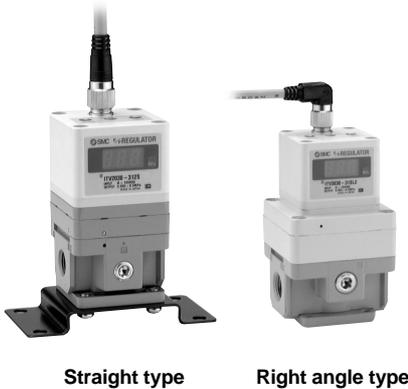




# Electro-Pneumatic Regulator Series *ITV2000/3000*

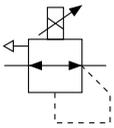
## Standard Specifications



Straight type

Right angle type

### Symbol



Model	ITV201□	ITV203□	ITV205□
	ITV301□	ITV303□	ITV305□
Minimum supply pressure	Set pressure +0.1MPa		
Maximum supply pressure	0.2MPa	1.0MPa	
Regulating pressure range	0.005 to 0.1MPa	0.005 to 0.5MPa	0.005 to 0.9MPa
Power supply	Voltage	24V DC ±10%, 12 to 15V DC	
	Current consumption	Power supply voltage 24V DC type: 0.12A or less Power supply voltage 12 to 15V DC type: 0.18A or less	
Input signal	Current type <sup>(1)</sup>	4 to 20mA, 0 to 20mA	
	Voltage type	0 to 5V DC, 0 to 10V DC	
	Preset input	4 points	
Input impedance	Current type	250Ω or less	
	Voltage type	Approx. 6.5kΩ	
	Preset input	Approx. 2.7kΩ	
Output signal <sup>(2)</sup> (monitor output)	Analog output	1 to 5V DC (load impedance: 1kΩ or more) 4 to 20mA (sink type) (load impedance: 250Ω or less)	
	Switch output	NPN open collector output: Max. 30V, 30mA PNP open collector output: Max. 30mA	
Linearity	Within ±1% (full span)		
Hysteresis	Within 0.5% (full span)		
Repeatability	Within ±0.5% (full span)		
Sensitivity	Within 0.2% (full span)		
Temperature characteristics	Within ±0.12% (full span)/°C		
Output pressure display	Accuracy	±3% (full span)	
	Minimum unit	MPa: 0.01, kgf/cm <sup>2</sup> : 0.01, bar: 0.01, PSI: 0.1 <sup>(3)</sup> , kPa: 1	
Ambient and fluid temperature	0 to 50°C (with no condensation)		
Enclosure	IP65 equivalent		
Weight	ITV20□□	350g	
	ITV30□□	645g	

Note 1) 2 wire type 4 to 20mA is not available. Power supply voltage (24V DC or 12 to 15V DC) is required.  
 Note 2) Select either analog output or switch output.  
 Further, when switch output is selected, select either NPN output or PNP output.  
 Note 3) The minimum unit for ITV205□ is 1PSI.

## How to Order

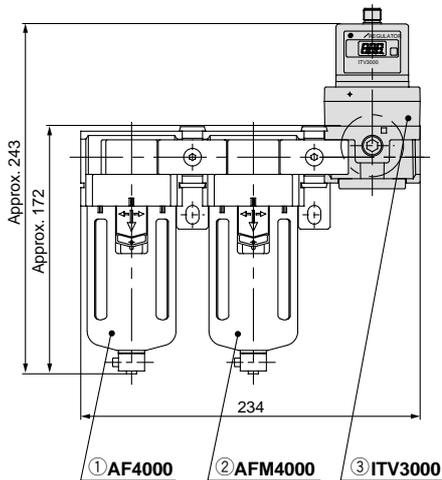
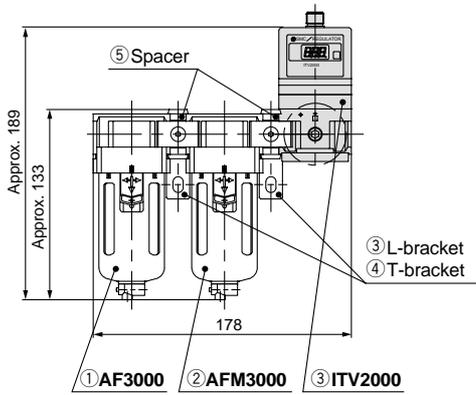
**ITV 3 0 1 0 - 0 1 2 S**

<b>Model</b>	2   2000 3   3000
<b>Pressure range</b>	1   0.1MPa 3   0.5MPa 5   0.9MPa
<b>Power supply voltage</b>	0   24V DC 1   12 to 15V DC
<b>Input signal</b>	0   Current 4 to 20mA 1   Current 0 to 20mA 2   Voltage 0 to 5V DC 3   Voltage 0 to 10V DC 4 *   Preset input
<b>Monitor output</b>	0 *   None (for preset input) 1   Analog output 1 to 5V DC 2 *   Switch output/NPN output 3 *   Switch output/PNP output 4 *   Analog output 4 to 20mA
<b>Thread type</b>	-   Rc(PT) N *   NPT T *   NPTF F *   G(PF)
<b>Port size</b>	2   1/4 (2000, 3000) 3   3/8 (2000, 3000) 4   1/2 (3000)
<b>Pressure display unit</b>	-   MPa 2 *   kgf/cm <sup>2</sup> 3 *   bar 4 *   PSI 5 *   kPa
<b>Cable connector type</b>	S   Straight type 3m L *   Right angle type 3m N *   Without cable connector
<b>Bracket</b>	-   Without bracket B *   Flat bracket C *   L-bracket

\* Option

- AC
- AV
- AU
- AF
- AR
- IR
- VEX
- AW
- AMR
- AWM
- AWD
- ITV**
- VBA
- VE
- VY
- G
- AL

# Series ITV2000/3000



## Specification Combinations

●: Standard specifications ○: Combination possible Blank: Combination not possible

