

Compact Electro-pneumatic Regulator Series ITV0000



Compact and lightweight electro-pneumatic regulator

100 Compact 15mm With a simplified high-density circuit board design, an extremely Lightweight 100g compact size has been achieved.

Compact Elctro-pneumatic Regulator Series ITVOOOO

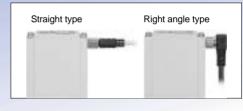


Realizes space savings and reduction of weight for manifold use

Stations can easily be increased or decreased due to DIN rail mount design.

Cable connectors

Straight type and right angle type are available.



Built-in One-touch fitting With error indication LED

Brackets

Flat and L brackets are available.

Model	Pressure range	Power supply voltage	Input signal	Output signal	Option
ITV001	0.1MPa		4 to 20mA		Cable connectors Straight type
ITV003	0.5MPa	24VDC	0 to 20mA	Analog output	Right angle type
ITV005	0.9MPa	12VDC	0 to 5VDC	1 to 5V	Brackets Flat bracket
ITV009	-100kPa		0 to 10VDC		L bracket

Equivalent to IP65

• Linearity within ±1% (full span)

- Hysteresis 0.5% (full span)
- Repeatability ±0.5% (full span)
- High-speed response time 0.1sec (without load)



Air filter

(5 µm or less)

Flat bracket

High stability

IR---

(Precision regulator)

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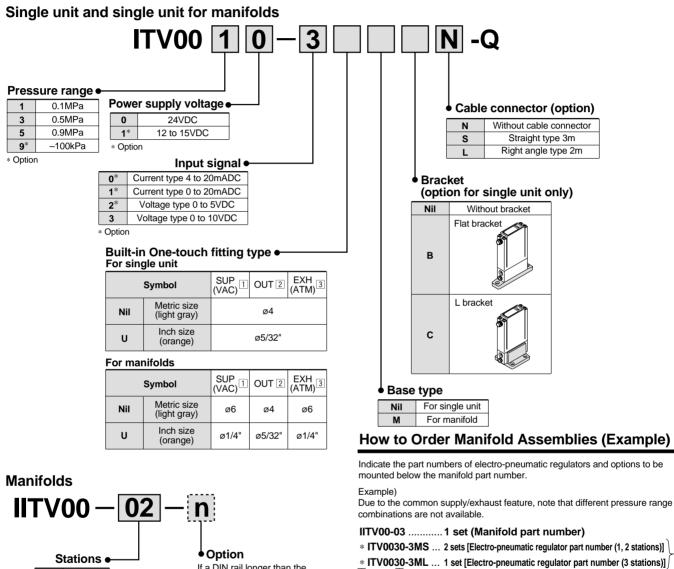
Stable pressure control is possible even when a metal cylinder is used. ITV (Electro-pneumatic regulator) Mist separator (0.01 um or less) (0.3 um or more)



SMC

Compact Electro-pneumatic Regulator Series ITV0000

How to Order



勿 SMC

02 2 stations 3 stations 03 10 10 stations

If a DIN rail longer than the specified stations is required, specify the applicable stations in two digits. (Maximum10 stations) Example) IITV00-05-07

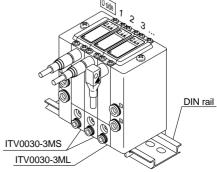
- Note) A DIN rail with the length specified by the number of stations is attached to the manifold. For dimensions of the DIN rail, refer to page 8
- different pressure range combinations are not available. The asterisk (*) specifies mounting. Add an astarisk (*) at the beginning of electro-pneumatic regulator part

Indicate part numbers in order starting from the first

numbers to be mounted.

Note: Due to the common supply/exhaust feature,

station on the D side.



