Electro-Pneumatic Regulator / Electronic Vacuum Regulator

Series ITV

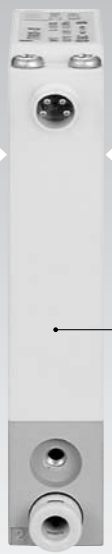
	Series	Model	Regulating pressure range	Port size	Page
Electro-Pneumatic Regulator	***Series ITV0000*** With a simplified high-density circuit board design, an extremely compact size has been achieved. 	**ITV001□**	0.001 to 0.1 MPa	Built-in One-touch fittings Metric size: ø4 Inch size: ø5/32	640
		ITV003□	0.001 to 0.5 MPa		
		ITV005□	0.001 to 0.9 MPa		
		ITV009□	–1 to to –100 KPa		
	Series ITV1000 Controls air pressure steplessly in proportion to an electric signal. 	**ITV101□**	0.005 to 0.1 MPa	1/8, 1/4	651
		ITV103□	0.005 to 0.5 MPa		
		ITV105□	0.005 to 0.9 MPa		
	Series ITV2000 Controls air pressure steplessly in proportion to an electric signal. 	**ITV201□**	0.005 to 0.1 MPa	1/4, 3/8	651
		ITV203□	0.005 to 0.5 MPa		
		ITV205□	0.005 to 0.9 MPa		
	Series ITV3000 Controls air pressure steplessly in proportion to an electric signal. 	**ITV301□**	0.005 to 0.1 MPa	1/4, 3/8, 1/2	651
		ITV303□	0.005 to 0.5 MPa		
		ITV305□	0.005 to 0.9 MPa		
Electronic Vacuum Regulator	***Series ITV209□*** Controls vacuum pressure steplessly in proportion to an electric signal. 	**ITV209□**	–1.3 to –80 kPa	1/4	669

Compact Electro-Pneumatic Regulator

Series ITV0000

Compact 15 mm

With a simplified high-density circuit board design, an extremely compact size has been achieved.



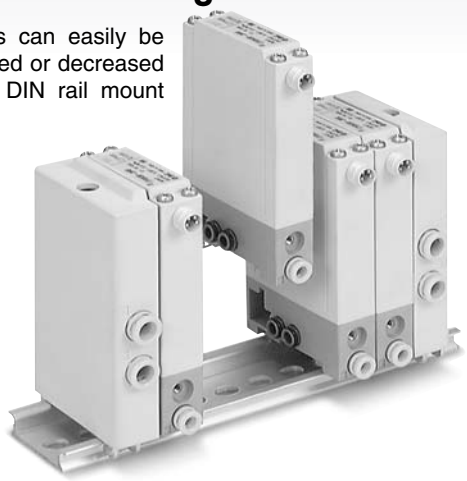
Actual size

Lightweight 100 g

Compact electro-pneumatic regulator
Series ITV0000

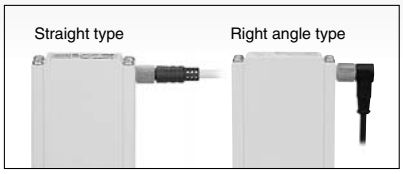
Realizes space-savings and reduction of weight for manifold use.

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 fittings

■ With error indication LED

■ Brackets

Flat and L-brackets are available.

Flat bracket

L-bracket

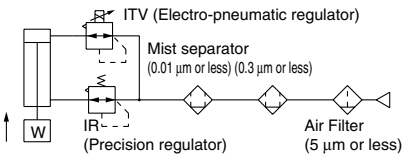
Model	Pressure range	Power supply voltage	Input signal	Output signal	Option
ITV001□	0.1 MPa	24 VDC	4 to 20 mA	Analog output	• Cable connectors Straight type Right angle type • Brackets Flat bracket L-bracket
ITV003□	0.5 MPa		0 to 20 mA		
ITV005□	0.9 MPa	12 VDC	0 to 5 VDC	1 to 5 V	
ITV009□	–100 kPa		0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

● Equivalent to IP65

● Linearity within ±1% (Full span)
Hysteresis 0.5% (Full span)
Repeatability ±0.5% (Full span)

● High-speed response time 0.1 sec
(Without load)

● High stability
Sensitivity 0.2% (Full span)



SMC

Compact Electro-Pneumatic Regulator
Series ITV0000

How to Order

For single unit and single unit for manifold

ITV00 1 0 – 3 □ □ □ N

Pressure range

1	0.1 MPa
3	0.5 MPa
5	0.9 MPa
9	–100 kPa

Power supply voltage

0	24 VDC ±10%
1	12 to 15 VDC

Input signal

0	Current type 4 to 20 mA DC
1*	Current type 0 to 20 mA DC
2	Voltage type 0 to 5 VDC
3	Voltage type 0 to 10 VDC

∗ Option

Built-in One-touch fittings type

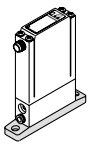
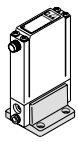
For single unit

Symbol		SUP (VAC) 1	OUT 2	EXH (ATM) 3
Nil	Metric size (Light gray)	ø4		
U	Inch size (Orange)	ø5/32"		

For manifold

Symbol		SUP (VAC) 1	OUT 2	EXH (ATM) 3
Nil	Metric size (Light gray)	ø6	ø4	ø6
U	Inch size (Orange)	ø1/4"	ø5/32"	ø1/4"

Bracket/ Option for single unit only

Nil	Without bracket
B	Flat Bracket 
C	L-bracket 

Base type

Nil	For single unit
M	For manifolds

Cable connector (Option)

N	Without cable connector
S	Straight type 3 m
L	Right angle type 2 m

Manifold

IITV00 – 02 – n

Stations

02	2 stations
03	3 stations
⋮	⋮
10	10 stations

Option

If a DIN rail longer than the specified stations is required, specify the applicable stations in two digits.
(Maximum 10 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 the external dimensions.

How to Order Manifold Assembly (Example)

Indicate the part numbers of electro-pneumatic regulators and options to be mounted below the manifold part number.

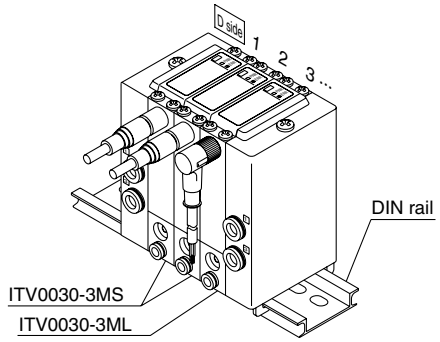
Example)
Due to the common supply/exhaust feature, note that different pressure range combinations are not available.

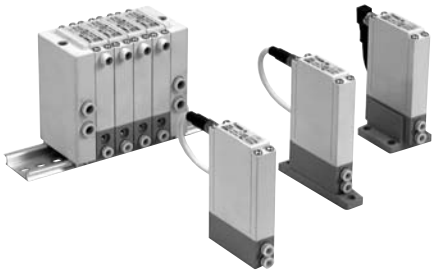
IITV00-03·····1 set (Manifold part no.)
∗ITV0030-3MS·····2 sets (Electro-pneumatic regulator part no. (1, 2 stations))
∗ITV0030-3ML·····1 set (Electro-pneumatic regulator part no. (3 stations))

Indicate part numbers in order starting from the first station on the D side.

Note) Combination with having different pressure ranges is not available due to common supply/exhaust features.

The asterisk (∗) specifies mounting. Add an asterisk (∗) at the beginning of electro-pneumatic regulator part numbers to be mounted.





Specifications

Model		ITV001□	ITV003□	ITV005□	ITV009□
Min. supply pressure		Set pressure +0.1 MPa			Set pressure −1 kPa
Max. supply pressure		0.2 MPa	1.0 MPa		−101 kPa
Regulating pressure range		0.001 to 0.1 MPa	0.001 to 0.5 MPa	0.001 to 0.9 MPa	−1 to −100 kPa
Maximum flow rate		3.5 ℓ/min(ANR) (Supply pressure: 0.2 MPa)	6 ℓ/min(ANR) (Supply pressure: 0.6 MPa)	6 ℓ/min(ANR) (Supply pressure: 0.6 MPa)	2 ℓ/min(ANR) (Supply pressure: −101 kPa)
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	Voltage type	0 to 5 VDC, 0 to 10 VDC			
	Current type	4 to 20 mADC, 0 to 20 mADC			
Input impedance	Voltage type	Approximately 10 kΩ			
	Current type	Approximately 250 Ω			
Output signal	Analog output	1 to 5 VDC (Load impedance: 1 kΩ or more) Output accuracy: Within ±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 characteristics		Within ±0.12% (Full span)/°C			
Operating temperature range		0 to 50°C (With no condensation)			
Enclosure		IP65 equivalent *			
Connection type		Built-in One-touch fittings			
Connection size	For single unit	Metric size	[1], [2], [3]: ø4		
		Inch size	[1], [2], [3]: ø5/32"		
	Manifold	Metric size	[1], [3]: ø6, [2]: ø4		
		Inch size	[1], [3]: ø1/4", [2]: ø5/32"		
Mass (1)		100 g or less (without options)			

Note 1) Indicates the mass of a single unit.
For IITV00-n
Total mass (g) ≤ Stations (n) x 100 + 130 (Mass of end block A, B assembly) + Mass (g) of DIN rail

Note 2) Specifications other than the following are optional. Pressure range: 0.1 MPa, 0.5 MPa, 0.9 MPa, Power supply voltage: 24 VDC, Input signal: 0 to 10 VDC

Note 3) When there is a downstream flow consumption, pressure may become unstable depending on piping conditions.

* When using under the conditions equivalent to IP65, connect the fitting or tube to the breathing hole prior to use. (For details, refer to page 649 in Specific Product Precautions.)

Option

Bracket

Flat bracket assembly
P39800022

L-bracket assembly
P39800023

Tighting torque when assembling is 0.3 N·m.

Cable connector

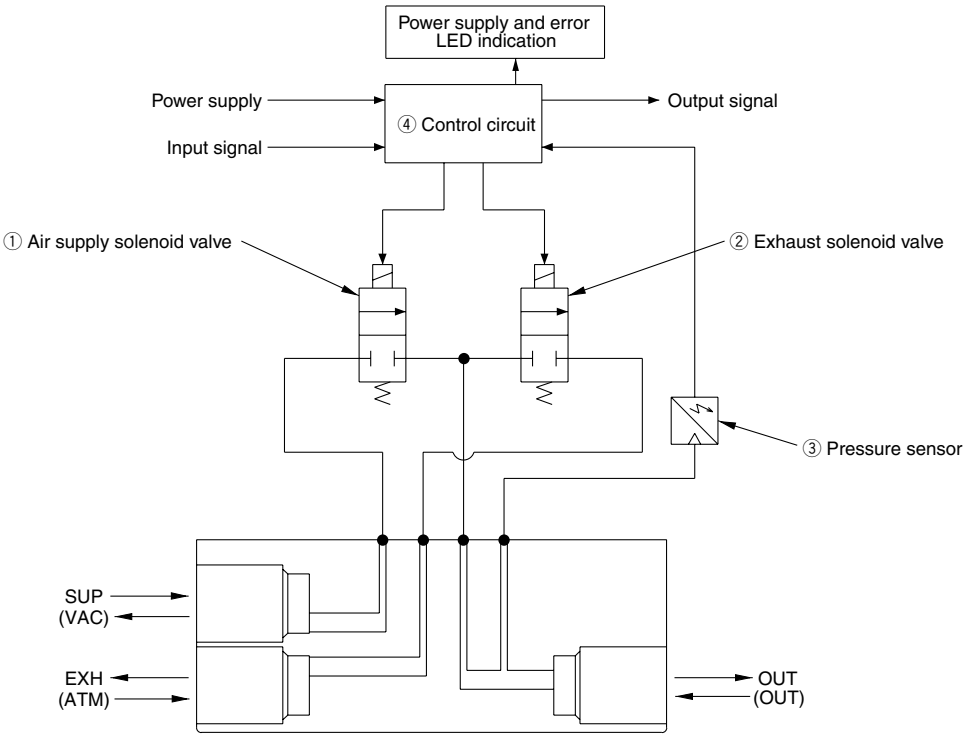
Straight type
M8-4DSX3MG4

Right angle type
ELWIKA-KV4408 PVC025 2M

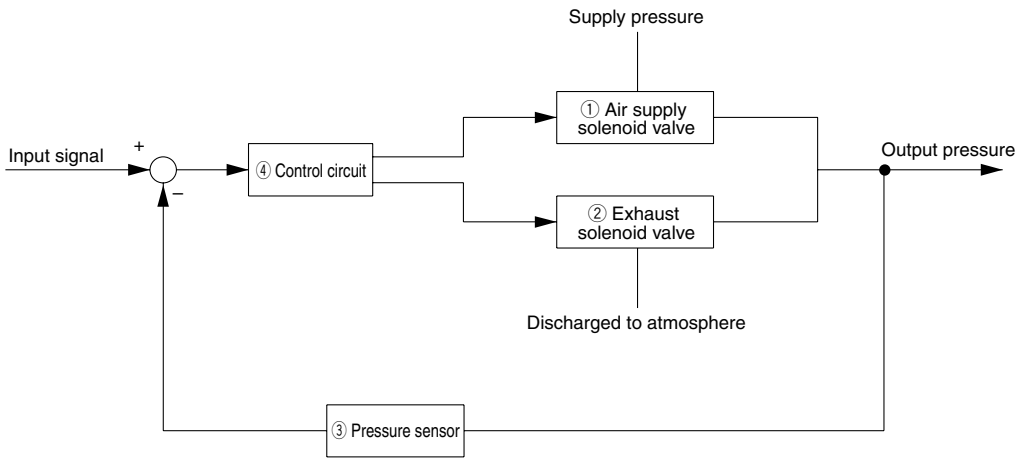
Working Principle

When the input signal rises, the air supply soloenoid 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.