Specifications	Symbol	Applicable model		
		ITV20□□	ITV30□□	
Standard specifications	Set pressure max. 0.1MPa	1	●	●
	Set pressure max. 0.5MPa	3	●	●
	Set pressure max. 0.9MPa	5	●	●
	Connection Rc(PT) 1/4	02	●	●
	Connection Rc(PT) 3/8	03	●	●
Connection Rc(PT) 1/2	04		●	
Accessories	Bracket	B	○	○
	Bracket	C	○	○
Optional specifications	Connection NPT1/4	N02	○	○
	Connection NPT3/8	N03	○	○
	Connection NPT1/2	N04		○
	Connection G(PF) 1/4	F02	○	○
	Connection G(PF) 3/8	F03	○	○
	Connection G(PF) 1/2	F04		○

## Modular Connection Part Numbers

Description	ITV20□□	ITV30□□	
Air filter	AF3000	AF4000	
Mist separator	AFM3000	AFM4000	
Attachments	L-bracket	B310L	B410L
	T-bracket	B310T	B410T
	Spacer	Y30	Y40
	Spacer with L-bracket	Y30L	Y40L
	Spacer with T-bracket	Y30T	Y40T

## Modular Products and Accessory Combinations

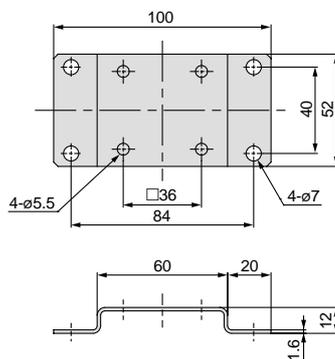
Applicable products and accessories	Applicable model	
	ITV20□□	ITV30□□
① Air filter	AF3000	AF4000
② Mist separator	AFM3000	AFM4000
③ L-bracket	B310L	B410L
④ T-bracket	B310T	B410T
⑤ Spacer	Y30	Y40
⑥ Spacer with L-bracket	Y30L	Y40L
⑦ Spacer with T-bracket	Y30T	Y40T

## Accessories (Optional)/Part Numbers

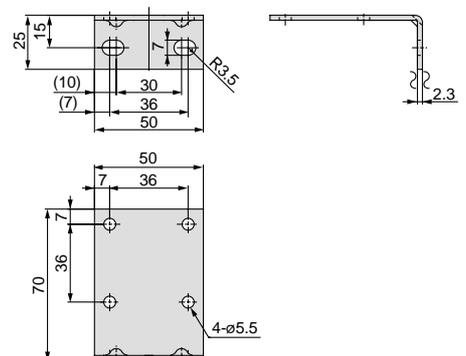
Description	Part No.	
	ITV20□□	ITV30□□
Flat bracket	P3020114	
L-bracket	INI-398-0-6	

### Dimensions

#### Flat bracket



#### L-bracket



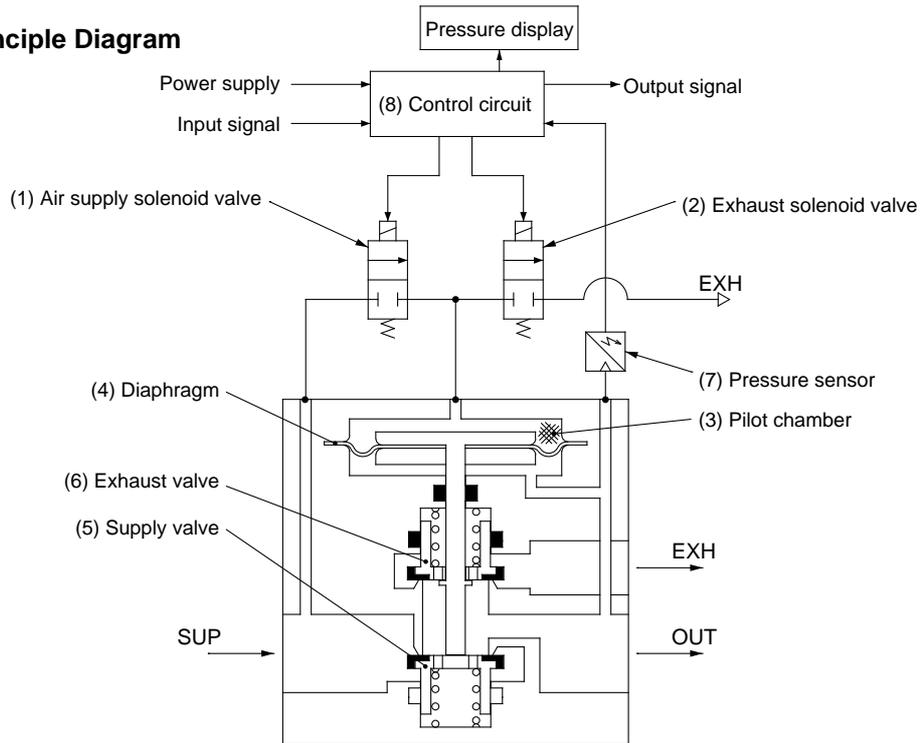
## Working Principles

When the input signal rises, the air supply solenoid valve (1) turns ON, and the exhaust solenoid valve (2) turns OFF. Therefore, supply pressure passes through the air supply solenoid valve (1) and is applied to the pilot chamber (3). The pressure in the pilot chamber (3) increases and operates on the upper surface of the diaphragm (4).

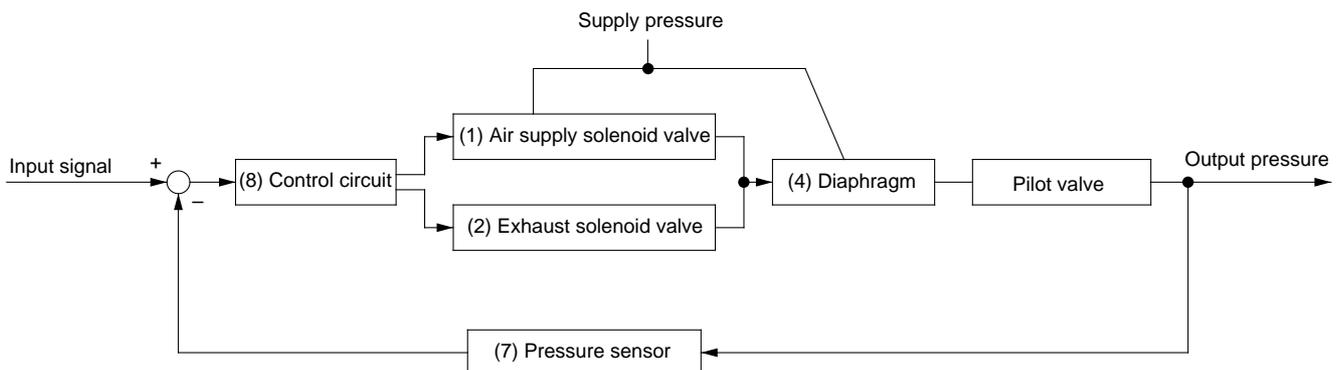
As a result, the air supply valve (5) linked to the diaphragm (4) opens, and a portion of the supply pressure becomes output pressure.

