Compact Electro-pneumatic Regulator

Series ITV0000

Compact and lightweight electro-pneumatic regulator
Compact Electro-pneumatic Regulator
Series ITV0000

Realizes space savings and reduction of weight for manifold use

Stations can easily be increased or decreased due to DIN rail mount design.

- Equivalent to IP65
- Linearity within ±1% (full span)
- Hysteresis 0.5% (full span)
- Repeatability ±0.5% (full span)
- High-speed response time 0.1 sec (without load)

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

Built-in One-touch fitting
With error indication LED

Brackets
- Flat and L brackets are available.

Features

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure range</th>
<th>Power supply voltage</th>
<th>Input signal</th>
<th>Output signal</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV001</td>
<td>0.1MPa</td>
<td>24VDC</td>
<td>4 to 20mA</td>
<td>Analog output</td>
<td>• Cable connectors</td>
</tr>
<tr>
<td>ITV003</td>
<td>0.5MPa</td>
<td>12VDC</td>
<td>0 to 20mA</td>
<td>1 to 5V</td>
<td>Straight type</td>
</tr>
<tr>
<td>ITV005</td>
<td>0.9MPa</td>
<td></td>
<td>0 to 5VDC</td>
<td></td>
<td>Right angle type</td>
</tr>
<tr>
<td>ITV009</td>
<td>-100kPa</td>
<td></td>
<td>0 to 10VDC</td>
<td></td>
<td>• Brackets</td>
</tr>
</tbody>
</table>

High stability
Stable pressure control is possible even when a metal cylinder is used.

- Mist separator (0.01 µm or less) (0.3 µm or more)
- Air filter (5 µm or less)
How to Order

Single unit and single unit for manifolds

ITV00 1 0 3 N -Q

Pressure range

<table>
<thead>
<tr>
<th>Symbol</th>
<th>SUP</th>
<th>OUT</th>
<th>EXH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metric</td>
<td>0.1MPa</td>
<td>0.5MPa</td>
<td>0.9MPa</td>
</tr>
<tr>
<td>Inch</td>
<td>12 to 15VDC</td>
<td>6 to 10VDC</td>
<td>9 to 10VDC</td>
</tr>
</tbody>
</table>

Power supply voltage

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>24VDC</td>
</tr>
<tr>
<td>1</td>
<td>12 to 15VDC</td>
</tr>
<tr>
<td>2</td>
<td>6 to 10VDC</td>
</tr>
</tbody>
</table>

Input signal

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

Built-in One-touch fitting type

For single unit

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Metric size (light gray)</th>
<th>Inch size (orange)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ</td>
<td>ø4</td>
<td>ø5/32&quot;</td>
</tr>
</tbody>
</table>

For manifolds

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Metric size (light gray)</th>
<th>Inch size (orange)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NJ</td>
<td>ø6</td>
<td>ø1/4&quot;</td>
</tr>
<tr>
<td>U</td>
<td>ø5/32&quot;</td>
<td>ø1/4&quot;</td>
</tr>
</tbody>
</table>

Cable connector (option)

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

Bracket (option for single unit only)

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

Base type

- NJ: For single unit
- M: For manifold

How to Order Manifold Assemblies (Example)

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

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

ITV0003-03 ...........1 set (Manifold part number)

- ITV0030-3MS ... 2 sets [Electro-pneumatic regulator part number (1, 2 stations)]
- ITV0030-3ML ... 1 set [Electro-pneumatic regulator part number (3 stations)]

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

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 page 8.

