



# Installation and Maintenance Manual Series ITV201\*-X244 (0.001~0.1MPa Type) Electro-Pneumatic Regulator

For future reference, please keep this manual in a safe place

This manual should be read in conjunction with the current catalogue

## Safety Instructions

These safety instructions are intended to prevent a hazardous situation and / or equipment damage. These instructions indicate the level of potential hazard by label 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.

(Note 1): ISO 4414: Pneumatic fluid power-Recommendations for the application of equipment to transmission and control systems.  
(Note 2): JIS B 8370 : Pneumatic system axiom

**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

- 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 .

- 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.
- Do not service machinery / equipment or attempt to remove component until safety is confirmed.**
  - Inspection and maintenance of machinery / equipment should only be performed after confirmation of safe locked-out control positions.
  - 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.
  - 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.)

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

## CAUTION

Ensure that the air supply system is filtered to 5 micron

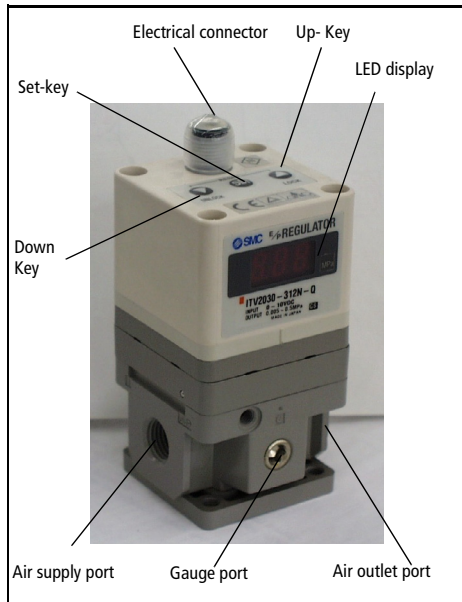


Fig 1

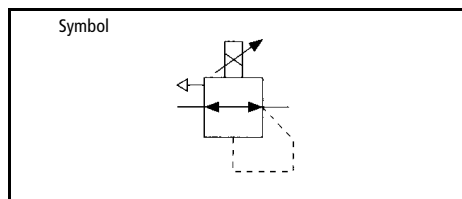


Fig 2

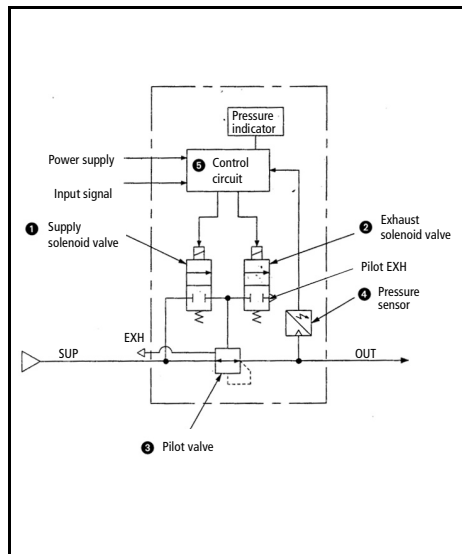


Fig 3

## Specifications

Model		ITV201□ - X244
Min. Supply Pressure		Setting Pressure + 0.1 MPa
Max. Supply Pressure		0.2 MPa (2.0 kgf/cm <sup>2</sup> )
Setting Pressure Range		0.001-0.1MPa
Supply voltage		24 VDC ± 10%: 0.12A or less 12-15VDC: 0.18A or less
Input Signal	Current Type (Note 1)	4-20mADC, 0-20mADC
	Voltage Type	0-5VDC, 0-10VDC
Input Impedance	Current Type	250Ω or less
	Voltage Type	approx. 6.5kΩ
Output signal (Note 2)	Analog Output	1-5VDC (Load Impedance: 1kΩ or less)
	Switch Output	NPN Open Collector Type : 30V 30mA PNP Open Collector Type : 30mA
Linearity		±1% or less (Full Scale)
Hysteresis		0.5% or less (Full Scale)
Repeatability		±0.5% or less (Full Scale)
Sensitivity		0.2% or less (Full Scale)
Temperature Characteristics		±0.12% or less (Full Scale)/°C
Protection Structure		Main unit: IP65, Cable connector: IP67
Display of Pressure	Accuracy	±3% (Full Scale)
	Min. Unit	MPa: 0.01, kgf/cm <sup>2</sup> : 0.01, bar: 0.01, PSI: 0.1, kPa: 1
Ambient and fluid temperature		0-50 °C (without condensation)