This output pressure feeds back to the control circuit (8) via the pressure sensor (7). Here, a correct operation functions until the output pressure is proportional to the input signal, making it possible to always obtain output pressure proportional to the input signal.

**Working Principle Diagram**



**Block diagram**



AC

AV

AU

AF

AR

IR

VEX

AW

AMR

AWM

AWD

**ITV**

VBA

VE

VY

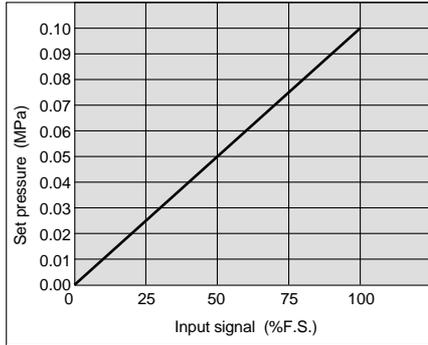
G

AL

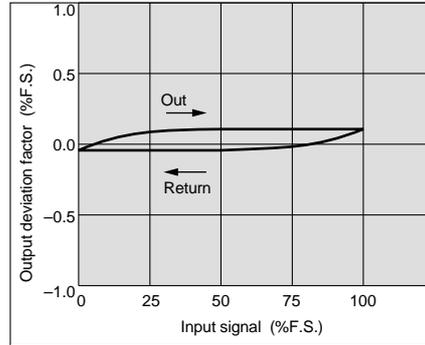
# Series ITV2000/3000

## Series ITV201

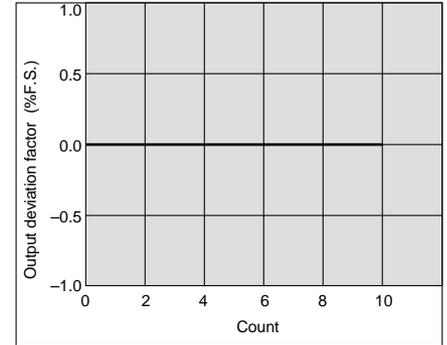
**Linearity**



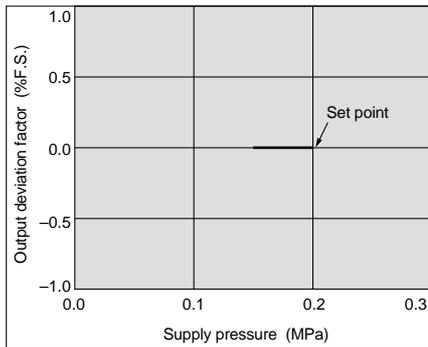
**Hysteresis**



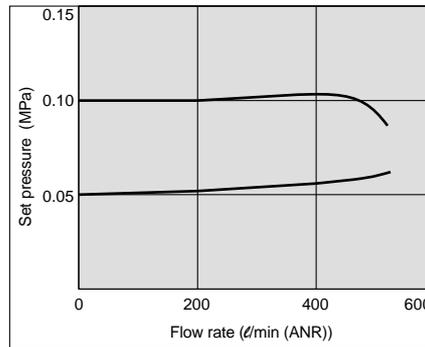
**Repeatability**



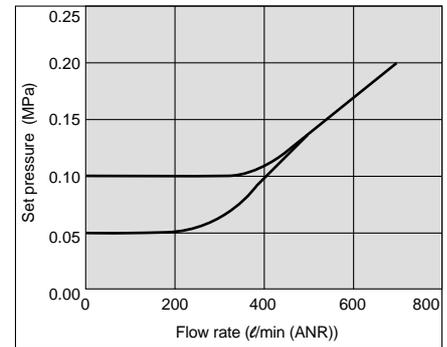
**Pressure characteristics** Set pressure: 0.05MPa



