Installation and Maintenance Manual
Series ITV3000 Electro-Pneumatic Regulator

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

This manual should be read in conjunction with the current catologue.

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 ISO4414 (Note1), JIS B 8370 (Note2) 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

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 component 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. (Bleed air into the system gradually to create back-pressure, i.e. incorporate a soft-start valve).
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) 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.

⚠ CAUTION

Ensure that the air supply system is filtered to 5 micron.

Specifications

Model		ITV301 □	ITV303 □	ITV305 □
Max. Supply Pressure		0.2MPa	1.0MPa	
Min. Supply Pressure		Setting pressure +0.1MPa		
Setting Pressure Range		0.005 to 0.1MPa	0.005 to 0.5MPa	0.005 to 0.9MPa
Power Voltage		DC24V±10%, DC12~15V		
Input Signal	(Note 1) Current type	4-20mA, 0-20mA		
	Voltage type	0-5VDC, 0-10VDC		
Input Impedance	Current type	250Ω or less		
	Voltage type	Approximately 6.5kΩ		
(Note 2) Output Signal	Analog Output	1-5VDC		
	Switch Output	NPN Open connector output: 30V, 30mA (Max)		
		PNP Open connector output: 30mA (Max)		
Linearity		±1% or less (Full span)		
Hysteresis		0.5% or less (Full span)		
Repeatability		±0.5% or less (Full span)		
Flow characteristic		See Fig 7		
Output pressure indication (3-digit)	Accuracy	±3% or less (Full span)		
	Min. unit	MPa: 0.01, kgf/cm²: 0.01, bar: 0.01, PSI: 0.1 (Note 3), kPa: 1		
Ambient and fluid temperature		0-50°C (No dew condensation)		

Note 1: 2-wire 4~20mA DC and 0~20mA DC are not possible. Power voltage (24 VDC or 12~15VDC) is necessary.
Note 2: Either analog output or switch output can be selected. For switch output selection, either NPN output or PNP output can be selected
Note 3: For ITV305*, 1PSI is the minimum unit.

Fig 3

Operation Principal (Fig 4)

When the input signal increases, the supply solenoid valve ❶ turns on and the exhaust solenoid valve ❷ turns off. Supply pressure is passed to the pilot valve ❸ 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 ❹ will provide output pressure feedback to the control circuit ❺. The control circuit will balance the input signal and output pressure to ensure that the output pressure remains proportional to the input signal.

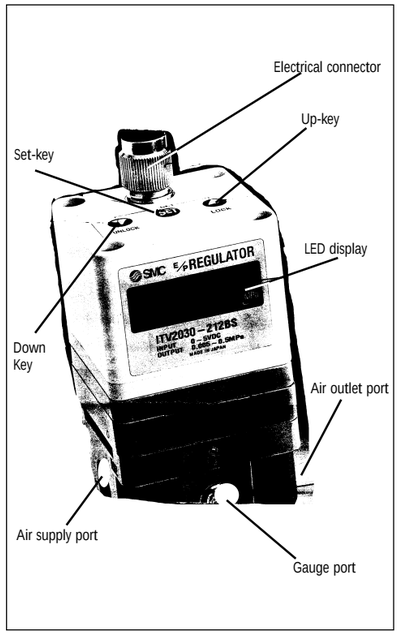


Fig 1

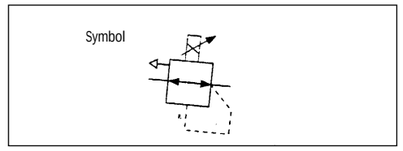


Fig 2

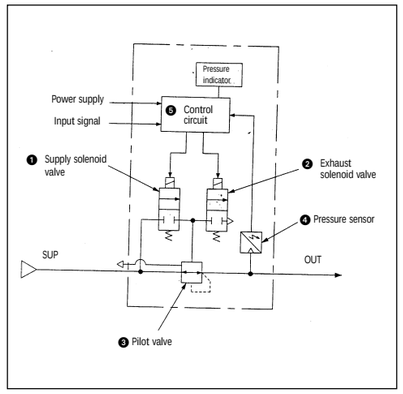


Fig 4

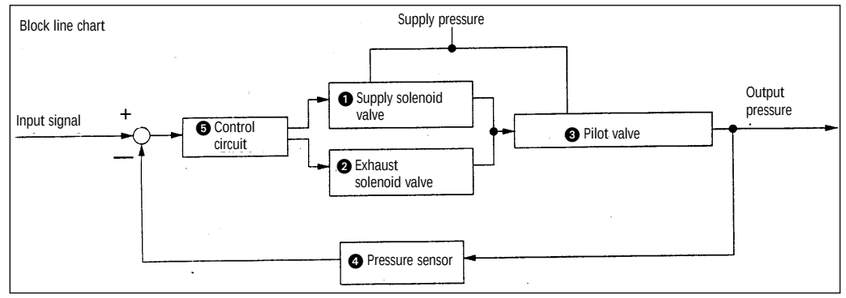
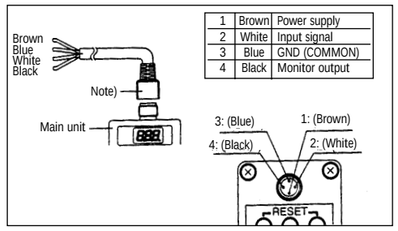