Manifolds

IITV00 - 02 - n

Stations

02 2 stations
03 3 stations
10 10 stations

Option

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

Example) IITV0000-05-07
## Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>ITV001</th>
<th>ITV003</th>
<th>ITV005</th>
<th>ITV009</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage</strong> consumption</td>
<td>24VDC ±10%, 12 to 15VDC</td>
<td>Power supply voltage 24VDC type: 0.12A or less</td>
<td>Power supply voltage 12 to 15VDC type: 0.18A or less</td>
<td></td>
</tr>
<tr>
<td><strong>Set pressure range</strong></td>
<td>0.001 to 0.1MPa</td>
<td>0.001 to 0.5MPa</td>
<td>0.001 to 0.9MPa</td>
<td>-1 to -101kPa</td>
</tr>
<tr>
<td><strong>Minimum supply pressure</strong></td>
<td>0.2MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum supply pressure</strong></td>
<td>1.0MPa</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum flow rate</strong></td>
<td>3.5l/min (ANR) (Supply pressure 0.2MPa)</td>
<td>6l/min (ANR) (Supply pressure 0.8MPa)</td>
<td>6l/min (ANR) (Supply pressure 0.6MPa)</td>
<td>2l/min (ANR) (Supply pressure: -101kPa)</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>Voltage</td>
<td>Current consumption</td>
<td>Power supply voltage 24VDC type: 0.12A or less</td>
<td>Power supply voltage 12 to 15VDC type: 0.18A or less</td>
</tr>
<tr>
<td><strong>Input signal</strong></td>
<td>Voltage type</td>
<td>Current type</td>
<td>Voltage type</td>
<td>Current type</td>
</tr>
<tr>
<td><strong>Input impedance</strong></td>
<td>Approx. 10kΩ</td>
<td>Approx. 250kΩ</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output signal</strong></td>
<td>Analog output</td>
<td>1 to 5 VDC (Load impedance: 1kΩ or more)</td>
<td>Output accuracy: Within ±6% (full span)</td>
<td></td>
</tr>
<tr>
<td><strong>Linearity</strong></td>
<td>Within ±1% (full span)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hysteresis</strong></td>
<td>Within ±0.5% (full span)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Repeatability</strong></td>
<td>Within ±0.5% (full span)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sensitivity</strong></td>
<td>Within ±0.2% (full span)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Temperature characteristics</strong></td>
<td>Within ±0.12% (full span)/°C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature range</strong></td>
<td>0 to 50°C (with no condensation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Enclosure</strong></td>
<td>Equivalent to IP65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection type</strong></td>
<td>Built-in One-touch fitting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Connection size</strong></td>
<td>For single unit</td>
<td>Metric size: ø4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inch size: ø5/32&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manifold</td>
<td>Metric size: ø6, ø4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Inch size: ø1/4&quot;, ø5/32&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>100g or less (without options)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note 1) Indicates the weight of a single unit.
Note 2) Specifications other than the following are optional.
Pressure range: 0.1MPa, 0.5MPa, 0.9MPa, Power supply voltage: 24VDC, Input signal: 0 to 10VDC

## Accessories (Optional)

### Bracket
- Flat bracket assembly
  - P39800022
- L bracket assembly
  - P39800023

### Cable connector
- Straight type
  - M8-4DSK3MG4
- Right angle type
  - ELWIKA-KV4408 PVC025 2M
Series ITV0000

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.

Working principle diagram

Block diagram
Compact Electro-pneumatic Regulator  Series ITVO000

**Series ITVO001**

**Linearity, hysteresis**

Output deviation factor % F.S.

Input signal % F.S.

**Repeatability**

With 50% of signal input

Output deviation factor % F.S.

Repetition

**Pressure characteristics**

Set pressure: 0.05 MPa

Output deviation factor % F.S.

Supply pressure MPa

**Flow characteristics**

Set pressure kPa

Flow rate l/min (ANR)

**Series ITVO003**

**Linearity, hysteresis**

Output deviation factor % F.S.

Input signal % F.S.

**Repeatability**

With 50% of signal input

Output deviation factor % F.S.

Repetition

**Pressure characteristics**

Set pressure: 0.25 MPa

Output deviation factor % F.S.

