

Electro-Pneumatic Regulator

Stepless control of air pressure proportional to an electrical signal

ITV1000
200 ℓ/min (ANR)*

ITV2000
1500 ℓ/min (ANR)*

ITV3000
4000 ℓ/min (ANR)*

200 ℓ/min type is newly
introduced to the series.
Oil free specifications (wetted parts)



Series **ITV1000/2000/3000**

* Pressure range: 0.9 MPa. Supply pressure: 1.0 MPa

Sensitivity: **0.2** kPa (100 kPa specifications)

IP65

Linearity: Within **±1**% (F.S.)

Hysteresis: Within **±0.5**% (F.S.)

Electro-Pneumatic Regulator

Series ITV1000/2000/3000

Standard Specifications

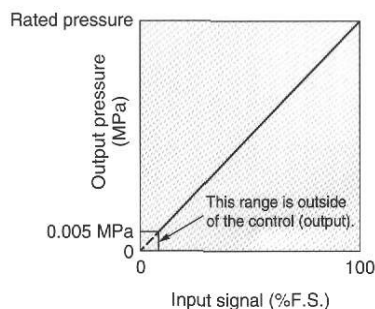
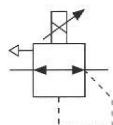


Straight type



Right angle type

JIS Symbol



Input/output characteristics chart

Model		ITV101□	ITV103□	ITV105□
		ITV201□	ITV203□	ITV205□
		ITV301□	ITV303□	ITV305□
Minimum supply pressure		Set pressure +0.1 MPa		
Maximum supply pressure		0.2 MPa	1.0 MPa	
Set pressure range		Note 1) 0.005 to 0.1 MPa 0.005 to 0.5 MPa 0.005 to 0.9 MPa		
Power supply	Voltage	24 VDC ± 10%, 12 to 15 VDC		
	Current consumption	Power supply voltage 24 VDC type: 0.12 A or less Power supply voltage 12 to 15 VDC type: 0.18 A or less		
Input signal	Current type	Note 2) 4 to 20 mA, 0 to 20 mA (Sink type)		
	Voltage type	0 to 5 VDC, 0 to 10 VDC		
	Preset input	4 points		
Input impedance	Current type	250 Ω or less		
	Voltage type	Approx. 6.5 kΩ		
	Preset input	Approx. 2.7 kΩ		
Output signal (monitor output)	Analog output	Note 3) 1 to 5 VDC (Load impedance: 1 kΩ or more) 4 to 20 mA (Sink type) (Load impedance: 250 Ω or less)		
	Switch output	NPN open collector output: Max. 30 V, 30 mA PNP open collector output: Max. 30 mA		
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 ² : 0.01, bar: 0.01, PSI: 0.1 Note 4), kPa: 1		
Ambient and fluid temperature		0 to 50°C (with no condensation)		
Enclosure		IP65		
Weight	ITV10□□	Approx. 250 g (without options)		
	ITV20□□	Approx. 350 g (without options)		
	ITV30□□	Approx. 645 g (without options)		

- Note 1) Please refer to graph 1, relation to the differences between the set pressure and input. Additionally, refer to the page 18 for the set pressure range by units of standard measured pressure. Additionally, refer to page 18 as maximum set pressure differs on unit of standard measure.
- Note 2) 2-wire type 4 to 20 mA is not available. Power supply voltage (24 VDC or 12 to 15 VDC) is required.
- Note 3) Select either analog output or switch output. Further, when switch output is selected, select either NPN output or PNP output.
- Note 4) The minimum unit for ITV205□ is 1 PSI.
- Note 5) The above characteristics are confined to the static state. When air is consumed on the output side, the pressure may fluctuate.

How to Order

ITV 3 0 1 0 - 0 1 2 S - Q

Model

1	1000
2	2000
3	3000

Pressure range

1	0.1 MPa
3	0.5 MPa
5	0.9 MPa

Power supply voltage

0	24 VDC
1	12 to 15 VDC

Input signal

0	Current 4 to 20 mA (Sink type)
1	Current 0 to 20 mA (Sink type)
2	Voltage 0 to 5 VDC
3	Voltage 0 to 10 VDC
4*	Preset input

* Option

Monitor output

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 20 mA (Sink type)

* Option

Thread type

-	Rc
N*	NPT
T*	NPTF
F*	G

* Option

Port size

1	1/8 (1000 type)
2	1/4 (1000, 2000, 3000 type)
3	3/8 (2000, 3000 type)
4	1/2 (3000 type)

Pressure display unit Note 1)

-	MPa
2	kgf/cm ²
3	bar
4	PSI
5	kPa

* Option

Cable connector type

S	Straight type 3 m
L*	Right angle type 3 m
N*	Without cable connector

* Option

Bracket

-	Without bracket
B*	Flat bracket
C*	L-bracket

* Option

CE compliance

-	-
Q	CE compliant

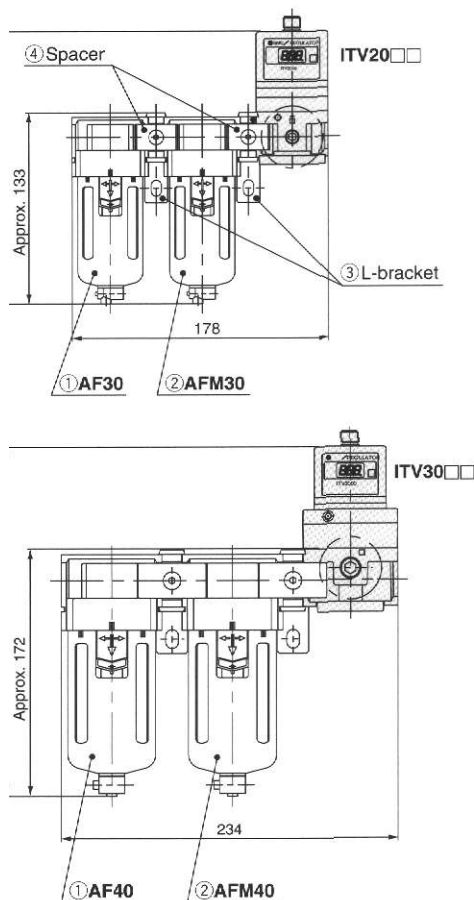
* Please visit our SMC homepage: <http://www.smcworld.com> for the latest details on our CE compliant products.

Electro-Pneumatic Regulator *Series ITV1000/2000/3000*

Combinations

☒ Standard specifications
 ☐ Combination possible
 ☐ Combination not possible

* ITV10□□ models are not applicable.



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

Modular Products and Accessory Combinations

* ITV10□□ models are not applicable.

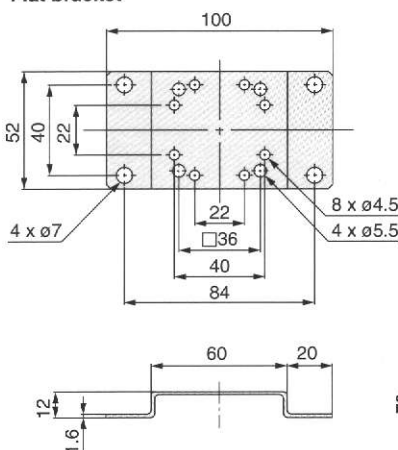
Applicable products and accessories	Applicable model	
	ITV20□□	ITV30□□
① Air filter	AF30	AF40
② Mist separator	AFM30	AFM40
③ L-bracket	B310L	B410L
④ Spacer	Y30	Y40
⑤ Spacer with L-bracket (③ + ④)	Y30L	Y40L

Accessories (Optional)/Part Numbers

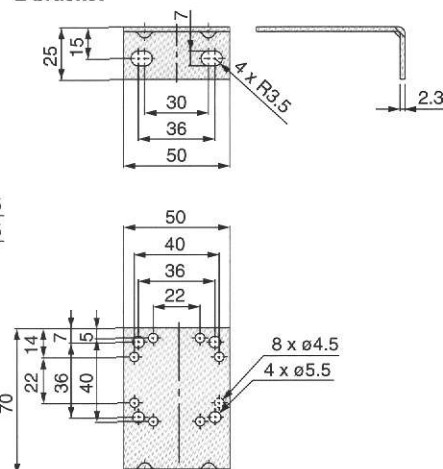
Description	Part No.		
	ITV10□□	ITV20□□	ITV30□□
Flat bracket	P3020114 (Mounting thread is not included.)		
L-bracket	INI-398-0-6 (Mounting thread is not included.)		
Connector	Straight type 3 m	TM-4DSX3HG4	
	Right angle type 3 m	TM-4DLX3HG4	

