

Installation and Maintenance Manual

Electro-Pneumatic Regulator

ITV1030-01F1BN4-DIU00490


1 Safety Instructions

This manual contains essential information for the protection of users and others from possible injury and/or equipment damage.

- Read this manual before using the product, to ensure correct handling, and read the manuals of related apparatus before use.
- Keep this manual in a safe place for future reference.
- These instructions indicate the level of potential hazard by label of "Caution", "Warning" or "Danger", followed by important safety information which must be carefully followed.
- To ensure safety of personnel and equipment the safety instructions in this manual and the product catalogue must be observed, along with other relevant safety practices.

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

- Electromagnetic compatibility:
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 as well as radiated disturbances.

Warning

- **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 can be used in various operating conditions, their compatibility with the specific pneumatic system must be based on specifications or after analysis and/or tests to meet specific requirements.

- **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 personnel.

- **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. Switch off air and electrical supplies and exhaust all residual compressed air in the system.

3) Before machinery/equipment is re-started, ensure all safety measures to prevent sudden movement of cylinders etc. (Supply air into the system gradually to create back pressure, i.e. incorporate a soft-start valve).

- **Do not use this product outside of the specifications. Contact SMC if it is to be used in any of the following conditions:**

1) Conditions and environments beyond the given specifications, or if the product is to be used outdoors.

2) Installations in conjunction with atomic energy, railway, air navigation, vehicles, medical equipment, food and beverage, 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.

1 Safety Instructions (continued)

Caution

- Ensure that the air supply system is filtered to 5 microns.

- Special Conditions for safe use

The ITV unit should be used within the range of specifications given below.

1. Protect the product from sources of heat which can generate surface temperatures higher than the temperature classification.
2. Protect the product and cables against all impact or mechanical damage.
3. Protect the product from direct sunlight or UV light using a suitable protective cover.
4. Do not disconnect the M12 or M8 connector before first switching off the power supply.
6. Use only a damp cloth to clean the product body, to avoid an electrostatic charge.
7. Provide suitable grounding of the product body to avoid electrostatic charging.

2 Specifications

2.1 Specifications

Model	ITV1030-01F1BN4-DIU00490	
Min. supply pressure	Set pressure + 15 psi	
Max. supply pressure	100 psi	
Set pressure range	0.7 to 70 psi	
Supply voltage	24 VDC ±10%	
Current consumption	0.2 A or less	
Input signal	Current type	4.3 to 20 mA
Input impedance	Current type	250 Ω or less ^{Note 5}
Output signal	Analogue	1 to 5 VDC (Output impedance: Approx. 1 kΩ) Output accuracy ±6% F.S. or less

Linearity	±1% F.S. or less	
Hysteresis	0.5% F.S. or less	
Repeatability	±0.5% F.S. or less	
Sensitivity	0.2% F.S. or less	
Temperature characteristics	±0.12% F.S./°C or less	
Operating temperature	0 to 50°C (No condensation)	
Pressure display	Accuracy	±2% F.S. ± 1 digit or less
	Min. Unit	psi : 0.1
Enclosure Protection	IP65 equivalent	
Weight	Approx. 300 g (No accessories)	

Note 1: Up to 0.7 psi residual pressure might exist even though 0% input signal should give 0 psi output pressure on shipment. It is recommended to add a 3-port valve to exhaust the output when 0 psi output pressure is requested.

Note 2: The settings (Zero/Span, Preset input, Switch output) can be adjusted by each minimum display unit. The units cannot be changed.

Note 3: This is a special product which exhausts the output pressure to 0.7 psi or less when the power supply is turned off.

Note 4: The output pressure is controlled at 0.7 psi or less when the input signal is approx. 4.1 mA or less. If the input signal is approx. 4.3 mA or more, it will convert to normal control mode. Therefore, with this condition output pressure chattering may occur when the input signal is between 4.1 to 4.3 mA.

Note 5: This value is for the state with no over current included. If an allowance is provided for an over current circuit, the input impedance will vary depending on the input current. This value is 350 Ω or less for an input current of 20 mA DC.

Note 6: Connect the external solenoid valve to the same power source as the E/P regulator.

Note 7: Maximum supply pressure of the product becomes 100 psi from the specification for the V111-5WOU valve.