Supply pressure MPa

**Flow characteristics**

Set pressure kPa

Flow rate l/min (ANR)
Series ITV005

**Linearity, hysteresis**

- **Output deviation factor (% F.S.)**
  - Input signal (% F.S.): 0 to 100

**Pressure characteristics**

- **Output deviation factor (% F.S.)**
  - Supply pressure (MPa): 0.4 to 1.2

**Flow characteristics**

- **Set pressure: 0.45MPa**

Series ITV009

**Linearity, hysteresis**

- **Output deviation factor (% F.S.)**
  - Input signal (% F.S.): 0 to 100

**Pressure characteristics**

- **Output deviation factor (% F.S.)**
  - Supply pressure (MPa): -120 to -20

**Flow characteristics**

- **Set pressure: 1.0MPa**

**Repeatability**

- **With 50% of signal input**

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

- **Repetition**
**Compact Electro-pneumatic Regulator Series ITV0000**

**Dimensions**

**Single unit**

- **Cable connector (4-wire)**
  - Straight type (optional)
  - Right angle type (optional)

- **L bracket** (optional)
- **Flat bracket** (optional)

- **Breathing hole (M3)**

- **Port position**

<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>
<tr>
<td>ITV009</td>
<td>VAC</td>
<td>ATM</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- When used under conditions equivalent to IP65, use the regulator after piping a fitting/tube to the breathing hole. (For details, refer to “Specific Product Precautions 1” on Page 11.)
- Minimum bending radius 80
**Dimensions**

**Single unit for manifolds**

Note) When used under the conditions equivalent to IP65, use the regulator after piping a fitting/tube into a breathing hole. (For details, refer to “Specific Product Precautions 1” on Page 11.)

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

### Dimensions

#### Manifolds

![Manifold Diagram]

- Stations are counted starting from the D side.
- Note: Stations are counted starting from the D side.

![Port Position Table]

**Port position**

<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>
<tr>
<td>ITV009</td>
<td>VAC</td>
<td>ATM</td>
<td></td>
</tr>
</tbody>
</table>

Note) Stations are counted starting from the D side.

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

**Note) When used under conditions equivalent to IP65, use the regulator after piping a fitting/tube to the breathing hole.**

(For details, refer to "Specific Product Precautions 1" on page 11.)

### Table of Manifold Stations

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

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

Note) Breathing hole (M3)

Note) When used under conditions equivalent to IP65, use the regulator after piping a fitting/tube to the breathing hole.

(For details, refer to "Specific Product Precautions 1" on page 11.)

**Note) For dimensions of the cable connector, refer to single unit on page 6.**
## ITV0000 Series

### MANIFOLD REQUEST SHEET

<table>
<thead>
<tr>
<th>Customer name</th>
<th>Request number</th>
<th>Date</th>
<th>Contact person</th>
<th>Quantity</th>
<th>Delivery date</th>
</tr>
</thead>
</table>

### 1. Manifold Identification

- **IITV00**
  - Number of stations
    - 02: 2 stations
    - 03: 3 stations
    - ...: ...
    - 10: 10 stations
  - DIN Rail options
    - (+) If a rail longer than number of requested stations is needed, please indicate here the number of total stations which the rail needs to contain (maximum 10).

### 2. Type of pneumatic port

- **Metriz size fittings**: X
- **Inches size fittings**: *

### 3. Cable options

- **No cable**: -
- **Straight (3m)**: M8-4DSX3MG4
- **Right angle 2m**: ELWIKA-KV4408 PVC025 2M

### 4. Manifold definition

Define the needed stations putting a X or a O in the template below.

#### Part number

**IITV00**

**Memo** How to order single units for manifolds

- **Symbol**: SUP OUT EXH
- **Nil**: Metric size (light gray)
- **U**: Inch Size (Orange)
- **Built in one touch fitting type**

#### Input signal

- **Pressure range**
  - 1: 0.1 Mpa
  - 2: 0.5 Mpa
  - 3: 0.9 Mpa
  - 9: -100 kpa

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

#### Cable options

- **Straight**
- **Right angle**

The part below is for SMC use only!