Specifications



Model		ITV001			ITV009	
Minimum supply	oressure		pressure + 0.1N	Set pressure -1kPa		
Maximum supply		0.2MPa	1.0MPa		-101kPa	
Set pressure rang	•	0.001 to 0.1MPa	0.001 to 0.5MPa	0.001 to 0.9MPa	-1 to -100kPa	
		3.5 / min (ANR)	6/min (ANR)	6/min (ANR)	2 min (ANR)	
Maximum flow rat	e	(Supply pressure:	(Supply pressure:	(Supply pressure:		
		0.2MPa)	0.6MPa)	0.6MPa)	-101kPa)	
	Voltage		24VDC ±10%	, 12 to 15VDC		
Power supply	Current	Power su	pply voltage 24	VDC type: 0.12	2A or less	
	consumption		ly voltage 12 to			
Input signal Voltage type Current type			0 to 5VDC,	0 to 10VDC		
		4 to 20mADC, 0 to 20mADC				
Input impedance Voltage type		Approx. 10kΩ				
input impedance	Current type	Approx. 250kΩ				
		1 to 5 VDC (Load impedance: $1k\Omega$ or more)				
Output signal	Analog output	Output accuracy: Within \pm 6% (full span)				
Linearity		Within ±1% (full span)				
Hysteresis		Within ±0.5% (full span)				
Repeatability		Within ±0.5% (full span)				
Sensitivity		Within 0.2% (full span)				
Temperature char	acteristics	Within ±0.12% (full span)/°C				
Operating temper	ature range	0 to 50°C (with no condensation)				
Enclosure		Equivalent to IP65*				
Connection type		Built-in One-touch fitting				
	For single unit	Metric size		1,2,3:ø4		
Connection size	For single unit	Inch size	Inch size 1, 2, 3: ø5/32"			
Somection SIZE	Manifold	Metric size	1, 3: ø6, 2: ø4			
		Inch size 1, 3: ø1/4", 2: ø5/32"				
Weight Note 1)		100g or less (without options)				

Note 1) Indicates the weight of a single unit.

For IITV00-n

Total weight (g) \leq Stations (n) x 100 + 130 (Weight of end block A, B assembly) + Weight (g) of DIN rail Note 2) Specifications other than the following are optional.

Pressure range: 0.1MPa, 0.5MPa, 0.9MPa, Power supply voltage: 24VDC, Input signal: 0 to 10VDC Note 3) When there is a downstream flow consumption, pressure may become unstable depending on piping

conditions. * When used under conditions equivalent to IP65, use the regulator after piping a fitting/tube to the breathing hole. (For details, refer to "Specific Product Precautions 1" on page 11.)

Accessories (Optional)

Bracket

Flat bracket assembly P39800022



L bracket assembly P39800023



Cable connector



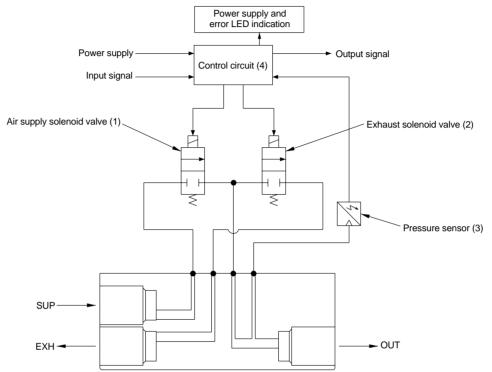
Right angle type ELWIKA-KV4408 PVC025 2M



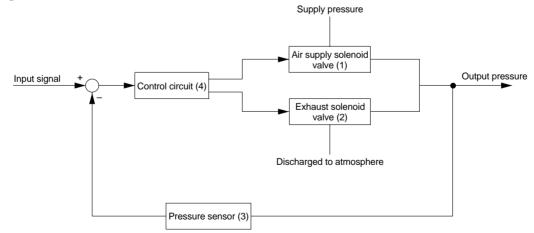
Working Principle

When the input signal rises, the air supply solenoid valve (1) turns ON. Due to this, part of the supply pressure passes through the air supply solenoid valve (1) and changes to output pressure. This output pressure feeds back to the control circuit (4) via the pressure sensor (3). Here, pressure corrections continue until output pressure becomes proportional to the input signal, enabling output pressure that is proportional to the input signal.

