions**

**ITV30**

**Flat bracket**

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

- **Mounting hole**: Right angle type (4-wire) Cable connector 3 m
- **Cable connector**: 3 m

**M12 x 1 Connector (Plug type)**

- **M5 x 0.8 Solenoid valve EXH**

**KT-ITV-L2** (Option)

**KT-ITV-F2** (Option)

**L-bracket assembly**

**L-bracket**

- **Solenoid valve EXH**

**3 x Rc 1/4, 3/8, 1/4 SUP port, OUT port**

**Dimensions**

- **4 x M5 x 0.8 thread depth 6 mm through**

- **2.3**

- **45**
Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)

**CC-Link/ITV30□-CC**

- 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

**DeviceNet™/ITV30□-DN**

- 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

**PROFIBUS DP/ITV30□-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/ITV30□-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 as on page 23.

With power cable connector

- ITV30□-PR
- ITV30□-RC

Common dimensions

Note) Do not attempt to rotate, as the cable connector does not turn.
Series ITV1000/2000/3000
Made to Order Specifications 1

Please contact SMC for detailed dimensions, specifications and lead times.

1 16 Points Preset Input Type

Able to control 16-point-pressure by 4 bit switching input

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV10 0 4 3 2 1</td>
<td>X93</td>
<td>X81</td>
<td>X81</td>
<td></td>
</tr>
<tr>
<td>ITV20 0 4 3 2 1</td>
<td>X93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV30 0 4 3 2 1</td>
<td>X93</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) in part number is the same model no. for the standard products.
Note 2) Monitor output is switch output type only. This cannot be selected for types without a monitor output or with analog output.
Note 3) Values can be adjusted starting from the minimum output pressure display units.

- 16 points preset type

<table>
<thead>
<tr>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>X102</td>
<td>X81</td>
<td>X156</td>
<td></td>
</tr>
</tbody>
</table>

Reverse type

In compliance with input, inverse proportional pressure is displayed.

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV10 0 4 3 2 1</td>
<td>X102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV20 0 4 3 2 1</td>
<td>X102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV30 0 4 3 2 1</td>
<td>X102</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 Digital Input Type

Parallel input type with digital 10 bit.

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV10 0 4 0 8 9</td>
<td>X93</td>
<td>X321</td>
<td>X102</td>
<td></td>
</tr>
<tr>
<td>ITV20 0 4 0 8 9</td>
<td>X93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV30 0 4 0 8 9</td>
<td>X93</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) in part number is the same model no. for the standard products.
Note 2) Right angle type cable connectors cannot be selected.

3 Reverse Type

In compliance with input, inverse proportional pressure is displayed.

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV10 0 4 3 2 1</td>
<td>X102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV20 0 4 3 2 1</td>
<td>X102</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV30 0 4 3 2 1</td>
<td>X102</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Rated pressure

Output pressure (MPa)

Input signal (% F.S.)

Reverse type

Input/output characteristics chart

Note 1) in part number is the same model no. for the standard products.
Note 2) Except for preset input type.

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

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV10 5 3 2 1 0</td>
<td>X224</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV20 5 3 2 1 0</td>
<td>X224</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV30 5 3 2 1 0</td>
<td>X224</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

High pressure type (SUP 1.2 MPa, OUT 1.0 MPa)

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>X224</td>
<td>X224</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X322</td>
<td>Compliant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5 Set Pressure Range 1 to 100 kPa

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV10 1 0 4 3 2 1</td>
<td>X25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITV20 1 0 4 3 2 1</td>
<td>X25</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Set pressure range 1 to 100 kPa

<table>
<thead>
<tr>
<th>Digital Input Type</th>
<th>Symbol</th>
<th>CE-compliant</th>
<th>Not compliant</th>
<th>Compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>X25</td>
<td>X25</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X323</td>
<td>Compliant</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6 High-Speed Response Time Type

Pressure response with no load is approx. 0.1 sec.

