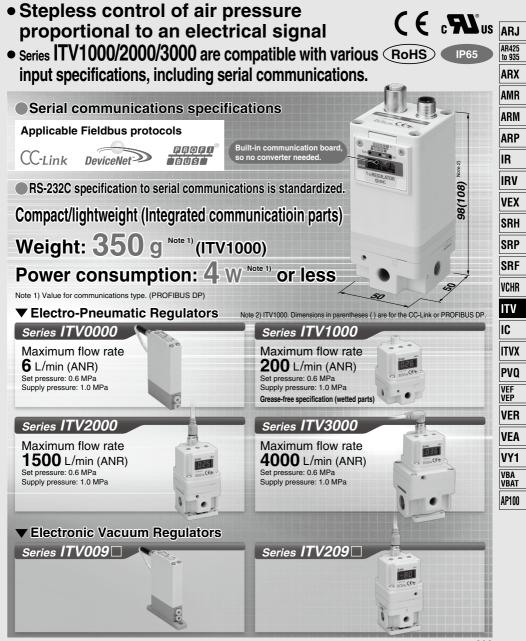
Electro-Pneumatic Regulator/Electronic Vacuum Regulator

Series ITV



Compact Electro-Pneumatic Regulator Series ITV0000 Compact Vacuum Regulator Series IT V009



saving and reduction of weight for manifold use. Stations can easily be in-

Realizes space-

creased or decreased due to DIN rail mount design.



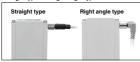
Model	Pressure range	Power supply voltage	Input signal	Output signal	Option							
ITV001□	0.1 MPa		4 to 20 mA DC		Cable connectors							
ITV003□	0.5 MPa	24 VDC 12 VDC	0 to 20 mA DC	Analog output	Straight type Right angle type							
ITV005□	0.9 MPa		12 VDC	12 VDC	12 VDC	12 VDC	12 VDC	12 VDC	12 VDC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

- Equivalent to IP65
- Linearity: ±1% F.S. or less Hysteresis: 0.5% F.S. or less Repeatability: ±0.5% F.S. or less
- High-speed response time: 0.1 sec (Without load) Note) This is not a guaranteed value as it depends on the operating environment.
- High stability



Cable connectors

Straight type and right angle type are available



- Built-in One-touch fittinas
- With error indication **LED**
- Brackets

Flat and L-brackets are available



Electro-Pneumatic Regulator Series ITV1000/2000/3000 Electronic Vacuum Regulator Series ITV209





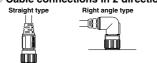
Serial communications specifications to Series ITV1000/2000/3000 are standardized.

Reduced wiring

Applicable Fieldbus protocols DeviceNet:

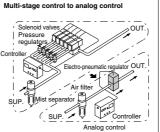
RS-232C specification to serial communications is standardized.

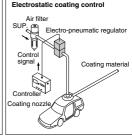
- Sensitivity: 0.2% F.S. or less
- Linearity: ±1% F.S. or less
- Hysteresis: 0.5% F.S. or less
- IP65
- Cable connections in 2 directions Straight type Right angle type



Grease-free specification (Series ITV1000)

Application examples





Electro-Pneumatic Regulator Electronic Vacuum Regulator

• Stepless control of air pressure proportional to an electrical signal.

Series ITV

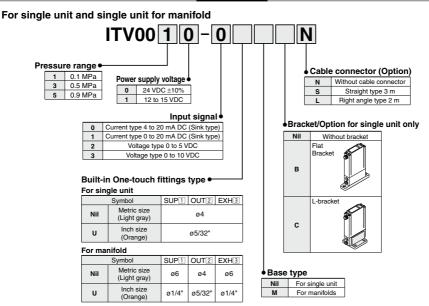
		Series	Model	Set pressure range	Input signal	Port size	Page	ARJ
		Series ITV0000	ITV001□	0.001 to 0.1 MPa	Current type: 4 to 20 mA DC (Sink type)		\	AR425 to 935
ı			ITV003□	0.001 to 0.5 MPa	Current type: 0 to 20 mA DC (Sink type)	Built-in One-touch fittings Metric size: ø4	806	ARX
	0	ļ		Voltage type: 0 to 5 VDC	Inch size: ø5/32		ARM	
н	ı		ITV005□	0.001 to 0.9 MPa	Voltage type: 0 to 10 VDC			ARP
,	5	Series ITV1000	ITV101□	0.005 to 0.1 MPa			\	IR
	gular		ITV103□	0.005 to 0.5 MPa	0	1/8, 1/4	814	IRV
9 9	בי ו	o assers	ITV105□	0.005 to 0.9 MPa	Current type: 4 to 20 mA DC (Sink type)			VEX SRH
	מחוומ	Series ITV2000	ITV201□	0.005 to 0.1 MPa	Current type: 0 to 20 mA DC (Sink type)			SRP
å	Electro-Pneumatic Regulator		ITV203□	0.005 to 0.5 MPa	Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC Preset input (4 points/16 points) 10 bit digital input CC-Link compatible	1/4, 3/8	814	SRF
3			11 7203	0.005 to 0.5 MFa			014	ITV
ľ			ITV205□	0.005 to 0.9 MPa				IC
ı	ı	Series ITV3000	ITV301□	0.005 to 0.1 MPa	DeviceNet [™] compatible PROFIBUS DP compatible		\	ITVX
ı	ı		ITV303□	0.005 to 0.5 MPa	RS-232C communication	1/4, 3/8, 1/2	814	PVQ VEF VEP
ı	ı		ITV305□	0.005 to 0.9 MPa				VER
							—	VEA
1	5	Series ITV009□			Current type: 4 to 20 mA DC (Sink type) Current type:	Built-in	\	VY1
	nlar		ITV009□	−1 to −100 kPa	0 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC	One-touch fittings Metric size: ø4 Inch size: ø5/32	836	VBA VBAT
Reg	E			Voltage type: 0 to 10 VDC	ITICIT SIZE. Ø5/32		AP100	
10 to	Electionic vacuum	Series ITV209	ITV209□	−1.3 to −80 kPa	Current type: 4 to 20 mA DC (Sink type) Current type: 0 to 20 mA DC (Sink type) Voltage type: 0 to 5 VDC Voltage type: 0 to 5 VDC Voltage type: 0 to 10 VDC Preset input (4 points/16 points) 10 bit digital input CC-Link compatible DeviceNet [™] compatible PROFIBUS DP compatible RS-232C communication	1/4	843	
				6010			805	(D)