(Note 1) Two wire control, 4 to 20 mADC and 0 to 20mADC are not available. Supply voltage of 12-15VDC or 24 VDC is required.  
(Note 2) Make selection of Analog output or Switch output. Also select NPN or PNP output when Switch output is selected.

Fig 3

## 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.

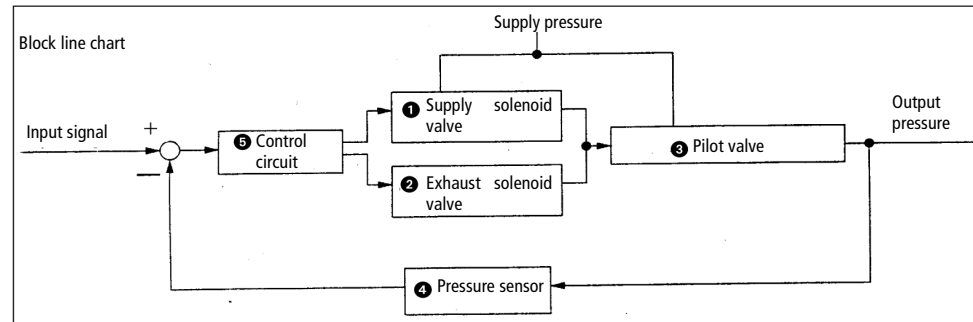
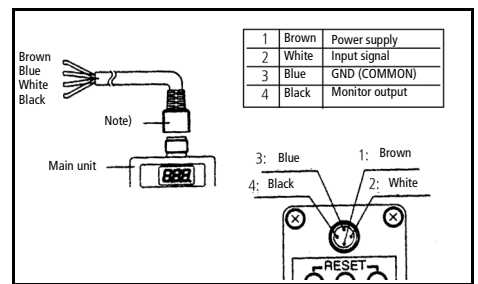


Fig 5

## CAUTION

### Wiring

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.



Note: The right angle type connector extends to the left side (over the supply port side)

## Wiring diagram

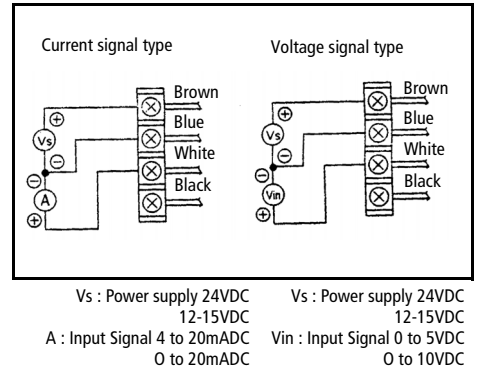


Fig 6

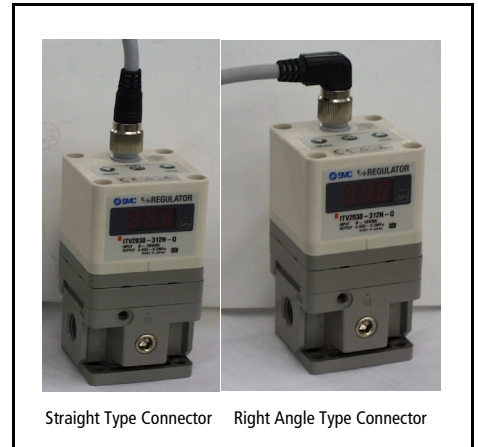


Fig 7

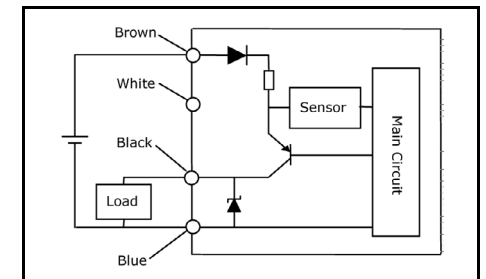
## Reset Function

Push 'Up' and 'Down' keys (Fig 1) together for longer than 3 seconds. Display shows 'RES'. Release keys to reset minimum pressure, maximum pressure and switch outputs P1 & P2 to start condition.