**Flow characteristics** Supply pressure: 0.2MPa

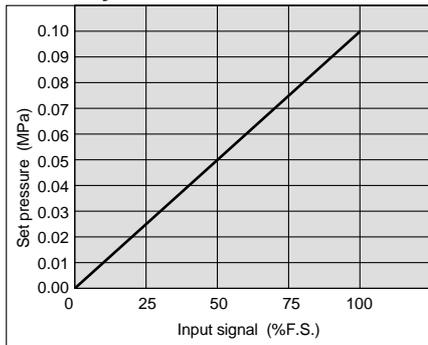


**Relief flow characteristics** Supply pressure: 0.2MPa

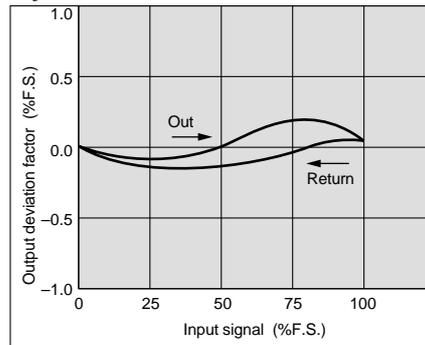


## Series ITV301

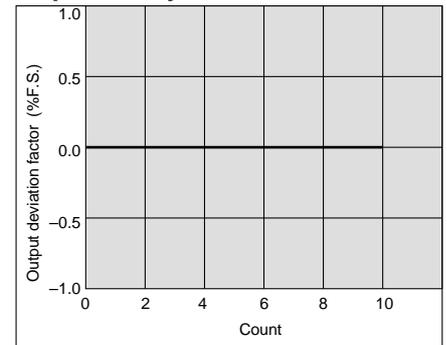
**Linearity**



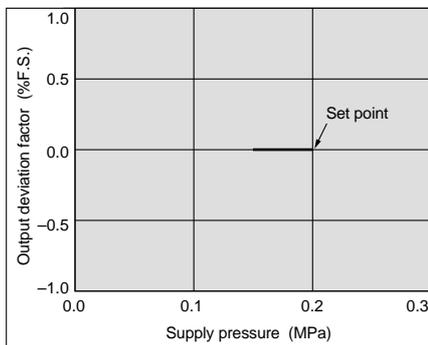
**Hysteresis**



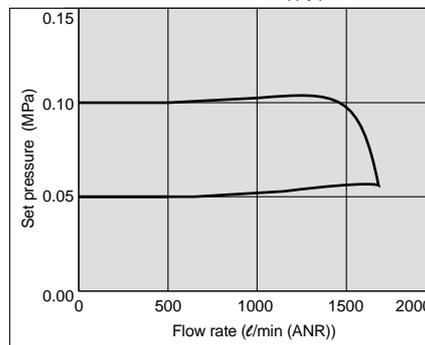
**Repeatability**



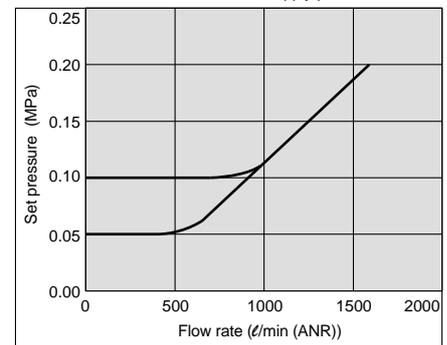
**Pressure characteristics** Set pressure: 0.05MPa



**Flow characteristics** Supply pressure: 0.2MPa

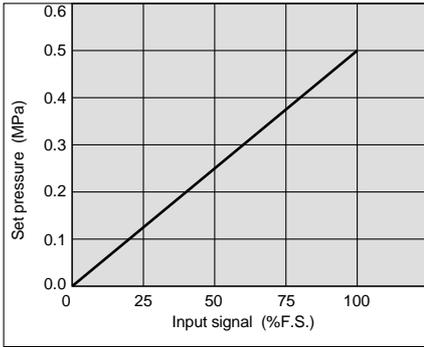


**Relief flow characteristics** Supply pressure: 0.2MPa

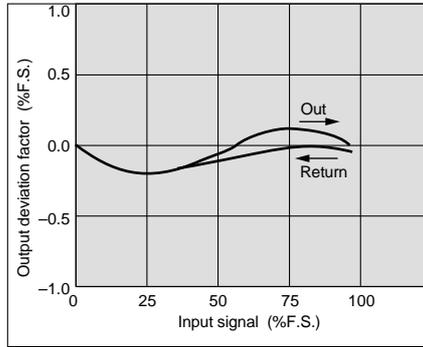


## Series ITV203

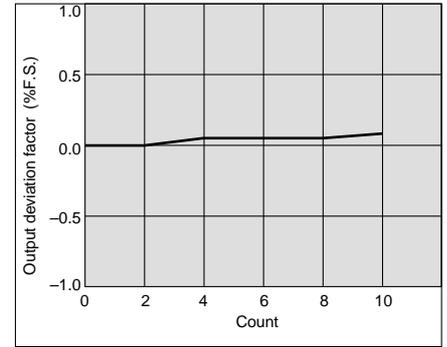
**Linearity**



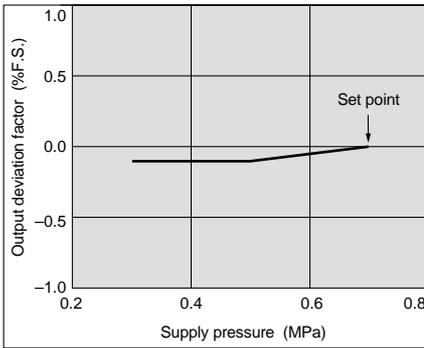
**Hysteresis**



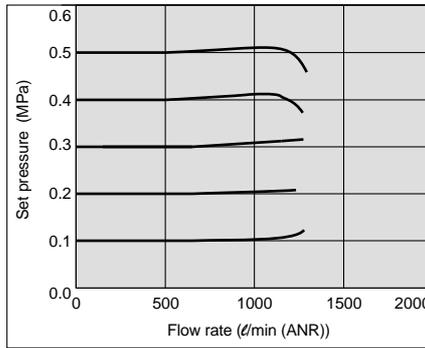
**Repeatability**



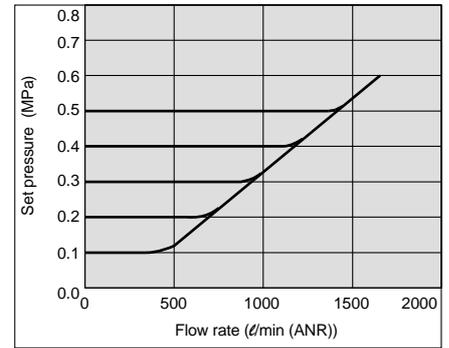
**Pressure characteristics** Set pressure: 0.2MPa