**ITV 2 0 1 0 - 0 1 2 S - X88**

High-speed response time specifications

- Pressure display unit
  1. MPa
  2. kgf/cm²
  3. bar
  4. psi
  5. kPa

- Cable connector type
  1. Straight type 3 m
  2. Right angle type 3 m
  3. Without cable connector

- Bracket
  1. Without bracket
  2. Flat bracket
  3. L-bracket

7 Manifold Specifications (Except Series ITV3000)

2 through 8 station manifold.

### How to Order Manifolds

**IITV20** - 02 - 5

- **Model**: IITV20
- **Stations**: 2 (2 stations) 3 (8 stations)
- **OUT port size**: 1/4 (1000 type) 3/8 (2000 type)
- **Connection thread type**: Nil PT NPT NPTF G

### How to Order Manifold Assemblies

**Example**

- **Electro-pneumatic regulator**
  - ITV1030-311S-X26

**Blanking plate assembly**

- P398020-13

**Electro-pneumatic regulator**

- ITV2050-212S-X26

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 size 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 set, please inform SMC of the order of a manifold station beside a purchase order.
## Compact Vacuum Regulator
### Series ITV009

### How to Order

#### For single unit and single unit for manifold

**ITV00 9 0**

<table>
<thead>
<tr>
<th>Pressure range</th>
<th>Cable connector (Option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 –100 kPa</td>
<td>N — Without connector</td>
</tr>
</tbody>
</table>

**Power supply voltage**

<table>
<thead>
<tr>
<th>Voltage type</th>
<th>Cable connector (Option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 24 VDC ±10%</td>
<td>N — Without connector</td>
</tr>
<tr>
<td>1 12 to 15 VDC</td>
<td>C — Straight type 3 m</td>
</tr>
</tbody>
</table>

**Input signal**

<table>
<thead>
<tr>
<th>Input signal</th>
<th>Cable connector (Option)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Current type 4 to 20 mA DC</td>
<td>N — Without connector</td>
</tr>
<tr>
<td>1 Current type 0 to 20 mA DC</td>
<td>S — Straight type 3 m</td>
</tr>
<tr>
<td>2 Voltage type 0 to 5 VDC</td>
<td>L — Right angle type 2 m</td>
</tr>
<tr>
<td>3 Voltage type 0 to 10 VDC</td>
<td></td>
</tr>
</tbody>
</table>

**Built-in One-touch fittings type**

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Metric size (Light gray)</th>
<th>Inch size (Orange)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Ø4</td>
<td>Ø5/32&quot;</td>
</tr>
<tr>
<td>U</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Base type**

<table>
<thead>
<tr>
<th>Base type</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>For single unit</td>
</tr>
<tr>
<td>M</td>
<td>For manifolds</td>
</tr>
</tbody>
</table>

**Manifold**

**II TV00 – 02 –**

<table>
<thead>
<tr>
<th>Stations</th>
<th>02</th>
<th>03</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>3</td>
<td>10</td>
</tr>
</tbody>
</table>

**Option**

If a DIN rail longer than the specified stations is required, specify the applicable stations in two digits. (Maximum 10 stations) Example) **ITV000-05-07**

**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.

### Cable connector (Option)

<table>
<thead>
<tr>
<th>N — Without connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>S — Straight type 3 m</td>
</tr>
<tr>
<td>L — Right angle type 2 m</td>
</tr>
</tbody>
</table>

### How to Order Manifold Assembly (Example)

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

**Example**

**ITV000-03-02**

- **ITV000-03-02** (Vacuum regulator part no. (1, 2 stations))
- **ITV000-03ML-01** (Vacuum regulator part no. (3 stations))

