



Installation and Maintenance Manual

Series ITV0000 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

1. The compatibility of pneumatic equipment is the responsibility of the person who designs the pneumatic system of 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 of 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 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 restarted, ensure all safety measures to prevent sudden movement of cylinders, etc. (Bleed air into the systems 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) 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.

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.

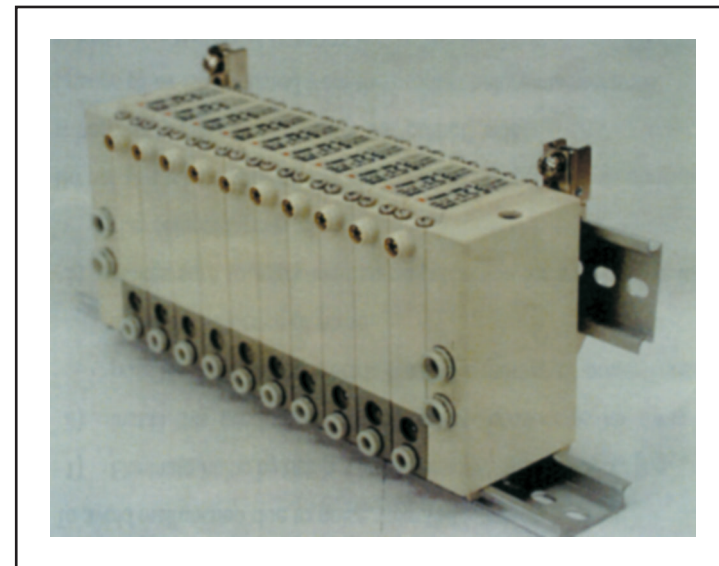


Fig. 1

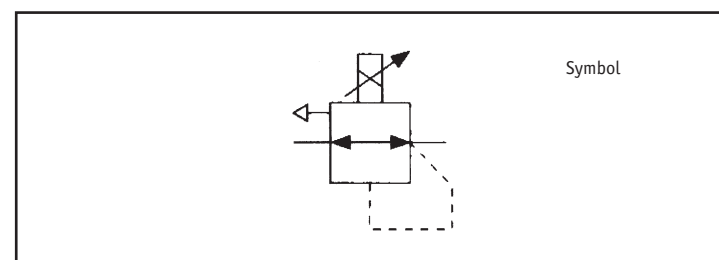


Fig. 2

Specifications

Table 1

Model	ITV001*	ITV003*	ITV005*	ITV009*
Max. Supply Pressure	0.2 MPa	1.0 MPa		-101 kPa
Setting Pressure Range	0.001 to 0.1 MPa	0.001 to 0.5 MPa	0.001 to 0.9 MPa	-1 to -100 kPa
Power Supply	24 V DC \pm 10 %, 12 to 15 V DC			
Current Consumption	Supply Voltage 24VDC Type	0.12A or less		
	Supply Voltage 12 VDC Type	0.18A or less		
Input Impedance	Current Type	250 Ω		
	Voltage Type	10 k Ω		
Output Signal	Analogue Output 1 to 5VDC (Load Impedance 1 k Ω or more)			
Max. Flow Rate	3.5 */m (ANR)	6.0 */m (ANR)	6.0 */m (ANR)	2.0 */m (ANR)
	@ SUP. 0.2 MPa	@ SUP. 0.6 MPa	@ SUP. 0.6 MPa	@ SUP. -101 kPa
Linearity	\pm 1 % F.S. or less			
Hysteresis	0.5 % F.S. or less			
Repeatability	\pm 0.5% F.S. or less			
Sensitivity	0.2% F.S. or less			
Temperature Characteristics	\pm 0.12% F.S. or less / $^{\circ}$ C			
Ambient Temperature	0 to 50 $^{\circ}$ C (Without condensation)			
Enclosure	Equivalent to IP65			
Mass	100g or less (Without option)			

Operating Principal (Fig. 3, 4)

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 port through the supply solenoid valve. The pressure sensor ③ will provide output pressure feedback to the control circuit ④. The control circuit will balance the input signal and output pressure to ensure that the output pressure remains proportional to the input signal.