### Metric size

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Qty.</th>
<th>Part no.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV0010-0MN-Q</td>
<td></td>
<td>ITV0050-0MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-1MN-Q</td>
<td></td>
<td>ITV0050-1MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-2MN-Q</td>
<td></td>
<td>ITV0050-2MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-3MN-Q</td>
<td></td>
<td>ITV0050-3MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0011-0MN-Q</td>
<td></td>
<td>ITV0051-0MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0011-1MN-Q</td>
<td></td>
<td>ITV0051-1MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0011-2MN-Q</td>
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<td>ITV0051-2MN-Q</td>
<td></td>
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<tr>
<td>ITV0011-3MN-Q</td>
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<td>ITV0051-3MN-Q</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Qty.</th>
<th>Part no.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV0030-0MN-Q</td>
<td></td>
<td>ITV0090-0MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0030-1MN-Q</td>
<td></td>
<td>ITV0090-1MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0030-2MN-Q</td>
<td></td>
<td>ITV0090-2MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0030-3MN-Q</td>
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<td>ITV0090-3MN-Q</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Inch size

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Qty.</th>
<th>Part no.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV0010-0UMN-Q</td>
<td></td>
<td>ITV0050-0UMN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-1UMN-Q</td>
<td></td>
<td>ITV0050-1UMN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-2UMN-Q</td>
<td></td>
<td>ITV0050-2UMN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-3UMN-Q</td>
<td></td>
<td>ITV0050-3UMN-Q</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Part number</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>P39800025-1</td>
<td>1</td>
</tr>
<tr>
<td>P39800024-1</td>
<td>1</td>
</tr>
</tbody>
</table>

---

### How to order single units for manifolds

- **Symbol**: SUP OUT EXH
- **Nil**: Metric size (light gray)
- **U**: Inch Size (Orange)
- **Built in one touch fitting type**

#### Input signal

- **Pressure range**
  - 1: 0.1 Mpa
  - 2: 0.5 Mpa
  - 3: 0.9 Mpa
  - 9: -100 kpa

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

#### Cable options

- **Straight**
- **Right angle**

The part below is for SMC use only!

### Metric size

<table>
<thead>
<tr>
<th>Part no.</th>
<th>Qty.</th>
<th>Part no.</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITV0010-0MN-Q</td>
<td></td>
<td>ITV0050-0MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-1MN-Q</td>
<td></td>
<td>ITV0050-1MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-2MN-Q</td>
<td></td>
<td>ITV0050-2MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0010-3MN-Q</td>
<td></td>
<td>ITV0050-3MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0011-0MN-Q</td>
<td></td>
<td>ITV0051-0MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0011-1MN-Q</td>
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<td>ITV0051-1MN-Q</td>
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</tr>
<tr>
<td>ITV0011-2MN-Q</td>
<td></td>
<td>ITV0051-2MN-Q</td>
<td></td>
</tr>
<tr>
<td>ITV0011-3MN-Q</td>
<td></td>
<td>ITV0051-3MN-Q</td>
<td></td>
</tr>
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### Accessories

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These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels of "Caution", "Warning" or "Danger". To ensure safety, be sure to observe ISO 4414 Note 1), JIS B 8370 Note 2) and other safety practices.

⚠️ Caution: Operator error could result in injury or equipment damage.

⚠️ Warning: Operator error could result in serious injury or loss of life.

⚠️ Danger: In extreme conditions, there is a possible result of serious injury or loss of life.

---

**Warning**

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system or decides its specifications. Since the products specified here are used in various operating conditions, their compatibility for the specific pneumatic system must be based on specifications or after analysis and/or tests to meet your specific requirements.

2. Only trained personnel should operate pneumatically operated machinery and equipment. Compressed air can be dangerous if an operator is unfamiliar with it. Assembly, handling or repair of pneumatic systems should be performed by trained and experienced operators.