### Combination with having different pressure ranges

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

### Pressure range

<table>
<thead>
<tr>
<th>Symbol</th>
<th>VAC</th>
<th>OUT</th>
<th>ATM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nil</td>
<td>Ø6</td>
<td>Ø6</td>
<td>Ø6</td>
</tr>
<tr>
<td>U</td>
<td>Ø1/4&quot;</td>
<td>Ø5/32&quot;</td>
<td>Ø1/4&quot;</td>
</tr>
</tbody>
</table>
Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV009</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>
<tr>
<td>Maximum flow rate</td>
<td>2 l/min (ANR) (Supply pressure: –101 kPa)</td>
</tr>
<tr>
<td>Power supply</td>
<td>Voltage 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>
</tr>
<tr>
<td>Input signal</td>
<td>Voltage type 0 to 5 VDC, 0 to 10 VDC</td>
</tr>
<tr>
<td>Current type</td>
<td>4 to 20 mA DC, 0 to 20 mA DC</td>
</tr>
<tr>
<td>Input impedance</td>
<td>Voltage type Approximately 10 kΩ</td>
</tr>
<tr>
<td>Current type</td>
<td>Approximately 250 Ω</td>
</tr>
<tr>
<td>Output signal</td>
<td>Analog output 1 to 5 VDC (Load impedance: 1 kΩ or more)</td>
</tr>
<tr>
<td>Linearity</td>
<td>Output accuracy: Within ±6% (Full span)</td>
</tr>
<tr>
<td>Hysteresis</td>
<td>Within ±1% (Full span)</td>
</tr>
<tr>
<td>Repeatability</td>
<td>Within ±0.5% (Full span)</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>Within ±0.2% (Full span)</td>
</tr>
<tr>
<td>Temperature characteristics</td>
<td>Within ±0.12% (Full span)/°C</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0 to 50°C (No condensation)</td>
</tr>
<tr>
<td>Enclosure</td>
<td>IP65 equivalent</td>
</tr>
<tr>
<td>Connection type</td>
<td>Built-in One-touch fittings</td>
</tr>
</tbody>
</table>

Connection size

<table>
<thead>
<tr>
<th>Connection type</th>
<th>For single unit</th>
<th>Manifold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric size</td>
<td>ø4</td>
<td>ø4</td>
</tr>
<tr>
<td>Inch size</td>
<td>ø5/32&quot;</td>
<td>ø5/32&quot;</td>
</tr>
<tr>
<td>Metric size</td>
<td>ø6</td>
<td>ø1/4&quot;</td>
</tr>
<tr>
<td>Inch size</td>
<td>ø5/32&quot;</td>
<td>ø5/32&quot;</td>
</tr>
</tbody>
</table>

Weight (Note 1)

100 g or less (without option)

Accessories (Option)

Bracket
Flat bracket assembly (including 2 mounting screws)
P39800022

L-bracket assembly (including 2 mounting screws)
P39800023

Tightening torque when assembling is 0.3 N·m.

Cable connector
Straight type
M8-4DSX3MG4

Right angle type
ELWIKA-KV4408 PVC025 2M

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.
* 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 back page 2)
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.
Series ITV009

Linearity, Hysteresis

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

Repeatability

- Output deviation factor (% F.S.) vs. Count

Pressure Characteristics

- Set pressure: –10 kPa

Flow Characteristics

- Set pressure (kPa) vs. Flow rate (l/min (ANR))
### 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</td>
<td>VAC</td>
<td>OUT</td>
<td>ATM</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 back page 2)

**Minimum bending radius:** 80
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 back page 2)

Note) For dimensions of the cable connector, refer to single unit on page 31.
**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.

Dimensions in inch are noted in parentheses.

VAC port: (ø6, ø1/4")
ATM port: (ø6, ø1/4")
OUT port: (ø4, ø5/32")

4 x M3 x 0.5 thread depth 3
Mounting hole

Note) For dimensions of the cable connector, refer to single unit on page 31.

<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>
<tr>
<td>Weight of DIN rail (g)</td>
<td>20</td>
<td>22</td>
<td>27</td>
<td>29</td>
<td>31</td>
<td>34</td>
<td>36</td>
<td>41</td>
<td>43</td>
</tr>
</tbody>
</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 back page 2)
Electronic Vacuum Regulator

Series ITV2090/2091

How to Order

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

Pressure range

<table>
<thead>
<tr>
<th>0</th>
<th>Current type 4 to 20 mA DC (Sink type)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Current type 0 to 20 mA DC (Sink type)</td>
</tr>
<tr>
<td>2</td>
<td>Voltage type 0 to 5 VDC</td>
</tr>
<tr>
<td>3</td>
<td>Voltage type 0 to 10 VDC</td>
</tr>
</tbody>
</table>

Power supply voltage

<table>
<thead>
<tr>
<th>0</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12 to 15 VDC</td>
</tr>
</tbody>
</table>

Note) Communication models are available only for 24 V DC.