Diagram of working principle

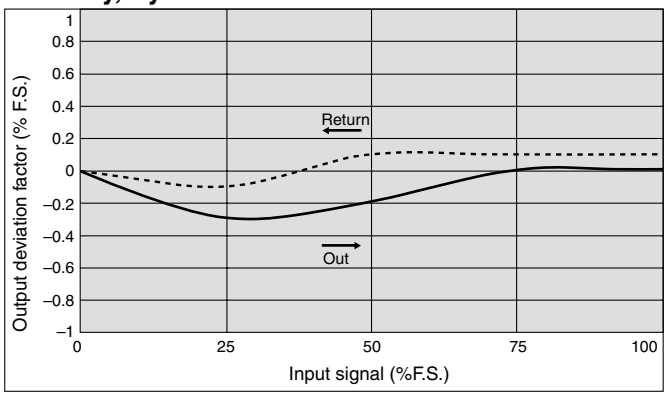


Block diagram



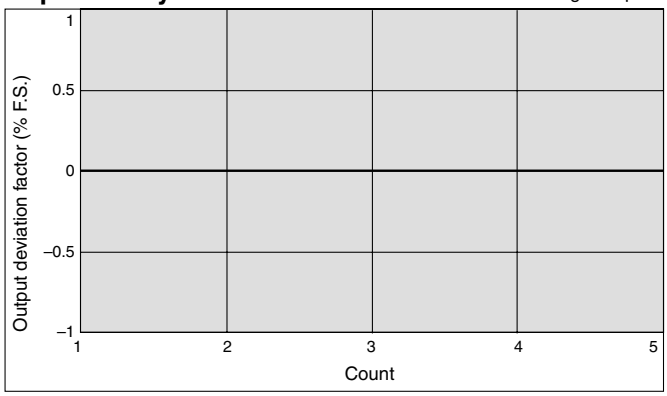
Series ITV001□

Linearity, Hyteresis



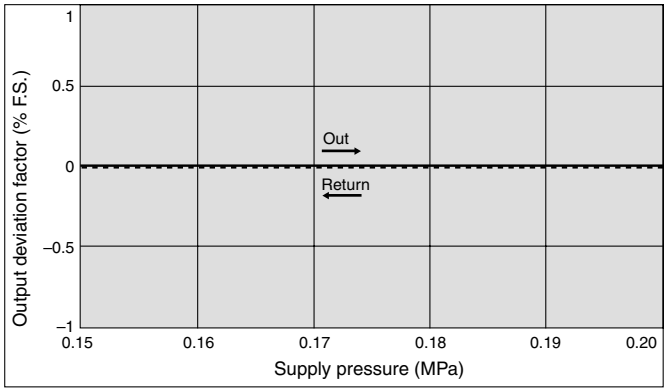
Repeatability

With 50% of signal input



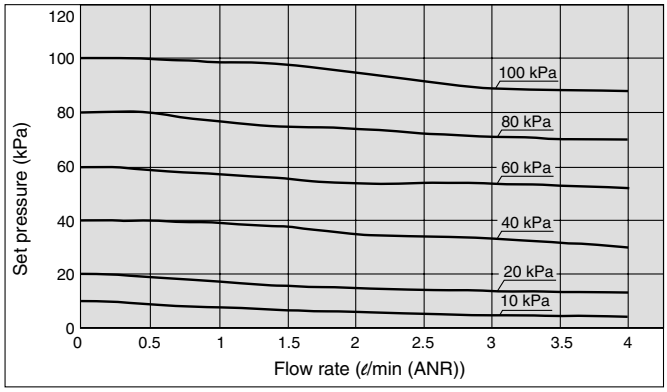
Pressure Characteristics

Set pressure: 0.05 MPa



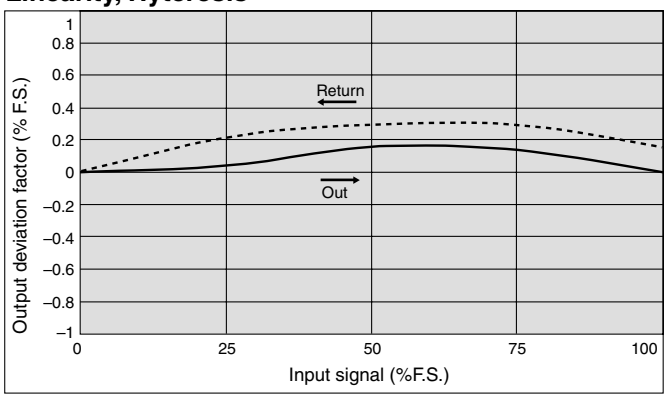
Flow Characteristics

Supply pressure: 0.2 MPa



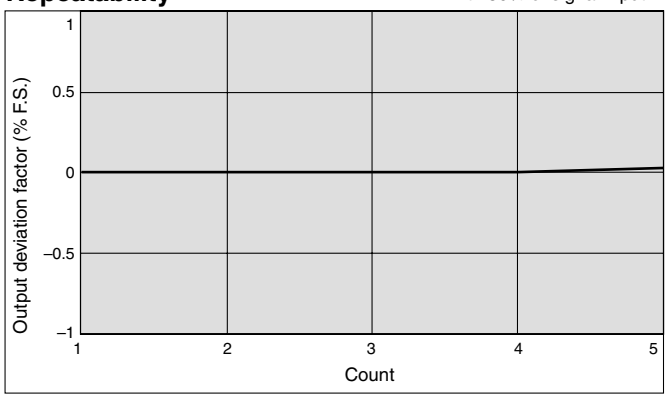
Series ITV003□

Linearity, Hyteresis



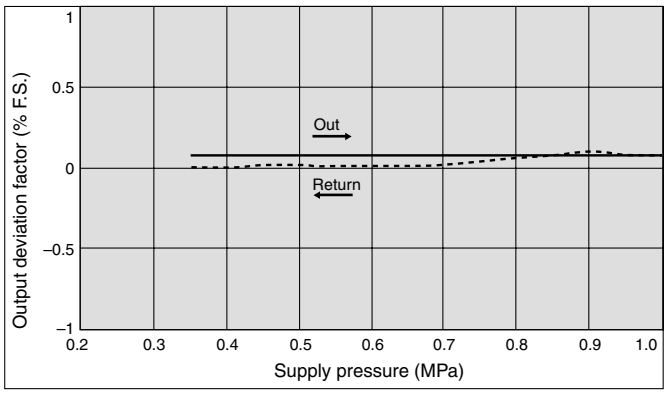
Repeatability

With 50% of signal input



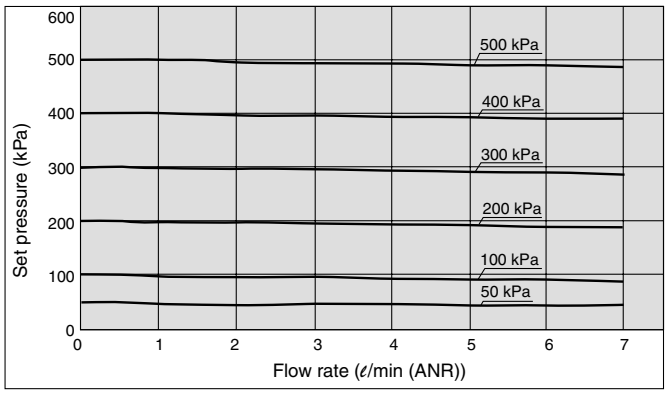
Pressure Characteristics

Set pressure: 0.25 MPa



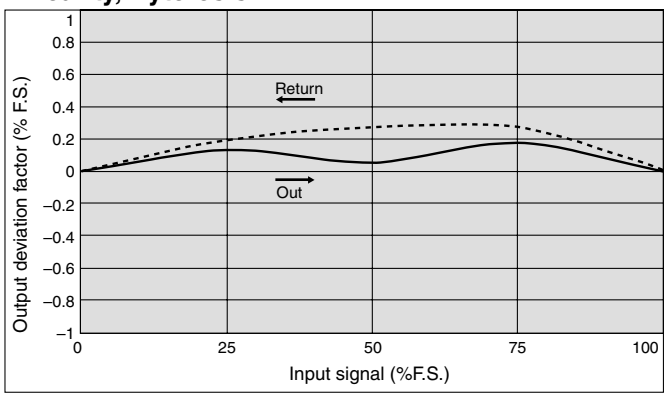
Flow Characteristics

Supply pressure: 0.6 MPa



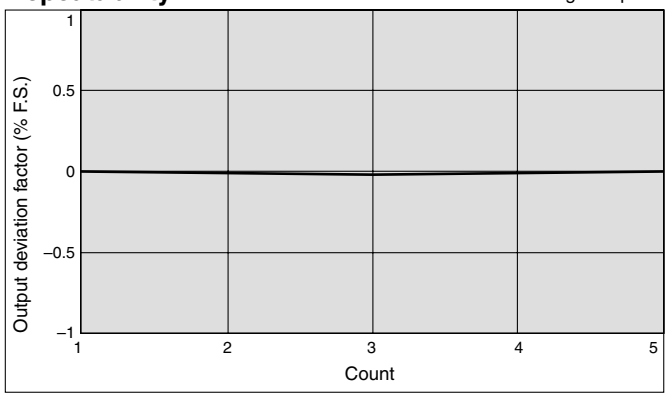
Series ITV005□

Linearity, Hyteresis



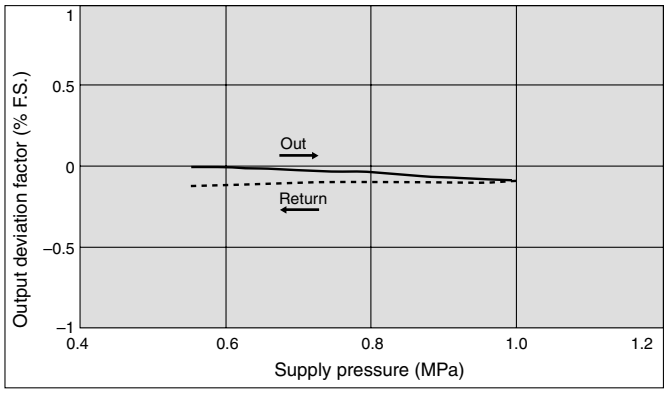
Repeatability

With 50% of signal input



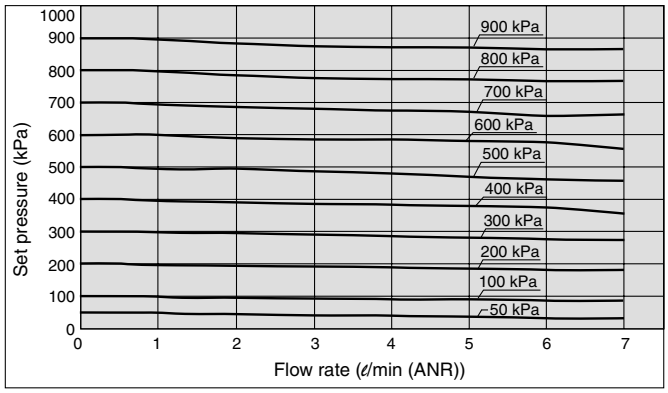
Pressure Characteristics

Set pressure: 0.45 MPa



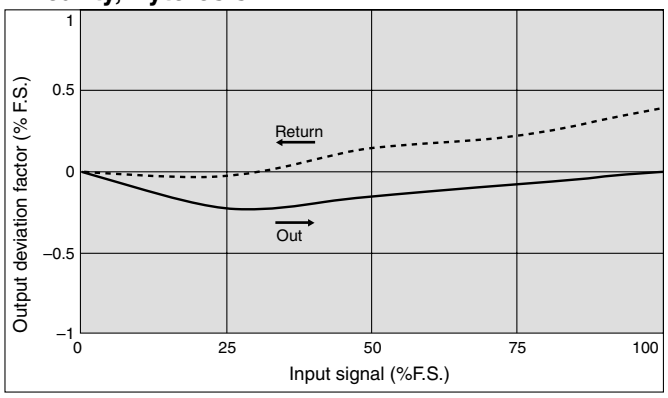
Flow Characteristics

Supply pressure: 1.0 MPa



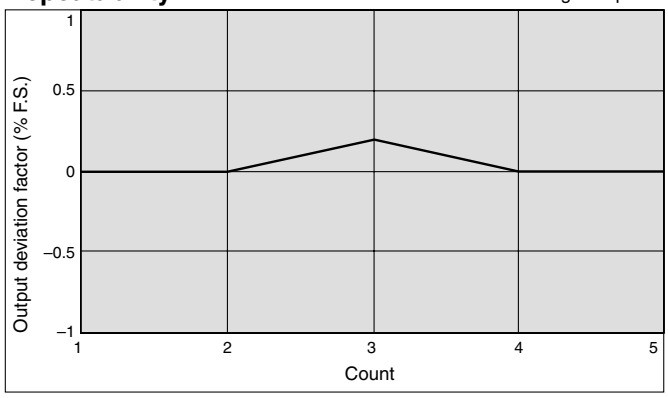
Series ITV009□

Linearity, Hyteresis



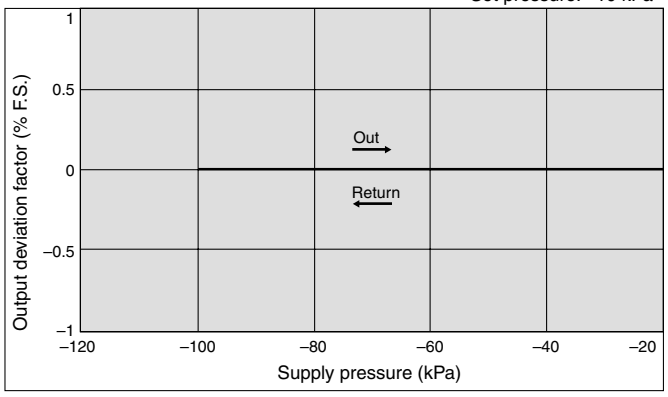
Repeatability

With 50% of signal input

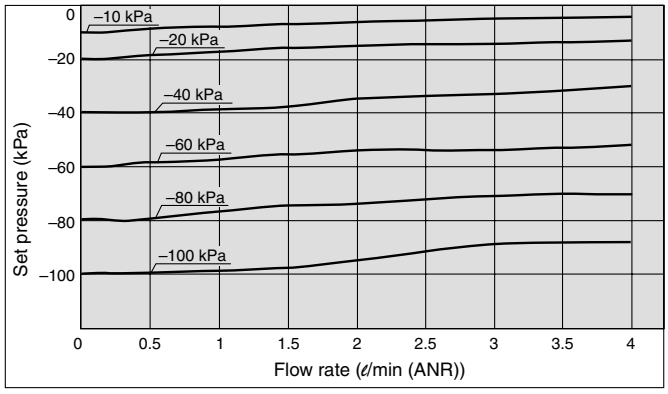


Pressure Characteristics

Set pressure: −10 kPa

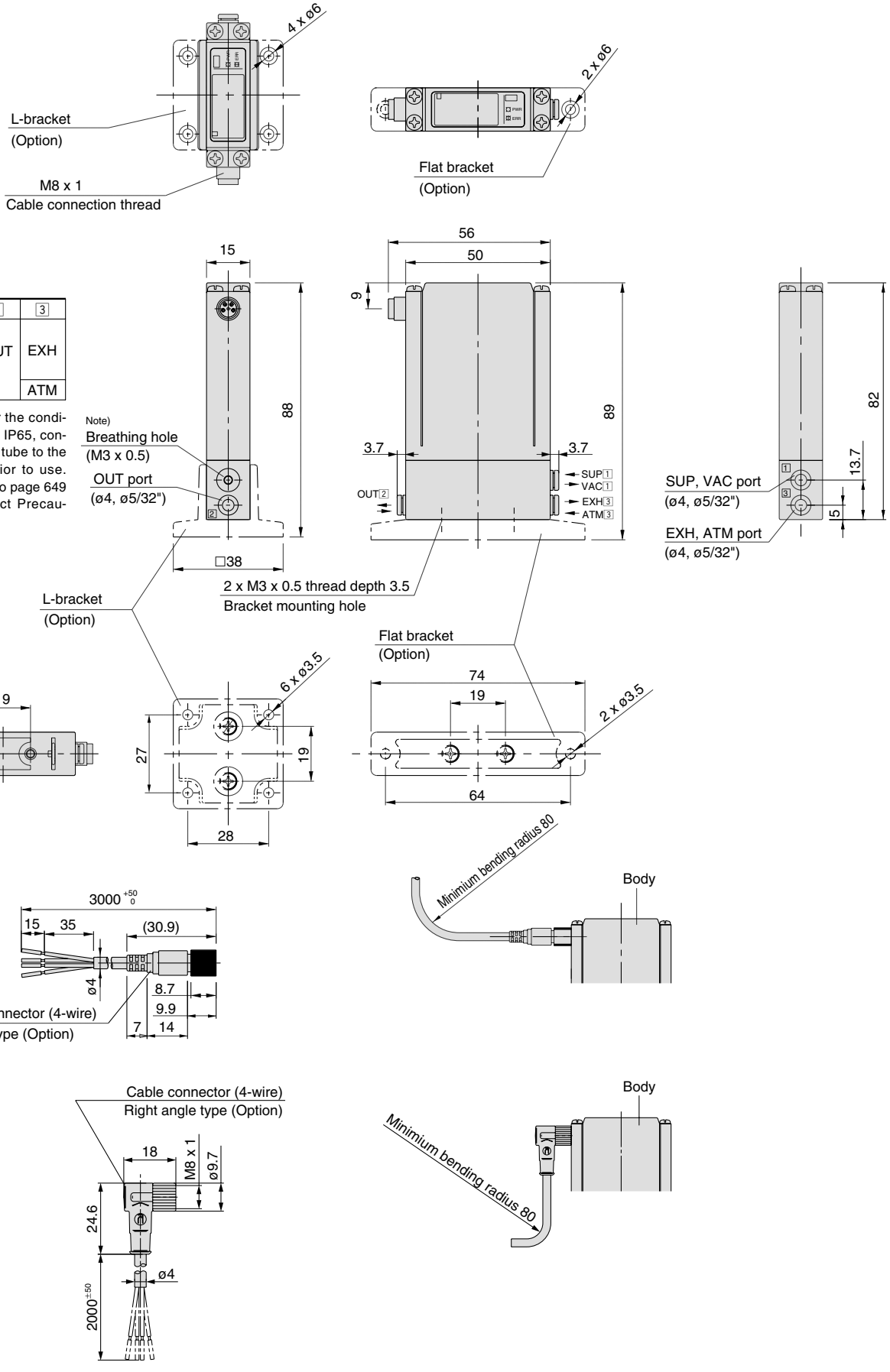


Flow Characteristics



Dimensions

For Single Unit



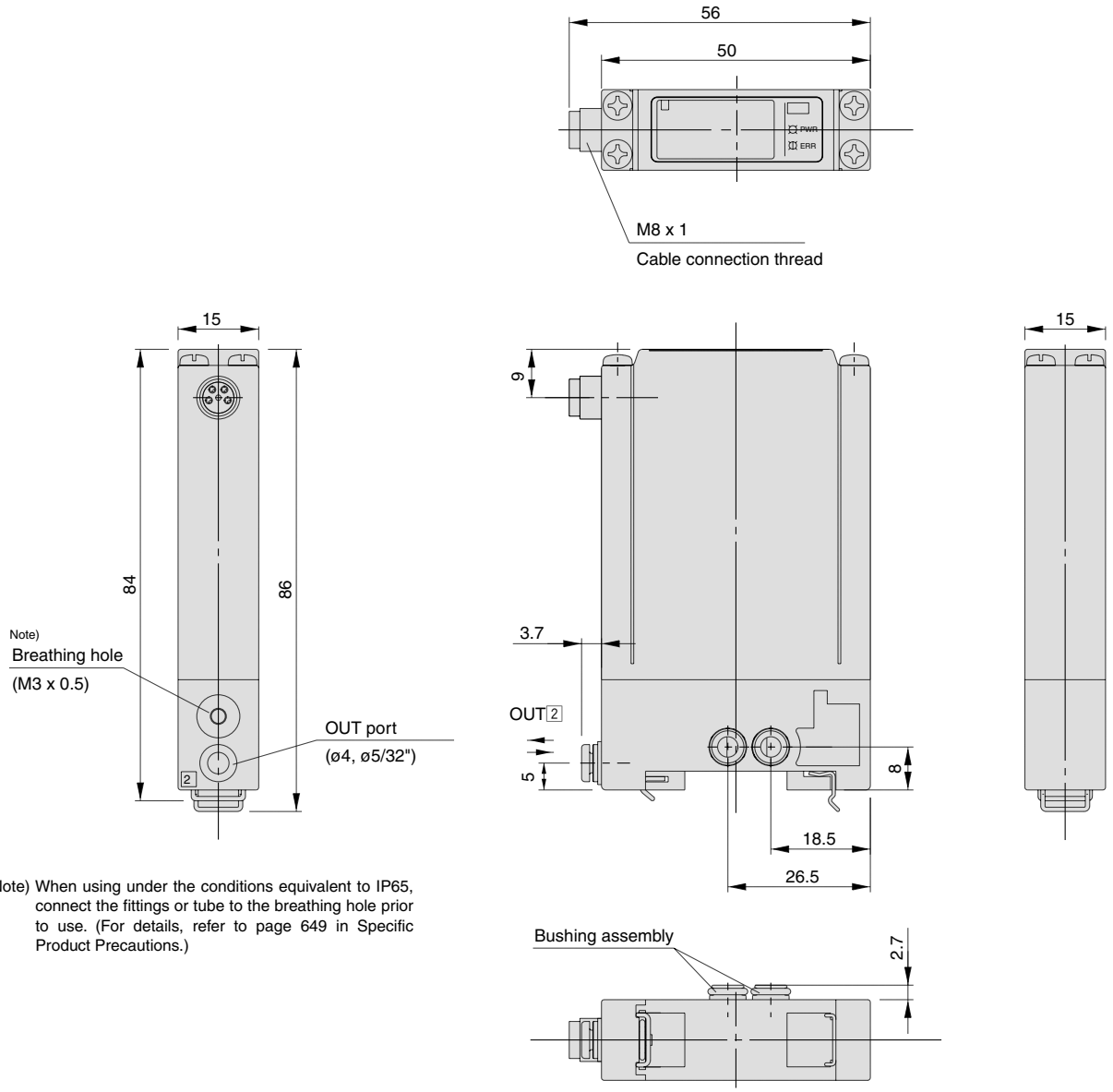
Port Location

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

Note) When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use. (For details, refer to page 649 in Specific Product Precautions.)

Dimensions

Single unit for manifold

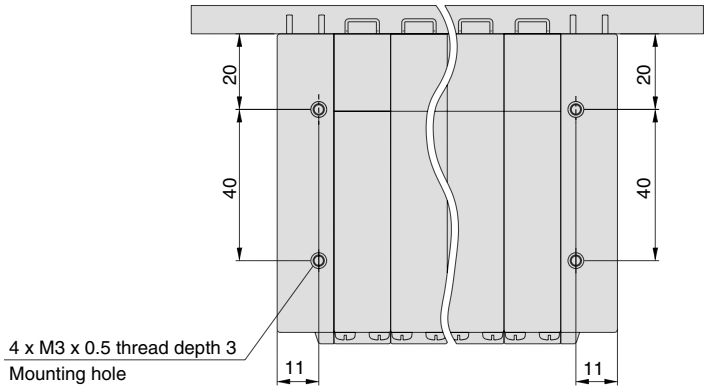


Note) When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use. (For details, refer to page 649 in Specific Product Precautions.)

Note) For dimensions of the cable connector, refer to single unit on page 646.

Dimensions

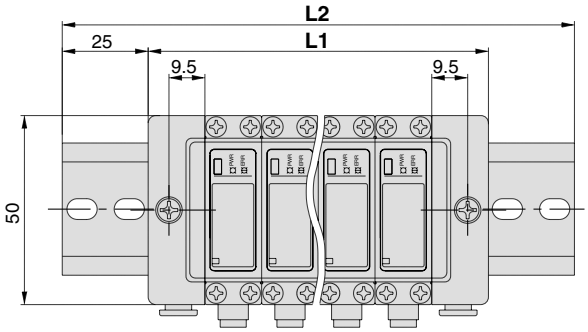
Manifold

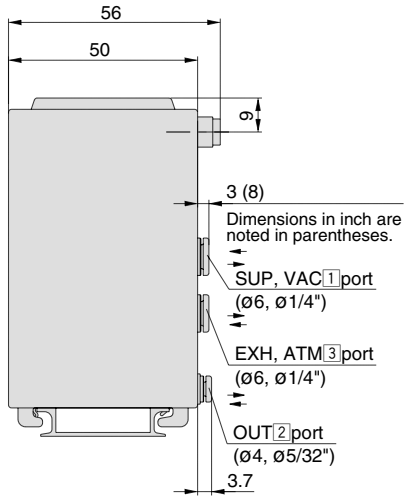


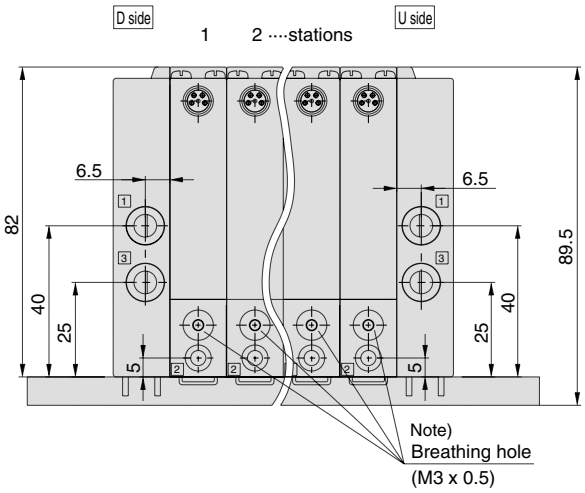
Port Location

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

Note) Stations are counted starting from the D side.







Note) For dimensions of the cable connector, refer to single unit on page 646.

Note) When using under the conditions equivalent to IP65, connect the fittings or tubing to the breathing hole prior to use. (For details, refer to "Specific Product Precautions" on page 649.)

(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
Mass of DIN rail (g)	20	22	27	29	31	34	36	41	43

Series ITV0000
Specific Product Precautions

Be sure to read before handling.
Refer to front matters 42 and 43 for Safety Precautions and pages 287 to 291 for Precautions on every series.

Air Supply

⚠ Caution

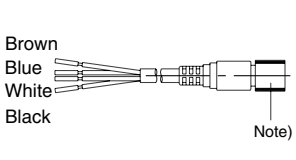
1. **Install an air filter near this product on the supply side. Select a filtration degree of 5 μm or less.**
2. **Compressed air containing large amounts of drainage can cause malfunction of this product and other pneumatic equipment. As a countermeasure, install an aftercooler, air dryer or Drain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

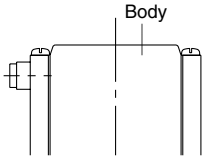
   For details on the above compressed air quality, refer to pages 2 and 3.

Wiring

⚠ Caution

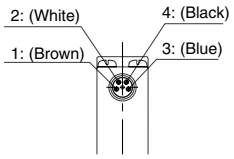
Connect the cable to the connector on the body with the wiring arranged as shown below. Proceed carefully, as incorrect wiring can cause damage.
Further, use DC power with sufficient capacity and a low ripple.





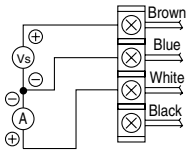
Terminal no.	1	2	3	4
Lead wire color	Brown	White	Blue	Black
Wiring	Power supply	Signal	COM	Monitor

Note) A right angle type is also available. The entry directions for the right angle type connector is downward (OUT port side). Never turn the connector as it is not designed to turn.
If forced, it will damage the connector port.



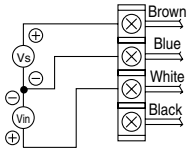
Wiring diagram

Current signal type



Vs : Power supply 24 VDC ±10%
12 to 15 VDC
A : Input signal 4 to 20 mADC
0 to 20 mADC

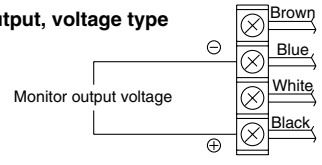
Voltage signal type



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

Monitor output wiring diagram

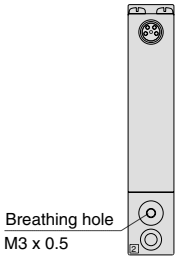
Analog output, voltage type



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 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 operaing 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 unnecessary 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 malfunction.**
7. **Use caution 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.
