



ORIGINAL INSTRUCTIONS

Instruction Manual

Electro-Pneumatic Regulator

10 bit Digital input type

ITV*0*0-60**** Series



The intended use of the electro-pneumatic regulator is to control the flow and pressure of fluid in response to digital input signals.

1 Safety Instructions

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

- ⁽¹⁾ ISO 4414: Pneumatic fluid power - General rules relating to systems.
 ISO 4413: Hydraulic fluid power - General rules relating to systems.
 IEC 60204-1: Safety of machinery - Electrical equipment of machines. (Part 1: General requirements)
 ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.

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

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

Warning

- Always ensure compliance with relevant safety laws and standards.**
All work must be carried out in a safe manner by a qualified person in compliance with applicable national regulations.
- This product is class A equipment intended for use in an industrial environment. There may be potential difficulties in ensuring electromagnetic compatibility in other environments due to conducted or radiated disturbances.

Caution

- Ensure that the air supply system is filtered to 5 microns.
- Refer to the SMC website (URL: <https://www.smcworld.com>) for more information about Safety Instructions.

2 Specifications

2.1 General specifications

Model	ITV*010	ITV*030	ITV*050
Min. supply pressure	(Set pressure) + 0.1 MPa		
Max. supply pressure	0.2 MPa	1.0 MPa	
Set pressure range	0.005 to 0.1 MPa	0.005 to 0.5 MPa	0.005 to 0.9 MPa
Supply voltage	24 VDC ± 10%,		
Current consumption	0.12 A or less		
Input signal	10 bit (parallel input)		
Input impedance	Approx. 4.7 kΩ		
Linearity	±1% F.S. or less		
Hysteresis	0.5% F.S. or less		
Repeatability	±0.5% F.S. or less		
Sensitivity	0.2% F.S. or less		
Temperature characteristics	±0.12% F.S. / °C or less		
Ambient and fluid temperature	0 to 50°C (no condensation)		
Pressure display	Accuracy	±2% F.S. ± 1 digit or less	
	Min. unit	MPa: 0.001 / kgf/cm ² : 0.01 / bar: 0.01, psi: 0.1 ^(Note 1) / kPa: 1	
Enclosure rating	Main unit: IP65, Cable connector: IP67		

Note 1) 1 PSI is the minimum display unit on the ITV*050.

2.2 Size / Weight specifications

Model	ITV10*0	ITV20*0	ITV30*0
Size (mm)	50x50x109	50x50x131	66x66x152
Weight (no options)	250 g	350 g	645 g

Warning

Special products (-X) might have specifications different from those shown in this section. Contact SMC for specific drawings.

3 Installation

3.1 Installation

Warning

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

- This product is pre-set at the factory and must not be dismantled by the user. Contact your local SMC office for advice.
- Ensure, when installing this product, that it is kept clear of power lines to avoid noise interference.
- Ensure that load surge protection is fitted when inductive loads are present (i.e. solenoid, relay etc.).

3.2 Environment

Warning

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

3.3 Piping

Caution

- Before piping make sure to clean up chips, cutting oil, dust etc.
- When installing piping or fittings, ensure sealant material does not enter inside the port. When using seal tape, leave 1 thread exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

3 Installation (continued)

3.4 Lubrication

Caution

- Do not use a lubricator on the input side of this product. If lubrication is required, place the lubricator on the 'output' side so that it does not enter the product.
- SMC products have been lubricated for life at manufacture, and do not require lubrication in service.
- If a lubricant is to be used in the system, refer to the catalogue for details.

4 Wiring

Caution

Connect the cable to the connector on the main unit as shown in the following diagram. Take precautions, as incorrect wiring will damage the unit. Use a DC power supply capable of supplying the necessary power requirements with minimal ripple.

Connector: Hirose RP13A-12PA-13SA(71) Circular Push pull socket

Signal name	Wire colour ^(Note)
+24 V	Pink - Black2
GND	Green - Black2
Signal common	Blue
MSB bit 10	Blue - Black2
bit 9	Grey - Black1
bit 8	Orange - Black1
bit 7	Green - Black1
bit 6	Pink - Black1
bit 5	Blue - Black1
bit 4	Grey
bit 3	Orange
bit 2	Green
LSB bit 1	Pink

Note: Wire colours shown are when the optional cable is used.

5 Error Indication

5.1 Error Display

Caution

If an abnormality is detected by the ITV the LED display will show 'Er' followed by a code number. Isolate the power supply and ascertain the problem and solve. Re-instate the power supply after correcting any fault. Error codes are as shown in the table below.

No	Content	Display
2	EEProm read / write error	Er 2
3	Memory read / write error	Er 3
4	Solenoid valve fault	Er 4
5	Switch output over-current	Er 5
6	Outside of the Zero-clear range	Er 6

6 Setting

Example) When the setting pressure is 0.3 MPa on an ITV2030 (0.5 MPa specification).

$$(0.3\text{MPa} / 0.5\text{MPa}) \times 1023 = 614 \text{ (DEC)} = 266 \text{ (HEX)}$$

Binary data of "614" (DEC) is "1001100110"

Value	1	0	0	1	1	0	0	1	1	0
Signal	MSB	9bit	8bit	7bit	6bit	5bit	4bit	3bit	2bit	1bit
Input	ON	OFF	OFF	ON	ON	OFF	ON	ON	ON	OFF

By inputting 12-24 VDC between common and each signal wire, the input state will become "ON".
Common is no polarity.

7 How to Order

Refer to the operation manual or catalogue on the SMC website (URL: <http://www.smcworld.com>) for How to order information.

8 Outline Dimensions

Refer to the operation manual or catalogue on the SMC website (URL: <http://www.smcworld.com>) for outline dimensions.

9 Maintenance

9.1 General maintenance

Caution

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

10 Limitations of Use

10.1 Limited warranty and disclaimer/compliance requirements

Refer to Handling Precautions for SMC Products.

11 Product Disposal

This product shall not be disposed of as municipal waste. Check your local regulations and guidelines to dispose of this product correctly, in order to reduce the impact on human health and the environment.

12 Contacts

Refer to www.smcworld.com or www.smc.eu for your local distributor/importer.

SMC Corporation

URL : <https://www.smcworld.com> (Global) <https://www.smc.eu> (Europe)
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