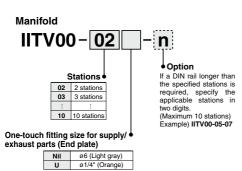
Compact Electro-Pneumatic Regulator

Series ITV0000



How to Order





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 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.

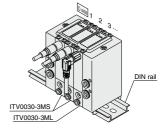
IITV00-03-----1 set (Manifold part no.)

*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.





Compact Electro-Pneumatic Regulator Series ITV0000

Specifications



Mode	l	ITV001□	ITV003□	ITV005□		
Minimum supply p	ressure	S	Set pressure +0.1 MPa			
Maximum supply p	ressure	0.2 MPa	0.2 MPa 1.0 MPa			
Set pressure range	9	0.001 to 0.1 MPa	0.001 to 0.5 MPa	0.001 to 0.9 MPa		
Voltage		24 V	DC ±10%, 12 to 15	VDC		
Power supply	Current	Power supply voltage 24 VDC type: 0.12 A or less				
	consumption	Power supply volt	age 12 to 15 VDC ty	pe: 0.18 A or less		
Input signal	Voltage type	0	to 5 VDC, 0 to 10 VE	C		
iliput signai	Current type	4 to 20 mA	DC, 0 to 20 mA DC	(Sink type)		
Input impedance	Voltage type		Approx. 10 kΩ			
input impedance	Current type		Approx. 250 Ω			
Output signal Note 4)	Analog output	1 to 5 VDC (Output impedance: Approx. 1 kΩ)				
Output signal	Analog output	Output accuracy: ±6% F.S. or less				
Linearity			±1% F.S. or less			
Hysteresis		0.5% F.S. or less				
Repeatability			$\pm 0.5\%$ F.S. or less			
Sensitivity		0.2% F.S. or less				
Temperature chara	ecteristics	±0.12% F.S./°C or less				
Operating tempera	ture range	0 to 50°C (No condensation)				
Enclosure		Equivalent to IP65 *				
Connection type		Bu	ilt-in One-touch fittir	igs		
	For single unit	Metric size	Metric size 1, 2, 3: ø4			
Connection size	For single unit	Inch size	1, 2, 3	3: ø5/32"		
Connection size	Manifold	Metric size	1, 3: ø	6, 2: ø4		
	wanitold	Inch size 1, 3: Ø1/4", 2: Ø5/32"				
Weight Note 1)		100	g or less (without op	tion)		
Note 1) Indicates the	weight of a sing	le unit				

Note 1) Indicates the weight of a single unit.

For IITV00-n

Total weight (g) Stations (n) x 100 + 130 (Weight of end block A, B assembly) + Weight (g) of DIN rail

Note 2) When there is a downstream flow consumption, pressure may become unstable depending on piping conditions.

Note 3) When the input signal is at 0%, the exhaust solenoid valve is controlled to reduce the outlet pressure to zero. For this reason, a noise may be generated. This noise is normal and does not indicate a fault.

Note 4) When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than

(ote 4) When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less the 100 kΩ, the analog output monitor accuracy of ±6% F.S. or less may not be available. The product with the accuracy of within ±6% is supplied upon your request. Output pressure remains unaffected.

* When using under the conditions equivalent to IP65, connect the fitting or tube to the breathing hole prior to use. (For details, refer to "Specific Product Precautions 1" on page 849)

Accessories (Option)

Bracket

Flat bracket assembly (includes 2 mounting screws) P39800022



L-bracket assembly (includes 2 mounting screws) P39800023



Tighting torque when assembling is 0.3 N·m.

Cable connector



Right angle type P398000-501-2



AR425 to 935

ARX AMR

ARP IR

IRV VEX

SRH

SRP SRF

VCHR

IC

ITVX

PVQ

VEF VEP

VER

VEA

VY1

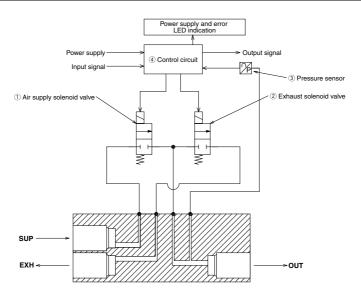
AP100

Series ITV0000

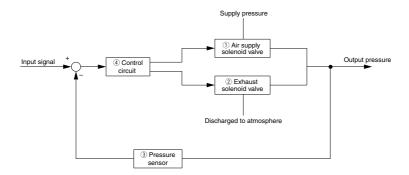
Working Principle

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.