Input signal/Communication model

<table>
<thead>
<tr>
<th>0</th>
<th>CC-Link compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DeviceNet™ compatibility</td>
</tr>
<tr>
<td>2</td>
<td>PROFIBUS DP compatibility</td>
</tr>
<tr>
<td>3</td>
<td>RS-232C communication</td>
</tr>
</tbody>
</table>

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) |

Note) For the communication models, CC, DN, PR and RC, only “Nil” is available as it does not have a pressure display.

Output signal/Communication model

<table>
<thead>
<tr>
<th>0</th>
<th>CE compliant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Pressure display unit

| 5 | 5 kPa |

Note) Order communication cable (other than RS-232C) separately. See below.

Cable connector type

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

Bracket

<table>
<thead>
<tr>
<th>N</th>
<th>Without bracket</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Flat bracket</td>
</tr>
<tr>
<td>C</td>
<td>L-bracket</td>
</tr>
</tbody>
</table>

Port size

| 2 | 1/4 |

Thread type

<table>
<thead>
<tr>
<th>Nil</th>
<th>Rc</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>NPT</td>
</tr>
<tr>
<td>T</td>
<td>NPTF</td>
</tr>
<tr>
<td>F</td>
<td>G</td>
</tr>
</tbody>
</table>

For communications cables, use the parts listed below (refer to the catalog [M8/M12 Connector] CAT.ES100-73 for details) or order the product certified for the respective protocol (with M12 connector) separately.

<table>
<thead>
<tr>
<th>Application</th>
<th>Communication cable part number</th>
<th>Remarks</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>DeviceNet™ compatibility</td>
<td>PCA-1557633 (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
<tr>
<td>PROFIBUS DP compatibility</td>
<td>PCA-1557646 (Plug type)</td>
<td>T-branch connector not supplied.</td>
</tr>
<tr>
<td></td>
<td>PCA-1557691 (Socket type)</td>
<td>T-branch connector not supplied.</td>
</tr>
</tbody>
</table>
Series ITV2090/2091

Standard Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV2090</th>
<th>ITV2091</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>24 VDC ±10%</td>
<td>12 to 15 VDC</td>
</tr>
<tr>
<td>Current consumption</td>
<td>Power supply voltage 24 VDC type: 0.12 A or less Note 6</td>
<td>Power supply voltage 12 to 15 VDC type: 0.18 A or less</td>
</tr>
</tbody>
</table>

Minimum supply vacuum pressure Note 1: Set pressure –13.3 kPa

Maximum supply vacuum pressure –101 kPa

Set pressure range –1.3 to –80 kPa

Current type 4 to 20 mA DC, 0 to 20 mA DC

Voltage type 0 to 5 VDC, 0 to 10 VDC

Preset input 4 points (Negative common)

Current type 250 Ω or less Note 3

Voltage type Approximately 6.5 kΩ

Preset input Power supply voltage 24 VDC type: Approximately 4.7 kΩ

Power supply voltage 12 VDC type: Approximately 2.0 kΩ

Output pressure display

Accuracy ±6% (Full span)

Units

Power supply voltage 24 VDC type: Approximately 4.7 kΩ

Power supply voltage 12 VDC type: Approximately 2.0 kΩ

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 allowance is provided for an 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.

Note 4) Either analog output or switch output must be selected. Furthermore, when switch output is selected, either NPN output or PNP output must also be selected. Use caution that the preset input type is not equipped with an output signal function.

Note 5) Please contact SMC regarding indication with other units of pressure.

Note 6) For communication models, the maximum current consumption is 0.16 A or less.

Note 7) For communication models, add roughly 80 g to the weight (100 g for the PROFIBUS DP).