**Flow characteristics** Supply pressure: 0.7MPa

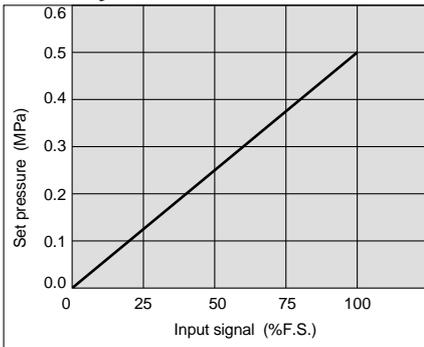


**Relief flow characteristics** Supply pressure: 0.7MPa

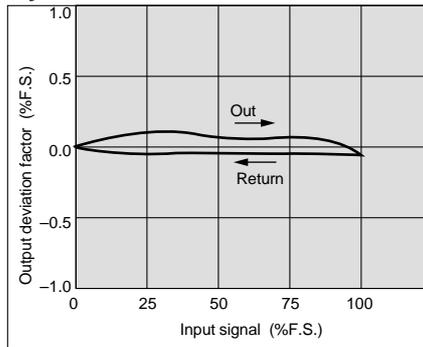


## Series ITV303

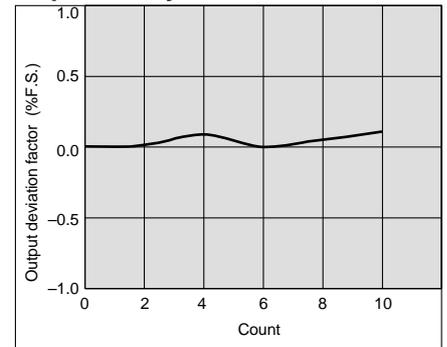
**Linearity**



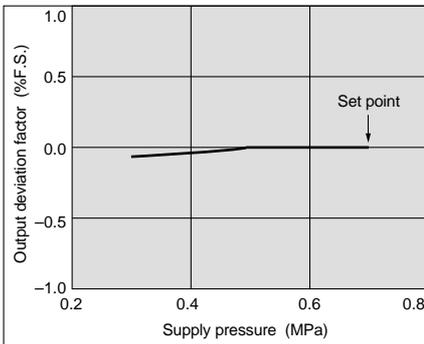
**Hysteresis**



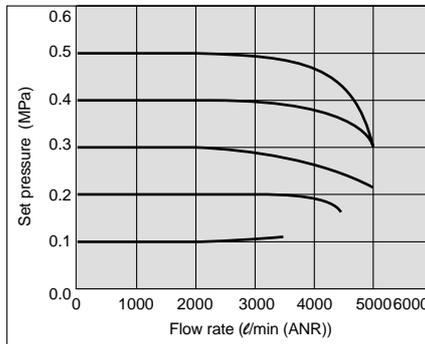
**Repeatability**



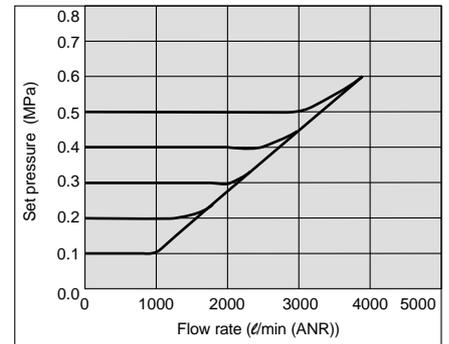
**Pressure characteristics** Set pressure: 0.2MPa



**Flow characteristics** Supply pressure: 0.7MPa



**Relief flow characteristics** Supply pressure: 0.7MPa



AC

AV

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AR

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VEX

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AMR

AWM

AWD

**ITV**

VBA

VE

VY

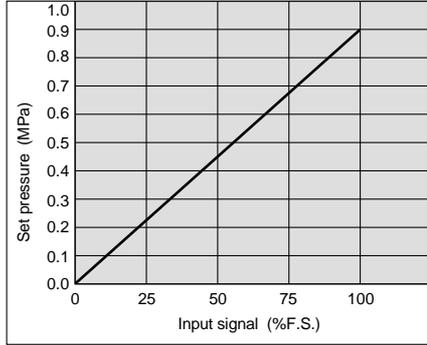
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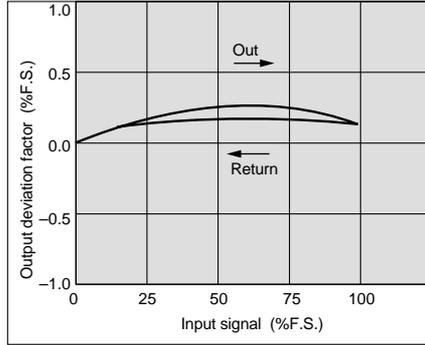
# Series ITV2000/3000

## Series ITV205

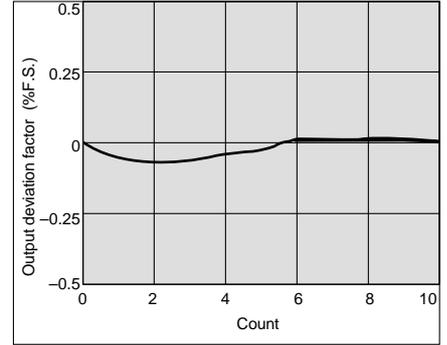
### Linearity



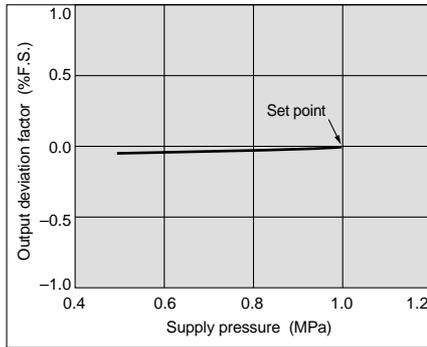
### Hysteresis



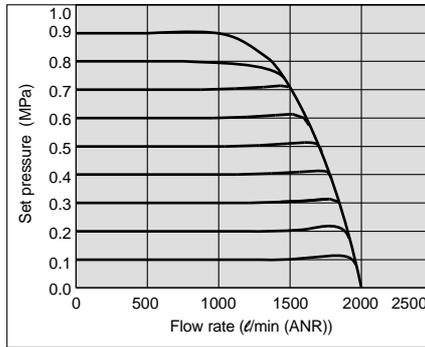
### Repeatability



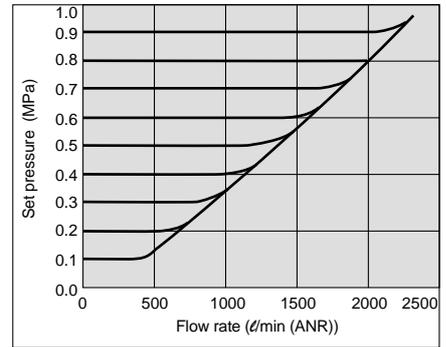
### Pressure characteristics Set pressure: 0.4MPa