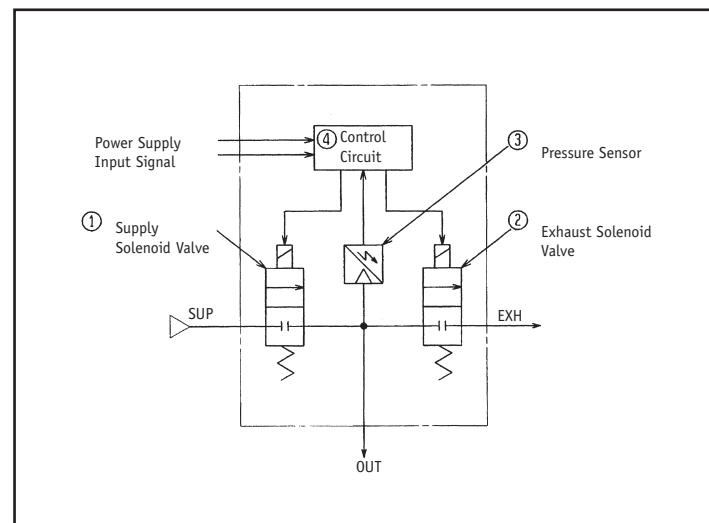


Fig. 3

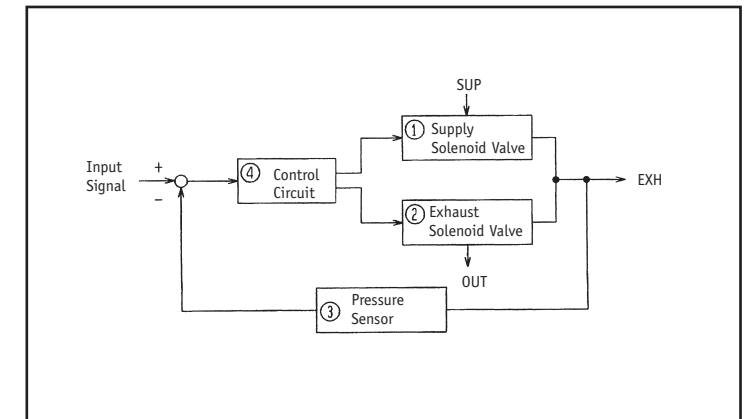


Fig. 4

Wiring

Wiring method

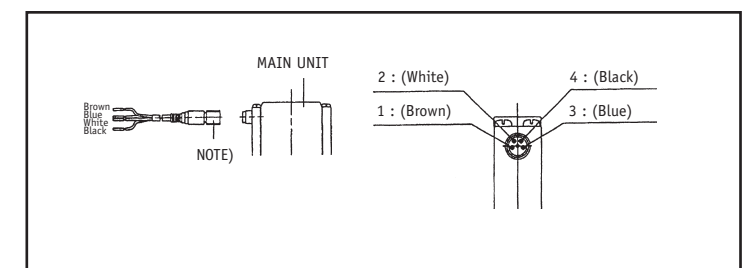


Fig. 5

Note) Do not turn the connector to avoid breakage of connector pins.

Table 2

Number	Colour	Contents
1	Brown	Power Supply
2	White	Input Signal
3	Blue	GND (COMMON)
4	Black	Output Signal

Wiring diagram

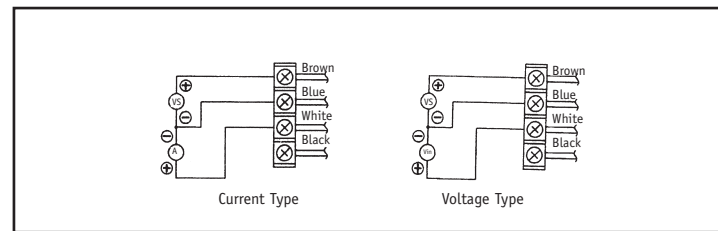


Fig. 6

Vs :Power Supply	24 V DC \pm 10 % (ITV00*0-****) 12 to 15 V DC (ITV00*1-****)
A :Input Signal	4 to 20 mA (ITV00**0****) 0 to 20 mA (ITV00**1****)
Vin:Input Signal	to 5 V DC (ITV00**-2****) 0 to 10 V DC (ITV00**-3****)

Output Signal

Monitor output voltages are as follows. Connect a measure instrument whose load impedance is 1 k Ω or more. When the output voltage is amplified for use, consider load impedance of 1 k Ω to design.