Working Principle Diagram

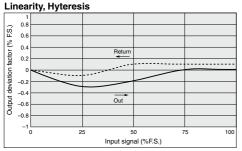


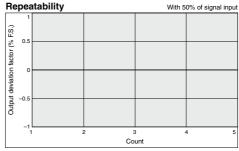
Block Diagram



Compact Electro-Pneumatic Regulator Series ITV0000

Series ITV001□





ARJ

AR425 to 935 ARX

AMR

ARM

ARP

IR

IRV

VEX

SRH

SRP

SRF

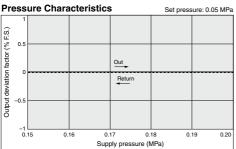
VCHR

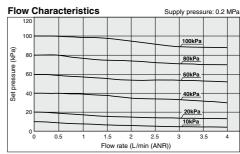
ITV

VER

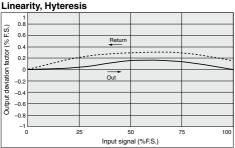
VEA

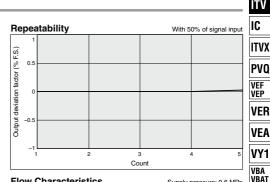
AP100

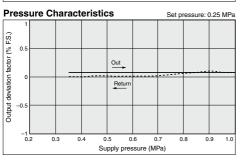


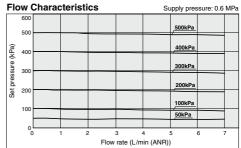


Series ITV003□



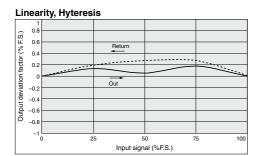


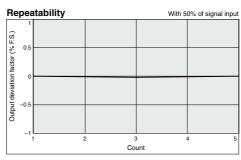


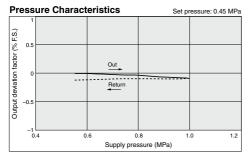


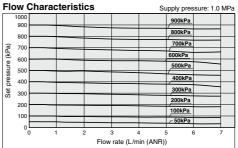
Series ITV0000

Series ITV005□



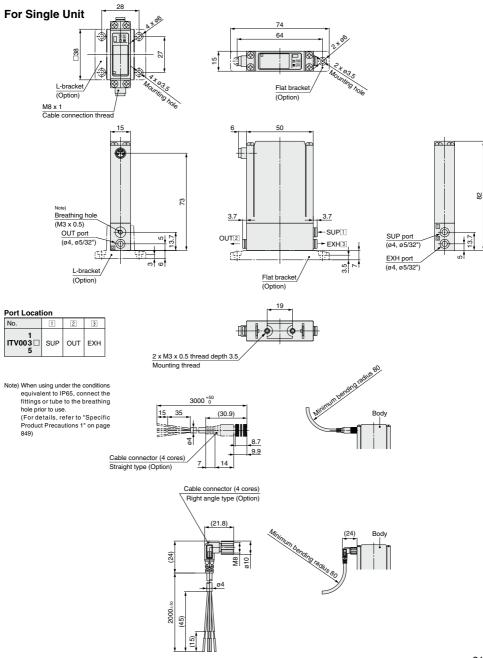






Compact Electro-Pneumatic Regulator Series ITV0000

Dimensions



SMC

ARJ AR425 to 935

ARX AMR

ARM

IR IRV

VEX

SRH SRP

> SRF VCHR

ITV IC

ITVX

PVQ

VEF VEP

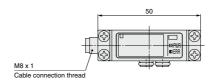
VEA VY1

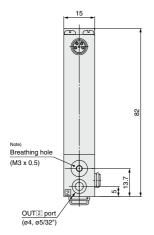
VBA VBAT

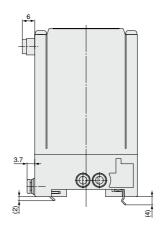
Series ITV0000

Dimensions

Single unit for manifold

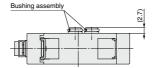








Note) When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use. (For details, refer to "Specific Product Precautions 1" on page 849)

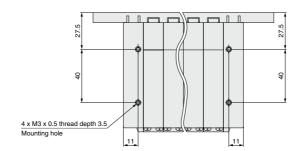


Note) For dimensions of the cable connector, refer to single unit on page 811.

Compact Electro-Pneumatic Regulator Series ITV0000

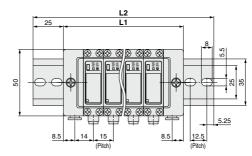
Dimensions

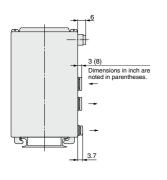
Manifold

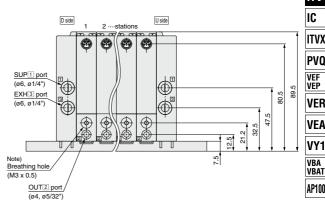


Port Location				
No.	1	2	3	
1 ITV003□	SUP	OUT	EXH	

Note) Stations are counted starting from the D side.







Note) For dimensions of the cable connector, refer to single unit on page 811.

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

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 1" on page 849).



ARJ AR425 to 935 ARX

AMR ARM

ARP

IR

IRV VEX SRH

SRP SRF VCHR

ITV IC

ITVX PVQ

VER

VEA

VY1

AP100

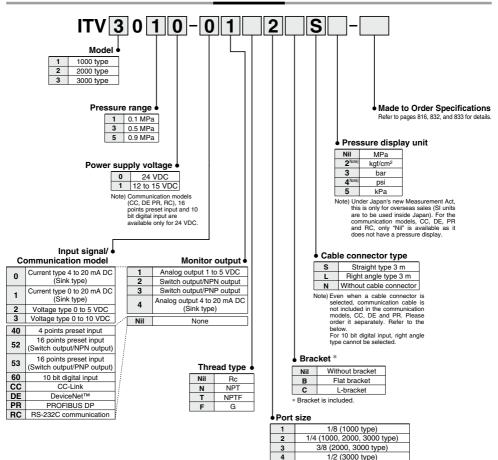
Electro-Pneumatic Regulator

Series ITV1000/2000/3000





How to Order



For communication cables, use the parts listed below (refer to M8/M12 connector in Best Pneumatics No.1 for details)

or order the product certified for the respective protocol (with M12 connector) separately.