### Flow characteristics Supply pressure: 1.0MPa

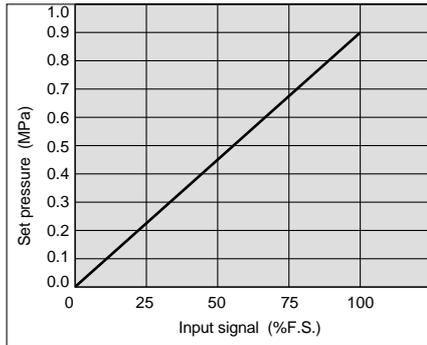


### Relief flow characteristics Supply pressure: 1.0MPa

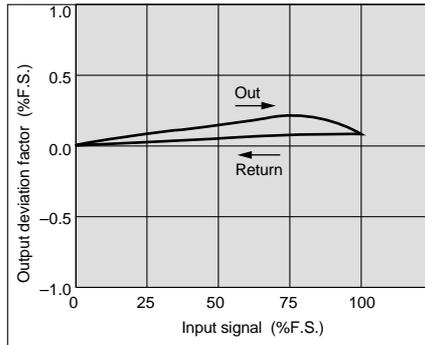


## Series ITV305

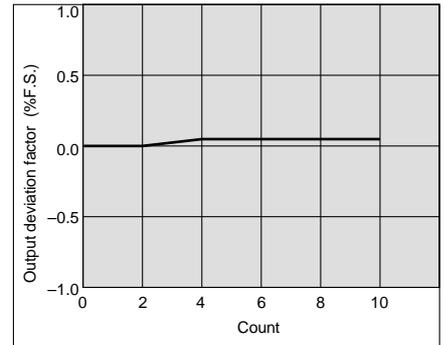
### Linearity



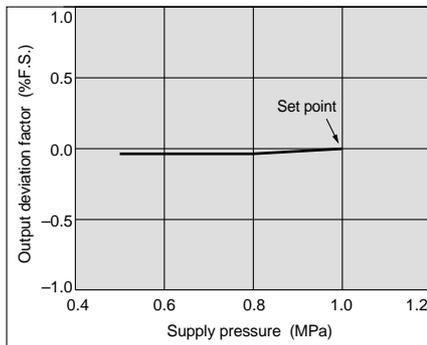
### Hysteresis



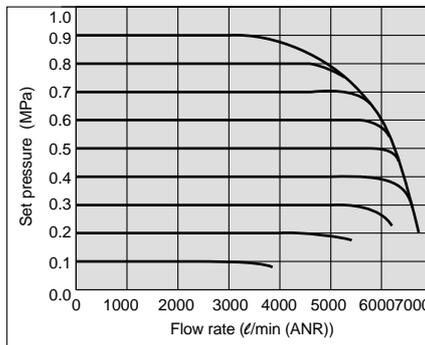
### Repeatability



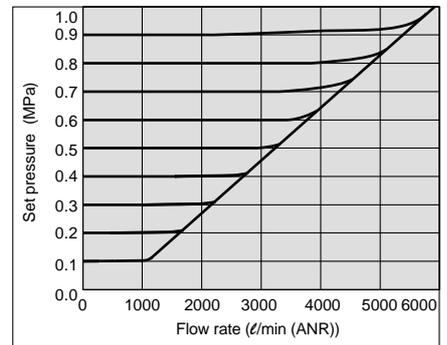
### Pressure characteristics Set pressure: 0.4MPa



### Flow characteristics Supply pressure: 1.0MPa



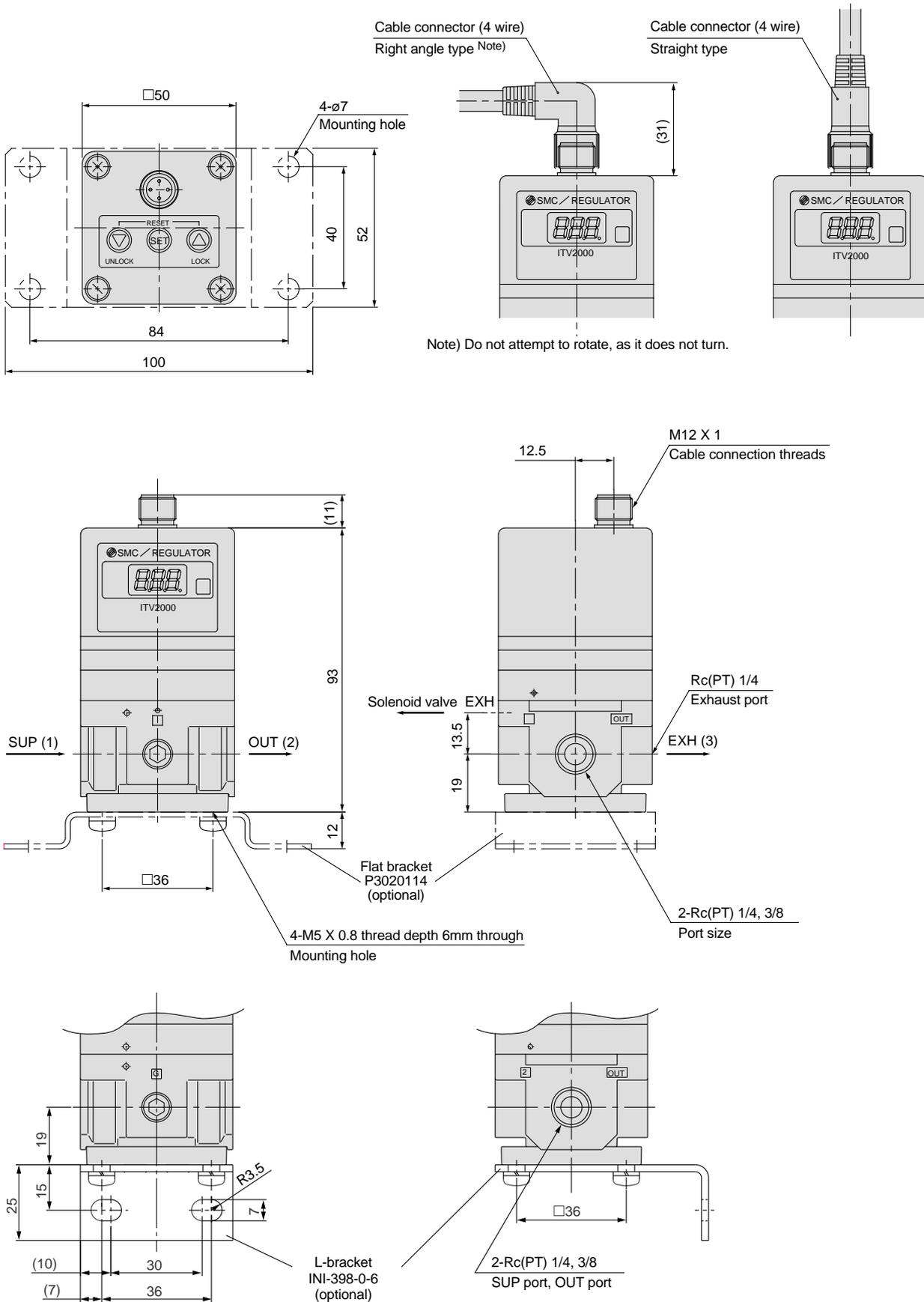
### Relief flow characteristics Supply pressure: 1.0MPa