Dimensions

Flat bracket



L-bracket

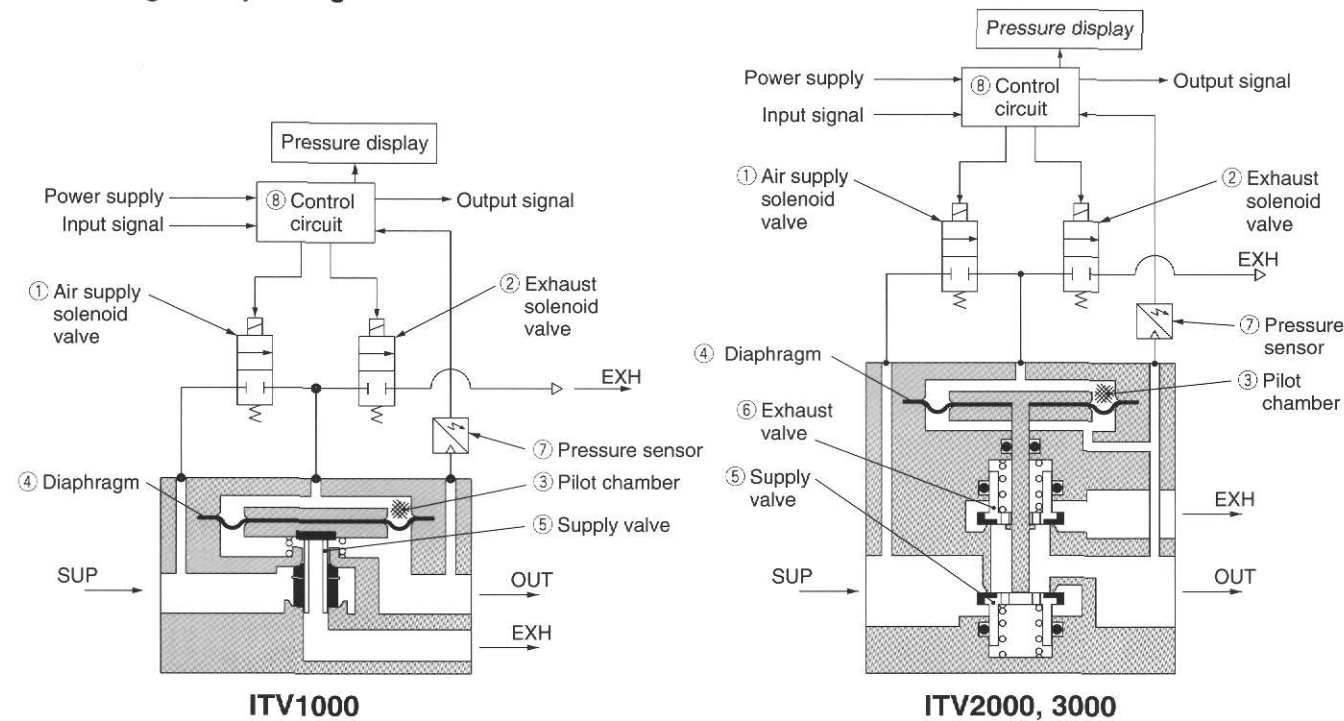


Series *ITV1000/2000/3000*

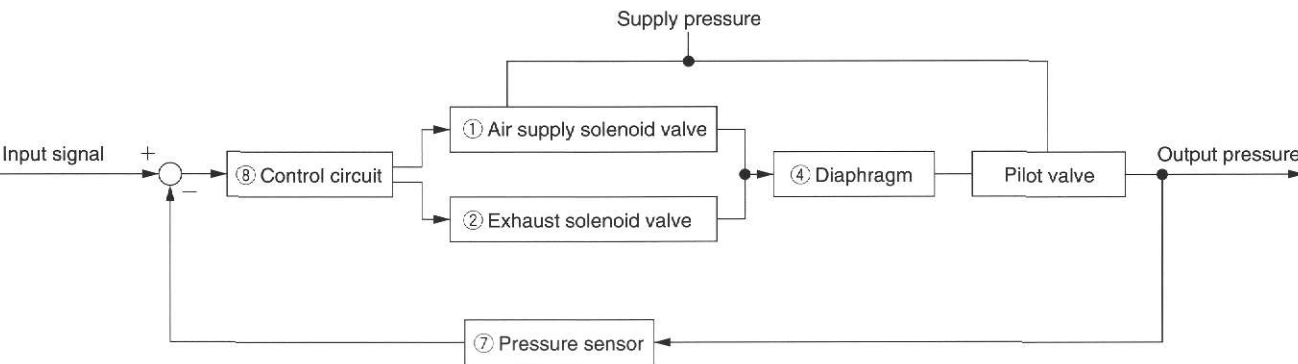
Working Principles

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



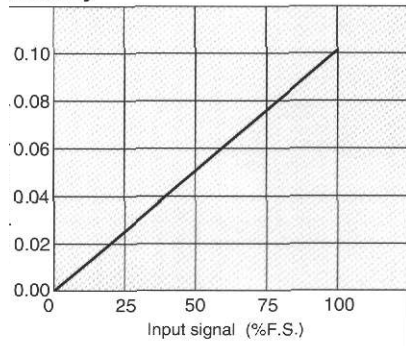
Block diagram



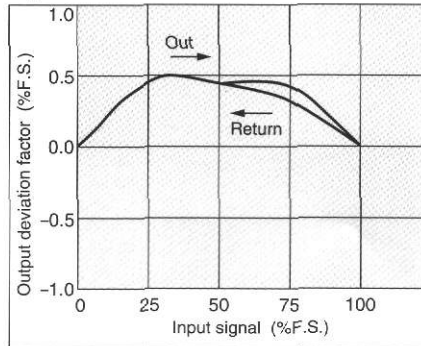
Electro-Pneumatic Regulator *Series ITV1000/2000/3000*

Series ITV101

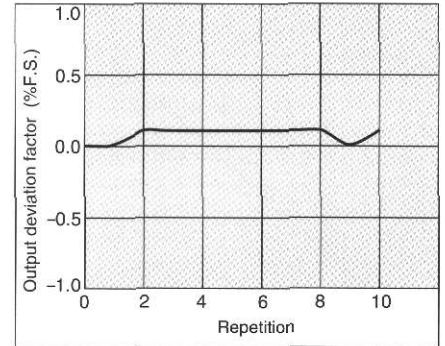
Linearity



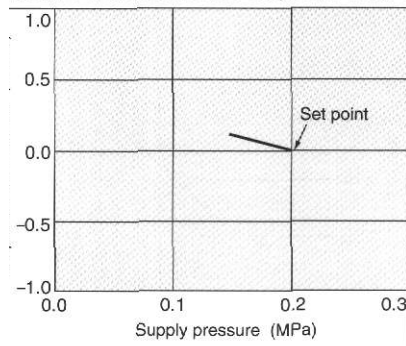
Hysteresis



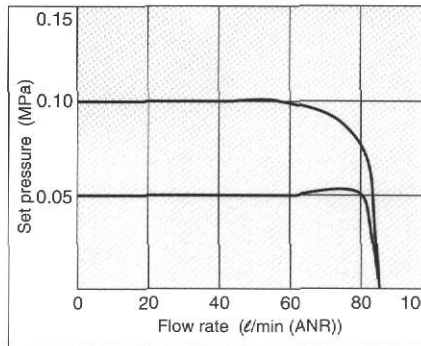
Repeatability



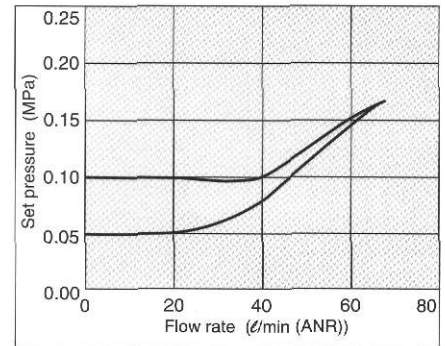
Pressure characteristics Set pressure: 0.05 MPa