Working principle diagram



Block diagram

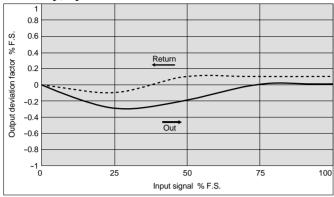


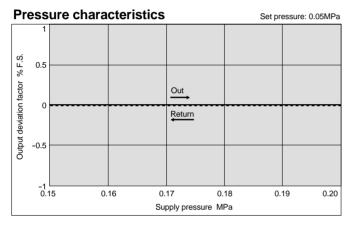
Compact Electro-pneumatic Regulator

Series ITV0000

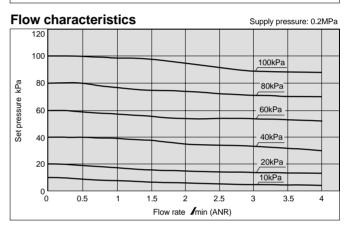
Series ITV001

Linearity, hysteresis



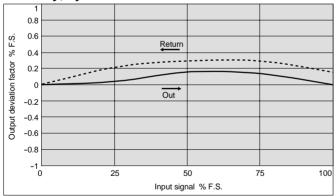


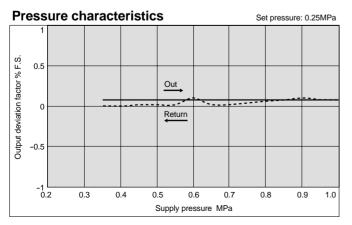
Repeatability With 50% of signal input

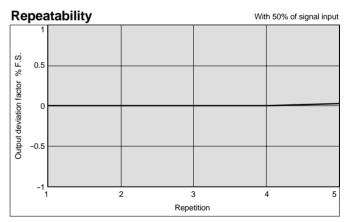


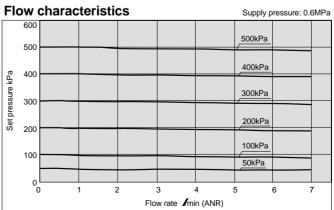
Series ITV003

Linearity, hysteresis





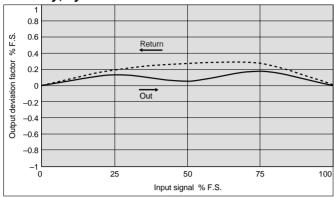


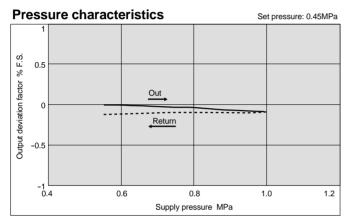




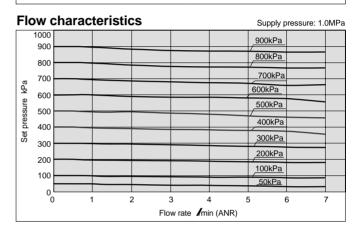
Series ITV005

Linearity, hysteresis



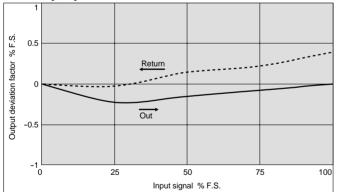


Repeatability With 50% of signal input

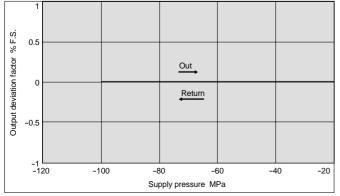


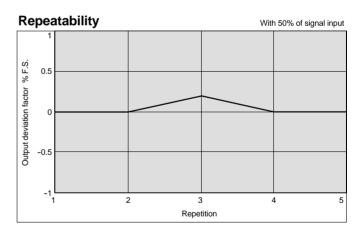
Series ITV009

Linearity, hysteresis

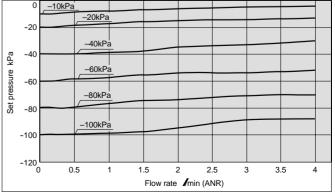


Pressure characteristics



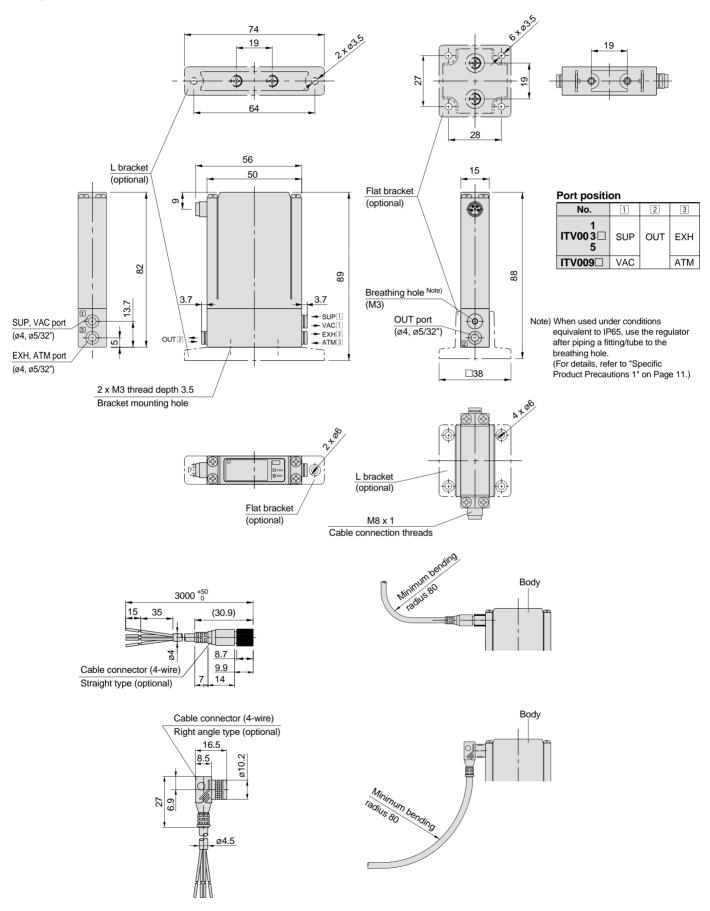






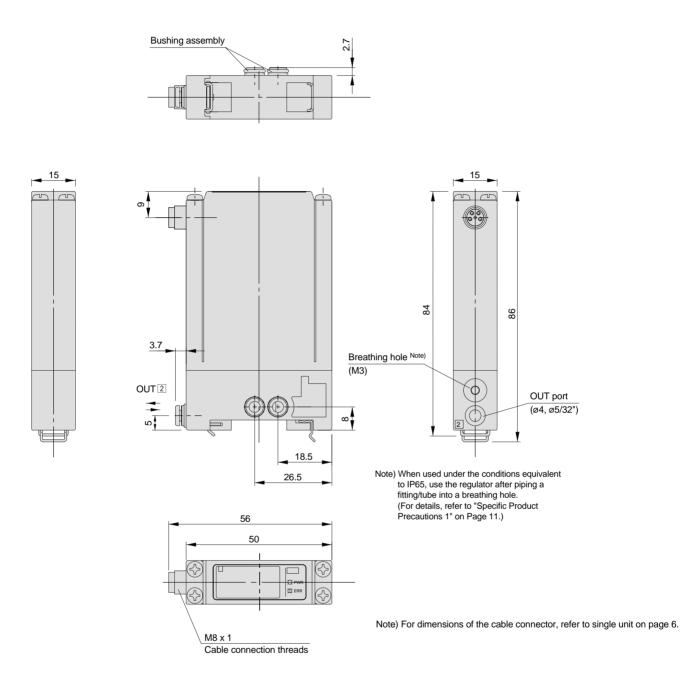
Dimensions

Single unit

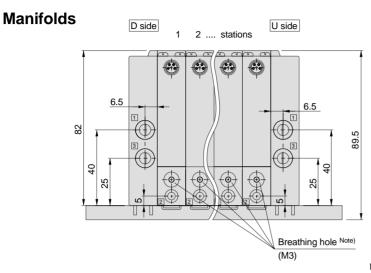


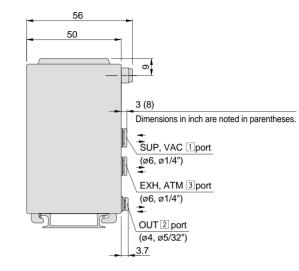
Dimensions

Single unit for manifolds