Table 3

Model	Output Pressure	Output Voltage (Note)
ITV001*	0.001 to 0.1 MPa	1 to 5 V DC
ITV003*	0.001 to 0.5 MPa	
ITV005*	0.001 to 0.9 MPa	
ITV009*	-1 to -100 kPa	

Note) Take care that the output voltage slightly fluctuates depending on characteristics of a built-in pressure sensor, a connected measure instrument and load impedance of electric circuit.

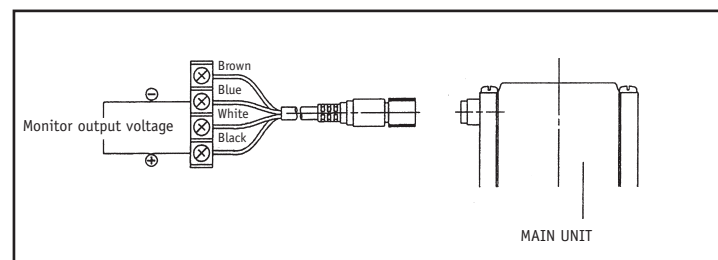


Fig. 7

Error indicating function

If input signal out of rated range is given, LED blinks.

To release error, turn off power supply temporarily and confirm given input.

Cautions

- When the power supply is turned off due to power supply failure under operation, the output pressure is retained

temporarily. Take care that the air keeps flowing out when the output pressure is open to atmosphere.

- If supply pressure is stopped while the power supply is turned on, the built-in solenoid valve will continue to operate generating beating noise. Turn off the power supply to stop operation.
- When the output signal is not used, take care not to contact other cables as it may cause incorrect operation.
- This product is adjusted according to the specifications before shipping from the factory. Avoid careless disassembling and removing each part as it may cause malfunction.
- To avoid malfunction due to the noise, take the following precautions:
 - Eliminate noise by using a line filter on AC power supply line.
 - Install this product and wiring to this product as far away as possible from strong electric fields like motors or power lines to avoid the influence of noise.
 - Make sure to apply load surge protection for an inductive load (i.e. solenoid, relay, etc.).
- Do not use a lubricator on the input side of this product. If lubrication is necessary, place the lubricator on "output" side.
- Ensure all air is exhausted from the product before maintenance.
- Special care for use of ITV009*
 - Connect vacuum pump to "VAC" port.
 - On adjustment of pressure, increasing input signal makes change from atmosphere to vacuum, and decreasing input signal makes change from vacuum to atmosphere.
 - ITV009* can use only negative pressure, so take care not to give positive pressure by mistake.
 - If capacity of vacuum ejector is relatively small or inside diameter of piping material is small, variation of setting pressure (degree of pressure variation when the condition is changed with flow or without flow) may become large. In this case, change vacuum ejector or piping material. And when such a change is impossible, add volume tank to the product. (Volume of the tank is depending on operating condition.)
 - After input signal is changed, response time of vacuum pressure is influenced by content volume (including piping) on setting side. And capacity of vacuum ejector also influences response time. For using this product, keep in mind these points enough.

When you enquire about the product, please contact the following.

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S P A I N	+34 - 45 18 41 00 (-902 25 52 55)
S W E D E N	+30 - 1 34 26 076
G R E E C E	+358 - 9 68 10 21
F I N L A N D	+32 - 3 35 51 464
B E L G I U M	+90 - 212 22 11 512
T U R K E Y	+49 - 31 03 40 20
G E R M A N Y	+33 - 1 64 76 10 00
F R A N C E	08 - 60 30 700
S W E D E N	+43 - 22 62 62 280
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P O L A N D	

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