Communication Specifications (CC, DN, PR, RC)

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV□□□□-CC□□</th>
<th>ITV□□□□-DN□□</th>
<th>ITV□□□□-PR□□</th>
<th>ITV□□□□-RC□□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>CC-Link</td>
<td>DeviceNet™</td>
<td>PROFIBUS DP</td>
<td>RS-232C</td>
</tr>
<tr>
<td>Version Note 1)</td>
<td>Ver 1.10</td>
<td>Release2.0</td>
<td>DP-V0</td>
<td>—</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>
<td>9.6 k/19.2 k/45.45 k 93.75 k/187.5 k/500 k 1.5 M/3 M/6 M/12 M bps</td>
<td>9.6 kbps</td>
</tr>
<tr>
<td>Configuration file Note 2)</td>
<td>—</td>
<td>EDS</td>
<td>GSD</td>
<td>—</td>
</tr>
<tr>
<td>I/O occupation area (input/output data)</td>
<td>4 word/4 word, 32 bit/32 bit (per station, remote device station)</td>
<td>16 bit/16 bit</td>
<td>16 bit/16 bit</td>
<td>16 bit/16 bit</td>
</tr>
<tr>
<td>Communication data resolution</td>
<td>12 bit (4096 resolution)</td>
<td>12 bit (4096 resolution)</td>
<td>12 bit (4096 resolution)</td>
<td>12 bit (4096 resolution)</td>
</tr>
<tr>
<td>Fail safe</td>
<td>HOLD/CLEAR (Switch setting)</td>
<td>HOLD/CLEAR (Switch setting)</td>
<td>CLEAR</td>
<td>HOLD</td>
</tr>
<tr>
<td>Terminating resistor</td>
<td>—</td>
<td>—</td>
<td>—</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 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.

Piping/Wiring Diagram

<table>
<thead>
<tr>
<th>VAC</th>
<th>ITV2090</th>
<th>OUT</th>
<th>Tank</th>
</tr>
</thead>
</table>

Vacuum pump, Ejector

Notes:
- Power supply and input signal (VDC, mA DC)
- ※1 Minimum supply vacuum pressure should be 13.3 kPa less than the maximum vacuum pressure setting value.
- ※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.
- ※3 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 power supply. This is 350 Ω or less for an input current of 20 mA DC.
- ※4 Either analog output or switch output must be selected. Furthermore, when switch output is selected, either NPN output or PNP output must also be selected. Use caution that the preset input type is not equipped with an output signal function.
- ※5 Please contact SMC regarding indication with other units of pressure.
- ※6 For communication models, the maximum current consumption is 0.16 A or less.
- ※7 For communication models, add roughly 80 g to the weight (100 g for the PROFIBUS DP).
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.
**Dimensions**

**ITV209**

**Flat bracket**

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

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

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

**L-bracket**

- 4 x M5 x 0.8 thread depth 6 mm through
- ATM. port, OUT port

**Series ITV209**
Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)

CC-Link/ITV2090-CC

<table>
<thead>
<tr>
<th>Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 x 1 Communication cable connection thread (Socket type)</td>
</tr>
<tr>
<td>M12 x 1 Power cable connection thread (Plug type)</td>
</tr>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
</tbody>
</table>

DeviceNet™/ITV2090-DN

<table>
<thead>
<tr>
<th>Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
<tr>
<td>M12 x 1 Power cable connection thread (Plug type)</td>
</tr>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
</tbody>
</table>

PROFIBUS DP/ITV2090-PR

<table>
<thead>
<tr>
<th>Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 x 1 Communication cable connection thread (Socket type)</td>
</tr>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
</tbody>
</table>

RS-232C/ITV2090-RC

<table>
<thead>
<tr>
<th>Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
<tr>
<td>M12 x 1 Communication cable connection thread (Plug type)</td>
</tr>
</tbody>
</table>

With power cable connector

<table>
<thead>
<tr>
<th>Dimensions (CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC PR RC Common dimensions</td>
</tr>
</tbody>
</table>

Straight type (4-wire)

Right angle type (4-wire)

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

<table>
<thead>
<tr>
<th>Description</th>
<th>Part no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat bracket assembly</td>
<td>KT-ITV-F2</td>
</tr>
<tr>
<td>L-bracket assembly</td>
<td>KT-ITV-L2</td>
</tr>
<tr>
<td>Power cable connector</td>
<td></td>
</tr>
<tr>
<td>Straight type 3 m</td>
<td>P398020-500-3</td>
</tr>
<tr>
<td>Right angle type 3 m</td>
<td>P398020-501-3</td>
</tr>
<tr>
<td>Bus adapter (CC-Link model only)</td>
<td>EX9-ACY00-MJ</td>
</tr>
</tbody>
</table>

### Dimensions

#### Flat bracket

![Flat bracket diagram]

#### L-bracket

![L-bracket diagram]
These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “Caution,” “Warning” or “Danger.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1, and other safety regulations.