Application	Communication cable part number	Note	
CC-Link compatibility	PCA-1567720 (Socket type)	Dedicated Bus adapter supplied	
CC-Link compatibility	PCA-1567717 (Plug type)	with the product.	
DeviceNet™	PCA-1557633 (Socket type)	T-branch connector not supplied.	
compatibility	PCA-1557646 (Plug type)	1-branch connector not supplied.	
PROFIBUS DP	PCA-1557688 (Socket type)	T-branch connector not supplied.	
compatibility	PCA-1557691 (Plug type)	1-branch connector not supplied.	

ITV1000 ITV2000

Standard Specifications

		ITV101□Note 8)	ITV103 Note 8)	ITV105 □ Note 8)			
Mod	el	ITV201□	ITV203□	ITV205□			
		ITV301□	ITV303□	ITV305□			
Minimum supp	ly pressure		Set pressure +0.1 MPa				
Maximum supply pressure		0.2 MPa	1.0 M	MРа			
Set pressure range Note 1)		0.005 to 0.1 MPa	0.005 to 0.1 MPa				
	Voltage	24	24 VDC ± 10%, 12 to 15 VDC				
Power supply	Current	Power supply voltage 24 VDC type: 0.12 A or less Note 9)					
	consumption		oltage 12 to 15 VDC type				
	Current type Note 2)		A DC, 0 to 20 mA DC (S				
Input signal	Voltage type	(0 to 5 VDC, 0 to 10 VDC	;			
put signal	Preset input	4 points (Negative	common), 16 points (No	common polarity)			
	Digital input	input 10 bit (Parallel)					
	Current type		250 Ω or less Note 6)				
Input	Voltage type		Approx. 6.5 kΩ				
impedance	Preset input	Power supply voltage 24 VDC type: Approx. 4.7 kΩ Power supply voltage 12 VDC type: Approx. 2.0 kΩ					
	Digital input	Approx. 4.7 kΩ					
Output signal (monitor	Analog output	4 to 20 mA DC (Sin	(Output impedance: App k type) (Output impedanut accuracy ± 6% F.S. o	nce: 250 Ω or less)			
output)	Switch	NPN open collector output: Max. 30 V, 80 mA					
	output	PNP open collector output: Max. 80 mA					
Linearity		± 1% F.S. or less					
Hysteresis			0.5% F.S. or less				
Repeatability		± 0.5% F.S. or less					
Sensitivity			0.2% F.S. or less				
Temperature ch	aracteristics		± 0.12% F.S./°C or less				
Output pressure	Accuracy	± 2% F.S. ± 1 digit or less					
display Note 4)	Minimum unit	MPa: 0.001, kgf/cm ² : 0.01, bar: 0.01, psi: 0.1 Note 5), kPa: 1					
Ambient and fluid temperature		0 to 50°C (No condensation)					
Enclosure		IP65					
	ITV10□□	App	orox. 250 g (without option	ons)			
Weight Note 10)	ITV20□□	Арр	orox. 350 g (without option	ons)			
	ITV30□□	Approx. 645 g (without options)					

Note 1) Please refer to Figure 1 for the relationship between set pressure and input. Because the maximum set pres-

sure differs for each pressure display, refer to page 853.

Note 2) 2-wire type 4 to 20 mA DC 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.

When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than 100 kΩ, the analog output monitor accuracy of within ±6% (full span) may not be available. The product with the accuracy of within ±6% is supplied upon your request. Output pressure remains unaffected.

Note 4) Adjustment of numerical values such as the zero/span adjustment or preset input type is set based on the

minimum units for output pressure display (e.g. 0.001 to 0.500 MPa). Note that the unit cannot be changed. Note 5) The minimum unit for 0.9 MPa (130 psi) types is 1 psi. Note 6) Value for the state with no over current circuit included. If an allowance is provided for an over current circuit, the input impedance varies depending on the input current. This is 350 Ω or less for an input current of 20 mA DC.

Note 7) The above characteristics are confined to the static state. When air is consumed on the output side, the pres-

Note 8) The ITV1000 series is a Grease-free specification (Wetted parts).

Note 9) Refer to the table below for communication specifications.

Note 10) Add 50 g for digital input type, 70 g for 16 points preset input type respectively.

Input signal (%F.S.) Figure 1. Input/output characteristics chart

ITV3000

Symbol

Rated pressure

Output pressure (MPa)

0.005MPa

This range is outside

Communication Specifications (CC, DE, PR, RC)

Serial-communications model

Model	ITV□0□0-CC	ITV□0□0-DE	ITV□0□0-PR	ITV□0□0-RC
Protocol	CC-Link	DeviceNet™	PROFIBUS DP	RS-232C
Version Note 1)	Ver 1.10	Volume1 (Edition3.8), Volume3 (Edition1.5)	DP-V0	_
Communication speed	156 k/625 k 2.5 M/5 M/10 M bps	125 k/250 k/500 k bps	9.6 k/19.2 k/45.45 k 93.75 k/187.5 k/500 k 1.5 M/3 M/6 M/12 M bps	9.6 kbps
Configulation file Note 2)	_	EDS	GSD	_
I/O occupation area (input/output data)	4 word/4 word, 32 bit/32 bit (per station, remote device station)	16 bit/16 bit	16 bit/16 bit	_
Communication data resolution	12 bit (4096 resolution)	12 bit (4096 resolution)	12 bit (4096 resolution)	10 bit (1024 resolution)
Fail safe	HOLD Note 3)/CLEAR (Switch setting)	HOLD/CLEAR (Switch setting)	CLEAR	HOLD
Electric insulation Note 4)	Insulation	Insulation	Insulation	Non-insulation
Terminating resistor	Built into the product (Switch setting)	Not built into the product	Built into the product (Switch setting)	_
Current consumption	0.16 A or less	0.14 A or less	0.16 A or less	0.12 A or less
ITV1000	330	320	350	320
Weight ITV2000	430	420	450	420
ITV3000	730	720	750	720

Note 1) Note that version information is subject to change.