3. Do not service machinery/equipment or attempt to remove components until safety is confirmed.
   1. Inspection and maintenance of machinery/equipment should only be performed after confirmation of safe locked-out control positions.
   2. When equipment is to be removed, confirm the safety process as mentioned above. Cut the supply pressure for this equipment and exhaust all residual compressed air in the system.
   3. Before machinery/equipment is restarted, take measures to prevent shooting-out of cylinder piston rod, etc. (Bleed air into the system gradually to create back-pressure.)

4. Contact SMC if the product is to be used in any of the following conditions:
   1. Conditions and environments beyond the given specifications, or if product is used outdoors.
   2. Installation on equipment in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverages, recreation equipment, emergency stop circuits, press applications, or safety equipment.
   3. An application which has the possibility of having negative effects on people, property, or animals, requiring special safety analysis.

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Note 1) ISO 4414: Pneumatic fluid power – Recommendations for the application of equipment to transmission and control systems.

Note 2) JIS B 8370: General Rules for Pneumatic Equipment
**Piping**

**Caution**

1. **Preparation before piping**
   Before piping, air blow (flush) or wash thoroughly to remove chips, cutting oil and other impurities from inside the piping.

2. **Wrapping of sealant tape**
   When connecting pipes and fittings, etc., be sure that chips from the pipe threads and sealing material do not get inside the regulator.
   Further, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

**Warning**

1. **Operating Environment**
   - Do not operate in locations with an atmosphere of corrosive gases, chemicals, sea water, water or steam, or where the same substances will adhere to the regulator.
   - Do not operate in locations where vibration or impact occurs.
   - In locations under direct sunlight, provide a protective cover, etc.
   - In locations near heat sources, block off the radiated heat.
   - In locations where water, lubricant or spatter from welding, etc. will adhere to the regulator, implement suitable protective measures.

**Air Supply**

**Warning**

1. **This regulator is designed for use with compressed air. Contact SMC if any other fluid will be used.**
2. **Do not use compressed air that includes chemicals, synthetic fluids containing organic solvents, salinity, or corrosive gases, since this can cause malfunction.**

**Handling of One-touch Fittings**

**Caution**

1. **Tube attachment/detachment for One-touch fittings**
   1) **Attaching a tube**
      - Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutter TK-1, 2 or 3. Do not use pliers, nippers or scissors, etc. If cutting is done with tools other than tube cutters, the tube may be cut diagonally or become flattened, etc. This can make a secure installation impossible and cause problems such as the tube coming loose after installation or air leakage. Allow some extra length in the tube.
      - Hold the tube and push it in slowly, inserting it all the way into the fitting.
      - After inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tube pulling out.
   2) **Detaching a tube**
      - Push in the release button sufficiently. When doing this, push the collar evenly.
      - Pull out the tube while holding down the release button so that it does not snap back. If the release button is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to detach it.
      - When using the removed tube again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tube is used as is, this can cause problems such as air leakage or difficulty in removing the tube.

2. **When mounting a One-touch fitting, use a suitable wrench to tighten the hexagonal flats of the fitting.**
   Moreover, position the wrench at the lower part of the hexagonal flats as close to the threads as possible. When a wrench of the proper size for the hexagonal flats is not used, it will damage the hexagonal flats.

3. **Tightening of M3, M5, and M6 connection threads**
   1) **M3**
      - After tightening by hand, tighten an additional 1/4 rotation with the correct tool.
   2) **M5 and M6**
      - After tightening by hand, tighten an additional 1/6 rotation with the correct tool.

   Overtightening can cause damage to the threads and/or air leakage due to deformation of the gasket. Undertightening can cause loose threads and air leakage, etc.

**Precautions on Tube by Other Manufacturers**

**Warning**

1. **When using tubes by manufacturers other than SMC, confirm that the tube’s outside diameter tolerance satisfy the following specifications.**
   1) Nylon tubing: ±0.1mm or less
   2) Soft nylon tubing: ±0.1mm or less
   3) Polyurethane tubing: +0.15mm or less, -0.2mm or less

   Do not use a tube if the outside diameter tolerance is not satisfied. It may not be possible to connect the tubing, or leakage or disconnection may occur after connecting.
**Air Supply**

**Caution**

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

2. Compressed air containing a large amount of drainage can cause malfunction of this product and other pneumatic equipment. As a countermeasure, install an after-cooler, air dryer or water separator, etc.