# Electro-Pneumatic Regulator *Series ITV2000/3000*

## Dimensions

### ITV20□□

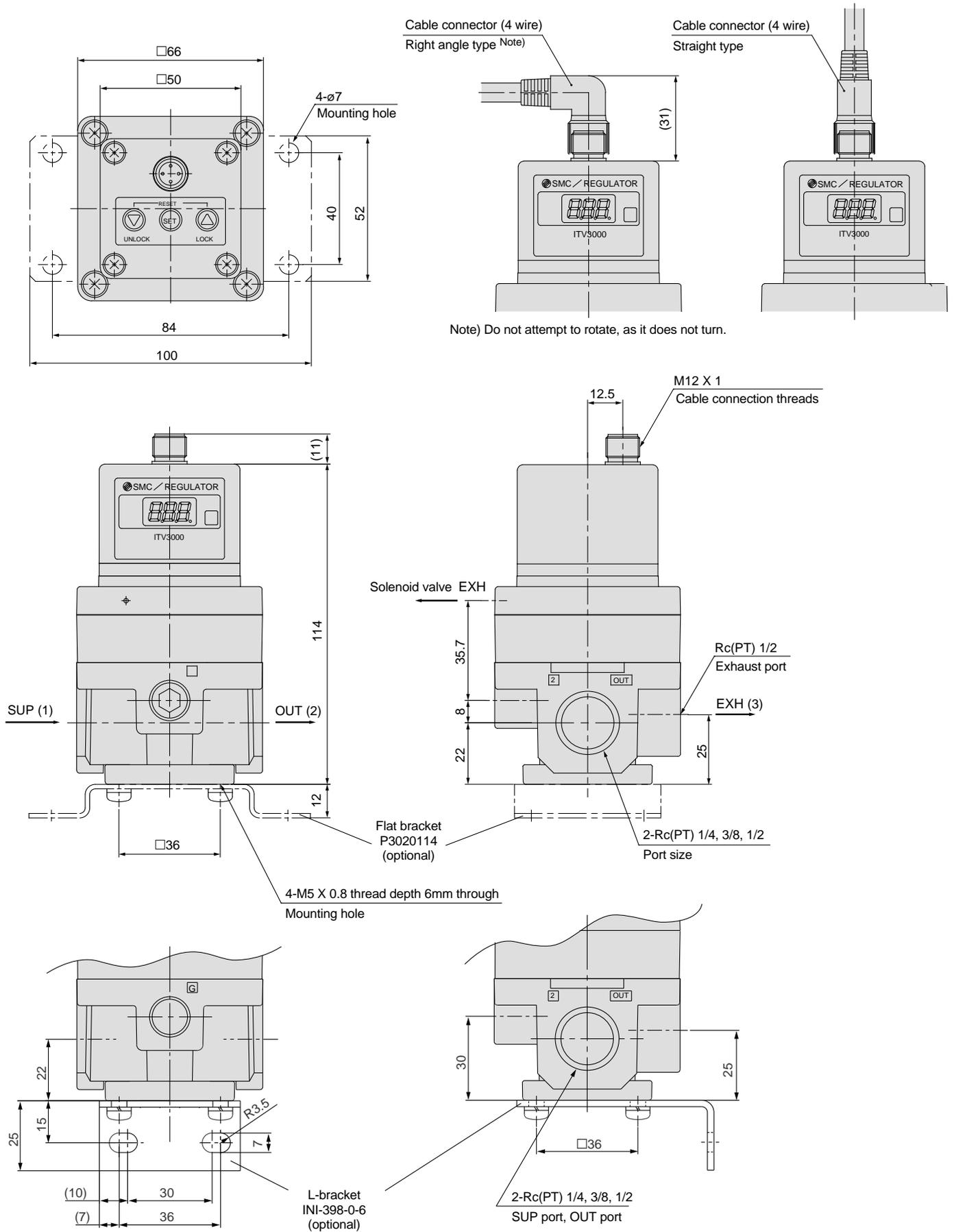


AC
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VEX
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AMR
AWM
AWD
<b>ITV</b>
VBA
VE
VY
G
AL

# Series ITV2000/3000

## Dimensions

### ITV30□□





# Series ITV2000/3000 Made to Order Specifications

Contact SMC regarding detailed dimensions, specifications and delivery times.



## 1 Ozone Resistant Specifications

Fluoro rubber is used for the rubber parts of seals.

80 — Standard part number

● Ozone resistant specifications

## 2 Manifold Specifications (Except Series ITV3000)

2 through 8 station manifold.