Flow characteristics Supply pressure: 0.2 MPa

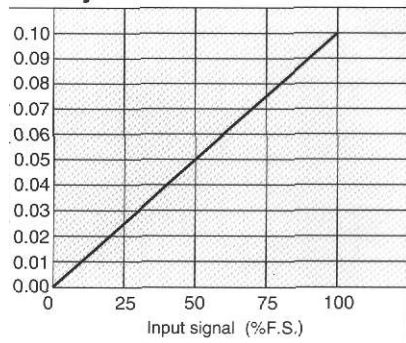


Relief flow characteristics Supply pressure: 0.2 MPa

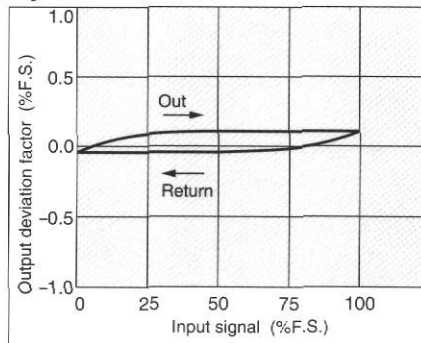


Series ITV201

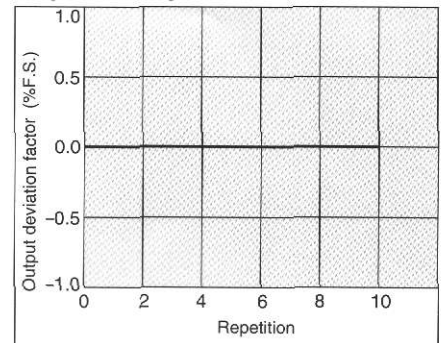
Linearity



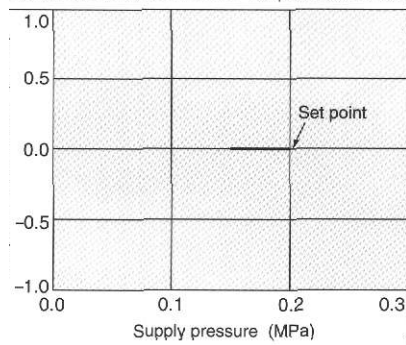
Hysteresis



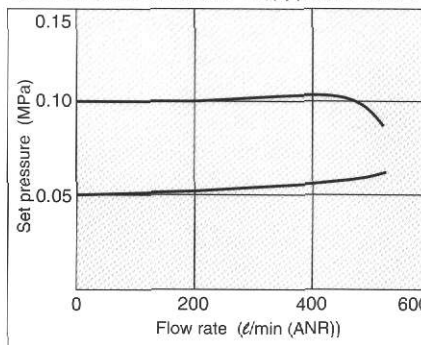
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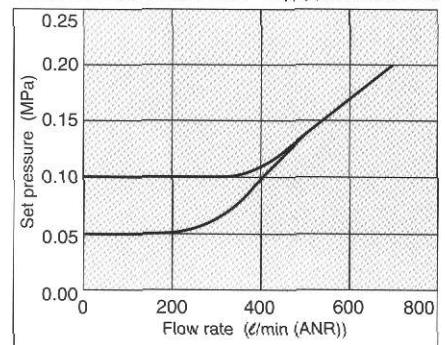
Pressure characteristics Set pressure: 0.05 MPa



Flow characteristics Supply pressure: 0.2 MPa



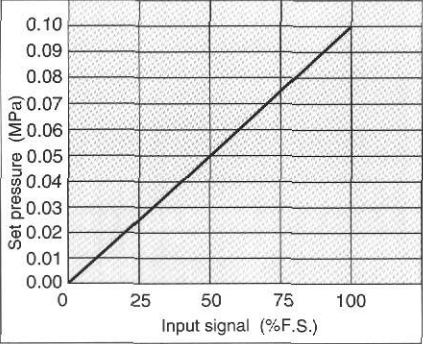
Relief flow characteristics Supply pressure: 0.2 MPa



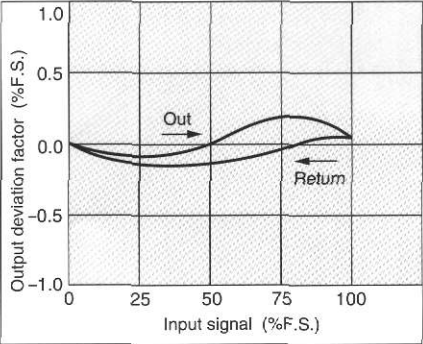
Series ITV1000/2000/3000

Series ITV301 ☐

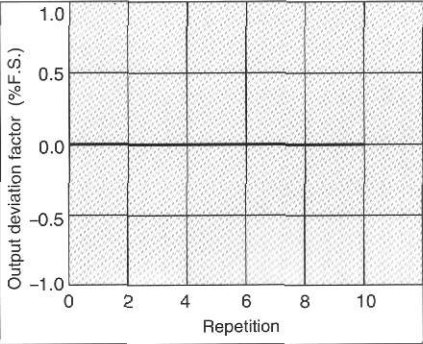
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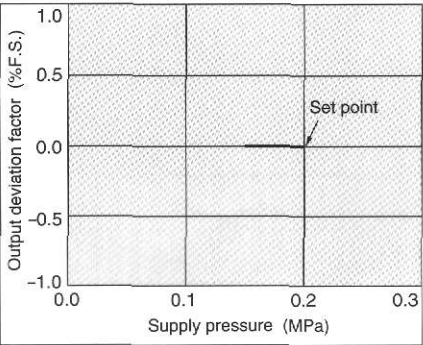
Hysteresis



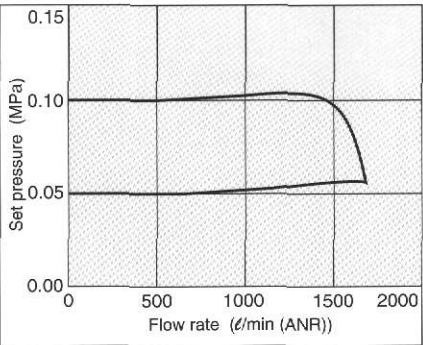
Repeatability



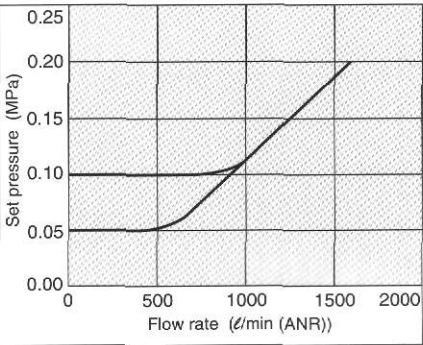
Pressure characteristics Set pressure: 0.05 MPa



Flow characteristics Supply pressure: 0.2 MPa

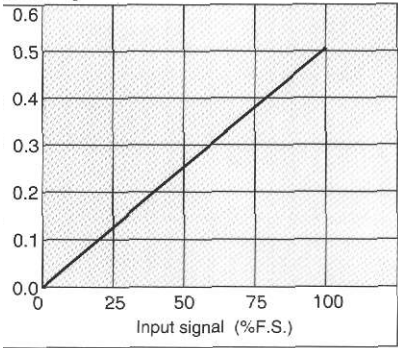


Relief flow characteristics Supply pressure: 0.2 MPa

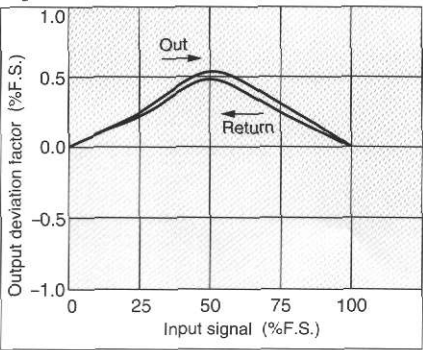


Series ITV103

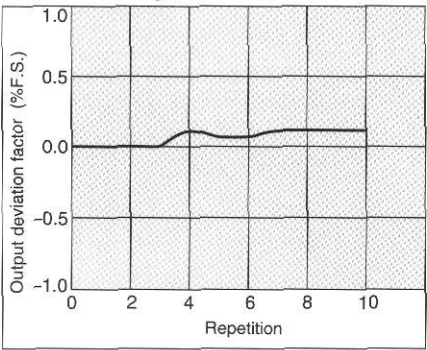
Linearity



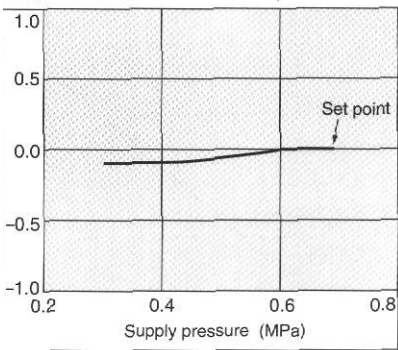
Hysteresis



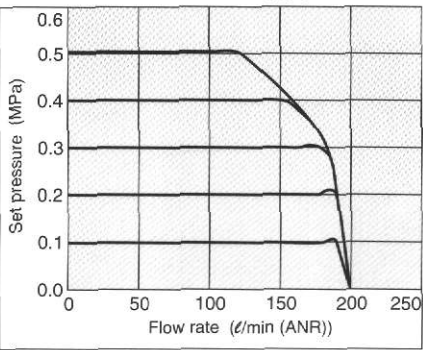
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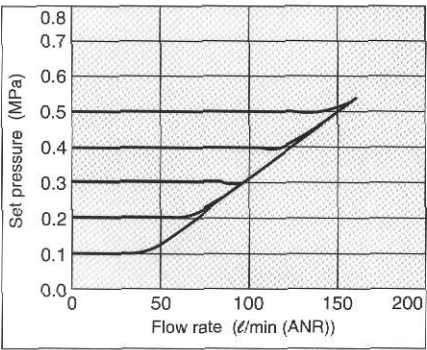
Pressure characteristics Set pressure: 0.2 MPa