Note 8: The M8 connector cable is not included. Please order the V100-49-1-5 connector cable (3 m) separately.

2 Specifications (continued)

2.2 Operation Principle

When the input signal increases the supply solenoid valve ① turns on and the exhaust solenoid valve ② turns off. Supply pressure is passed to the pilot valve ③ through the supply solenoid valve. The pilot valve will open the main valve allowing partial supply pressure to pass to the out port. The pressure sensor ④ will provide output pressure feedback to the control circuit ⑤. The control circuit will balance the input signal and output pressure to ensure that the output pressure remains proportional to the input signal.

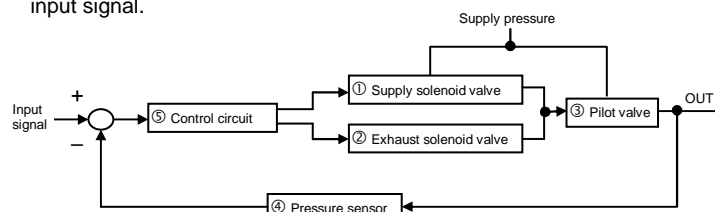


Fig. 1 - Control diagram

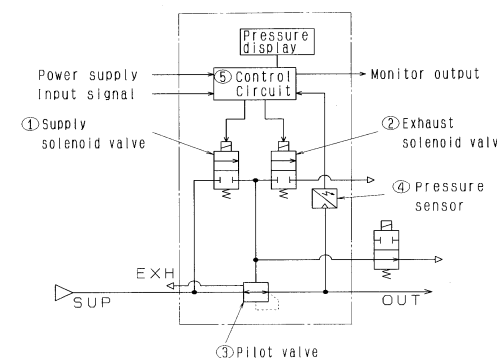


Fig. 2 - Schematic diagram

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.).
- Ensure precautions are in place if the product is used in a 'free flow output' condition. Air will continue to flow continuously.
- Do not use a lubricator on the input side of this product. If lubrication is necessary, place the lubricator on the 'output' side.
- Ensure all air is exhausted from the product before maintenance.
- The length of the connector cable should be 10 m maximum.

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 Installation (continued)

3.3 Piping

Warning

- 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 1.5 to 2 threads exposed on the end of the pipe/fitting.
- Tighten fittings to the specified tightening torque.

Thread	Tightening Torque (Nm)
1/8	3 to 5

3.4 Lubrication

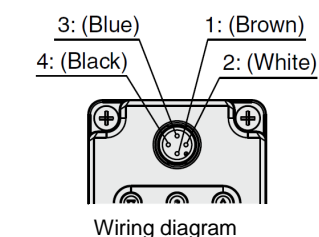
Caution

- 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.

4 Wiring

Caution

- Proceed carefully, as incorrect wiring can cause damage.
- Use a DC power supply with sufficient capacity and a low ripple.
- Turn off the power supply to remove and insert the connector.
- Never rotate the right angled type connector as it is not designed to rotate.

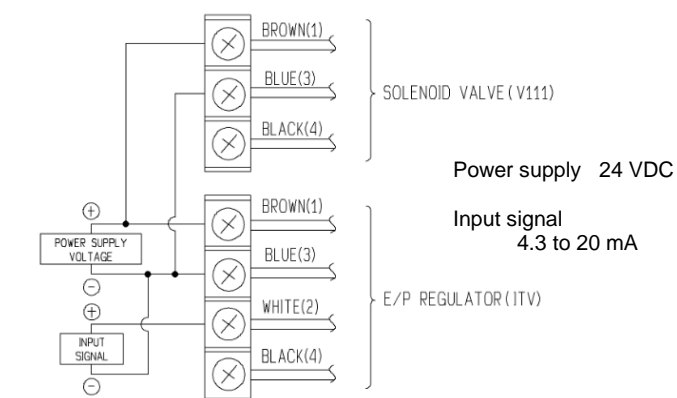


Wiring diagram

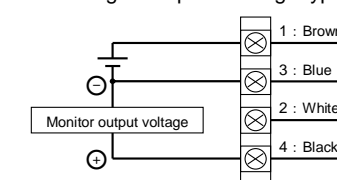
Current / Voltage type

	Current / Voltage type	
1	Brown	Power supply
2	White	Input Signal
3	Blue	GND (Common)
4	Black	Monitor output

(Note) The wire colour is shown for when the optional cable is used.