   2) For avoiding the influence of noise or static electricity, install this product and its wiring as far as possible from strong electric fields such as those of motors and power lines, etc.
   3) Make sure to take protective measures against load surge for an induction load (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 throught the breathing hole.**
    Use a fitting/tube (M-3AU-3 fitting and TIU01m-mm tube are recommended), extend the piping to the location where there is no water, dust, etc.



12. **When using in an enclosed environment, like an inspection box, etc., make sure to install a fan or other such device to prevent from overheating.**
    When power is on, an operating tone occurs to confirm the operation of the solenoid valves. Note that this is not abnormal.

Electro-Pneumatic Regulator

Series ITV1000/2000/3000

(Option)

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)*

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

Equivalent to IP65

Sensitivity: 0.2 kPa (100 kPa specifications)

Linearity: Within ±1% (F.S.)

Hysteresis: Within 0.5% (F.S.)

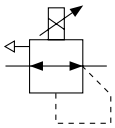
Electro-Pneumatic Regulator
Series ITV1000/2000/3000

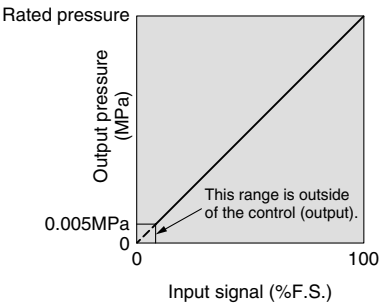
ITV1000

ITV2000

ITV3000

JIS Symbol





Graph (1) Input/output characteristics chart

Standard Specifications

Model		ITV101□ / ITV201□ / ITV301□	ITV103□ / ITV203□ / ITV303□	ITV105□ / ITV205□ / 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) Note 3)	Analog output	1 to 5 VDC (Load impedance: 1 kΩ or more) 4 to 20 mA (Sink type) (Load impedance: 250 Ω or less) Output accuracy within ±6% (full span)		
	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 Note 4)	Accuracy	±3% (full span)		
	Minimum unit	MPa: 0.01, kgf/cm²: 0.01, bar: 0.01, psi: 0.1 Note 5), kPa: 1		
Ambient and fluid temperature		0 to 50°C (No condensation)		
Enclosure		Equivalent to IP65		
Mass	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 page 668 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) Values can be adjusted starting from the minimum output pressure display units (ex. 0.01 to 0.50 MPa) are used for the zero/span adjustment or the preset input type adjustment. Units are not interchangeable.
Note 5) The minimum unit for the 0.9 MPa (130 psi) type is 1 psi.
Note 6) 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 □ – □ – □

Model

1	1000 type
2	2000 type
3	3000 type

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

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)

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

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)

Bracket

Nil	Without bracket
B	Flat bracket
C	L-bracket

Cable connector type

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

Pressure display unit

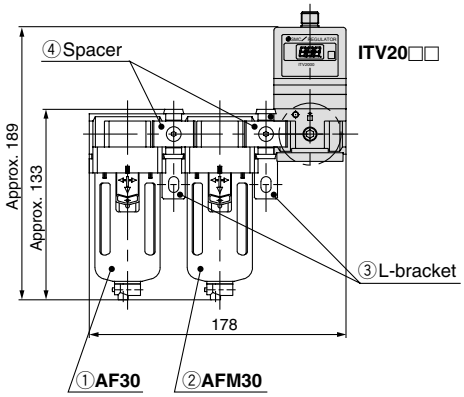
Nil	MPa
2 Note 1)	kgf/cm²
3	bar
4 Note 1)	psi
5	kPa

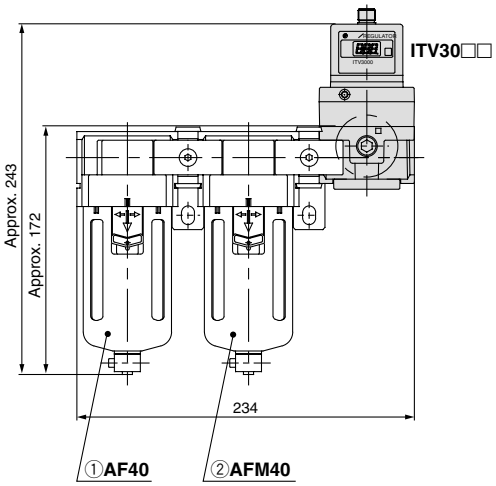
CE compliance

Nil	Not compliant
Q	Compliant

Note) Refer to pages 653, 664 and 665 for CE marked products in the Made to Order specifications.
* Please visit our SMC homepage: http://www.smcworld.com for the latest details on our CE compliant products.

Made to Order
Refer to pages 653, 664 and 665 for details.





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		◎
Acces-sories	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.

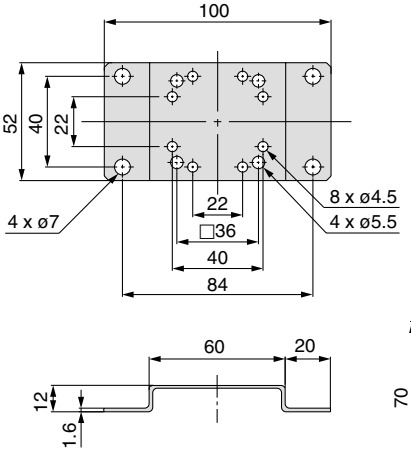
Applicable products and accessories	Applicable model	
	ITV20□□	ITV30□□
① **Air filter**	AF30	AF40
② **Mist separator**	AFM30	AFM40
③ **L-bracket**	B310L	B410L
④ **Spacer**	Y30	Y40
⑤ **Spacer with L-bracket (③ + ④)**	Y30L	Y40L

Accessory (Option)/Part No.

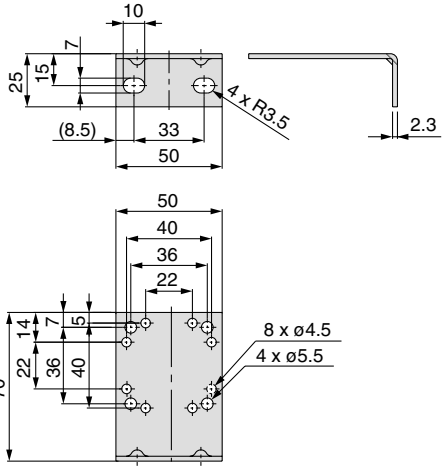
Description		Part No.		
		ITV10□□	ITV20□□	ITV30□□
Flat bracket		P3020114 (Mounting thread is not included.)		
L-bracket		INI-398-0-6 (Mounting thread is not included.)		
Cable connector	**Straight type 3 m**	P398020-500-3		
	Right angle type 3 m	P398020-501-3		

Dimensions

Flat bracket



L-bracket



Made to Order

Made to Order

(Refer to pages 664 and 665 for details.)

Symbol	CE-compliant	Specifications
X80	Not compliant	DeviceNet compliant
X155	Compliant	
X300	Not compliant	CC-Link compliant
X305	Compliant	
X310	Not compliant	RS-232C compliant
–	Compliant	
X81	Not compliant	16 points preset input type
X156	Compliant	
X93	Not compliant	Digital input type
X157	Compliant	
X102	Not compliant	Reverse type
X321	Compliant	
X224	Not compliant	High pressure type (SUP 1.2 MPa, OUT 1.0 MPa)
X322	Compliant	
X25	Not compliant	Set pressure range 1 to 100 kPa (Except Series ITV3000)
X323	Compliant	
X88	Not compliant	High speed response type (Except Series ITV3000)
X154	Compliant	
X26	Not compliant	For manifold mounting (Except Series ITV3000)
X153	Compliant	

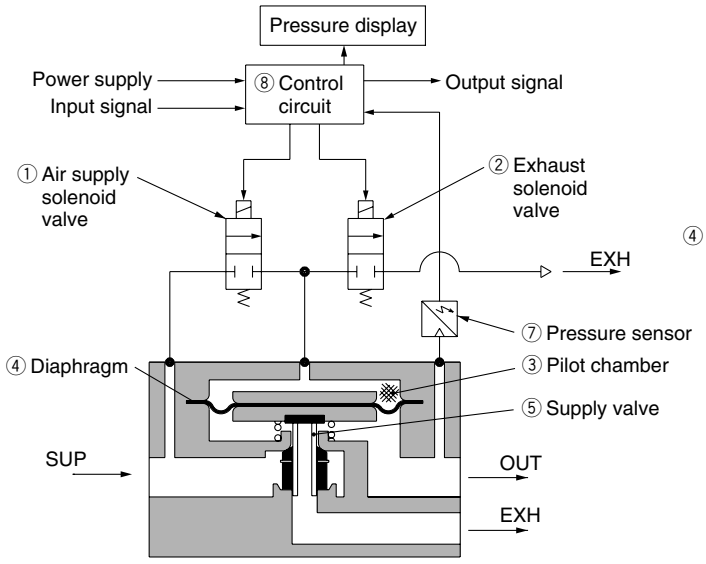
Note 1) Manifolds are compatible with 2 to 8 stations. Consult with SMC for 9 stations or more.