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

2. Only personnel with appropriate training should operate machinery and equipment.
   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

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

1. The product is provided for use in manufacturing industries.
   The product herein described is basically provided for peaceful use in manufacturing industries. If considering using the product in other industries, consult SMC beforehand and examine specifications or a contract if necessary.
   If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered. *2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.
   *2) Vacuum pads are excluded from this 1 year warranty.
      A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
      Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.
**Series ITV0000/1000/2000/3000 Specific Product Precautions**

Be sure to read before handling. Refer to back page 1 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Common Precautions.

---

### Series ITV0000/009 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.

![Wiring Diagrams](image)

<table>
<thead>
<tr>
<th>Lead wire color</th>
<th>Terminal No.</th>
<th>Wiring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>1</td>
<td>Power</td>
</tr>
<tr>
<td>Blue</td>
<td>2</td>
<td>Signal</td>
</tr>
<tr>
<td>White</td>
<td>3</td>
<td>COM</td>
</tr>
<tr>
<td>Black</td>
<td>4</td>
<td>Monitor</td>
</tr>
</tbody>
</table>

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.

### 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.
   
   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 pressure 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. 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 (solenoids, 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 instruction 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.
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.
### Specific Product Precautions 2

Be sure to read before handling. Refer to back page 1 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Common Precautions.

<table>
<thead>
<tr>
<th>Series ITV0000/1000/2000/3000 Precautions</th>
</tr>
</thead>
</table>

#### Warning

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.

<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>7 to 9</td>
<td>12 to 14</td>
<td>22 to 24</td>
<td>28 to 30</td>
</tr>
</tbody>
</table>

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.

2. Wrapping of pipe 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 pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

### Operating Environment

#### 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. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.
2. Consult with SMC when used in power plants, or if instrumentation related.

#### 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".
Specific Product Precautions 3

Series ITV0000/1000/2000/3000

Be sure to read before handling. Refer to back page 1 for Safety Instructions, “Handling Precautions for SMC Products” (M-E03-3) for Common Precautions.

### 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. 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. In this product, the output side pressure cannot be completely relieved within the range of 0.005 MPa or less. If it is desired to reduce the pressure completely to 0 MPa, install a 3 way valve or other device on the output side to exhaust the 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. Please note that the right angle cable does not rotate and is limited to only one entry direction.

9. 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.).

10. 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 Series AN200 or AN400) on the exhaust port (EXH port). The port sizes are Rc 1/8, Rc 1/4 and Rc 1/2.

11. Specifications on page 10 is in case of static environment. Pressure may fluctuate when air is consumed at the output side.

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

### Design and Selection

**Caution**

1. The direct-current power supply to combine should be UL authorized power supply.

   (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.

   2. A circuit using max. 30 Vrms or less (42.4 V peak), which is powered by UL1310 or UL1585 compatible Class-2 power supply.

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.
**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.

**Current Signal Type**
- Brown: Power supply
- Blue: Input signal
- White: GND (COMMON)
- Black: Monitor output

**Voltage Signal Type**
- Brown: Power supply
- Blue: Input signal
- White: GND (COMMON)
- Black: Monitor output

**Preset Input Type**
- Brown: Power supply
- Blue: Input signal 1
- White: Input signal 2
- Black: Input signal 3

**Wiring diagram**

- **Current signal type**
  - Vs: Power supply 24 VDC
  - A: Input signal 4 to 20 mA DC

- **Voltage signal type**
  - Vs: Power supply 24 VDC
  - Vin: Input signal 0 to 20 mA DC

**Preset input type**

- Vs: Power supply 24 VDC
- Vin: Input signal 0 to 5 VDC

One of the preset pressures P1 through P4 is selected by the ON/OFF combination of S1 and S2.

- Note: This is 1 psi for 130 psi types.