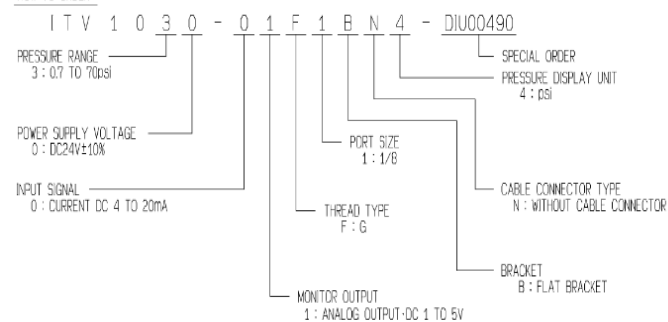
Monitor output wiring diagram
Analogue output - Voltage type



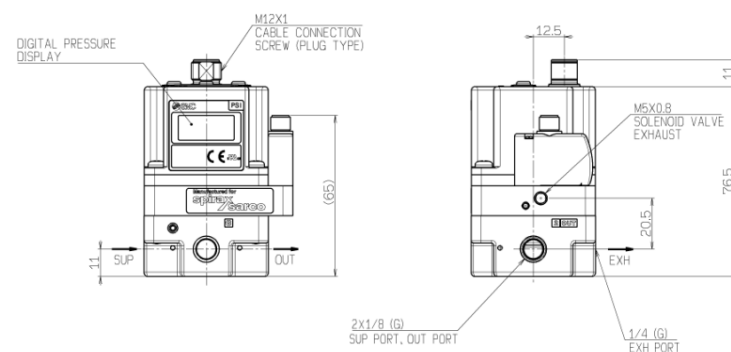
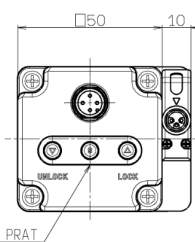
Only use equipment with a minimum load impedance of 100 kΩ.

5 How to Order

HOW TO ORDER



6 Outline Dimensions (mm)



7 Maintenance and Inspection

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.
- Do not make any modification to the product.
- Do not disassemble the product, unless required by installation or maintenance instructions.

8 Limitations of Use



Caution

- If the electric power supply is turned off while pressure is applied, the pressure will be exhausted on the output side.
- 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. Disconnect the power supply when the supply pressure is shut off, as the life of the product may be shortened.
- Do not block the exhaust ports on this product.
- This product has an exhaust function for when the electric power supply is turned off but this product does not have a shut off valve function. Operate the system to shut off the supply pressure when not operating the product.
- The product is adjusted for each specification at the time of shipment from the factory. Do not perform unnecessary disassembly or removal of parts as it will cause failure.

9. Contacts

AUSTRIA	(43) 2262 62280-0	LATVIA	(371) 781 77 00
BELGIUM	(32) 3 355 1464	LITHUANIA	(370) 5 264 8126
BULGARIA	(359) 2 974 4492	NETHERLANDS	(31) 20 531 8888
CZECH REP.	(420) 541 424 611	NORWAY	(47) 67 12 90 20
DENMARK	(45) 7025 2900	POLAND	(48) 22 211 9600
ESTONIA	(372) 651 0370	PORTUGAL	(351) 21 471 1880
FINLAND	(358) 207 513513	ROMANIA	(40) 21 320 5111
FRANCE	(33) 1 6476 1000	SLOVAKIA	(421) 2 444 56725
GERMANY	(49) 6103 4020	SLOVENIA	(386) 73 885 412
GREECE	(30) 210 271 7265	SPAIN	(34) 945 184 100
HUNGARY	(36) 23 511 390	SWEDEN	(46) 8 603 1200
IRELAND	(353) 1 403 9000	SWITZERLAND	(41) 52 396 3131
ITALY	(39) 02 92711	UNITED KINGDOM	(44) 1908 563888

SMC Corporation

URL : [http:// www.smcworld.com](http://www.smcworld.com) (Global) <http:// www.smceu.com> (Europe)

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