Flow characteristics Supply pressure: 0.7 MPa

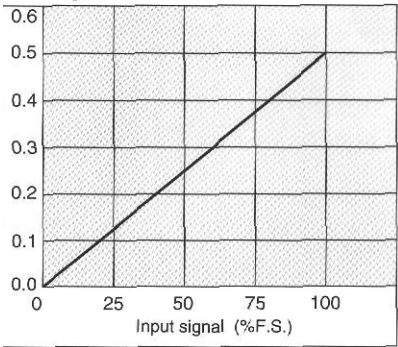


Relief flow characteristics Supply pressure: 0.7 MPa

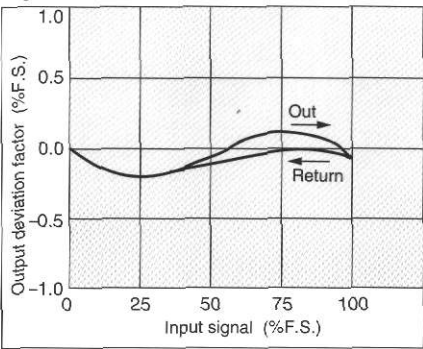


Series ITV203

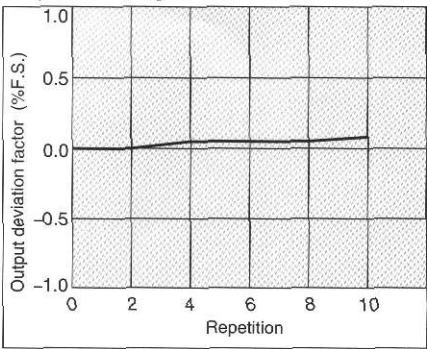
Linearity



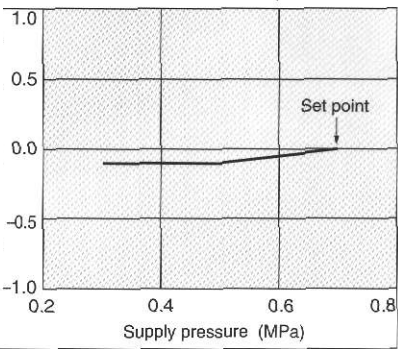
Hysteresis



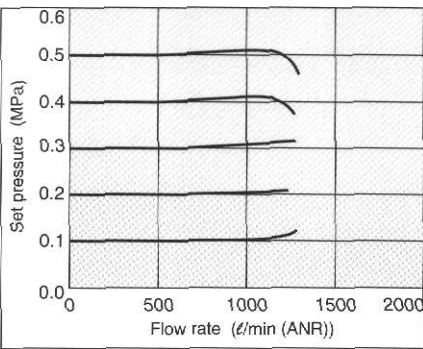
Repeatability



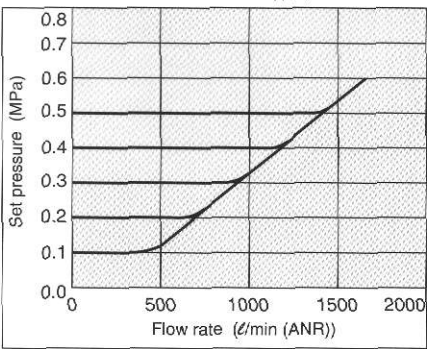
Pressure characteristics Set pressure: 0.2 MPa



Flow characteristics Supply pressure: 0.7 MPa



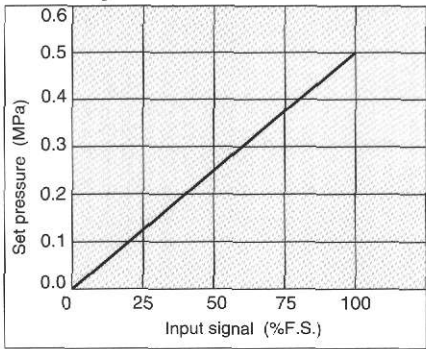
Relief flow characteristics Supply pressure: 0.7 MPa



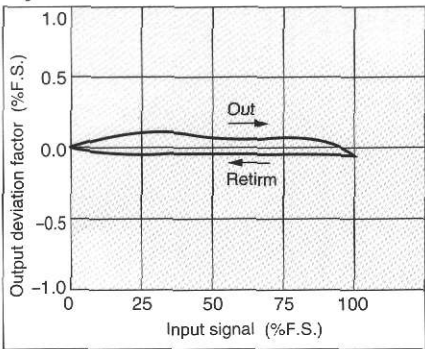
Series ITV1000/2000/3000

Series ITV303

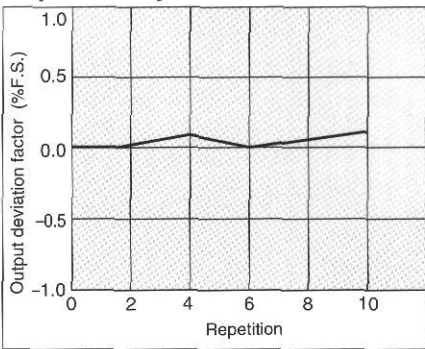
Linearity



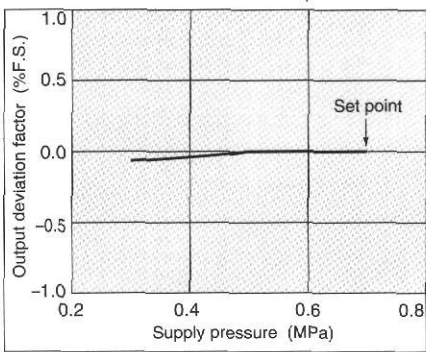
Hysteresis



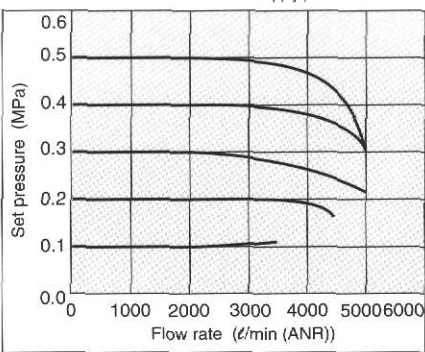
Repeatability



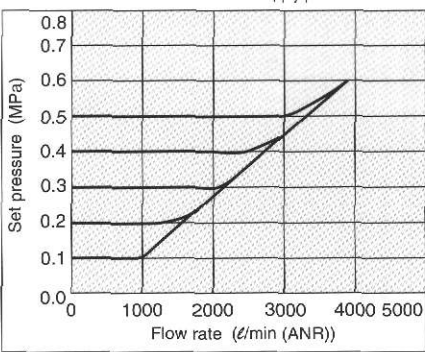
Pressure characteristics Set pressure: 0.2 MPa



Flow characteristics Supply pressure: 0.7 MPa



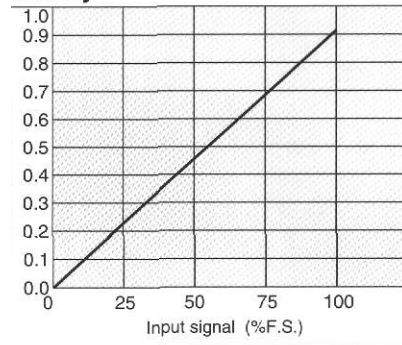
Relief flow characteristics Supply pressure: 0.7 MPa



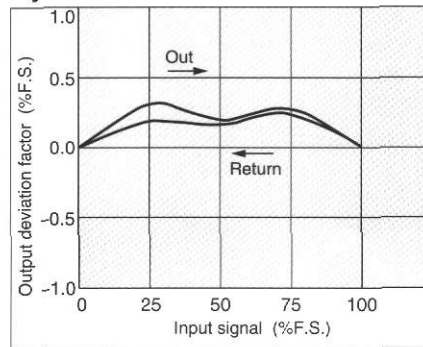
Electro-Pneumatic Regulator *Series ITV1000/2000/3000*