Note 2) Configuration files can be downloaded from the operation manual page on SMC's website:http://www.smcworld.com Note 3) The output HOLD value when a CC-Link communications error occurs can be set based on the bit area data.

Note 4) The insulation between the electrical signal of the communication system and ITV power supply.

ARJ AR425 to 935 ARX

AMR

ARM ARP

> IR IRV

VEX

SRH SRP

SRF **VCHR**

IΤV

IC

ITVX

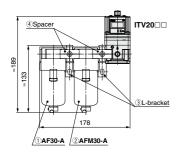
PVQ

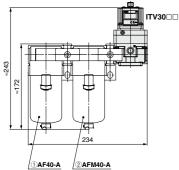
VER

VEA

VY1 VBA

VBAT AP100





Made to Order

(Refer to pages 832 and 835 for details.)

Symbol	Specifications
X102	Reverse type
X224	High pressure type (SUP 1.2 MPa, OUT 1.0 MPa)
X25	Set pressure range 1 to 100 kPa (Except Series ITV3000)
X88	High speed response type (Except Series ITV3000)
X26	For manifold mounting (Except Series ITV3000)
X410	Linearity: ±0.5% F.S. or less
X420	With alarm output
Note 1) Ma	nifolds 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.

Note 3) Compliant with CE marking

Model	Bracket tightening torque		
ITV1000	0.76 ± 0.05 N·m		
ITV2000/3000	1.5 ± 0.05 N·m		

Modular Products and Accessory Combinations

Applicable products and accessories	Applicable model			
Applicable products and accessories	ITV20□□	ITV30□□		
① Air filter	AF30-A	AF40-A		
② Mist separator	AFM30-A	AFM40-A		
③ L-bracket	B310L	B410L		
4 Spacer	Y30	Y40		
5 Spacer with L-bracket (3 + 4)	Y30L	Y40L		
6 Spacer with T-bracket	_	Y40T		

^{*} For ITV10 ., use a modular adapter (Refer to page 585 for details).

Accessories (Option)/Part No.

[Bracket]

Applicable model	Description	Part No.
ITV10□□	Flat has also to a second by (in all all as a second in a second in a	P398010-600
ITV20□□, 30□□	Flat bracket assembly (including mounting screws)	P398020-600
ITV10□□	I hypothet comply (including mounting covery)	P398010-601
ITV20□□, 30□□	L-bracket assembly (including mounting screws)	P398020-601

[Cable connector]

[Oable connector]				
Applicable model	Description		Part No.	
Current type Voltage type	Cable connector (4 cores)	Straight type 3 m	P398020-500-3	
4 points preset input	Cable connector (4 cores)	Right angle type 3 m	P398020-501-3	
	Power cable (4 cores)	Straight type 3 m	P398020-500-3	
16 mainta muaaat immut	rower cable (4 cores)	Right angle type 3 m	P398020-501-3	
16 points preset input	Signal cable (5 cores)	Straight type 3 m	P398020-502-3	
		Right angle type 3 m	P398020-503-3	
10 bit digital input	Cable connector (13 cores)	Straight type 3 m	INI-398-0-59	
CC-Link PROFIBUS DP	Power cable (4 cores)	Straight type 3 m	P398020-500-3	
DeviceNet™		Right angle type 3 m	P398020-501-3	
	Power cable (4 cores)	Straight type 3 m	P398020-500-3	
DO 0000	rower capie (4 cores)	Right angle type 3 m	P398020-501-3	
RS-232C	Communication cables	Straight type 3 m	P398020-502-3	
	connector (5 cores)	Right angle type 3 m	P398020-503-3	

Note 1) For the 10-bit digital type, there is no right angle type cable connector.

Note 2) Even when 'with cable connector' is selected the communication cable is not included in the communication model (CC, DE, PR). Please order separately.

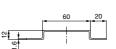
[Bus adapter]

Applicable model	able model Description	
CC-Link	Bus adapter (Bus adapter supplied with the product.)	EX9-ACY00-MJ

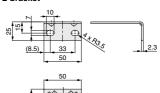
Dimensions

Flat bracket

100 52 40



L-bracket





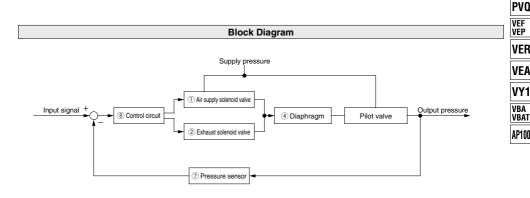
Working Principles

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

As a result, the air supply valve \S linked to the diaphragm \P opens, and a portion of the supply pressure becomes output pressure.

This output pressure feeds back to the control circuit ® 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 Pressure display ® Control Output signal Power supply Input signal circuit 7 Pressure sensor Pressure display ② Exhaust Air supply solenoid solenoid Power supply ® Control Output signal valve valve circuit Input signal (7) Pressure sensor **EXH** 1 Air supply 2 Exhaust solenoid solenoid valve valve 4 Diaphragm 3 Pilot chamber EXH 6 Exhaust valve (4) Diaphragm Supply 3 Pilot chamber **EXH** valve Supply valve OUT SUP OUT SUP EXH 6 Exhaust valve ITV1000 ITV2000, 3000