## CAUTION

- If the electrical supply fails, settings are 'held' for a short period.
- If the air pressure fails with power 'on' the solenoid will 'flutter'. Turn off the power.
- If the monitor output function is not used, ensure that the wire is totally insulated.

## PNP Circuit



Note: If the supply exceeds 30mA the sensor will output to the LED display and show 'Er 5'.

## CAUTION

- 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. All 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.
- Length of connector cable shall be 10m maximum.

When you enquire about the product, please contact the following

## SMC Corporation:

	Phone		Phone
AUSTRIA	(43) 2262-62 280	ITALY	(39) 02-92711
BELGIUM	(32) 3-355 1464	NETHERLANDS	(31) 20-531 8888
CZECH REP.	(420) 5-414 24611	NORWAY	(47) 67 12 90 20
DENMARK	(45) 70 25 29 00	POLAND	(48) 22-548 50 85
FINLAND	(358) 9-859 580	PORTUGAL	(351) 2-610 89 22
FRANCE	(33) 1-64 76 1000	SPAIN	(34) 945-18 4100
GERMANY	(49) 6103 4020	SWEDEN	(46) 8-603 0700
GREECE	(30) 1-342 6076	SWITZERLAND	(41) 52- 396 3131
HUNGARY	(36) 1-371 1343	TURKEY	(90) 212 221 1512
IRELAND	(353) 1-403 9000	UK	(44) 1908-56 3888

## Setting the Regulator

## CAUTION

As soon as the 'set' key is operated minimum/maximum pressure will be present at the outlet port.

## CAUTION

As soon as primary pressure is applied to the regulator minimum pressure will be present at the outlet port.

- Release 'Key Lock' as explained in section 'Function of Key-Lock'
- To set minimum pressure (display shows F-1) use up/down keys (Fig 1) and press 'Set' key (Fig 1) to 'Lock' setting.
- To set maximum pressure (display shows F-2) use up/down keys (Fig 1) and press 'Set' key (Fig 1) to 'Lock' setting.
- To set switch output 1 (display shows P-1) use up/down keys (Fig 1) and press 'Set' key (Fig 1) to 'Lock' setting.
- To set switch output 2 (display shows P-2) use up/down keys (Fig 1), and press 'Set' key (Fig 1) to 'Lock' setting.

**Note 1: If the above sequence has been followed correctly, the settings will complete automatically.**

**Note 2: If only setting minimum pressure, when pressure is 'Set', pressing the set button once more will 'skip' to the next step.**

## Function of Key-Lock

With input signal applied



The keys are locked after connecting power, and can not be operated.

'Loc' is indicated on Display (Fig 1) when any keys are pushed.

## 1. Key-Lock Release

- Push 'Down' key (Fig 1) for longer than 2 seconds.
- Display will flash 'Loc' (locked).
- Push 'Set' key (Fig 1) to unlock.

**Note: To cancel push 'Up' key (Fig 1).**

## 2. Key-Lock

- Push 'Up' key (Fig 1) for longer than 2 seconds.
- Display will flash 'unL' (unlocked).
- Push 'Set' key (Fig 1) to lock.

**Note: To cancel push 'Down' key (Fig 1).**

## Function of the 'Error' Display

If an abnormality is detected by the ITV2000 the LED display (Fig 1) will show 'Er' followed by a code number. Isolate the power supply and ascertain and solve the problem. Re-instate power supply after correcting fault.

Error codes are as follows:

Nº	Content	Display
1	Input Signal Outside Spec.	Er 1
2	EEPROM Reading/Writing Error	Er 2
3	Memory Reading/Writing Error	Er 3
4	Solenoid Valve Fault	Er 4
5	Switch Output Over-Current	Er 5