Series ITV105

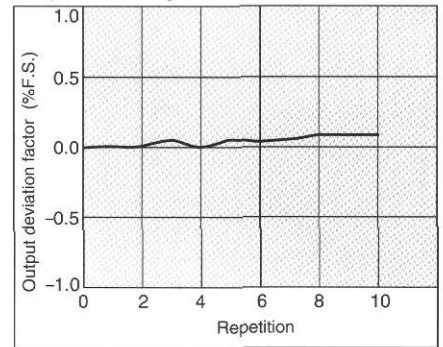
Linearity



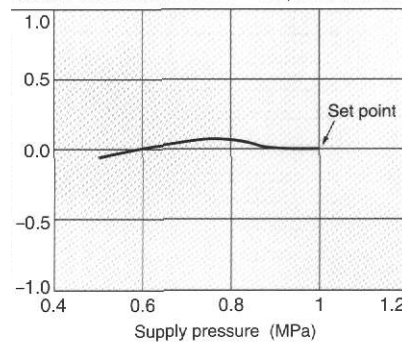
Hysteresis



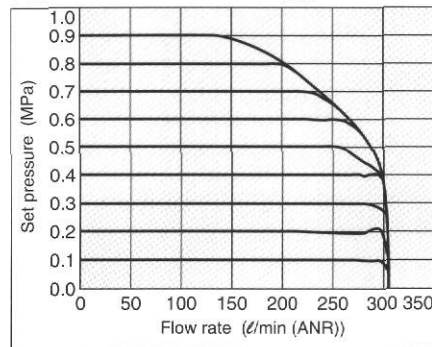
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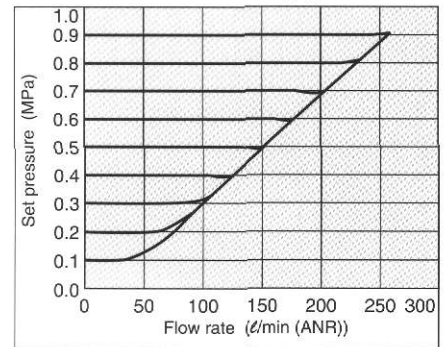
Pressure characteristics Set pressure: 0.4 MPa



Flow characteristics Supply pressure: 1.0 MPa

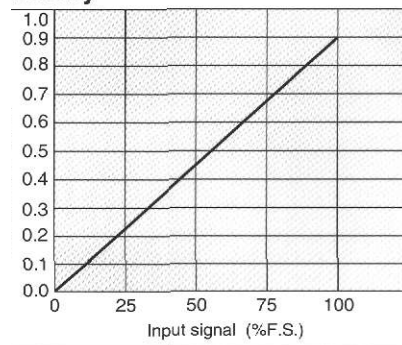


Relief flow characteristics Supply pressure: 1.0 MPa

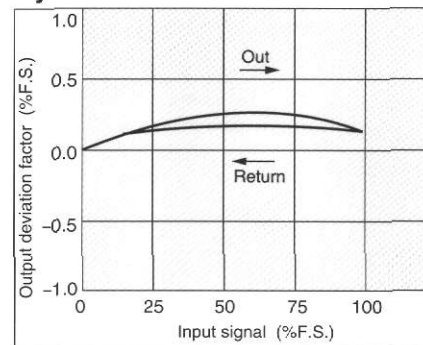


Series ITV205

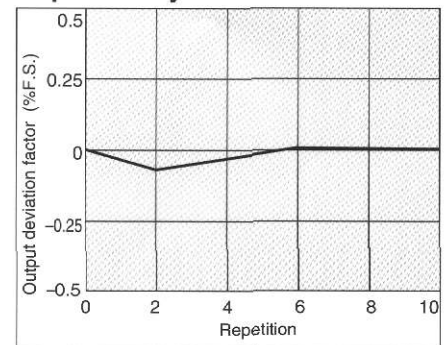
Linearity



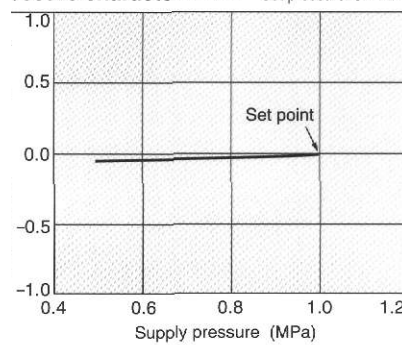
Hysteresis



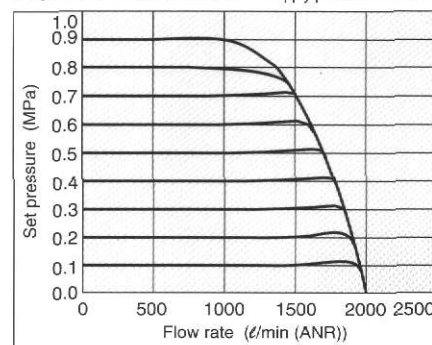
Repeatability



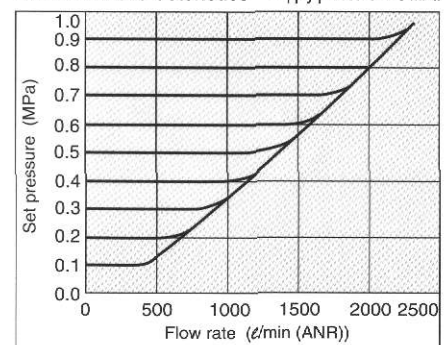
Pressure characteristics Set pressure: 0.4 MPa



Flow characteristics Supply pressure: 1.0 MPa



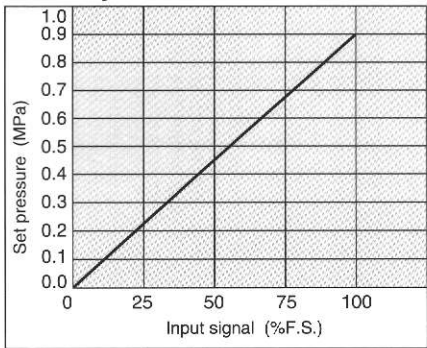
Relief flow characteristics Supply pressure: 1.0 MPa



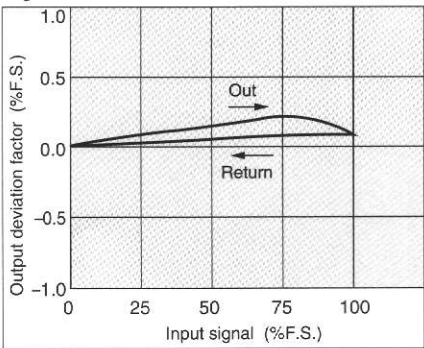
Series ITV1000/2000/3000

Series ITV305

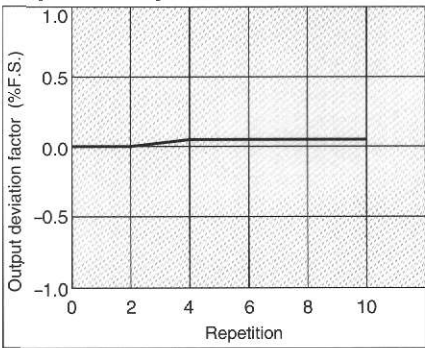
Linearity



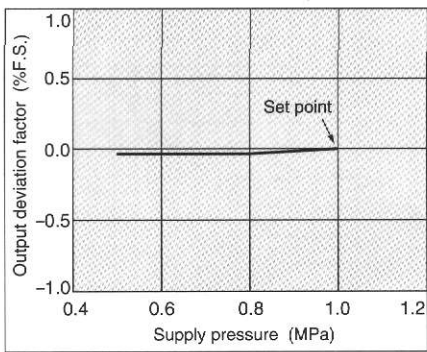
Hysteresis



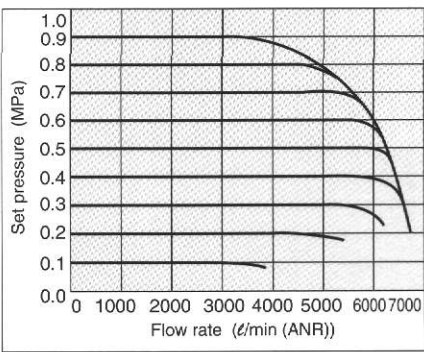
Repeatability



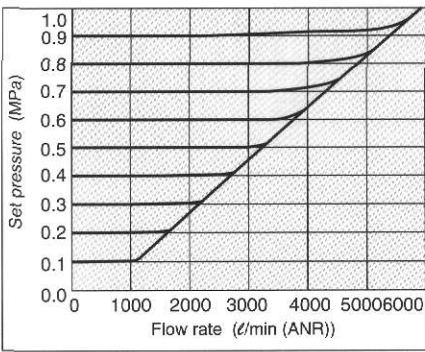
Pressure characteristics Set pressure: 0.4 MPa