817 ®

ARJ

AR425

to 935

AMR

ARM

ARP

IR

IRV

VEX

SRH

SRP

SRF

VCHR

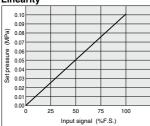
ITV

IC

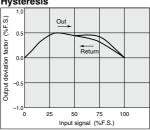
ITVX

Series ITV101□

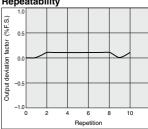
Linearity



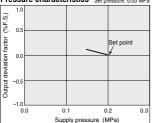
Hysteresis



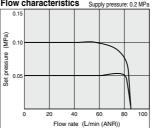
Repeatability



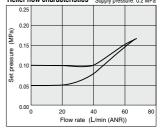
Pressure characteristics Set pressure: 0.05 MPa



Flow characteristics Supply pressure: 0.2 MPa

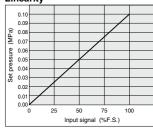


Relief flow characteristics Supply pressure: 0.2 MPa

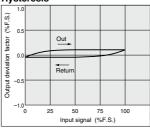


Series ITV201□

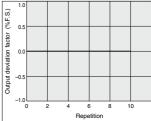
Linearity



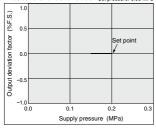
Hysteresis

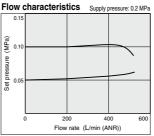


Repeatability

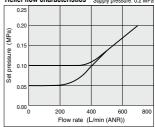


Pressure characteristics Set pressure: 0.05 MPa



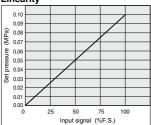


Relief flow characteristics Supply pressure: 0.2 MPa

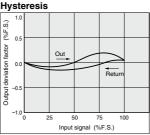


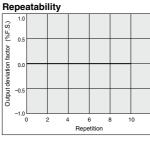
Series ITV301□





Hysteresis





ARM ARP

IR

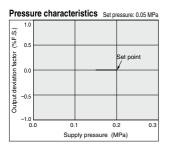
ARJ

AR425

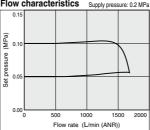
to 935

ARX

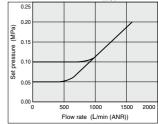
AMR



Flow characteristics Supply pressure: 0.2 MPa



Relief flow characteristics Supply pressure: 0.2 MPa



VEX SRH

IRV

SRP SRF

VCHR

ITV

IC

ITVX

PVQ

VEF VEP VER

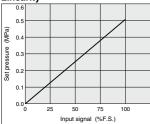
VEA

VY1 VBA VBAT

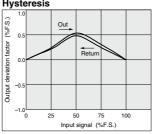
AP100

Series ITV103□

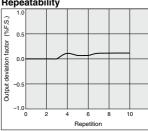
Linearity



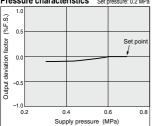
Hysteresis



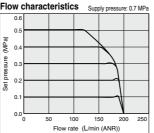
Repeatability



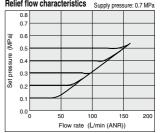
Pressure characteristics Set pressure: 0.2 MPa



Flow characteristics

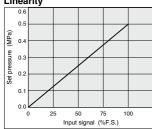


Relief flow characteristics

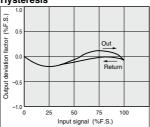


Series ITV203□

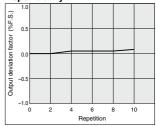
Linearity



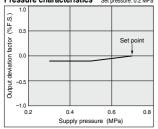
Hysteresis



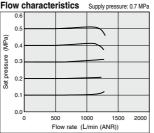
Repeatability



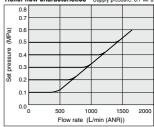
Pressure characteristics Set pressure: 0.2 MPa



Flow characteristics

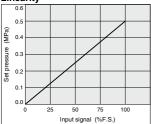


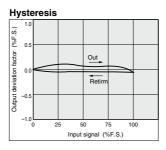
Relief flow characteristics Supply pressure: 0.7 MPa

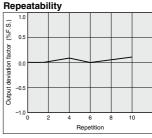


Series ITV303□









ARM ARP

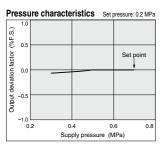
ARJ

AR425

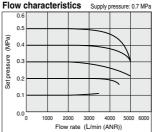
to 935

ARX

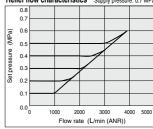
AMR



Flow characteristics



Relief flow characteristics Supply pressure: 0.7 MPa



IR

IRV VEX

SRH

SRP SRF

VCHR

ITV

IC

ITVX

PVQ

VEF VEP

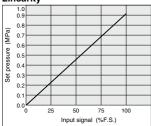
VER VEA

VY1

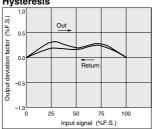
VBA VBAT AP100

Series ITV105□

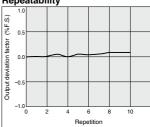
Linearity



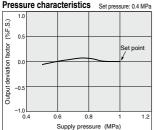
Hysteresis



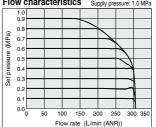
Repeatability



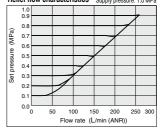
Pressure characteristics



Flow characteristics Supply pressure: 1.0 MPa

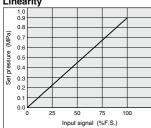


Relief flow characteristics Supply pressure: 1.0 MPa

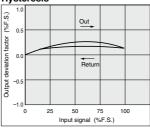


Series ITV205

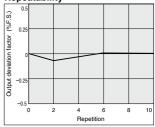
Linearity



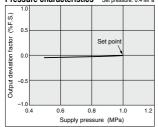
Hysteresis



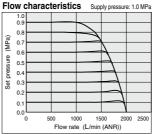
Repeatability



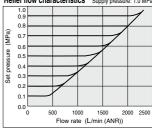
Pressure characteristics Set pressure: 0.4 MPa