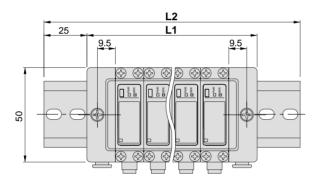


Dimensions





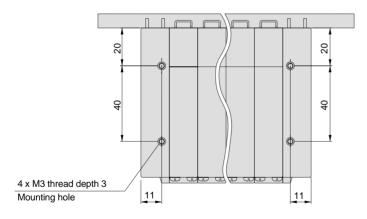
Note) For dimensions of the cable connector, refer to single unit on page 6.



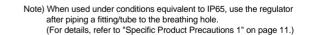
Port	position
	position

No.	1	2	3
1 ITV003□ 5	SUP	OUT	EXH
ITV009	VAC		ATM

Note) Stations are counted starting from the D side.



									(mm)
Manifold stations n	2	3	4	5	6	7	8	9	10
L1	60	75	90	105	120	135	150	165	180
L2	110.5	123	148	160.5	173	185.5	198	223	235.5





DIN Rail options*

If a rail longer than number of requested

stations is needed, please indicate here the

number of total stations which the rail needs to contain (maximum 10) Ex. IITV00-05-07

ITV0000 Series

SNC

MANIFOLD REQUEST SHEET

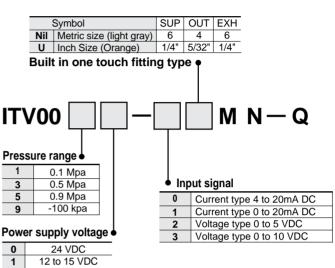
Manifold Identification



ITV00: Customer name

Request number	
Date	
Contact person	
Quantity	
Delivery date	

MEMO How to order single units for manifolds



2 Type of pneumatic port

Metriz size fittings X

IITV00 -

02

03

10

Number of stations •

2 stations

3 stations

10 stations

Inches size fittings

Metric size is standard; if you need inch size, please mark with an "X" the check box.