Flow characteristics Supply pressure: 1.0 MPa



Relief flow characteristics Supply pressure: 1.0 MPa

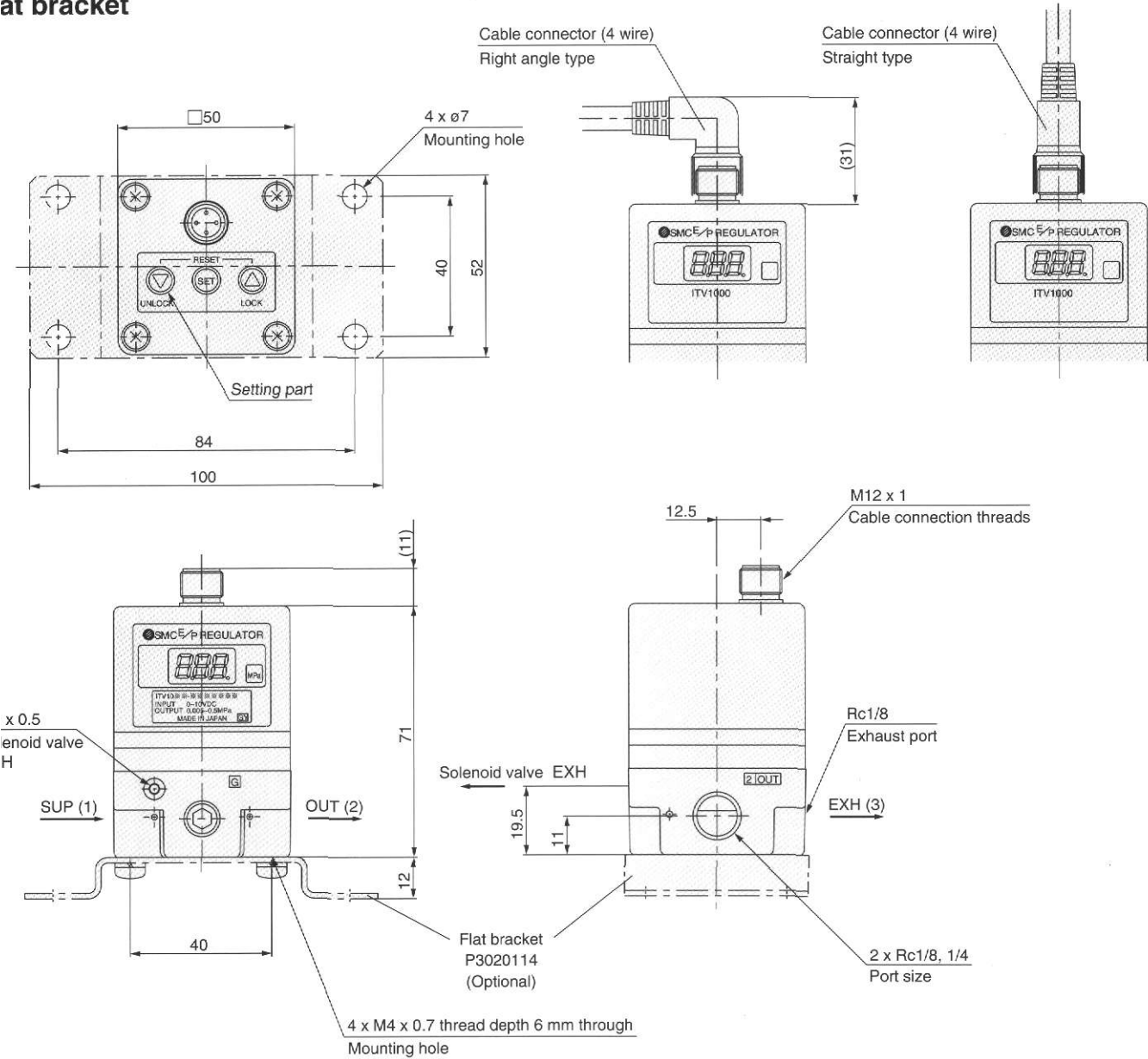


Electro-Pneumatic Regulator **Series ITV1000/2000/3000**

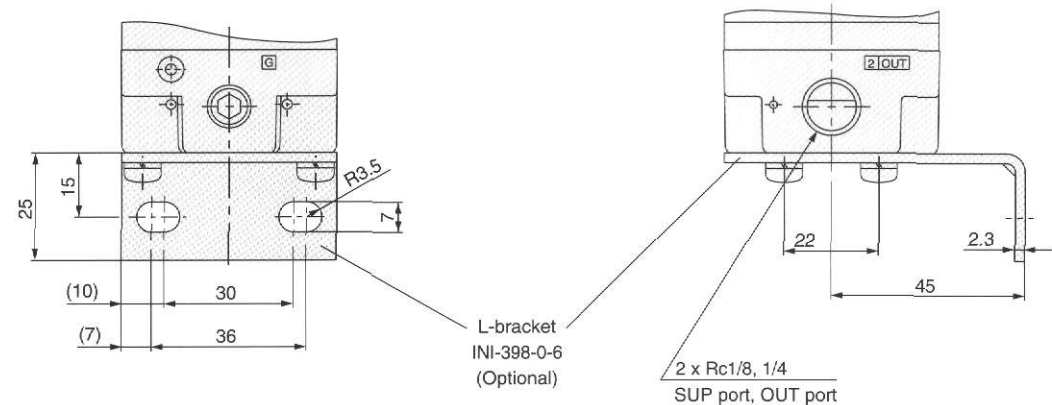
Dimensions

**V10□□
at bracket**

Note) Do not attempt to rotate, as the cable connector does not turn.