Note 2) Products without symbols are also compatible. Consult with SMC separately.

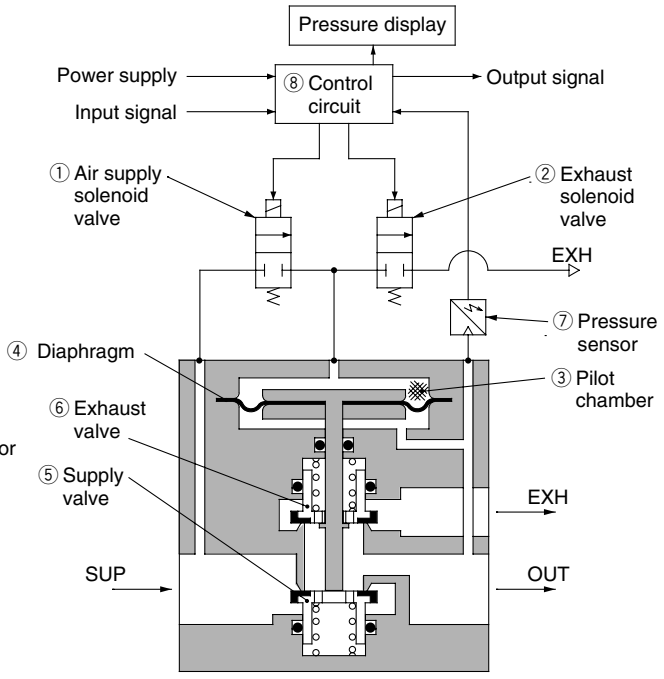
Working Principles

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

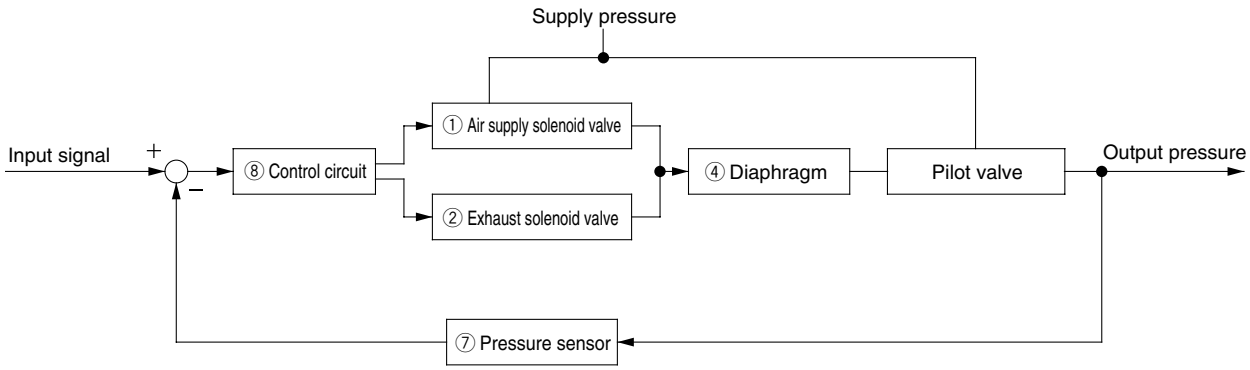


ITV1000



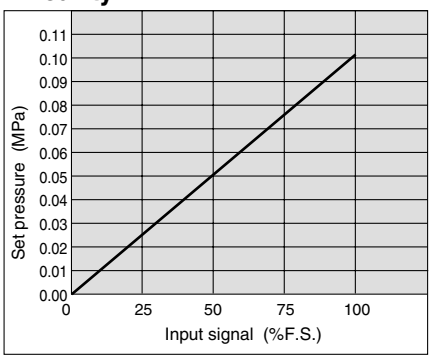
ITV2000, 3000

Block diagram

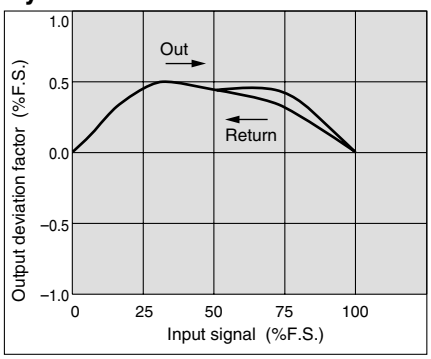


Series ITV101□

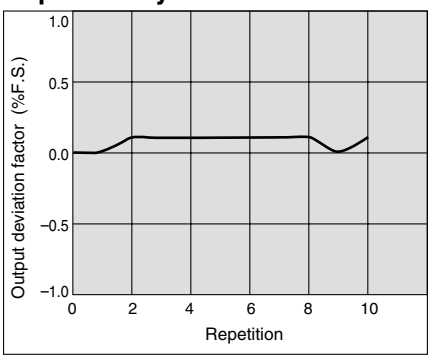
Linearity



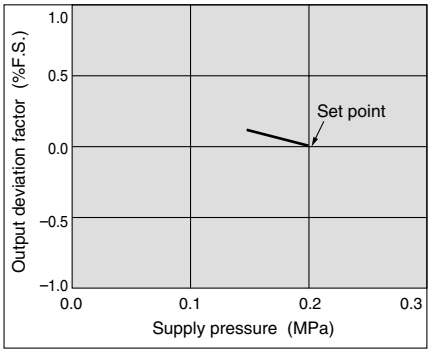
Hysteresis



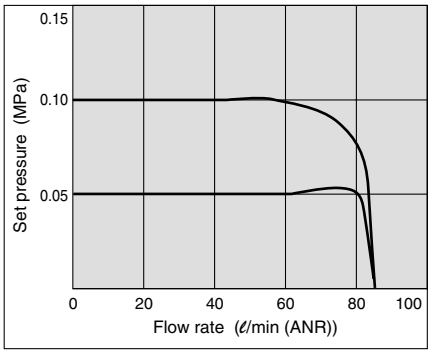
Repeatability



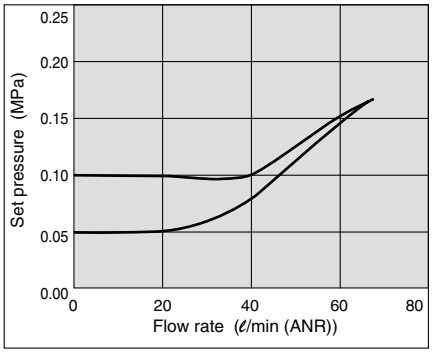
Pressure characteristics Set pressure: 0.05 MPa



Flow characteristics Supply pressure: 0.2 MPa

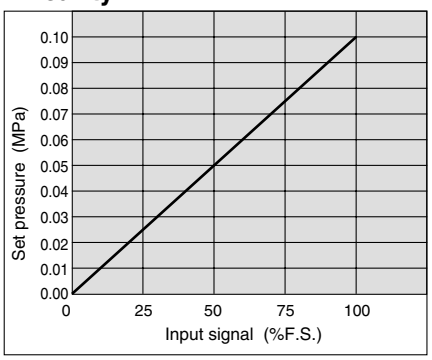


Relief flow characteristics Back pressure: 0.2 MPa

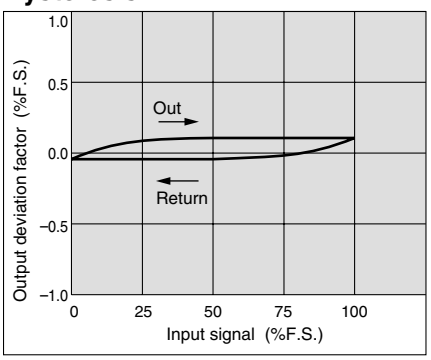


Series ITV201□

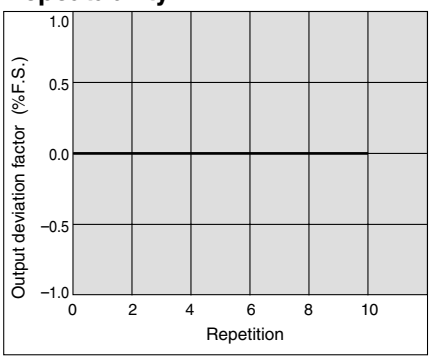
Linearity



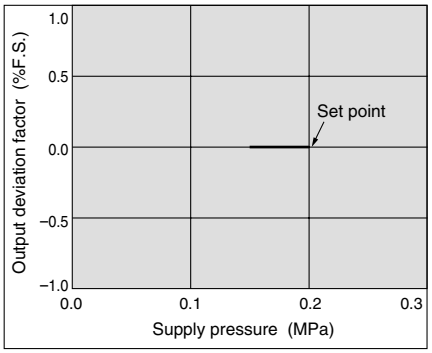
Hysteresis



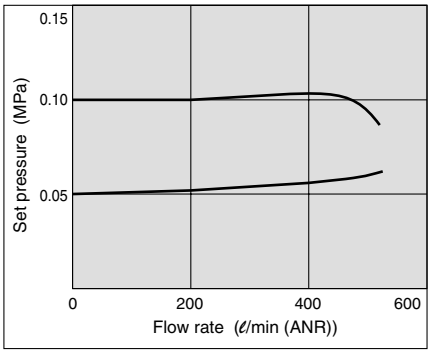
Repeatability



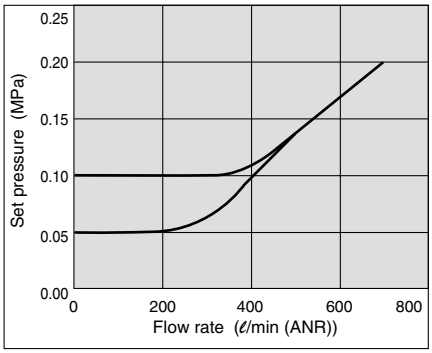
Pressure characteristics Set pressure: 0.05 MPa