3 Cable options

No cable	-				
Straight (3m)	M8-4DSX3MG4				
Right angle 2m	ELWIKA-KV4408 PVC025 2M				
* Please cross the "No cable" check box or indicate					

(*)

the number of conne eed in correspondence of each type

4 Manifold definition

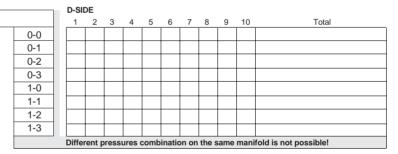
Define the needed stations putting a X or a O in the template below

Part number

Please indicate here the

pressure range of the modules you require in the manifold.

IITV00



Cable options

Straight

Right angle

The part below is for SMC use only! -

Metric size				
Part no.	Qty.	Part no.	Qty.	
ITV0010-0MN-Q		ITV0050-0MN-Q		
ITV0010-1MN-Q		ITV0050-1MN-Q		
ITV0010-2MN-Q		ITV0050-2MN-Q		
ITV0010-3MN-Q		ITV0050-3MN-Q		
ITV0011-0MN-Q		ITV0051-0MN-Q		
ITV0011-1MN-Q		ITV0051-1MN-Q		
ITV0011-2MN-Q		ITV0051-2MN-Q		
ITV0011-3MN-Q		ITV0051-3MN-Q		
Total		Total		
ITV0030-0MN-Q		ITV0090-0MN-Q		
ITV0030-1MN-Q		ITV0090-1MN-Q		
ITV0030-2MN-Q		ITV0090-2MN-Q		
ITV0030-3MN-Q		ITV0090-3MN-Q		
ITV0031-0MN-Q		ITV0091-0MN-Q		
ITV0031-1MN-Q		ITV0091-1MN-Q		
ITV0031-2MN-Q		ITV0091-2MN-Q		
ITV0031-3MN-Q		ITV0091-3MN-Q		
Total		Total		
Accesories	Part number	Qty.		

Part no.	Qty.	Part no.	Qty.
ITV0010-0UMN-Q		ITV0050-0UMN-Q	
ITV0010-1UMN-Q		ITV0050-1UMN-Q	
ITV0010-2UMN-Q		ITV0050-2UMN-Q	
ITV0010-3UMN-Q		ITV0050-3UMN-Q	
ITV0011-0UMN-Q		ITV0051-0UMN-Q	
ITV0011-1UMN-Q		ITV0051-1UMN-Q	
ITV0011-2UMN-Q		ITV0051-2UMN-Q	
ITV0011-3UMN-Q		ITV0051-3UMN-Q	
Total		Total	
ITV0030-0UMN-Q		ITV0090-0UMN-Q	
ITV0030-1UMN-Q		ITV0090-1UMN-Q	
ITV0030-2UMN-Q		ITV0090-2UMN-Q	
ITV0030-3UMN-Q		ITV0090-3UMN-Q	
ITV0031-0UMN-Q		ITV0091-0UMN-Q	
ITV0031-1UMN-Q		ITV0091-1UMN-Q	
ITV0031-2UMN-Q		ITV0091-2UMN-Q	
ITV0031-3UMN-Q		ITV0091-3UMN-Q	
Total		Total	

Part number

M8-4DSX3MG4 ELWIKA-KV4408 PVC025 2M Qty.

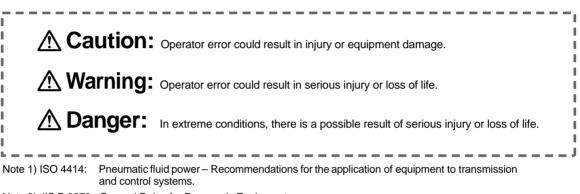
Inch size

Accesories	Part number	Qty.
D SIDE End plate	P39800025-1	1
U SIDE End plate	P39800024-1	1

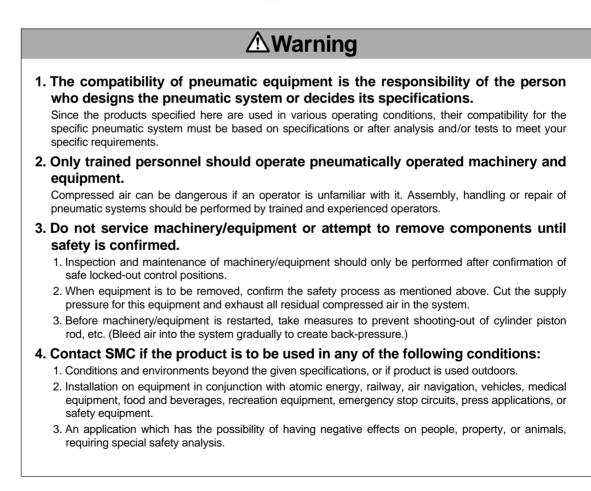


Series ITV0000 Safety Instructions

These safety instructions are intended to prevent a hazardous situation and/or equipment damage. These instructions indicate the level of potential hazard by labels 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 2) JIS B 8370: General Rules for Pneumatic Equipment



Electro-pneumatic Regulator Precautions

Be sure to read before handling.