3. If large amounts of carbon dust are generated by the compressor, it can accumulate inside this product and cause a malfunction.

For details on the above compressed air quality, refer to SMC’s "Air Cleaning Equipment" catalog.

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**Wiring**

**Caution**

1. Connect the cable to the connector on the body with the wiring arranged as shown below. Proceed carefully, as incorrect wiring can cause damage. Furthermore, use DC power at the correct rating and with a low ripple.

For details on the above compressed air quality, refer to SMC’s "Air Cleaning Equipment" catalog.

**Wiring diagram**

**Current signal type**

- Vs: Power supply 24VDC
  - 12 to 15VDC
- A: Input signal 4 to 20mADC
  - 0 to 20mADC

**Voltage signal type**

- Vs: Power supply 24VDC
  - 12 to 15VDC
- Vin: Input signal 0 to 5VDC
  - 0 to 10VDC

**Monitor output wiring diagram**

**Analog output/Voltage type**

- Monitor output voltage

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**Note)** A right angle type is also available. The entry direction for the right angle type connector is downward (OUT port side). Never turn the connector as it is not designed to turn. If turned forcibly, it will damage the connector port.
Caution

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

2. If electric power is shut off while pressure is being applied, output pressure will be maintained.

   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 supply to this regulator is cut off due to a power failure, etc., when it is in a regulated state, output pressure will be maintained temporarily. Handle carefully when operating with output pressure released to the atmosphere, as air will continue to flow out until reaching atmospheric pressure.

4. If supply pressure to this regulator 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 solenoid valve may be shortened by this, be sure to shut off the power supply when supply pressure is shut off.

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

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

7. Be aware that the right angle cable does not rotate and is limited to only one entry direction.

8. Take the following steps to avoid malfunction caused by noise.
   1) Remove power supply noise during operation by installing a line filter, etc., in the AC power line.
   2) Install this product and its wiring as far as possible from strong electric fields such as those of motors and power lines, etc.
   3) Be sure to implement protective measures against load surge for induction loads (solenoid valves, relays, etc.).

9. Characteristics are limited only to the static state, and when air is consumed on the output side, pressure may fluctuate.

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

11. In locations where the body is exposed to water, dust, etc., there is a possibility that they can enter into the body through the breathing hole.

   Using a fitting/tube (M-3AU-3 fitting and TIU01□□□□ tube are recommended), install piping extended to a location where there is no water, dust, etc.
EUROPEAN SUBSIDIARIES:

Austria
SMC Pneumatik GmbH (Austria), Gisalstrasse B, A-2100 Korneuburg
Phone: +43 2262-52385, Fax: +43 2262-52385
E-mail: office@smc.at
http://www.smc.at

Belgium
SMC Pneumatics N.V./S.A.
Nijverheidstraat 20, B-2160 Wommelgem
Phone: 03-355-1464, Fax: 03-355-1466
E-mail: post@smcpneumatics.be

Czech Republic
SMC Industrial Automation CZ s.r.o.
Hudcova 78a, CZ-61200 Brno
Phone: +420 5 414 24611, Fax: +420 5 412 18034
E-mail: office@smc.cz

Denmark
SMC Pneumatik A/S
Krudtsminde 4B, DK-8300 Odder
Phone: (45)70252900, Fax: (45)70252901
E-mail: smc@smc-pneumatik.dk

Estonia
SMC Pneumatics Estonia OÜ
Laki 12-101, 106 21 Tallinn
Phone: 09-859 580, Fax: 09-8595 8595
http://www.smcpneumatics.ee

Finland
SMC Pneumatics Finland OY
PL72, Tlistinniityntie 4, SF-20301 ESPOO
Phone: 09-859 580, Fax: 09-8595 8595
http://www.smcfitec.sci.fi