Flow characteristics Supply pressure: 0.2 MPa

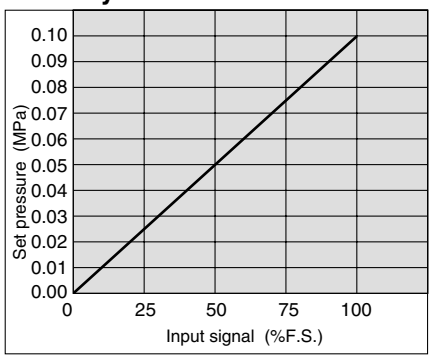


Relief flow characteristics Back pressure: 0.2 MPa

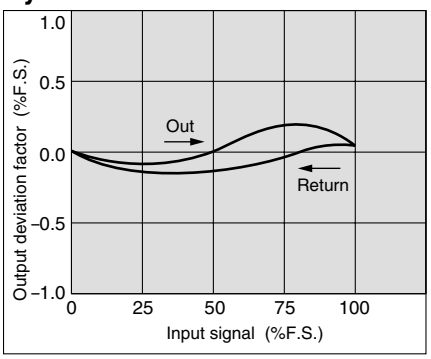


Series ITV301□

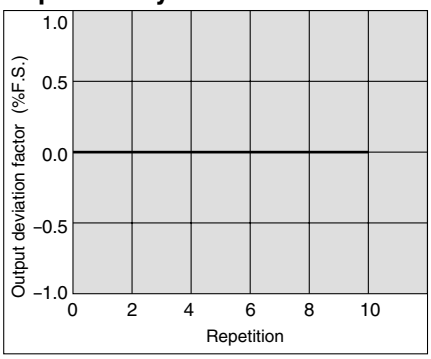
Linearity



Hysteresis

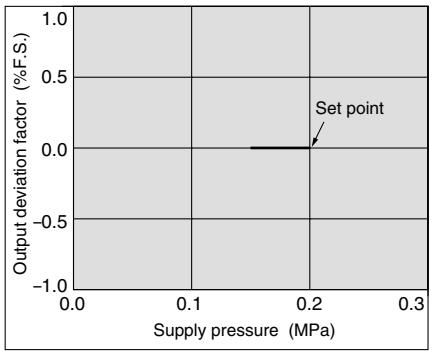


Repeatability



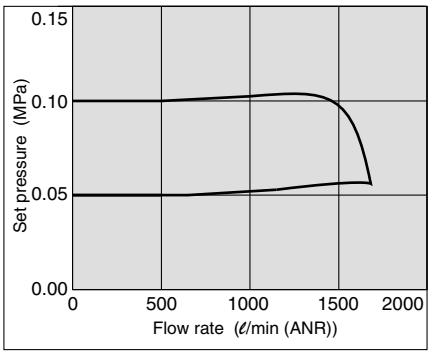
Pressure characteristics

Set pressure: 0.05 MPa



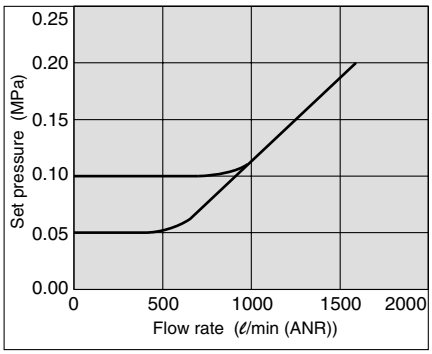
Flow characteristics

Supply pressure: 0.2 MPa



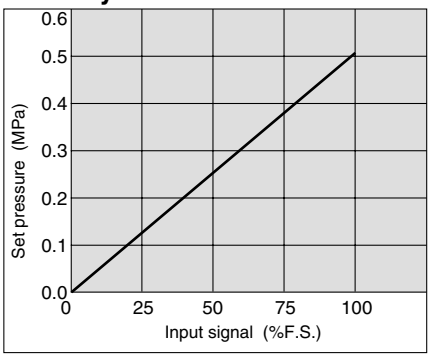
Relief flow characteristics

Back pressure: 0.2 MPa

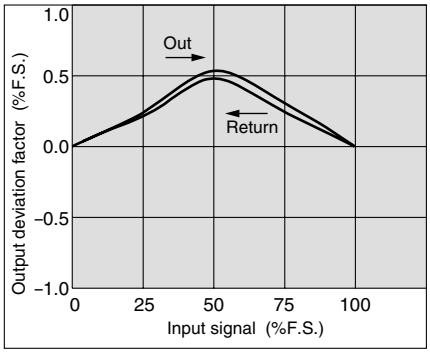


Series ITV103□

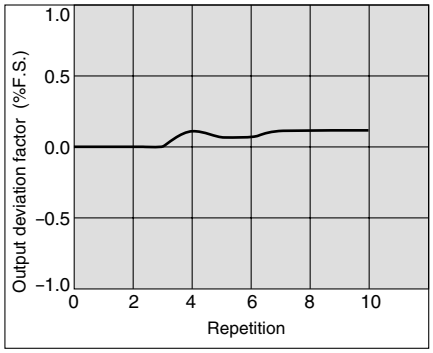
Linearity



Hysteresis

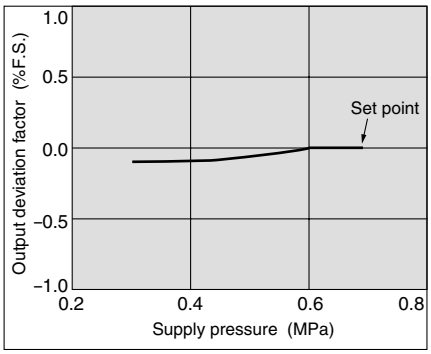


Repeatability



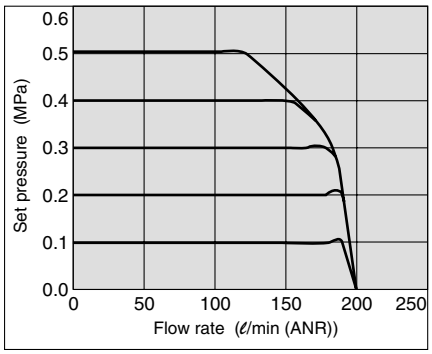
Pressure characteristics

Set pressure: 0.2 MPa



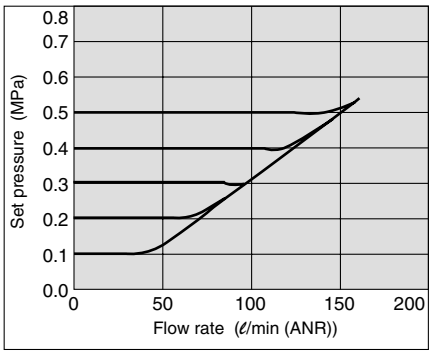
Flow characteristics

Supply pressure: 0.7 MPa



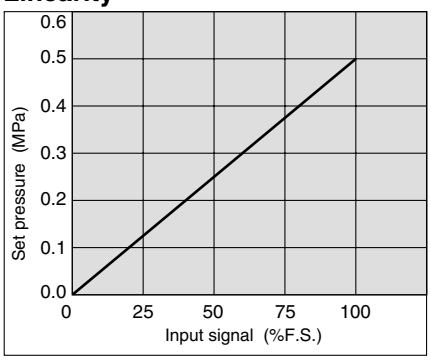
Relief flow characteristics

Back pressure: 0.7 MPa

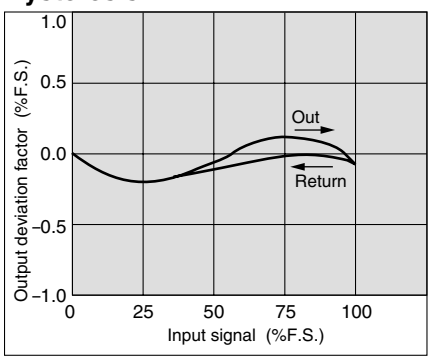


Series ITV203□

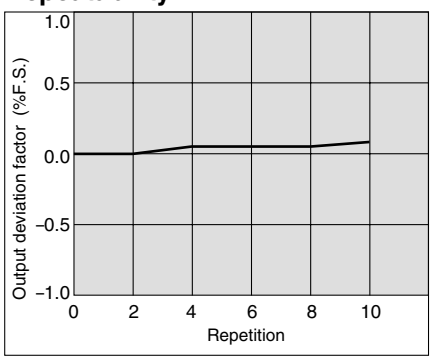
Linearity



Hysteresis

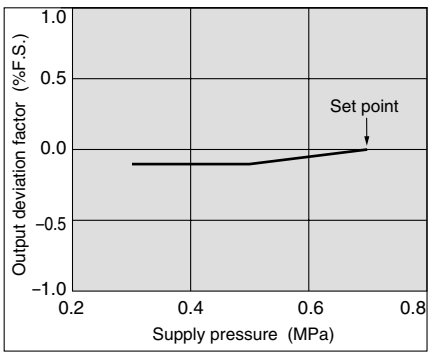


Repeatability



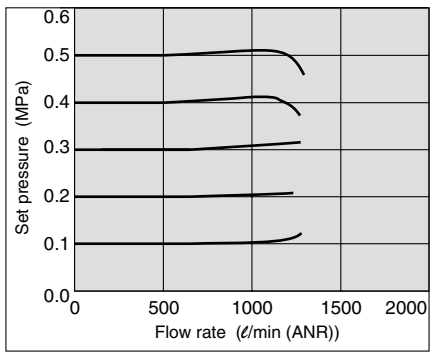
Pressure characteristics

Set pressure: 0.2 MPa



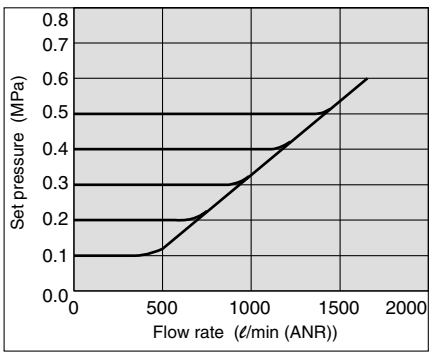
Flow characteristics

Supply pressure: 0.7 MPa



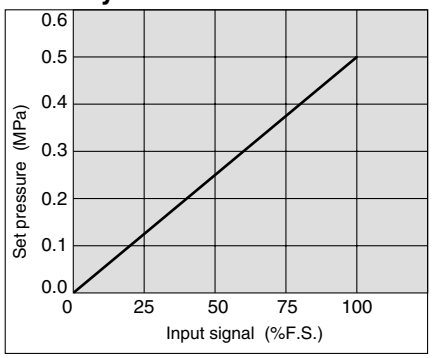
Relief flow characteristics

Back pressure: 0.7 MPa

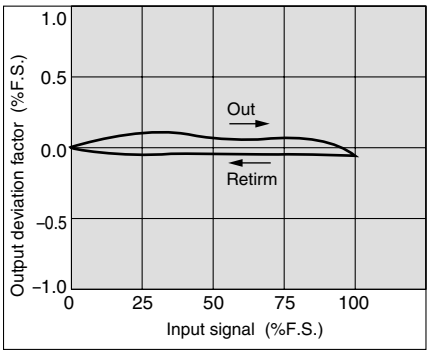


Series ITV303□

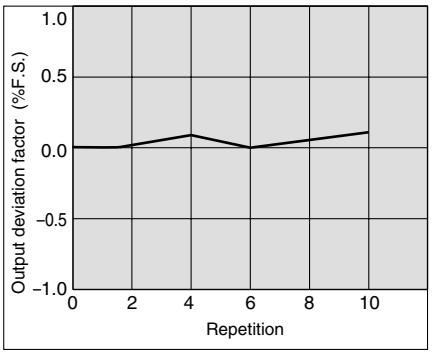
Linearity



Hysteresis

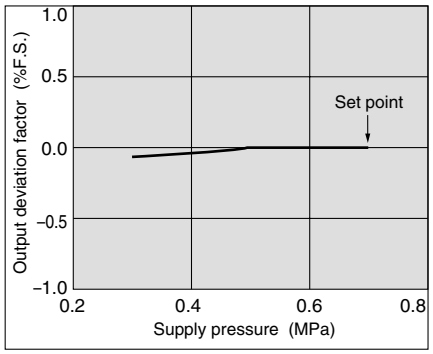


Repeatability



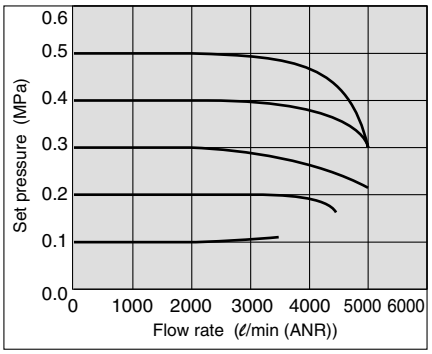
Pressure characteristics

Set pressure: 0.2 MPa



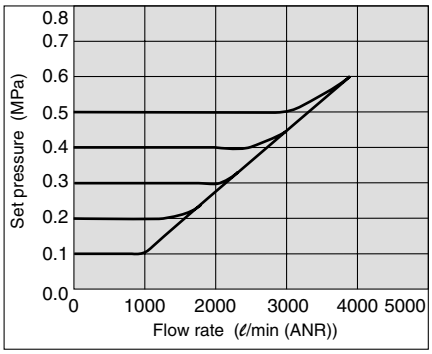
Flow characteristics

Supply pressure: 0.7 MPa



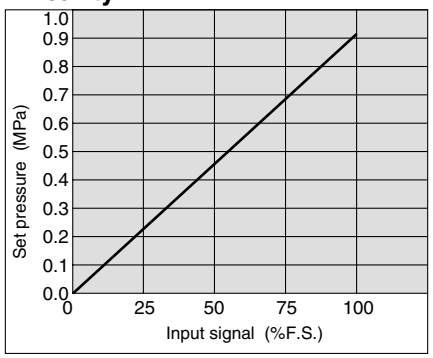
Relief flow characteristics

Back pressure: 0.7 MPa

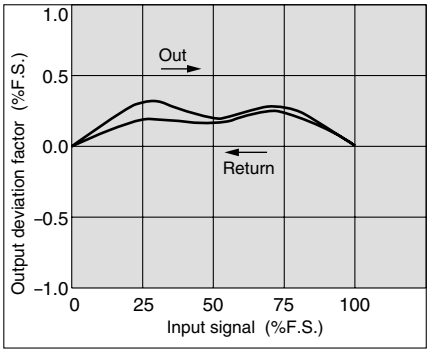


Series ITV105□