Piping

≜Caution

1. Preparation before piping

Before piping, air blow (flush) or wash thoroughly to remove chips, cutting oil and other impurities from inside the piping.

2. Wrapping of sealant tape

When connecting pipes and fittings, etc., be sure that chips from the pipe threads and sealing material do not get inside the regulator.

Further, when sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Operating Environment

AWarning

- 1. Do not operate in locations with an atmosphere of corrosive gases, chemicals, sea water, water or steam, or where the same substances will adhere to the regulator.
- 2. Do not operate in locations where vibration or impact occurs.
- 3. In locations under direct sunlight, provide a protective cover, etc.
- 4. In locations near heat sources, block off the radiated heat.
- 5. In locations where water, lubricant or spatter from welding, etc. will adhere to the regulator, implement suitable protective

Air Supply

AWarning

- 1. This regulator is designed for use with compressed air. Contact SMC if any other fluid will be used.
- 2. Do not use compressed air that includes chemicals, synthetic fluids containing organic solvents, salinity, or corrosive gases, since this can cause malfunction.

Handling of One-touch Fittings

- 1. Tube attachment/detachment for One-touch fittings
 - 1) Attaching a tube
 - Take a tube having no flaws on its periphery and cut it off at a right angle. When cutting the tube, use tube cutter TK-1, 2 or 3. Do not use pliers, nippers or scissors, etc. If cutting is done with tools other than tube cutters, the tube may be cut diagonally or become flattened, etc. This can make a secure installation impossible and cause problems such as the tube coming loose after installation or air leakage. Allow some extra length in the tube.
 - 2. Hold the tube and push it in slowly, inserting it all the way into the fitting.
 - After inserting the tube, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, this can cause problems such as air leakage or the tube pulling out.
 - 2) Detaching a tube
 - 1. Push in the release button sufficiently. When doing this, push the collar evenly.
 - Pull out the tube while holding down the release button so that it does not snap back. If the release button is not pressed down sufficiently, there will be increased bite on the tube and it will become more difficult to detach it.
 - 3. When using the removed tube again, cut off the portion which has been chewed before reusing it. If the chewed portion of the tube is used as is, this can cause problems such as air leakage or difficulty in removing the tube.
- **2.** When mounting a One-touch fitting, use a suitable wrench to tighten the hexagonal flats of the fitting.

Moreover, position the wrench at the lower part of the hexagonal flats as close to the threads as possible. When a wrench of the proper size for the hexagonal flats is not used, it will damage the hexagonal flats.

- 3. Tightening of M3, M5, and M6 connection threads
 - 1) M3

After tightening by hand, tighten an additional 1/4 rotation with the correct tool.

- 2) M5 and M6
 - After tightening by hand, tighten an additional 1/6 rotation with the correct tool.

Overtightening can cause damage to the threads and/or air leakage due to deformation of the gasket. Undertightening can cause loose threads and air leakage, etc.

Precautions on Tube by Other Manufacturers

∆Caution

- 1. When using tubes by manufacturers other than SMC, confirm that the tube's outside diameter tolerance satisfy the following specifications.
 - 1) Nylon tubing: ±0.1mm or less
 - 2) Soft nylon tubing: ±0.1mm or less
 - 3) Polyurethane tubing: +0.15mm or less,

-0.2mm or less

Do not use a tube if the outside diameter tolerance is not satisfied. It may not be possible to connect the tubing, or leakage or disconnection may occur after connecting.





Series ITV0000 **Specific Product Precautions 1**

Be sure to read before handling.

Refer to pages 9 and 10 for safety instructions and precautions.

Air Supply

A Caution

- 1. Install an air filter near this product on the supply side. Select a filtration degree of 5µm or less.
- 2. Compressed air containing a large amount of drainage can cause malfunction of this product and other pneumatic equipment. As a countermeasure, install an after-cooler, air dryer or water separator, etc.
- 3. If large amounts of carbon dust are generated by the compressor, it can accumulate inside this product and cause a malfunction.

For details on the above compressed air quality, refer to SMC's "Air Cleaning Equipment" catalog.