### How to Order Manifolds

IITV20 —  —  —

● Valve stations

2	2 stations
⋮	⋮
8	8 stations

● OUT port size

02	1/4
03	3/8

● Connection thread type

—	PT
N	NPT
F	PF

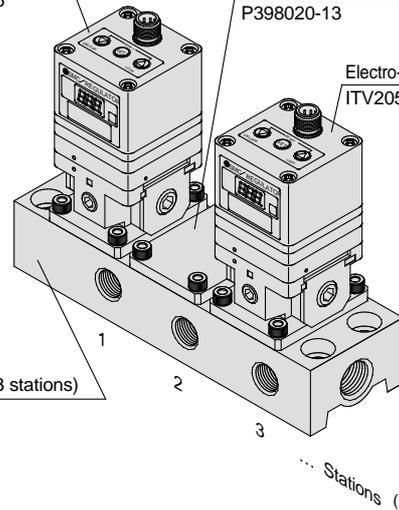
### How to Order Manifold Assemblies

#### Example

Electro-pneumatic regulator  
ITV2030-312S-X26

Blanking plate assembly  
P398020-13

Electro-pneumatic regulator  
ITV2050-212S-X26



Manifold base (3 stations)  
IITV20-02-3

Stations (1)

IITV20-02-3..... 1set (3 station manifold base part no.)  
 \*ITV2030-312S-X26 .....1set (Electro-pneumatic regulator part no.) (2)  
 \*P398020-13 .....1set (Blanking plate assembly part no.)  
 \*ITV2050-212S-X26 .....1set (Electro-pneumatic regulator part no.) (2)  
 The \* is the symbol for mounting. Add the \* symbol at the beginning of part numbers for electro-pneumatic regulators, etc. to be mounted on the base.

- Note 1) Electro-pneumatic regulators are counted starting from station 1 on the left side with the OUT ports in front.
- Note 2) The port size for mounted electro-pneumatic regulators is Rc(PT)1/4 only.
- Note 3) When there is a large number of stations, use piping with the largest possible inside diameter for the supply side, such as steel piping.
- Note 4) The use of the straight type cable connector is recommended.

- AC
- AV
- AU
- AF
- AR
- IR
- VEX
- AW
- AMR
- AWM
- AWD
- ITV**
- VBA
- VE
- VY
- G
- AL

## ⚠ Precautions

Be sure to read before handling.

Refer to p.0-26 and 0-27 for Safety Instructions and p.1.0-1 and 1.0-2 for precautions.

### Operating Environment

#### ⚠ Warning

- ① In locations where there is contact with spatter from water, oil or solder, etc., implement suitable protective measures.

### Air Supply

#### ⚠ Caution

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

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

### Handling

#### ⚠ Caution

- ① 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.
- ② If electric power is shut off while pressure is being applied, pressure will be retained on the output side. 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 to this product is cut off due to a power failure, etc. when it is in a controlled state, output pressure will be retained temporarily. Handle carefully when operating with output pressure released to the atmosphere, as air will continue to flow out.

### Handling

#### ⚠ Caution

- ④ 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. Since the life of the product may be shortened, shut off the power supply also when supply pressure is shut off.
- ⑤ In this product, the output side pressure cannot be completely relieved within the range of 0.005MPa or less. If it is desired to reduce the pressure completely to 0MPa, install a 3 way valve or other device on the output side to exhaust the pressure.
- ⑥ This product is adjusted for each specification at the time of shipment from the factory. Avoid careless disassembly or removal of parts, as this can lead to malfunction.
- ⑦ The optional cable connector is a 4 wire type. When the monitor output (analog output or switch output) is not being used, keep it from touching the other wires as this can cause malfunction.
- ⑧ Please note that the right angle cable does not rotate and is limited to only one entry direction.
- ⑨ Take the following steps to avoid malfunction due to noise.
  - 1) Remove power supply noise during operation by installing a line filter, etc. in the AC power line.
  - 2) 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.).
- ⑩ Due to the large volume of the output side, a loud exhaust noise will be produced when being used for the purpose of a relief function. Therefore, install a silencer (SMC Series AN200 or AN400) on the exhaust port (EXH port). The port sizes are Rc1/4 and Rc1/2.
- ⑪ For details on the handling of this product, refer to the instruction manual which is included with the product.

## ⚠ Precautions

Be sure to read before handling.

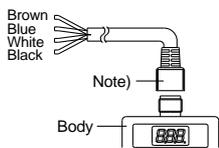
Refer to p.0-26 and 0-27 for Safety Instructions and p.1.0-1 and 1.0-2 for common precautions.

### Wiring

## ⚠ Caution

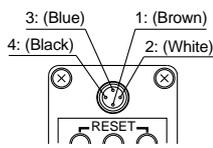
Connect the cable to the connector on the body with the wiring arranged as shown below. Proceed carefully, as incorrect wiring can cause damage.

Further, use DC power with sufficient capacity and a low ripple.



**Current signal type**  
**Voltage signal type**

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



**Preset input type**

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

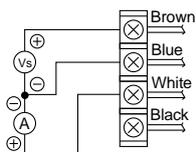
Note) A right angle type cable is also available.

The entry direction for the right angle type connector is to the left (SUP port side).

Never turn the connector as it is not designed to turn.

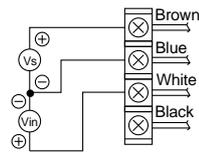
### Wiring diagram

**Current signal type**



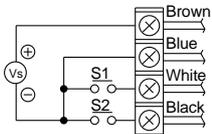
Vs: Power supply 24V DC  
12 to 15V DC  
A : Input signal 4 to 20mA DC  
0 to 20mA DC

**Voltage signal type**



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

**Preset input type**



Vs: Power supply 24V DC  
12 to 15V DC

One of the preset pressures P1 through P4 is selected by the ON/OFF combination of S1 and S2.

S1	OFF	ON	OFF	ON
S2	OFF	OFF	ON	ON
Preset pressure	P1	P2	P3	P4

\* For safety reasons, it is recommended that one of the preset pressures be set to 0MPa.

AC

AV

AU

AF

AR

IR

VEX

AW

AMR

AWM

AWD

**ITV**

VBA

VE

VY

G

AL