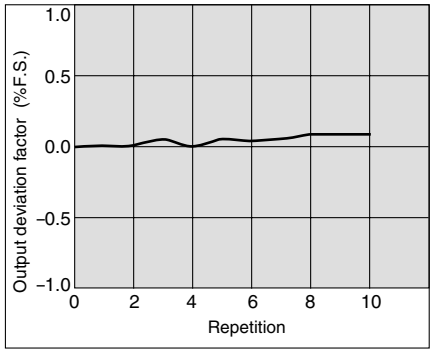
Linearity



Hysteresis

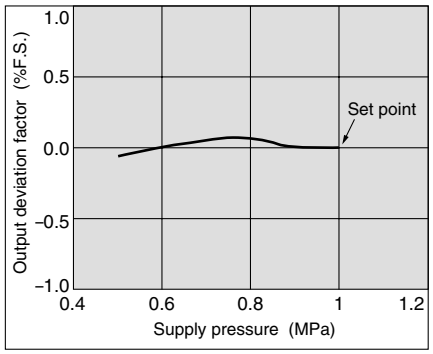


Repeatability



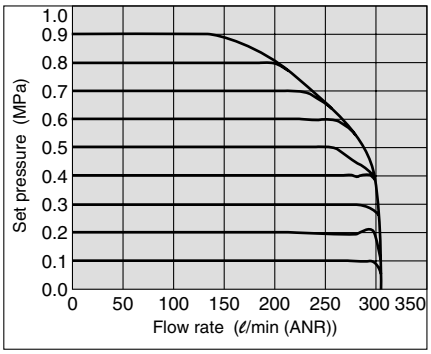
Pressure characteristics

Set pressure: 0.4 MPa



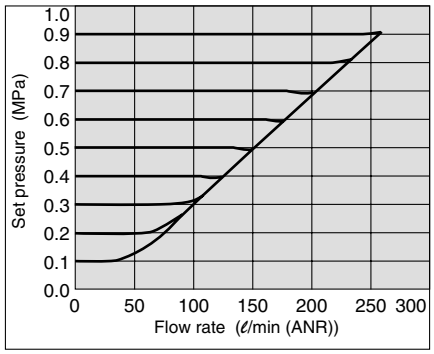
Flow characteristics

Supply pressure: 1.0 MPa



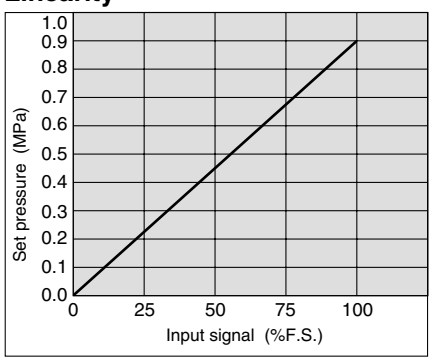
Relief flow characteristics

Back pressure: 1.0 MPa

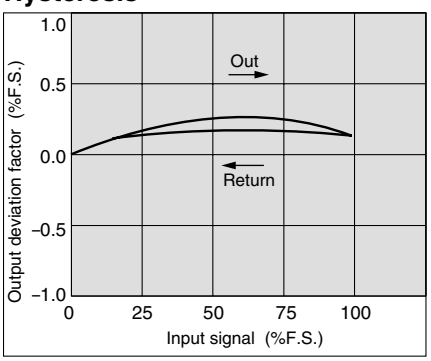


Series ITV205□

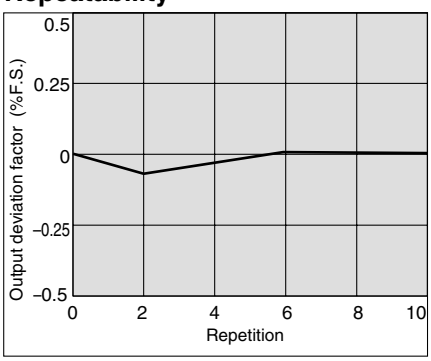
Linearity



Hysteresis

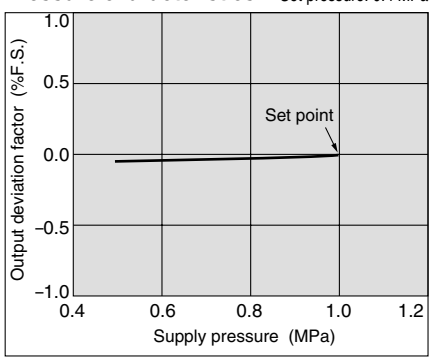


Repeatability



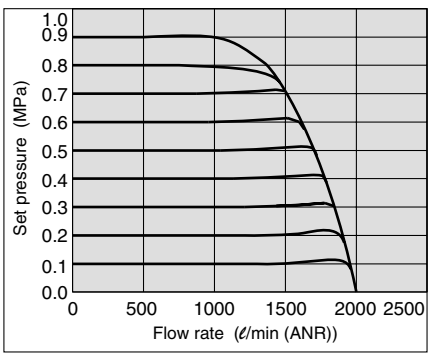
Pressure characteristics

Set pressure: 0.4 MPa



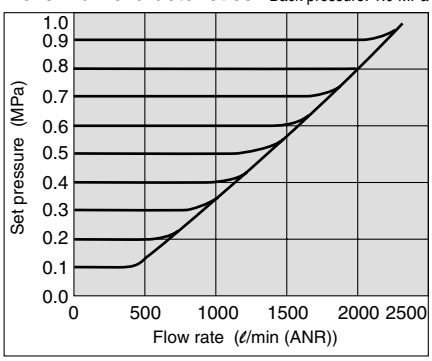
Flow characteristics

Supply pressure: 1.0 MPa



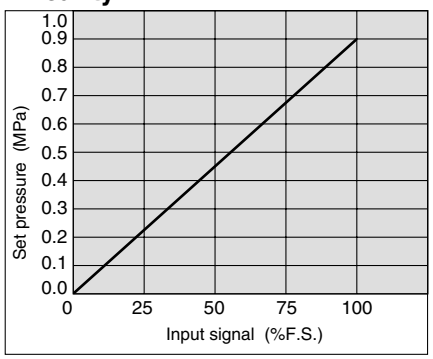
Relief flow characteristics

Back pressure: 1.0 MPa

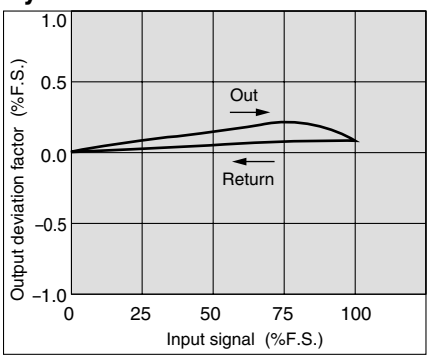


Series ITV305□

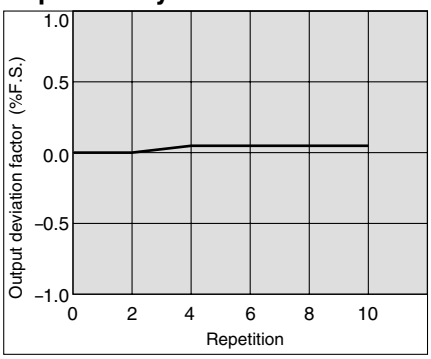
Linearity



Hysteresis

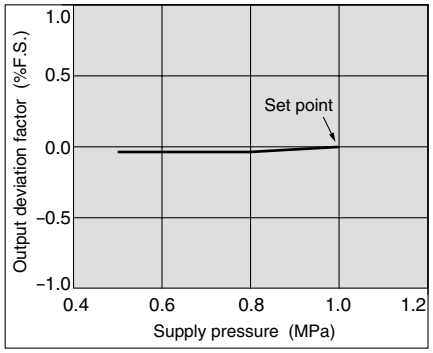


Repeatability



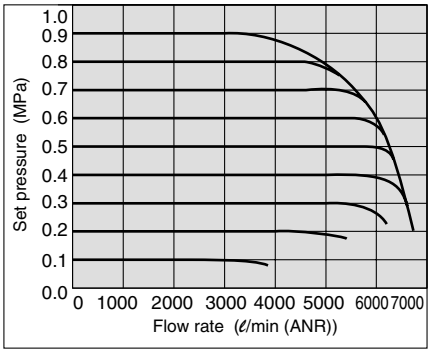
Pressure characteristics

Set pressure: 0.4 MPa



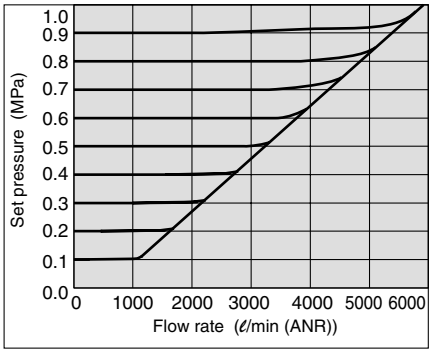
Flow characteristics

Supply pressure: 1.0 MPa



Relief flow characteristics

Back pressure: 1.0 MPa

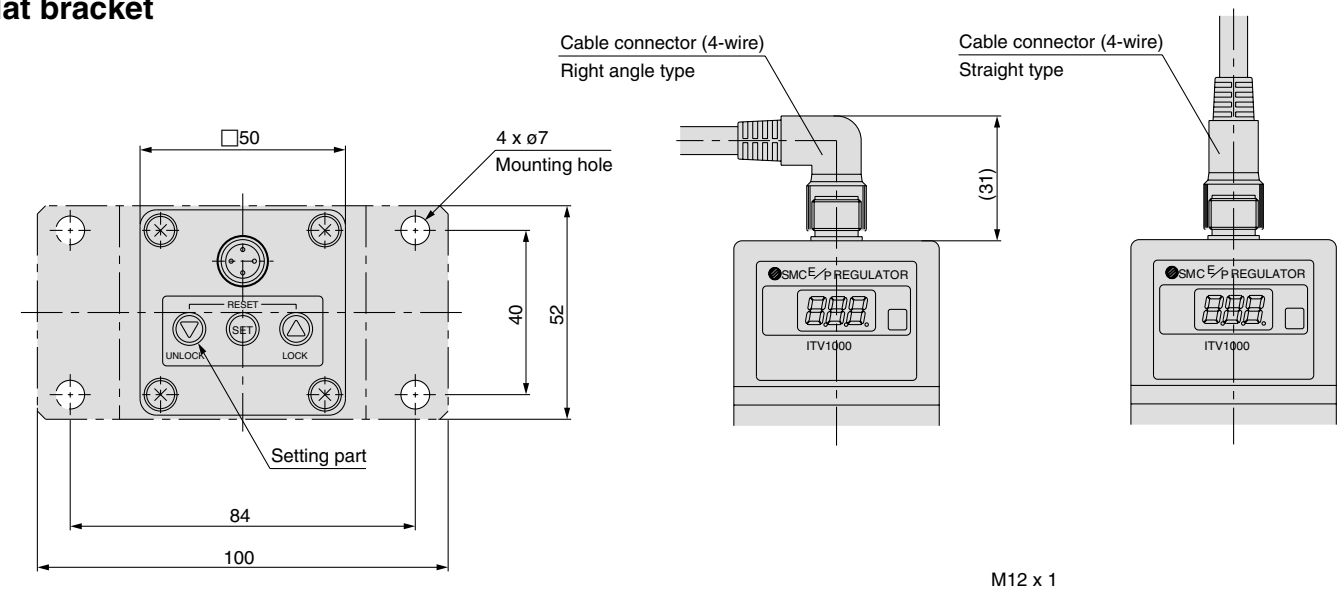


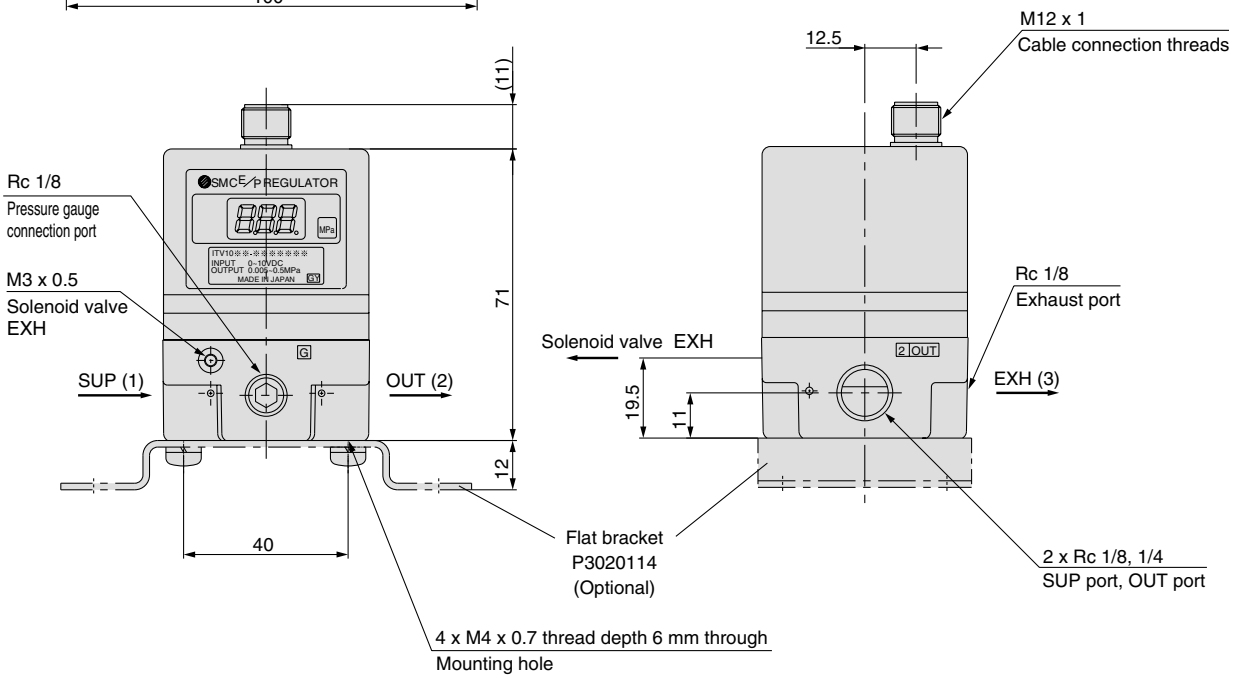
Dimensions

ITV10□□

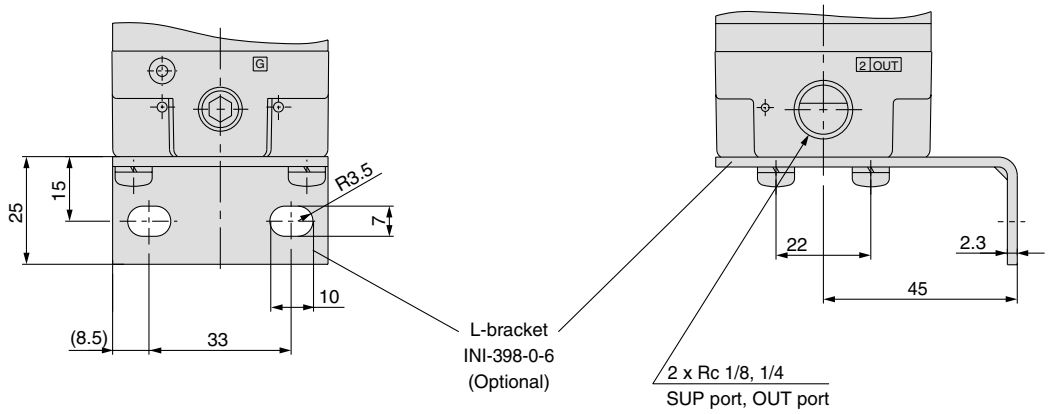
Flat bracket

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





L-bracket

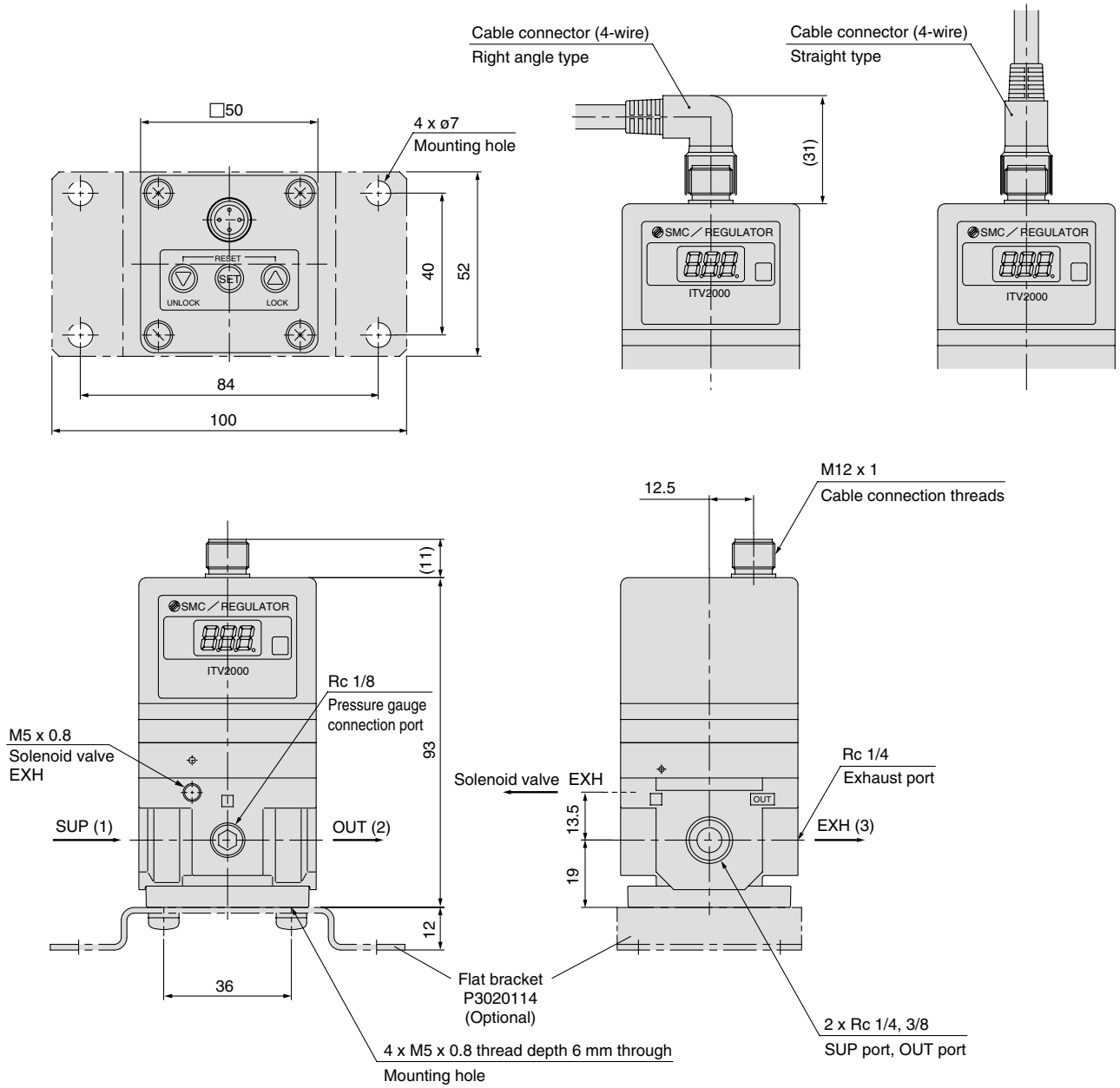


Dimensions

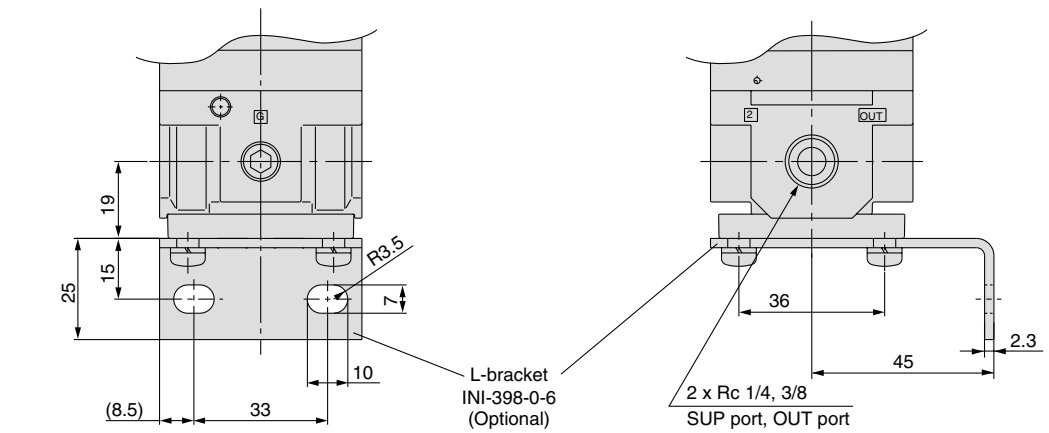
ITV20□□

Flat bracket

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



L-bracket

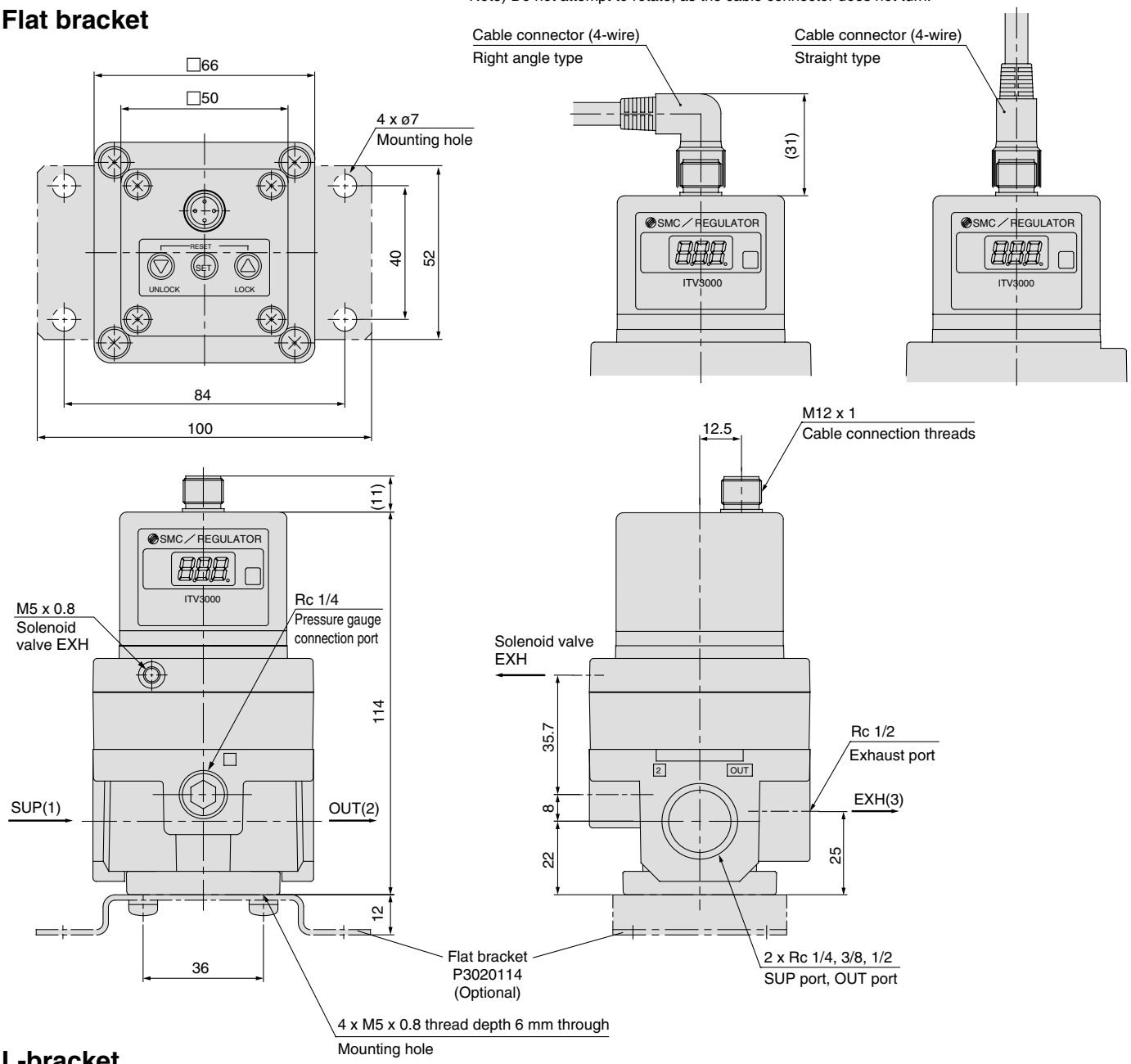


Dimensions

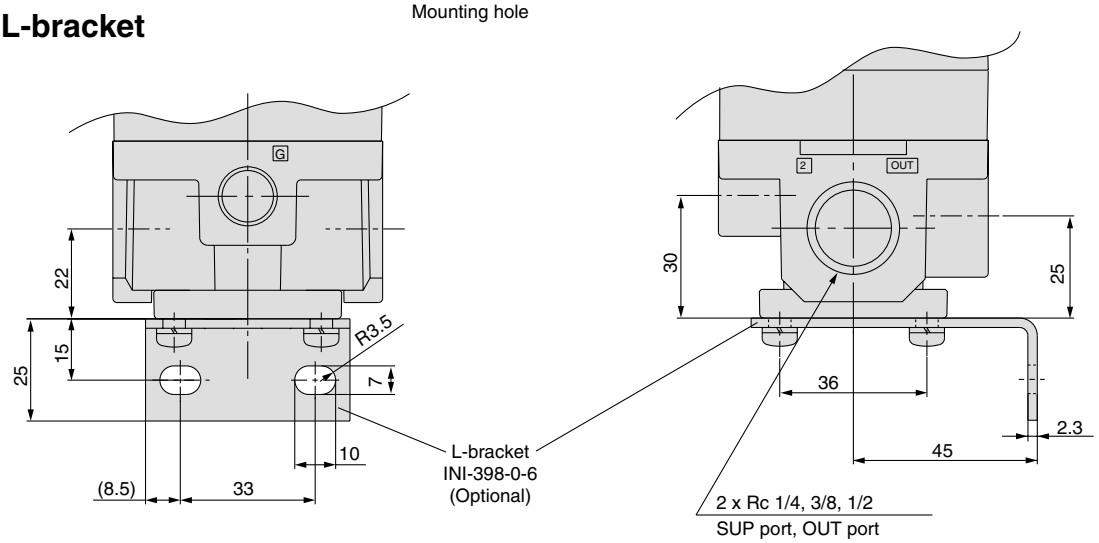
ITV30□□

Flat bracket

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



L-bracket



Series ITV1000/2000/3000
Made to Order Specifications 1

Made to Order

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 DeviceNet Compliant

It is conforming to DeviceNet.