Bracket



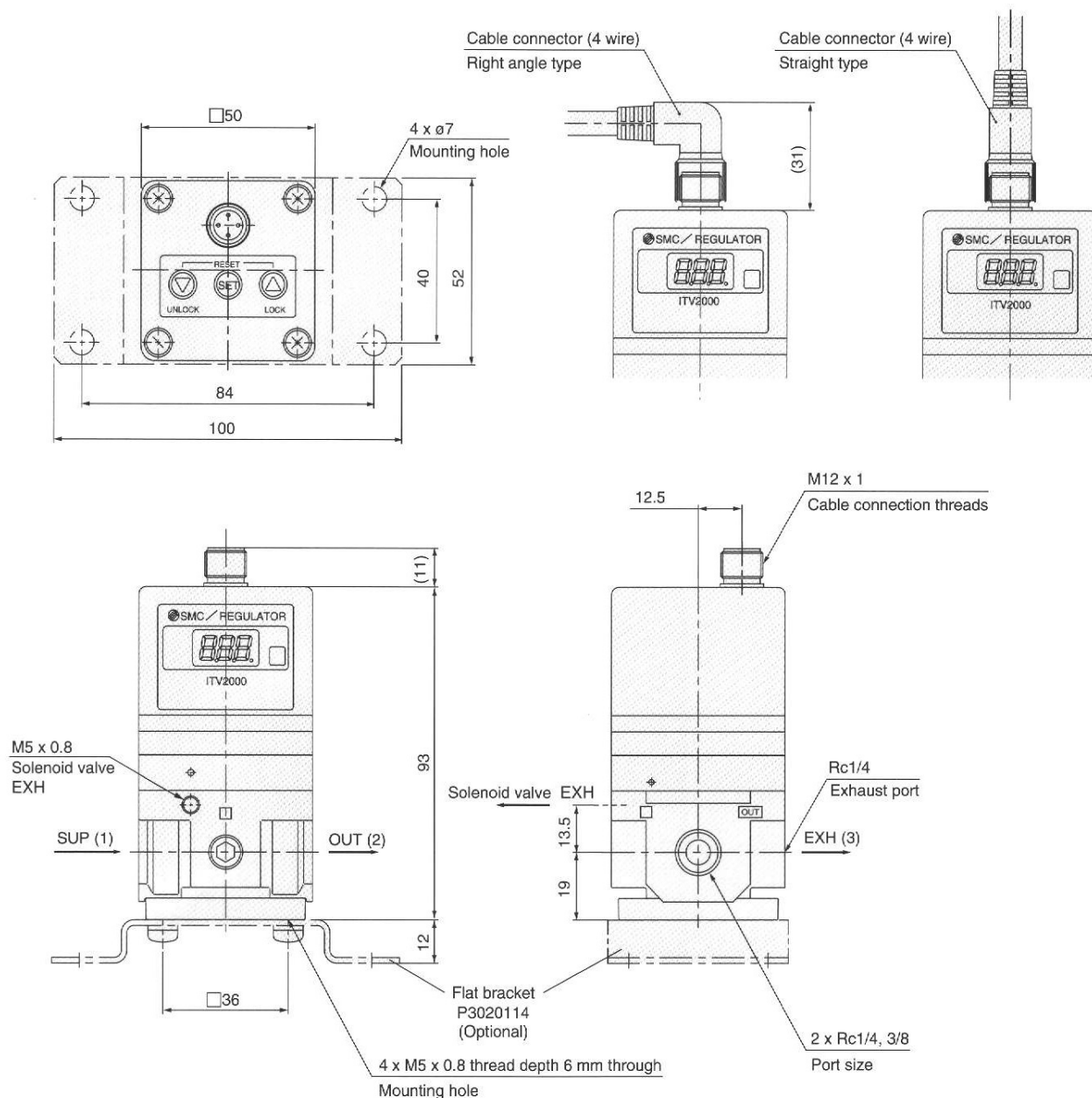
Series ITV1000/2000/3000

Dimensions

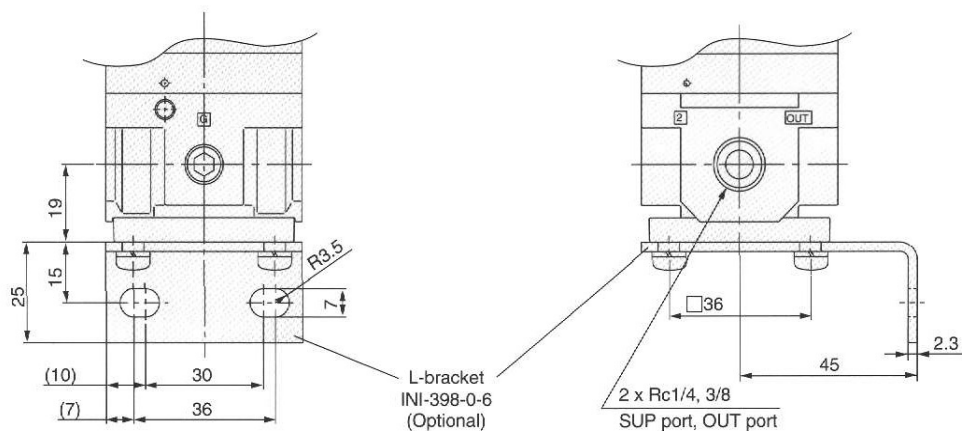
ITV20□□

Flat bracket

Note) Do not attempt to rotate, as the cable connector does not turn.



L-bracket



Dimensions

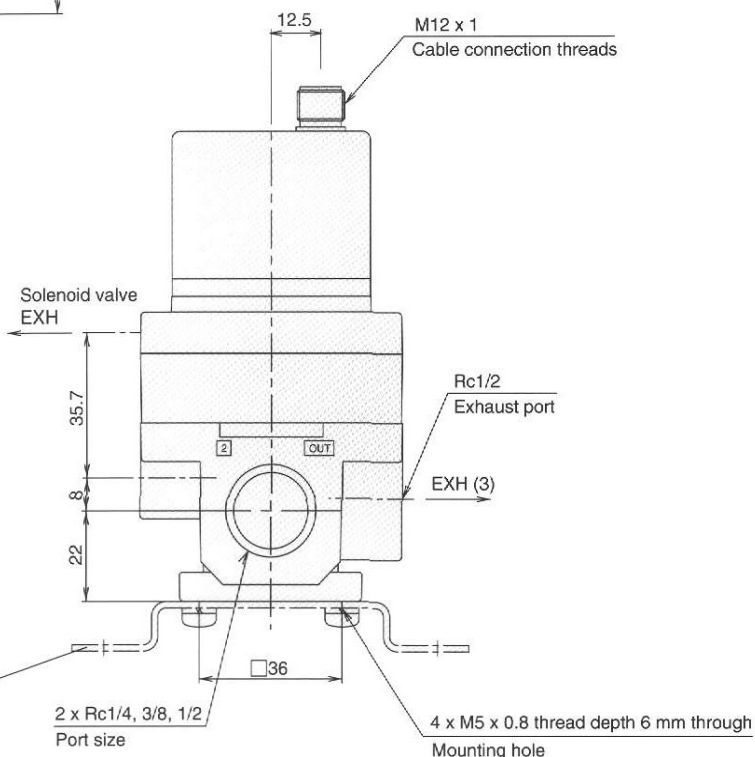
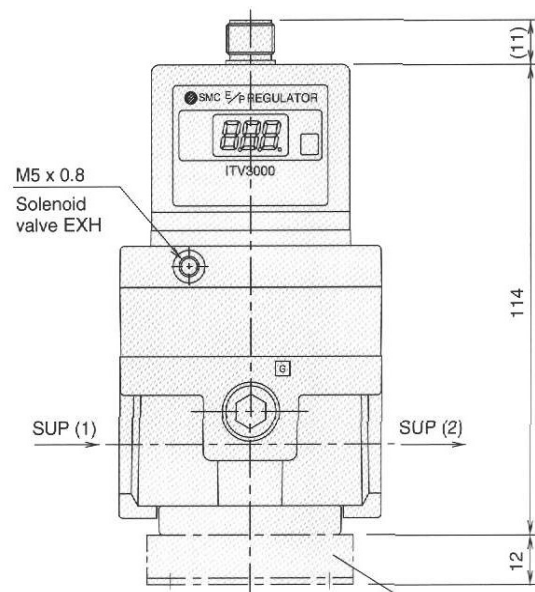
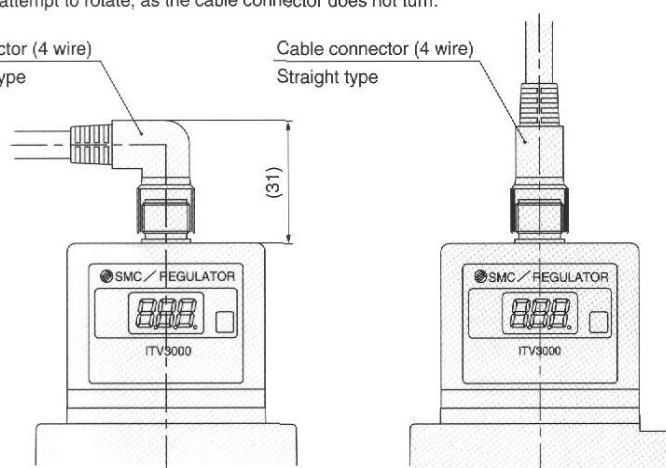
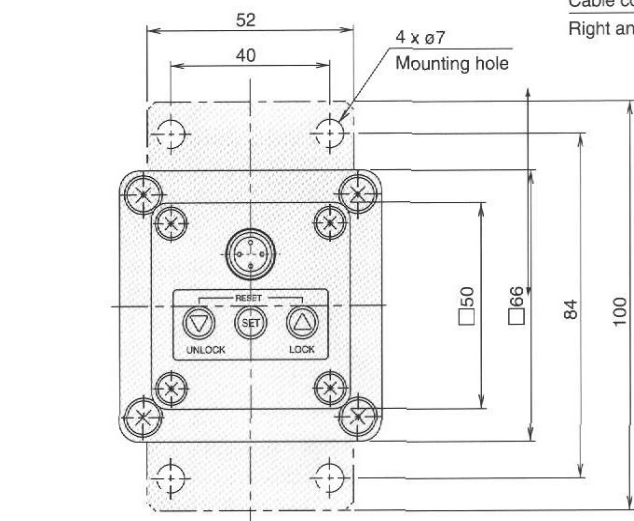
ITV30□□

Flat bracket

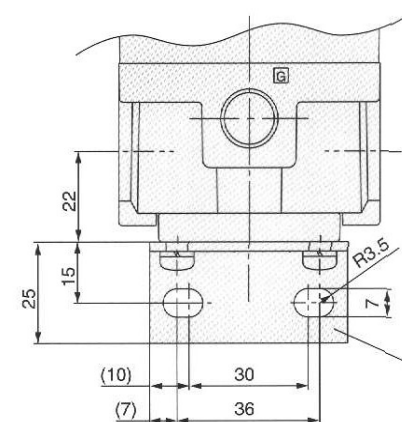
Note) Do not attempt to rotate, as the cable connector does not turn.