**Monitor output wiring diagram**

- **Analogue output: Voltage type**
  - Brown
  - Blue
  - White
  - Black

- **Analogue output: Current type (Sink type)**
  - Brown
  - Blue
  - White
  - Black

**Switch output: NPN type**
- Load
- Note: When 80 mA DC or more is applied, detecting device for overcurrent starts activating and then emits an error signal. (Error number "5")

**Switch output: PNP type**
- Load
- Note: When 80 mA DC or more is applied, detecting device for overcurrent starts activating and then emits an error signal. (Error number "5")

**Trademark Information**

DeviceNet™ is a trademark of ODVA.
**Set Pressure Range**

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

Set pressure range, by unit of standard measured pressure

<table>
<thead>
<tr>
<th>Unit</th>
<th>ITV01</th>
<th>ITV03</th>
<th>ITV05</th>
<th>ITV209</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPa</td>
<td>0.005 to 0.1</td>
<td>0.005 to 0.5</td>
<td>0.005 to 0.9</td>
<td>—</td>
</tr>
<tr>
<td>kgf/cm²</td>
<td>0.05 to 1</td>
<td>0.05 to 5</td>
<td>0.05 to 9</td>
<td>—</td>
</tr>
<tr>
<td>bar</td>
<td>0.05 to 1</td>
<td>0.05 to 5</td>
<td>0.05 to 9</td>
<td>—</td>
</tr>
<tr>
<td>psi</td>
<td>0.7 to 15</td>
<td>0.7 to 70</td>
<td>0.7 to 130</td>
<td>—</td>
</tr>
<tr>
<td>kPa</td>
<td>5 to 100</td>
<td>5 to 500</td>
<td>5 to 900</td>
<td>—1.3 to –80</td>
</tr>
</tbody>
</table>

**CE Marking**

When using the power supply cable for the CE compliant product (including Made to Order), mount the ferrite core on the cable according to the following “Ferrite core necessity”.

* **Series ITV0000**

<table>
<thead>
<tr>
<th>Model</th>
<th>Ferrite core necessity</th>
<th>Recommended power supply cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV0000-□□-Q</td>
<td>Unnecessary</td>
<td>M8-4DSX3MG4 (Straight type) ELWIKA-KV4408 PVC025 2M (Right angle type)</td>
</tr>
</tbody>
</table>

* **Series ITV1000/2000/3000**

<table>
<thead>
<tr>
<th>Model</th>
<th>Ferrite core necessity</th>
<th>Recommended power supply cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV□□□□□□-Q</td>
<td>Necessary</td>
<td>P398010-12 (Straight type) (With ferrite core) P398010-13 (Right angle type) (With ferrite core)</td>
</tr>
<tr>
<td>ITV□□□□CC-□□-Q</td>
<td>Unnecessary</td>
<td>P398020-500-3 (Straight type) P398020-501-3 (Right angle type)</td>
</tr>
<tr>
<td>ITV□□□□DN-□□-Q</td>
<td>Necessary (Ferrite core is supplied as an accessory for the body.)</td>
<td>P398020-504-3 (Straight type) P398020-505-3 (Right angle type)</td>
</tr>
<tr>
<td>ITV□□□□PR-□□-Q</td>
<td>Necessary (Ferrite core is supplied as an accessory for the body.)</td>
<td>P398020-500-3 (Straight type) P398020-501-3 (Right angle type)</td>
</tr>
</tbody>
</table>

Note) Recommended power supply cable length is 3 m. (ELWIKA-KV4408 PVC025 2M is 2 m.) If any other length is desired, please consult with SMC.
## 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.

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 instruction manual included with the product for details on its handling.
Revision history

Edition D
- Addition of Series ITV1000.
- Number of pages from 16 to 20.  HX

Edition E
- Addition of Series ITV0000/009.
- Addition of Series ITV209.
- Addition of Fieldbus-compatible specifications CC-Link, DeviceNet™ and PROFIBUS DP.
- Addition of RS-232C serial communication specification.
- Addition of CE [option] and UL.
- Number of pages from 20 to 52.  NS

Edition F
- Change of enclosure for Series ITV209 to conform to IP65.  OZ