ITV10□0–40□□□□–X80
ITV20□0–40□□□□–X80
ITV30□0–40□□□□–X80

DeviceNet compliant

Symbol	CE-compliant
X80	Not compliant
X155	Compliant

Note 1) □ in part number is the same model no. for the standard products.
Note 2) The pressure is not indicated.

3 CC-Link Compliant

It is conforming to CC-Link

ITV10□0–40□□□□–X300
ITV20□0–40□□□□–X300
ITV30□0–40□□□□–X300

CC-Link compliant

Symbol	CE-compliant
X300	Not compliant
X305	Compliant

Note 1) □ in part number is the same model no. for the standard products.
Note 2) The pressure is not indicated.

4 RS-232C Compliant

It is conforming to RS-232C.

ITV10□0–40□□□□–X310
ITV20□0–40□□□□–X310
ITV30□0–40□□□□–X310

RS-232C compliant

Note 1) □ in part number is the same model no. for the standard products.
Note 2) The pressure is not indicated.

5 16 Points Preset Input Type

Able to control 16-point-pressure by 4 bit switching input

ITV10□0–4(2/3)□□□□□–X81
ITV20□0–4(2/3)□□□□□–X81
ITV30□0–4(2/3)□□□□□–X81

16 points preset type

Symbol	CE-compliant
X81	Not compliant
X156	Compliant

Note 1) □ in part number is the same model no. for the standard products.
Note 2) Monitor output is switch output type only. This cannot be selected for types without a monitor output or with analog output.
Note 3) Values can be adjusted starting from the minimum output pressure display units.

MPa	kgf/cm²	bar	psi	kPa
0.01	0.01	0.01	0.01	1

*130 psi type: 1 psi

6 Digital Input Type

Parallel input type with digital 10 bit.

ITV10□0–40□□□(SN)□–X93
ITV20□0–40□□□(SN)□–X93
ITV30□0–40□□□(SN)□–X93

Digital input type

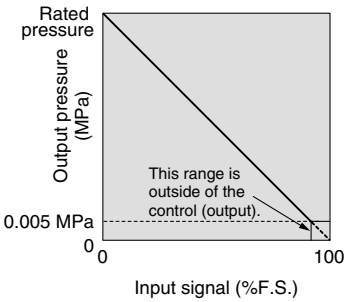
Symbol	CE-compliant
X93	Not compliant
X157	Compliant

Note 1) □ in part number is the same model no. for the standard products.
Note 2) Right angle type cable connectors cannot be selected.

7 Reverse Type

In compliance with input, inverse proportional pressure is displayed.

ITV10□□–□□□□□□□–X102
ITV20□□–□□□□□□□–X102
ITV30□□–□□□□□□□–X102



Input/output characteristics chart

Reverse type

Symbol	CE-compliant
X102	Not compliant
X321	Compliant

Note 1) □ in part number is the same model no. for the standard products.
Note 2) Except for preset input type.

8 High Pressure Type (SUP 1.2 MPa, OUT 1.0 MPa)

ITV10 5□–□□□□□□□–X224
ITV20 5□–□□□□□□□–X224
ITV30 5□–□□□□□□□–X224

High pressure type (SUP 1.2 MPa, OUT 1.0 MPa)

Symbol	CE-compliant
X224	Not compliant
X322	Compliant

9 Set Pressure Range 1 to 100 kPa

ITV10 1□–□□□□□□□–X25
ITV20 1□–□□□□□□□–X25

Set pressure range 1 to 100 kPa

Symbol	CE-compliant
X25	Not compliant
X323	Compliant

Series ITV1000/2000/3000
Made to Order Specifications 2

Made to Order

Contact SMC regarding detailed dimensions, specifications and delivery times.

10 High-Speed Response Time Type

Pressure response with no load is approx. 0.1 sec.

ITV 2 0 1 0 – 0 1 □ 2 □ S □ – X88

Model

1	1000 type
2	2000 type

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

Monitor output

1	Analog output 1 to 5 VDC

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

Port size

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

Bracket

Nil	Without bracket
B	Flat bracket
C	L-bracket

Cable connector type

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

Pressure display unit

Nil	MPa
2	kgf/cm²
3	bar
4	psi
5	kPa

High-speed response time specifications

Symbol	CE-compliant
X88	Not compliant
X154	Compliant

11 Manifold Specifications (Except Series ITV3000)

2 through 8 station manifold.

How to Order Manifolds

IITV20 – □ 02 – 5

ITV1000, 2000

Valve stations

2	2 stations
⋮	⋮
8	8 stations

OUT port size

02	1/4
03	3/8

Connection thread type

Nil	PT
N	NPT
F	PF

IITV20-02-3 .....1 set (3 station manifold base part no.)
*ITV1030-311S-X26 .....1 set (Electro-pneumatic regulator part no.) Note 2)
*P398020-13 .....1 set (Blanking plate assembly part no.)
*ITV2050-212S-X26 .....1 set (Electro-pneumatic regulator part no.) Note 2)

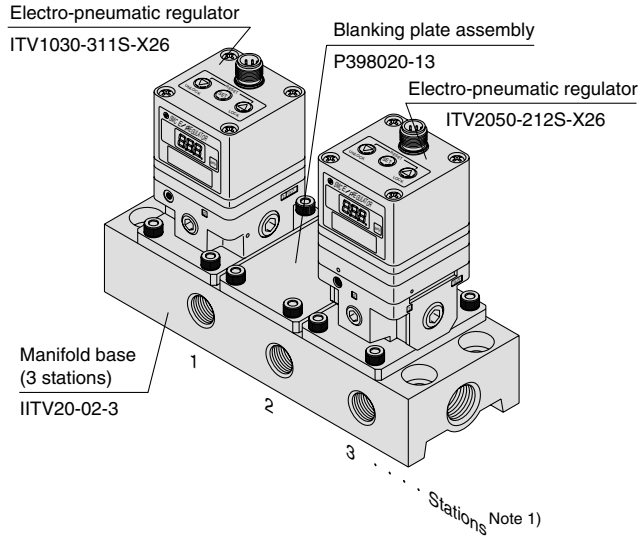
The * is the symbol for mounting. Add the * symbol at the beginning of part numbers for electro-pneumatic regulators, etc. to be mounted on the base.

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

Model	ITV101□	ITV103□	ITV105□	ITV201□	ITV203□	ITV205□
ITV101□	●	—	—	●	—	—
ITV103□	—	●	●	—	●	●
ITV105□	—	●	●	—	●	●
ITV201□	●	—	—	●	—	—
ITV203□	—	●	●	—	●	●
ITV205□	—	●	●	—	●	●

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 Rc 1/8 (ITV1000), Rc 1/4 (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.

Series ITV1000/2000/3000
Electro-Pneumatic Regulator Precautions

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions and pages 667 and 668 for Specific Product Precautions.

Piping

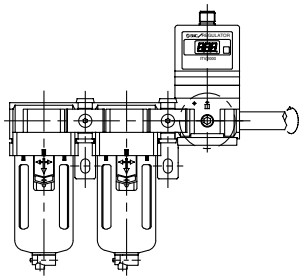
⚠ Warning

1. Screw piping together with the recommended proper torque while holding the side that has female threads.

Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive. Furthermore, if the side with the female threads is not held while tightening, excessive force will be applied directly to piping brackets, etc. causing damage or other problems.

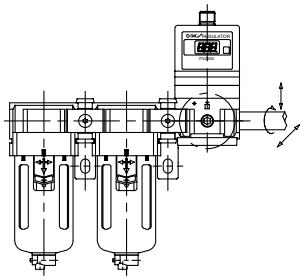
Recommended proper torque: N·m (kgf·cm)

Connection thread	1/8	1/4	3/8	1/2
Torque	7 to 9 (70 to 90)	12 to 14 (120 to 140)	22 to 24 (220 to 240)	28 to 30 (280 to 300)



2. Do not allow twisting or bending moment to be applied other than the weight of the equipment itself.

Provide separate support for external piping, as damage may otherwise occur.



3. Since excessive moment loads and the propagation of vibrations, etc. can easily result from inflexible piping made of materials such as steel, avoid these problems by using flexible tubing for intermediate connections.

⚠ Caution

1. Preparation before piping

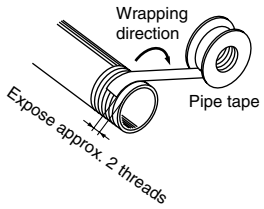
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

Piping

2. Wrapping of pipe tape

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material do not get inside the piping.

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



Operating Environment

⚠ Warning

1. Do not operate in locations having an atmosphere of corrosive gases, chemicals, sea water, or where there will be contact with the same.

2. Do not operate in locations where vibration or impact occurs.

3. In locations which receive direct sunlight, provide a protective cover, etc.

4. In locations near heat sources, block off any radiated heat.

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

⚠ Caution

In locations where the body is exposed to water, steam, dust, etc., there is a possibility that moisture or dust could enter the body through the EXH (solenoid) ports, thereby causing problems. To overcome this, simply install tubing to each port, using the fittings, and extend the tubing so that the other end is at a location where no water splash, etc. occurs. Make sure not to bend, or block the I.D. of the tubing as this will have a detrimental affect on the pressure control.

Air Supply

⚠ Warning

1. These products are designed for use with compressed air. Contact SMC if any other fluid will be used.

2. Do not use compressed air which includes chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, etc., as this can cause damage or malfunction.

Series ITV1000/2000/3000
Specific Product Precautions 1

Be sure to read before handling.
Refer to front matters 42 and 43 for Safety Instructions.

Operating Environment

⚠ Warning

1. **Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.**
2. **Consult with SMC when used in power plants, or if instrumentation related.**

Air Supply

⚠ Caution

1. **Install an air filter near this product on the supply side. Select a filtration degree of 5 μm 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 pages 2 and 3.

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 0.005 MPa or less. If it is desired to reduce the pressure completely to 0 MPa, 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) For avoiding the influence of noise or static electricity, 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 Rc 1/8, Rc 1/4 and Rc 1/2.**
11. **Specifications on page 652 is in case of static environment. Pressure may fluctuate when air is consumed at the output side.**
12. **For details on the handling of this product, refer to the instruction manual which is included with the product.**

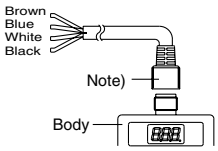
Series ITV1000/2000/3000
Specific Product Precautions 2

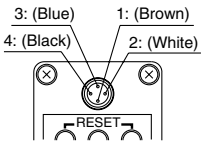
Be sure to read before handling.
Refer to front matters 42 and 43 for Safety Instructions.

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

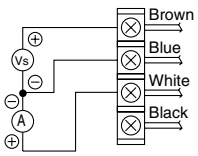
Preset input type

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.

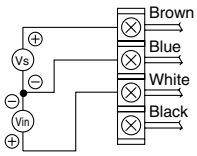
Wiring diagram

Current signal type



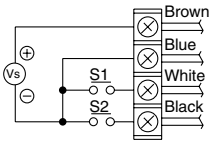
Vs: Power supply 24 VDC
12 to 15 VDC
A : Input signal 4 to 20 mADC
0 to 20 mADC

Voltage signal type



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

Preset input type



Vs: Power supply 24 VDC
12 to 15 VDC

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

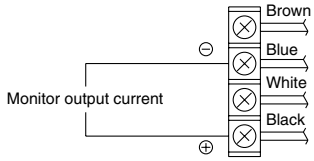
∗ For safety reasons, it is recommended that one of the preset pressures be set to 0 MPa.
∗ Values can be adjusted starting from the minimum output pressure display units.

MPa	kgf/cm²	bar	psi	kPa
0.01	0.01	0.01	0.01	1

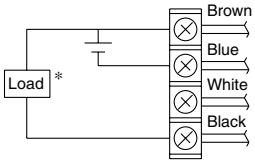
∗130 psi type: 1 psi

Monitor output wiring diagram

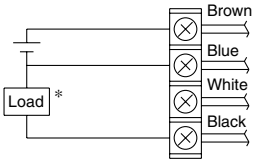
Analog output, voltage type



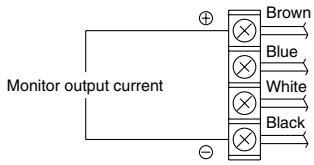
Switch output, NPN type



Switch output, PNP type



Analog output, current type (sink type)



∗ When 30 mA DC or more is applied, detecting device for overcurrent starts activating and then emits an error signal.
(Error number “5”)

Set Pressure Range

The regulating pressure range, by unit of standard measured pressure, is shown in the table below.

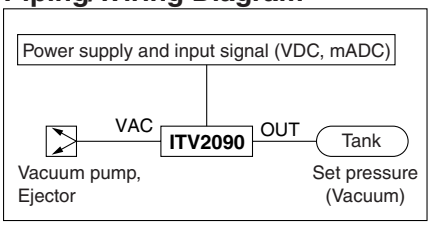
Regulating pressure range, by unit of standard measured pressure

Unit	Regulating pressure range		
	ITV□01□	**ITV□03□**	**ITV□05□**
MPa	0.005 to 0.1	0.005 to 0.5	0.005 to 0.9
kgf/cm²	0.05 to 1	0.05 to 5	0.05 to 9
bar	0.05 to 1	0.05 to 5	0.05 to 9
psi	0.7 to 15	0.7 to 70	0.7 to 130
kPa	5 to 100	5 to 500	5 to 900

Electronic Vacuum Regulator
Series ITV2090/2091

■ Stepless control of vacuum pressure in proportion to an electric signal

Piping/Wiring Diagram



Standard Specifications

Model		ITV2090	ITV2091
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	
Minimum supply vacuum pressure (1)		Set pressure –13.3 kPa	
Maximum supply vacuum pressure		–101 kPa	
Set pressure range		–1.3 to –80 kPa	
Input signal	Current type (2)	4 to 20 mA, 0 to 20 mA	
	Voltage type	0 to 5 VDC, 0 to 10 VDC	
	Preset input	4 points	
Input impedance	Current type	250 Ω or less	
	Voltage type	Approximately 6.5 kΩ	
	Preset input	Approximately 2.7 kΩ	
Output signal (3) (Monitor output)	Analog output	1 to 5 VDC (Load impedance: 1 kΩ or more) 4 to 20 mA (Sink type) (Load impedance: 250 Ω or less) Output accuracy within ±6% (Full span)	
	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)	
	Units	kPa (4) Minimum display: 1	
Ambient and fluid temperature		0 to 50°C (No condensation)	
Enclosure		IP65 equivalent	
Mass		350 g	

Note 1) The minimum supply vacuum pressure should be 13.3 kPa less than the maximum vacuum pressure setting value.
Note 2) 4 to 20 mA is not possible with the 2-wire type. Power supply voltage (24 VDC or 12 to 15 VDC) is required.
Note 3) Either analog output or switch output must be selected. Furthermore, when switch output is selected, either NPN output or PNP output must also be selected. Use caution that the preset input type is not equipped with an output signal function.
Note 4) Please contact SMC regarding indication with other units of pressure.