Cable connector (4 wire)
Right angle type

Cable connector (4 wire)
Straight type



L-bracket



Flat bracket
P3020114
(Optional)

2 x Rc1/4, 3/8, 1/2
Port size

4 x M5 x 0.8 thread depth 6 mm through
Mounting hole

L-bracket
INI-398-0-6
(Optional)

2 x Rc1/4, 3/8, 1/2
SUP port, OUT port

Series ITV1000/2000/3000

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 model number

● Ozone resistant specifications

2 Reverse Type

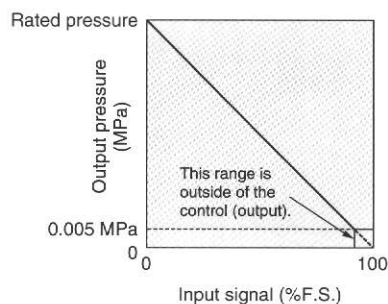
In compliance with input, inverse proportional pressure is displayed.

ITV10 — — X102

ITV20 — — X102

ITV30 — — X102

● Reverse type



Input/output characteristics chart

Note 1) in part number is the same model no. for the standard products.

Note 2) Except for preset input type.

3 16 Points Preset Input Type

Able to control 16 point pressure by 4 bit switching input

ITV10 0 — 4 — X81

ITV20 0 — 4 — X81

ITV30 0 — 4 — X81

● 16 points preset type

Note 1) in part number is the same model no. for the standard products.

Note 2) Monitor output is switch output type only.

4 Digital Input Type

Parallel input type with digital 10 bit.

ITV10 0 — 4 0 — X93

ITV20 0 — 4 0 — X93

ITV30 0 — 4 0 — X93

● Digital input type

Note 1) in part number is the same model no. for the standard products.

5 DeviceNet Compliant

It is conforming to DeviceNet.

ITV10 0 — 4 0 — X80

ITV20 0 — 4 0 — X80

ITV30 0 — 4 0 — X80

● DeviceNet compliant

Note 1) in part number is the same model no. for the standard products.

Note 2) The pressure is not indicated.

Series ITV1000/2000/3000 Made to Order Specifications

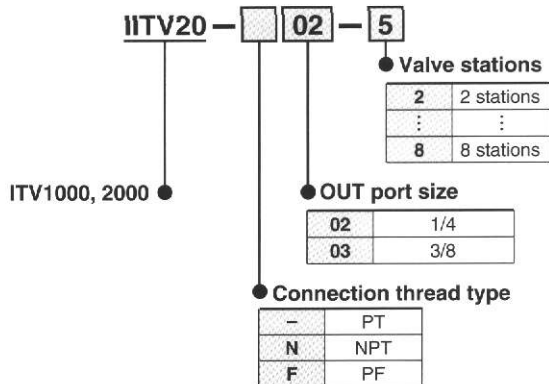
Contact SMC regarding detailed dimensions, specifications and delivery times.



Manifold Specifications (Except Series ITV3000)

rough 8 station manifold.

How to Order Manifolds



ITV20-02-31 set (3 station manifold base part no.)
 ITV2030-311S-X261 set (Electro-pneumatic regulator part no.) Note 2)
 P398020-131 set (Blanking plate assembly part no.)
 ITV2050-212S-X261 set (Electro-pneumatic regulator part no.) Note 2)

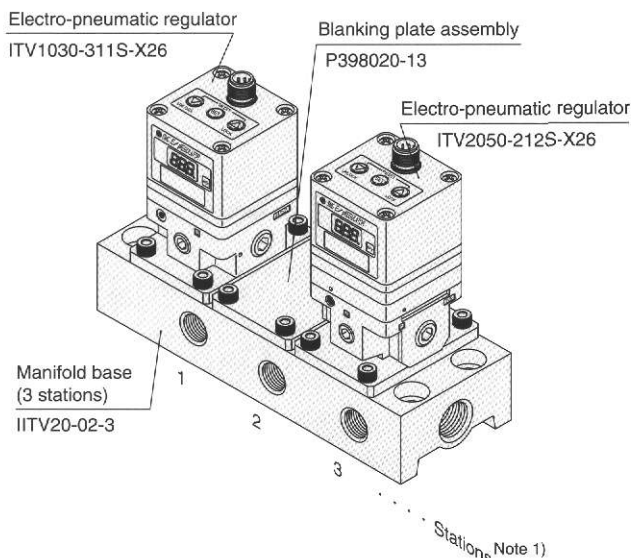
→ The * is the symbol for mounting. Add the * symbol at the beginning of part numbers for electro-pneumatic regulators, etc. to be mounted on the base.

e) Refer to the table below for possible mixed combination.

Model	ITV101	ITV103	ITV105	ITV201	ITV203	ITV205
V101	●	—	—	●	—	—
V103	—	●	●	—	●	●
V105	—	●	●	—	●	●
V201	●	—	—	●	—	—
V203	—	●	●	—	●	●
V205	—	●	●	—	●	●

How to Order Manifold Assemblies

Example



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 Rc1/8 (ITV1000), Rc1/4 (ITV2000) only.

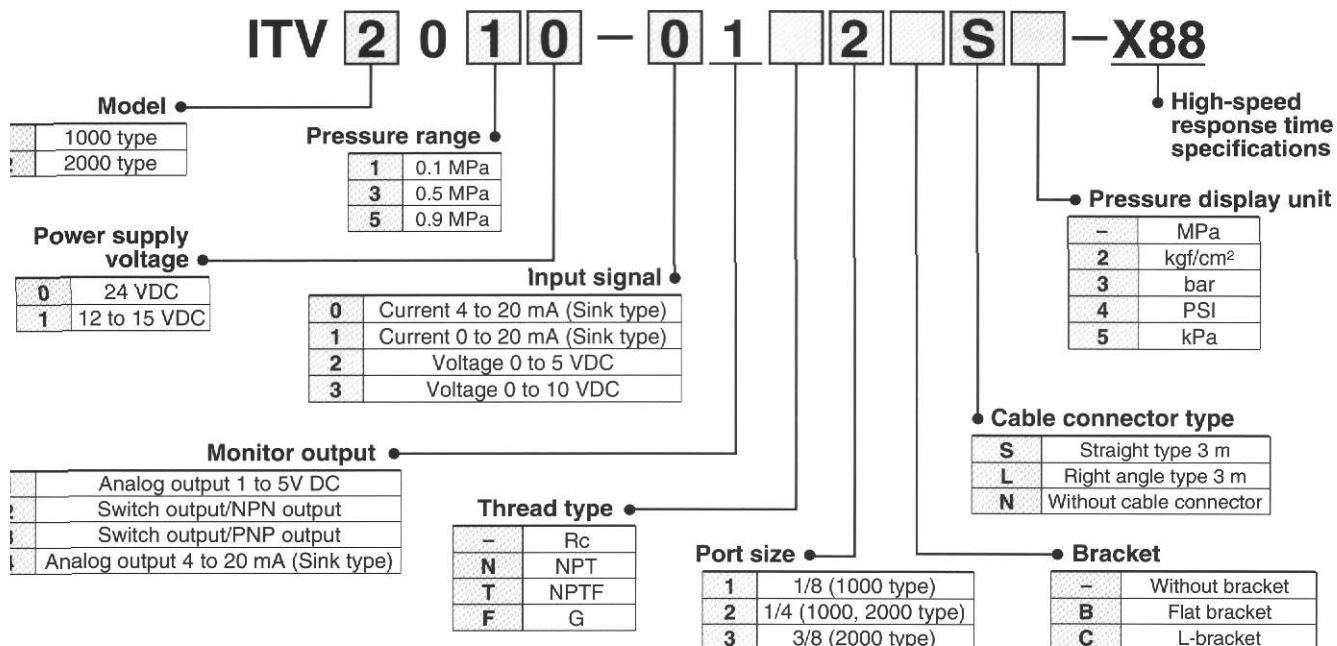
Note 3) When there is a large number of stations, use piping with the largest possible inside diameter for the supply side, such as steel piping.

Note 4) The use of the straight type cable connector is recommended. To mount right angle type, be certain to check that no possible interference occurs.

Note 5) When mounting a blanking plate and the regulator with different pressure set, please inform SMC of the order of a manifold station beside a purchase order.

High-Speed Response Time Specifications

Pressure response with no load is approx. 0.1 sec.



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