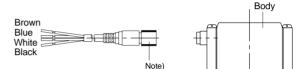
Wiring

∧ Caution

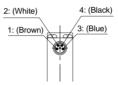
1. Connect the cable to the connector on the body with the wiring arranged as shown below. Proceed carefully, as incorrect wiring can cause damage.

Furthermore, use DC power at the correct rating and with a low ripple.

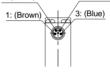
Not



Terminal no.	1	2	3	4
Lead wire colour	Brown	White	Blue	Black
Wiring	Power supply	Signal	COM	Monitor



I	
e)	right angle type is also
	vailable. The entry direction
	or the right angle type
	onnector is downward (OUT
	ort side). Never turn the
	onnector as it is not
	esigned to turn. If turned
	orcibly, it will damage the



Wiring diagram Current signal type Brown



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

Voltage signal type Brown

connector port.

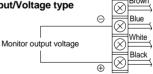
	\sim	
\oplus	\otimes	Blue
	\otimes	Blue
Ÿ	S	White
	\otimes	
۹	~	Black
(Vin)	\otimes	
Ð	<u> </u>	

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

Brown

Monitor output wiring diagram

Analog output/Voltage type





Series ITV0000 Specific Product Precautions 2

Be sure to read before handling.

Refer to pages 9 and 10 for safety instructions and precautions.

Handling

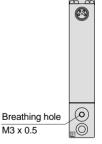
∆Caution

- 1. Do not use a lubricator on the supply side of this product, as this can cause a malfunction. When lubrication of terminal equipment is necessary, connect a lubricator on the output side of this regulator.
- 2. If electric power is shut off while pressure is being applied, output pressure will be maintained.

However, this output pressure is held only temporarily and is not guaranteed. If exhausting of this pressure is desired, shut off the power after reducing the set pressure, and discharge the air using a residual pressure exhaust valve, etc.

- 3. If power supply to this regulator is cut off due to a power failure, etc., when it is in a regulated state, output pressure will be maintained temporarily. Handle carefully when operating with output pressure released to the atmosphere, as air will continue to flow out until reaching atmospheric pressure.
- 4. If supply pressure to this regulator is interrupted while the power is still on, the internal solenoid valve will continue to operate and a humming noise may be generated. Since the life of the solenoid valve may be shortened by this, be sure to shut off the power supply when supply pressure is shut off.
- 5. This product is adjusted for each specification at the time of shipment from the factory. Avoid unneccessary disassembly or removal of parts, as this can lead to a malfunction.

- 6. The optional cable connector is a 4 wire type. When the monitor output (analog output) is not being used, keep the monitor output wire (black) from touching the other wires as this can cause a malfunction.
- 7. Be aware that the right angle cable does not rotate and is limited to only one entry direction.
- 8. Take the following steps to avoid malfunction caused by noise.
 - 1) Remove power supply noise during operation by installing a line filter, etc., in the AC power line.
 - Install this product and its wiring as far as possible from strong electric fields such as those of motors and power lines, etc.
 - 3) Be sure to implement protective measures against load surge for induction loads (solenoid valves, relays, etc.).
- 9. Characteristics are limited only to the static state, and when air is consumed on the output side, pressure may fluctuate.
- 10. For details on the handling of this product, refer to the instruction manual included with the product.
- 11. In locations where the body is exposed to water, dust, etc., there is a possibility that they can enter into the body through the breathing hole.





EUROPEAN SUBSIDIARIES:



Austria

SMC Pneumatik GmbH (Austria). Girakstrasse 8, A-2100 Korneuburg Phone: +43 2262-62280, Fax: +43 2262-62285 E-mail: office@smc.at http://www.smc.at



Belgium SMC Pneumatics N.V./S.A. Nijverheidsstraat 20, B-2160 Wommelgem

Phone: 03-355-1464, Fax: 03-355-1466 E-mail: post@smcpneumatics.be



Czech Republic SMC Industrial Automation CZ s.r.o. Hudcova 78a, CZ-61200 Brno Phone: +420 5 414 24611, Fax: +420 5 412 18034 E-mail: office@smc.cz http://www.smc.cz



Denmark

SMC Pneumatik A/S Knudsminde 4B, DK-8300 Odder Phone: (45)70252900, Fax: (45)70252901 E-mail: smc@smc-pneumatik.dk

Estonia SMC Pneumatics Estonia OÜ Laki 12-101, 106 21 Tallinn Phone: 06 593540. Fax: 06 593541 http://www.smcpneumatics.ee



SMC Pneumatics Finland OY PL72, Tiistinniityntie 4, SF-02031 ESPOO Phone: 09-859 580, Fax: 09-8595 8595 http://www.smcfitec.sci.fi