France
SMC Pneumatique, S.A.
1, Boulevard de Strasbourg, Parc Gustave Eiffel
Bassy Saint Georges
F-77607 Marine La Vallée Cedex 3
Phone: 01-6476 1000, Fax: 01-6476 1010

Germany
SMC Pneumatics BV
De Ruiterkade 120, NL-1011 AB Amsterdam
Phone: 020-5318888, Fax: 020-5318880
E-mail: info@smcpneumatics.nl

Greece
S. Paranopoulos S.A.
7, Konstantinoupolioes Street,
GR-11855 Athens
Phone: 01-3426076, Fax: 01-3455578

Hungary
SMC Hungary Kft.
Budatini út 107-113, H-1117 Budapest
Phone: +36 1 371 1343, Fax: +36 1 371 1344
E-mail: office@smc-automation.hu
http://www.smc-automation.hu

Ireland
SMC Pneumatics (Ireland) Ltd.
2002 Citywest Business Campus,
Naas Road, Saggart, Co. Dublin
Phone: 01-403 5000, Fax: 01-484-0500

Italy
SMC Italia S.p.A.
Via Garibaldi 62, I-20061 Carugate, (Milano)
Phone: 02-92711, Fax: 02-9271365
E-mail: mailbox@smcitalia.it
http://www.smcitalia.it

Latvia
SMC Pneumatics Latvia SIA
Smeria 1-270, Riga LV-1006, Latvia
Phone: 0777-9474, Fax: 0777-9475
http://www.smc.lv

Lithuania
UBA Išteklių Lietuva
Savanorių pr. 180, LT-2600 Vilnius, Lithuania
Phone/Fax: 370-2651602

Netherlands
SMC Pneumatics (UK) Ltd
Vincent Avenue, Crownhill,
Milton Keynes, MK8 0AN
Phone: 0800 1382930 Fax: 01908-555064
E-mail: sales@pneumatics.co.uk
http://www.smcromania.ro

Poland
SMC Industrial Automation Polska Sp.z.o.o.
ul. Konstruktorska 11A, PL-02-673 Warszawa,
Phone: +48 22 546 5085, Fax: +48 22 546 5087
E-mail: office@smc.pl
http://www.smc.pl

Portugal
SMC Sucursal Portugal, S.A.
Rua de Engº Ferreira Dias 402, 4100-246 Porto
Phone: 22-610-89-22, Fax: 22-610-89-36
E-mail: postpt@smc.smces.es

Romania
SMC Romania srl
Vasile Stroescu 19, Sector 2, Bucharest
Phone: 01-3265111, Fax: 01-3261489
E-mail: smccadm@canad.ro
http://www.smc.smces.es

Russia
SMC Pneumatics Russia LLC
3640 Sredniy pr. St. Petersburg 199004
Phone:(812) 118 5445, Fax:(812) 118 5449
E-mail: smccadm@canad.ro
http://www.smc-pneumatik.ru

Slovakia
SMC Priemyselná Automatizácia, s.r.o.
Námestie Martina Benku 10
SK-81107 Bratislava
Phone: +421 2 444 56028, Fax: +421 2 444 56028
E-mail: office@smc.sk
http://www.smc.sk

Spain
SMC España, S.A.
Avenida de la Industria 24, 28928, Las Rozas
Phone: 91-633 07 00, Fax: 91-633 07 10
http://www.smcru.com

Sweden
SMC Pneumatics Sweden AB
Ekhagsvägen 29-31, S-141 71 Huddinge
Phone: 08-603 07 00, Fax: 08-603 07 10
http://www.smc.com

UK
SMC Pneumatics (UK) Ltd
Vincent Avenue, Crownhill,
Milton Keynes, MK8 0AN
Phone: 0800 1382930 Fax: 01908-555064
E-mail: sales@pneumatics.co.uk
http://www.smc-ind-avtom.si

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