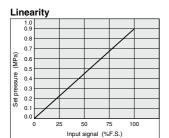
Flow characteristics

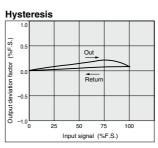


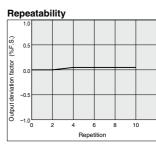
Relief flow characteristics Supply pressure: 1.0 MPa

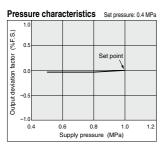


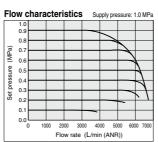
Series ITV305□

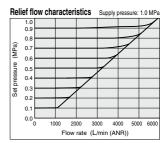












ARP
IR
IRV
VEX

ARJ

AR425

to 935

ARX

AMR

ARM

SRF VCHR

SRP

ITV

IC ITVX

PVQ

VEF VEP

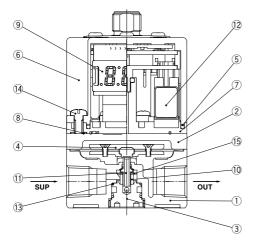
VER VEA

VY1

AP100

Construction

ITV1000

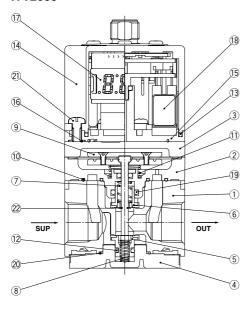


Main Component Parts

	No.	Material		
•	1	Body	Aluminum alloy	
	2	Cover	Aluminum alloy	
•	3	Valve guide	Aluminum alloy	
			Aluminum alloy	
•	4	Diaphragm assembly	Weather resistant NBR	
			Steel	
	5	Seal	NBR	
	_	David accomply	Resin	
	6	Bowl assembly	Silicone rubber	
	7	Sub-plate	Resin	
	8	Seal	NBR	
	9	Control circuit assembly	_	
•	10	Bumper	NBR	
_		Valve	Stainless steel	
•	11	valve	HNBR	
	12	Solenoid valve	_	
•	13	O-ring	NBR	
	14 Round head Phillips screw		Steel	
•	15	Flat washer	Stainless steel	

^{*} Parts in contact with fluid are indicated with a mark .

ITV2000



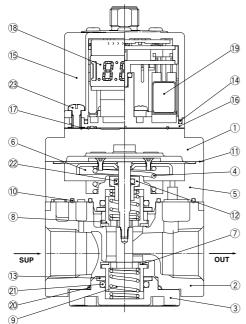
Main Component Parts

	Component Parts				
No.	Description	Material			
1	Body	Aluminum alloy			
2	Intermediate body	Aluminum alloy			
3	Cover	Aluminum alloy			
4	Valve guide	Aluminum alloy			
5	Valve (Supply valve)	HNBR/Brass			
6	Valve (Exhaust valve)	HNBR/Brass			
7	Valve spring	Stainless steel			
8	Valve spring	Stainless steel			
		Stainless steel			
9	Disabas and assemble	Aluminum alloy			
9	Diaphragm assembly	Weather resistant NBR			
		Steel			
10 Seal NBR 11 Bias spring Stainless steel		NBR			
		Stainless steel			
12	O-ring	NBR			
13	Seal	NBR			
14	David annually	Resin			
14	Bowl assembly	Silicone rubber			
15	Sub-plate	Resin			
16	Seal	NBR			
17	Control circuit assembly	_			
18	Solenoid valve	_			
19	O-ring	NBR			
20	O-ring	NBR			
21	Round head Phillips screw	Steel			
22 Retaining ring Stainless steel					
Bods in control with fluid one indicated with a mode A					

^{*} Parts in contact with fluid are indicated with a mark .

Construction

ITV3000



Main Component Parts

_				
No.	Description	Material		
1	Cover	Aluminum alloy		
2	Body	Aluminum alloy		
3	Valve guide	Aluminum alloy		
4	Bias spring	Stainless steel		
5	Intermediate body	Aluminum alloy		
		Weather resistant NBR		
		Rolled sheet steel		
6	Diaphragm assembly	Stainless steel		
		Aluminum alloy		
		Steel		
7	Valve (Supply valve)	HNBR/Brass		
8	Valve (Exhaust valve)	HNBR/Brass		
9	Valve spring	Stainless steel		
10	10 Seal NBR			
11	11 Seal NBR			
12	Rod guide Brass			
13	13 O-ring retainer Aluminum alloy			
14 Seal		NBR		
15	Bowl assembly	Resin		
10	Bowl assembly	Silicone rubber		
16	Sub-plate	Resin		
17	Seal	NBR		
18	Control circuit assembly	_		
19	Solenoid valve	_		
20	O-ring	NBR		
21	O-ring	NBR		
22	O-ring	NBR		
23	Round head Phillips screw	Steel		
Doute in contect with fluid are indicated with a mark				

^{*} Parts in contact with fluid are indicated with a mark ...

AR425 to 935

ARX AMR ARM

ARP IR

IRV

SRH

SRF

VCHR ITV

IC

ITVX

PVQ VEF VEP

VER

VEA VY1

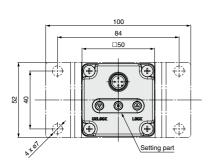
VBA VBAT

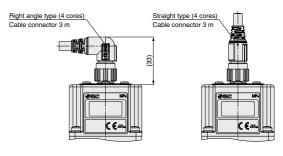
Dimensions

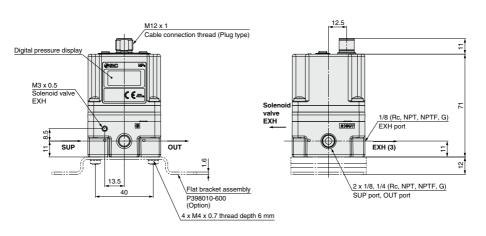
ITV10□□

Flat bracket

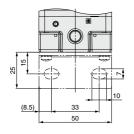
Note) Do not attempt to rotate, as the cable connector does not turn.