SMC Pneumatique, S.A 1, Boulevard de Strasbourg, Parc Gustave Eiffel Bussy Saint Georges F-77607 Marne La Vallee Cedex 3 Phone: 01-6476 1000, Fax: 01-6476 1010 http://www.smc-france.fr



SMC Pneumatik GmbH Boschring 13-15, D-63329 Egelsbach Phone: 06103-4020, Fax: 06103-402139 E-mail: info@smc-pneumatik.de



Greece S. Parianopoulus S.A 7, Konstantinoupoleos Street, GR-11855 Athens Phone: 01-3426076, Fax: 01-3455578



Hungary SMC Hungary Ipari Automatizálási Kft. Budafoki ut 107-113, H-1117 Budapest Phone: +36 1 371 1343, Fax: +36 1 371 1344 E-mail: office@smc-automation.hu http://www.smc-automation.hu



SMC Pneumatics (Ireland) Ltd. 2002 Citywest Business Campus, Naas Road, Saggart, Co. Dublin Phone: 01-403 9000, Fax: 01-464-0500



Italy SMC Italia S.p.A Via Garibaldi 62, I-20061Carugate, (Milano) Phone: 02-92711, Fax: 02-9271365 E-mail: mailbox@smcitalia.it



SMC Pneumatics Latvia SIA Smerla 1-705, Riga LV-1006, Latvia Phone: 0777-94-74, Fax: 0777-94-75

Latvia



UAB Ottensten Lietuva Savanoriu pr. 180, LT-2600 Vilnius, Lithuania Phone/Fax: 370-2651602

Netherlands

SMC Pneumatics BV De Ruyterkade 120, NL-1011 AB Amsterdam Phone: 020-5318888, Fax: 020-5318880 E-mail: info@smcpneumatics.nl



SMC Pneumatics Norway A/S Vollsveien 13 C, Granfos Næringspark N-1366 Lvsaker Tel: (47) 67 12 90 20, Fax: (47) 67 12 90 21 http://www.smc-norge.no

Norway



SMC Industrial Automation Polska Sp.z.o.o. ul. Konstruktorska 11A, PL-02-673 Warszawa, Phone: +48 22 548 5085, Fax: +48 22 548 5087 E-mail: office@smc.pl http://www.smc.pl



Portugal SMC Sucursal Portugal, S.A. Rua de Eng^o Ferreira Días 452, 4100-246 Porto Phone: 22-610-89-22, Fax: 22-610-89-36 E-mail: postpt@smc.smces.es

Romania

SMC Romania srl Vasile Stroescu 19, Sector 2, Bucharest Phone: 01-3205111, Fax: 01-3261489 E-mail: smccadm@canad.ro http://www.smcromania.ro



SMC Pneumatik LLC. 36/40 Sredny pr. St. Petersburg 199004 Phone.:(812) 118 5445, Fax:(812) 118 5449 E-mail: smcfa@peterlink.ru http://www.smc-pneumatik.ru



Slovakia SMC Priemyselná Automatizáciá, s.r.o. Námestie Martina Benku 10 SK-81107 Bratislava Phone: +421 2 444 56725, Fax: +421 2 444 56028 E-mail: office@smc.sk http://www.smc.sk



Slovenia SMC industrijska Avtomatika d.o.o. Grajski trg 15, SLO-8360 Zuzemberk Phone: +386 738 85240 Fax: +386 738 85249 E-mail: office@smc-ind-avtom.si http://www.smc-ind-avtom.si



Spain SMC España, S.A. Zuazobidea 14 01015 Vitoria Phone: 945-184 100, Fax: 945-184 124 E-mail: post@smc.smces.es



Sweden SMC Pneumatics Sweden AB Ekhagsvägen 29-31, S-141 71 Huddinge Phone: 08-603 07 00, Fax: 08-603 07 10 http://www.smc.nu



Switzerland SMC Pneumatik AG Dorfstrasse 7, CH-8484 Weisslingen Phone: 052-396-3131, Fax: 052-396-3191 E-mail: info@smc.ch http://www.smc.ch



Entek Pnömatik San. ve Tic Ltd. Sti. Perpa Tic. Merkezi Kat: 11 No: 1625, TR-80270 Okmeydani Istanbul Phone: 0212-221-1512, Fax: 0212-221-1519 http://www.entek.com.tr



SMC Pneumatics (UK) Ltd Vincent Avenue, Crownhill, Milton Keynes, MK8 0AN Phone: 0800 1382930 Fax: 01908-555064 E-mail: sales@pneumatics.co.uk http://www.smcpneumatics.co.uk



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