How to Order

ITV 209 0 – 0 1 □ 2 □ S 5 – □

Pressure range

9	–1.3 to –80 kPa

Power supply voltage

0	24 VDC
1	12 to 15 VDC

Input signal

0	Current type 4 to 20 mADC
1	Current type 0 to 20 mADC
2	Voltage type 0 to 5 VDC
3	Voltage type 0 to 10 VDC
4	Preset input

Monitor output

0	None (For preset input)
1	Analog output 1 to 5 VDC
2	Switch output/NPN output
3	Switch output/PNP output
4	Analog output 4 to 20 mADC (Sink type)

Thread type

Nil	Rc
N	NPT
T	NPTF
F	G

Port size

2	1/4

Option (Bracket)

Nil	Without bracket
B	Flat bracket
C	L-bracket

Cable connector type

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

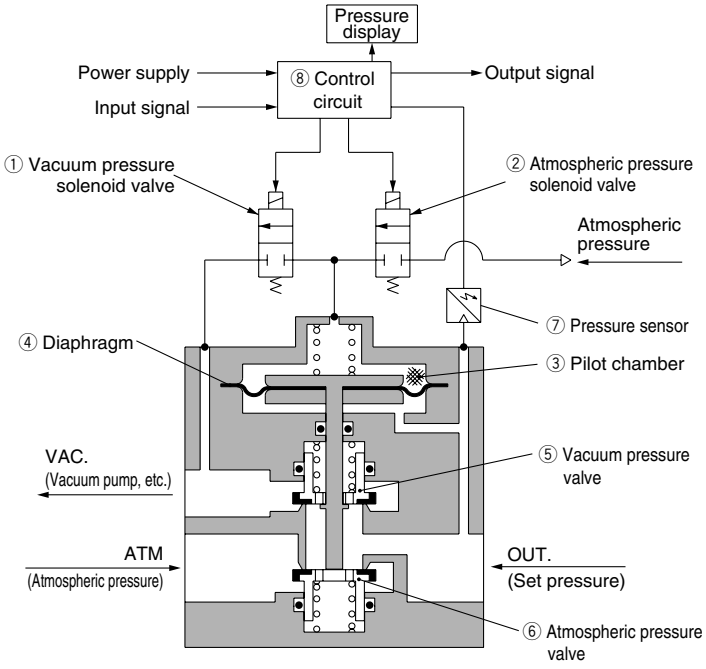
Pressure display unit

5	kPa

CE-compliant

Nil	Not compliant
Q	Compliant

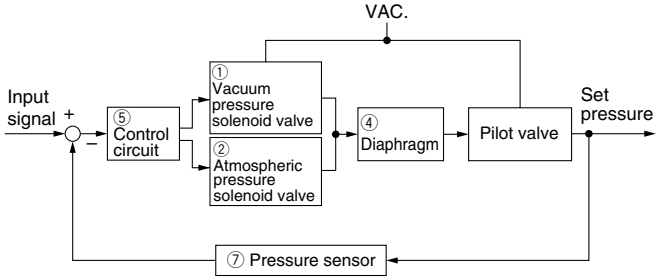
Working Principle



Working Principle

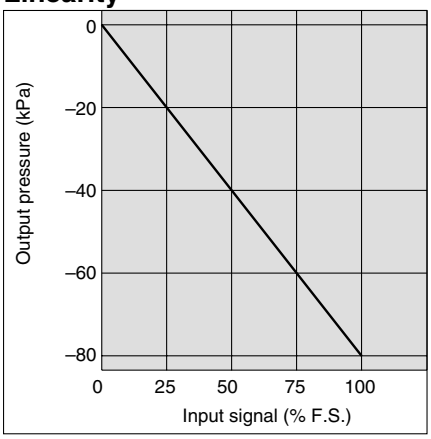
When the input signal increases, the vacuum pressure solenoid valve ① turns ON, and the atmospheric pressure solenoid valve ② turns OFF. Because of this, VAC. and the pilot chamber ③ are connected, the pressure in the pilot chamber ③ becomes negative and acts on the top of the diaphragm ④.
As a result, the vacuum pressure valve ⑤ which is linked to the diaphragm ④ opens, VAC. and OUT. are connected, and the set pressure becomes negative.
This negative pressure feeds back to the control circuit ⑧ via the pressure sensor ⑦. Then, a correct operation works until a vacuum pressure proportional to the input signal is reached, and a vacuum pressure is obtained which is always proportional to the input signal.

Block Diagram

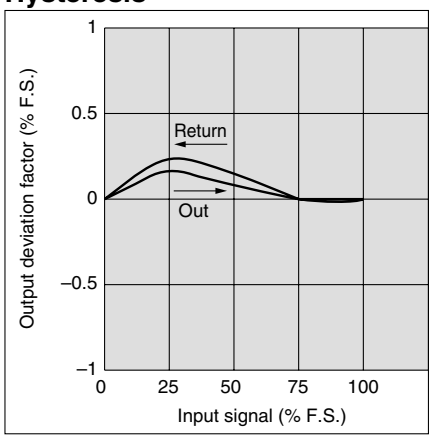


Series ITV209□

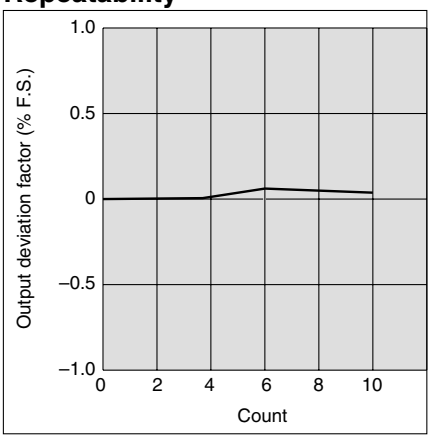
Linearity



Hysteresis

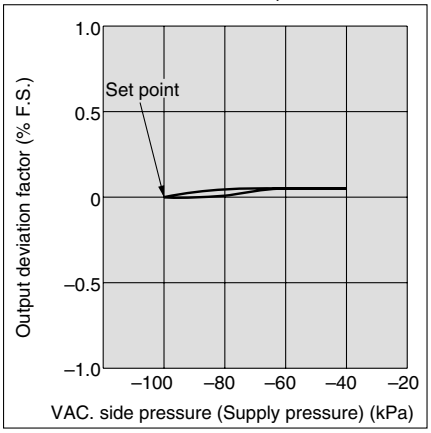


Repeatability



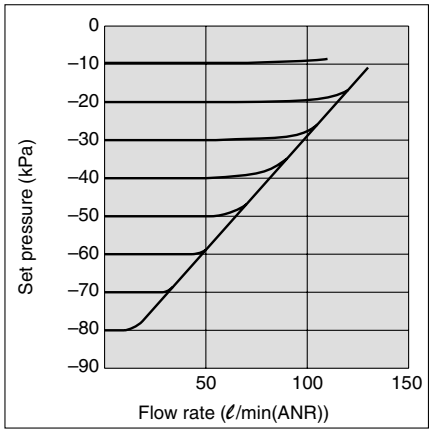
Pressure Characteristics

Set pressure: –20 kPa



Flow Characteristics

Supply vacuum pressure: –100 kPa



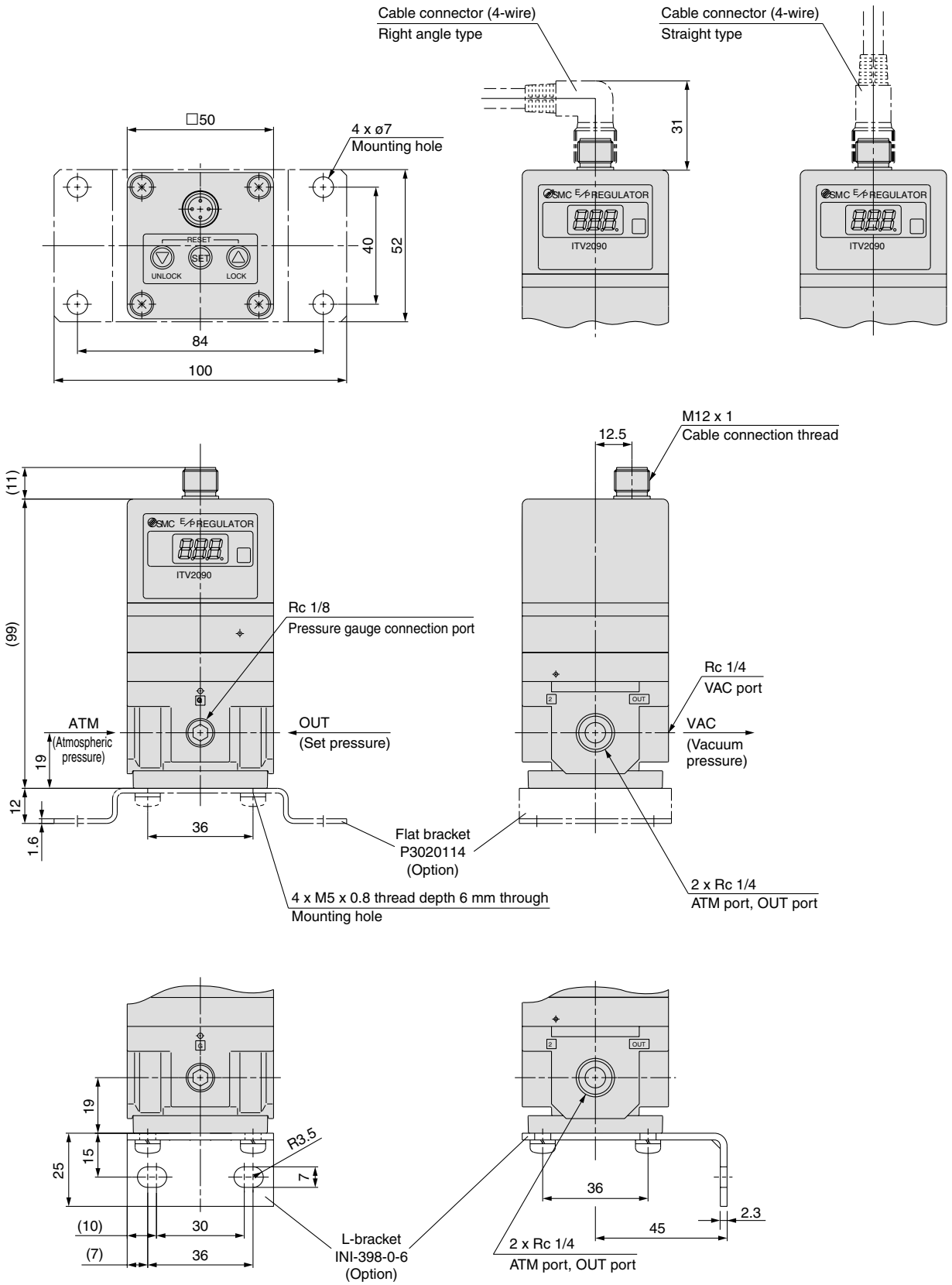
Flow characteristics measurement conditions

- Exhaust flow rate of the vacuum pump used for measurement: 500 ℓ/min (ANR)
- Inlet vacuum pressure: –100 kPa (When outlet flow rate is 0 ℓ/min (ANR))
- Maximum flow rate: 132 ℓ/min (ANR) (With inlet vacuum pressure at –39 kPa)

Dimensions

ITV2090

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

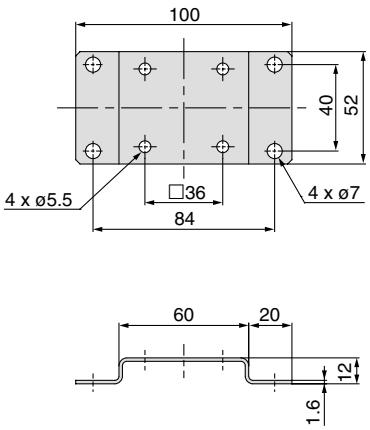


Accessory (Option)/Part No.

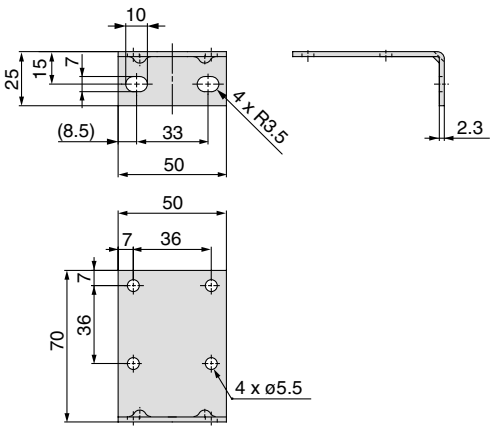
Description		Part no.
Flat bracket		P3020114 (Not including mounting screws)
L-bracket		INI-398-0-6 (Not including mounting screws)
Cable connector	Straight type 3 m	P398020-500-3
	Right angle type 3 m	P398020-501-3

Dimensions

Flat bracket



L-bracket



Series ITV209□
Specific Product Precautions 1

Be sure to read before handling.
Refer to front matters 42 and 43 for Safety Precautions and pages 287 to 291 for Precautions on every series.

Handling

⚠ Caution

1. Connect the vacuum pump to the port, which is labeled "VAC".
2. Pressure adjustment changes from "atmospheric pressure to vacuum pressure" when the input signal is increased, and from "vacuum pressure to atmospheric pressure" when the input signal is decreased.
3. When adjusting the vacuum pressure, be careful not to block the atmospheric pressure inlet port labeled "ATM".
4. Since this product is designed exclusively for use with negative pressure, be careful not to apply positive pressure in error.
5. In cases where the vacuum pump being used has a relatively small capacity, or the piping has a small inside diameter, etc., large variations in the set pressure (the range of pressure variation when changing from no flow to flow state) may appear. In this situation, the vacuum pump or the piping, etc. should be changed. In cases where it is not practical to change the vacuum pump, install a capacity tank (volume depending on the operating conditions) on the VAC side.
6. The vacuum pressure response time after a change in the input signal is influenced by the internal volume on the setting side (including piping). Since the capacity of the vacuum pump also influences the response time, give careful consideration to these points before operation.
7. If the electric power is shut off when in a control state, the pressure on the setting side will go into a holding condition. However, this setting side pressure will be held only temporarily and is not guaranteed. In addition, when atmospheric pressure is desired, shut off the power after reducing the set pressure, and then introduce atmospheric pressure by using a vacuum release valve, etc.
8. If the power for this product is cut off by a power failure, etc. when it is in a controlled state, the setting side pressure will be held temporarily. Further, if operated without sealing the setting side so that atmospheric air is sucked in, handle with care as air will continue to be sucked in.
9. If the VAC side pressure to this product is interrupted while the power is still on, the internal solenoid valve will continue to operate and may cause a humming noise. Since this may shorten the life of the product, be sure to shut off the power when the VAC side pressure is shut off.
10. The setting side pressure cannot be completely released from this product in the range below –1.3 kPa. In cases where the pressure needs to be reduced completely to 0 kPa, install a 3 port valve, etc. on the setting side to discharge the residual pressure.
11. This product is adjusted for each specification at the factory before shipment. Avoid careless disassembly or removal of parts, as this can cause failure.
12. The optional cable connector is a 4-wire type. When the monitor output (analog output, switch output) is not being used, keep it from touching the other wires, as this can cause malfunction.
13. Use caution that the right angle cable does not rotate and is limited to only one entry direction.
14. Take the following steps to avoid malfunction due to noise.
    1) Eliminate power supply noise during operation by installing a line filter, etc. in the AC power line.
    2) For avoiding the influence of noise or static electricity, install this product and its wiring as far as possible from strong electric fields such as those of motors and power lines, etc.
    3) Make sure to take protective measures against load surge for an induction load (solenoid valves, relays, etc.).
15. Refer to the instruction manual included with the product for details on its handling.

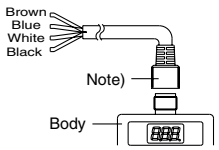
Series ITV209□
Specific Product Precautions 2

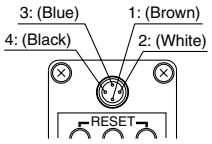
Be sure to read before handling.
Refer to front matters 42 and 43 for Safety Precautions and pages 287 to 291 for Precautions on every series.

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

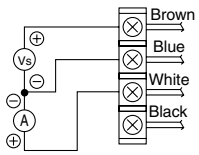
Preset Input Type

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 rotate it, since it's not designed to turn.

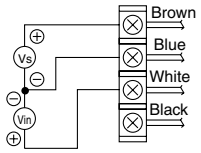
Wiring diagram

Current signal type



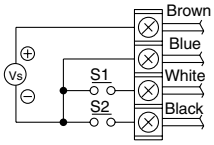
Vs : Power supply 24 VDC
12 to 15 VDC
A : Input signal 4 to 20 mADC
0 to 20 mADC

Voltage signal type



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

Preset input type



Vs : Power supply 24 VDC
12 to 15 VDC

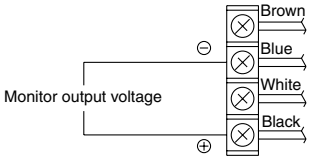
One of the preset pressures P1 through P4 is selected by the ON/OFF combination of S1 and S2.

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

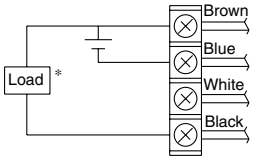
∗ For safety reasons, it is recommended that one of the preset pressures be set to 0 MPa.

Monitor output wiring diagram

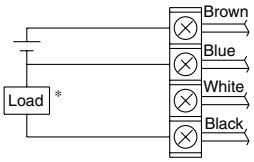
Analog output: Voltage type



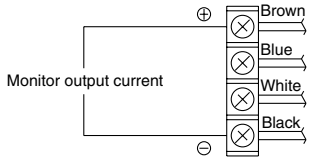
Switch output: NPN type



Switch output: PNP type



Analog output: Current type



∗ When 30 mADC or more is applied, detecting device for overcurrent starts activating and then emits an error signal. (Error number “5”)