Fig 5

⚠ CAUTION

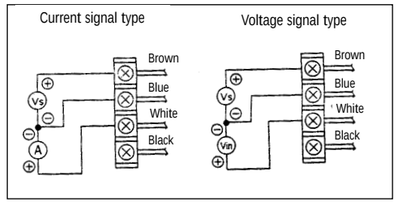
Wiring
Connect the cable to the connector on the main unit as shown in the following diagram. Take precautions as incorrect wiring will damage the unit. Use a DC power supply capable of supplying the necessary power requirements with minimal ripple.



1	Brown	Power supply
2	White	Input signal
3	Blue	GND (COMMON)
4	Black	Monitor output

Note: The right angle type connector extends to the left side (over the supply port side). Don't turn the connector to avoid breakage of connector pins

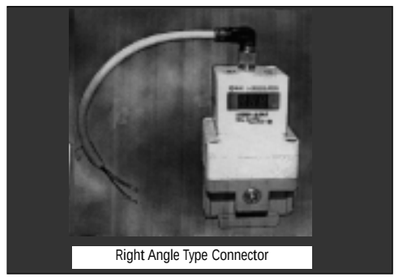
Wiring diagram



Vs: Power supply 24VDC 12~15VDC
A: Input Signal 4 to 20mADC 0 to 20mADC

Vs: Power supply 24VDC 12~15VDC
Vin: Input Signal 0 to 5VDC 0 to 10VDC

Fig 6



Right Angle Type Connector

Fig 7

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

Note 1: If the above sequence of events 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

a **Loc** b **unL**

∇ Push 'down' key (Fig 1) for longer than 2 seconds. Display (a) flashes 'loc'.
1. Push 'set' key (Fig 1) lock automatically releases.

Note: Push 'down' key (Fig 1) again to cancel operation.

2. Key Lock Release
1. Push down on 'un-lock' (Fig 1) key for longer than 2 seconds.
2. Key-lock will release.

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

3. To Lock
1. Push down on 'up' Δ (Fig 1) for longer than 2 seconds.
2. Led will flash 'unL' (un-lock).
3. 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 ITV3000, 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 the 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

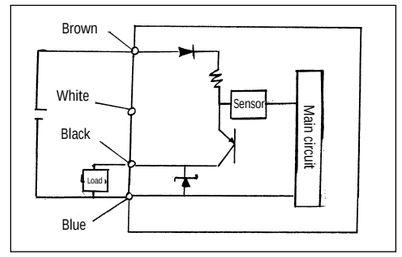
Reset Function

Push up and down keys (Fig 1) together for longer than 3 seconds. Display (Fig 1) shows 'RES'. Release keys, minimum, maximum pressures, switch outputs P1 and P2 are reset to start condition.

⚠ CAUTION

1. If the electrical supply fails, settings are 'held' for a short period.
2. If the air pressure fails with power 'on' the solenoid will 'flutter'. Turn off the power.
3. 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 (Fig 1) and show 'Er 5'.

⚠ CAUTIONS

1. This product (ITV3000) is pre-set at the factory and must not be dismantled by the user. Contact your local SMC office for advice.
2. Ensure, when installing this product, that it is kept clear of power lines to avoid noise interference.
3. Ensure that load surge protection is fitted when inductive loads are present (i.e. solenoid, relay etc.).
4. Ensure precautions are in place if the product is used in a 'free flow output' condition. All will continue to flow continuously.
5. Do not use a lubricator on the input side of this product. If lubrication is necessary, place the lubricator on the 'output' side.
6. Ensure all air is exhausted from the product before maintenance.

When you enquire about the product, please contact the following
SMC Corporation:

ENGLAND	Phone 01908-563888	**TURKEY**	Phone 212-2211512
ITALY	Phone 02-92711	**GERMANY**	Phone 6103-402-0
HOLLAND	Phone 020-5318888	**FRANCE**	Phone 01-64-76-10-00
SWITZERLAND	Phone 052-34-0022	**SWEDEN**	Phone 08-603 07 00
SPAIN	Phone 945-184100	**AUSTRIA**	Phone 02262-62-280
	Phone 902-255255	**IRELAND**	Phone 01-4501822
GREECE	Phone 01-3426076	**DENMARK**	Phone 8738-0800
FINLAND	Phone 09-68 10 21	**NORWAY**	Phone 67-12 90 20
BELGIUM	Phone 03-3551464	**POLAND**	Phone 48-22-6131847