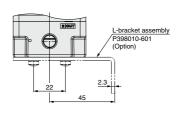




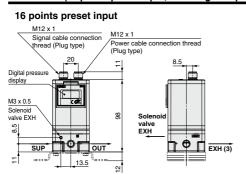


L-bracket





Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet™, PROFIBUS DP and RS-232C



10 bit digital input HIROSE ELECTRIC CO., LTD. Made RP13A-12RB-13PA (71) (ø14.3) (ø14.3) Digital pressure display M3 x 0 5 Solenoid 98 valve EXH Solenoid valve EXH

ď

OUT 13.5

ARJ

AR425

to 935

ARX

AMR

ARM

ARP

IR

IRV

VEX

SRH

SRP

SRF

VCHR

ITV

IC

ITVX

PVO

VEF

VEP

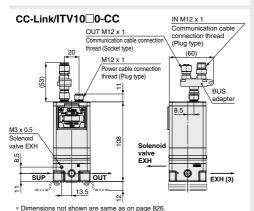
VER VEA VY1

VBA

VBAT

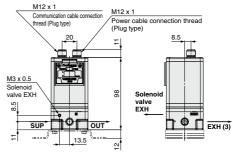
AP100

EXH (3)



DeviceNet™/ITV10□0-DE

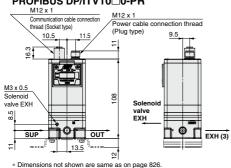
SUP



* Dimensions not shown are same as on page 826

RS-232C/ITV10□0-RC

PROFIBUS DP/ITV10□0-PR M12 x 1



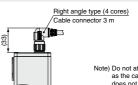
M12 x 1 M12 x 1 Communication cable connection Power cable connection thread thread (Plug type) (Plug type) M3 x 0.5 Solenoid 86 valve EXH Solenoid valve EXH SUP OUT EXH (3) 13.5 ď * Dimensions not shown are same as on page 826.

With power cable connector

* ITV10□0- CC common dimensions Note) Order communication cable

(other than 16 points, RS-232C) separately. (Refer to page 814.)





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

827 ©

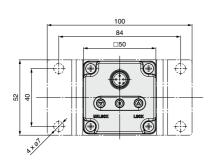
SMC

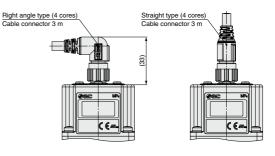
Dimensions

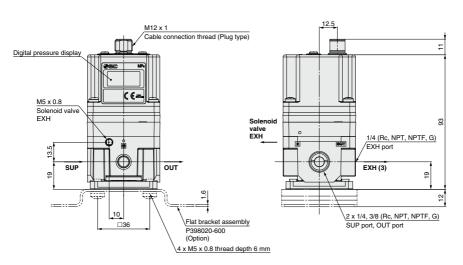
ITV20□□

Flat bracket

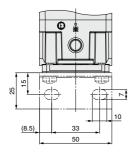
Note) Do not attempt to rotate, as the cable connector does not turn.

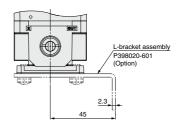




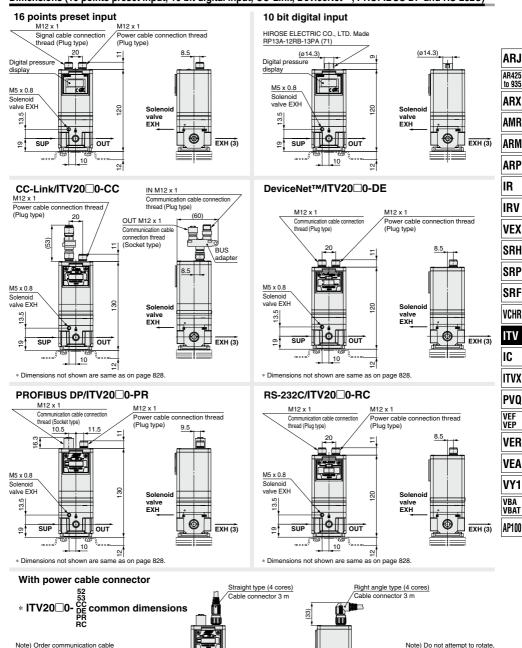


L-bracket





Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)



(other than 16 points, RS-232C)

separately. (Refer to page 814.)

ØSMC

829 ©

as the cable connector

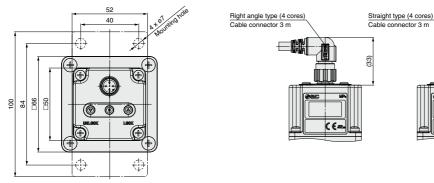
does not turn.

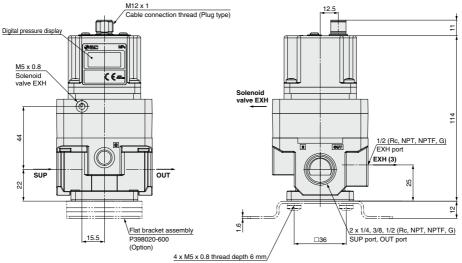
Dimensions

ITV30□□

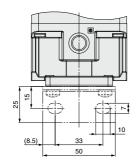
Flat bracket

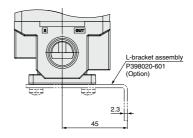
Note) Do not attempt to rotate, as the cable connector does not turn.



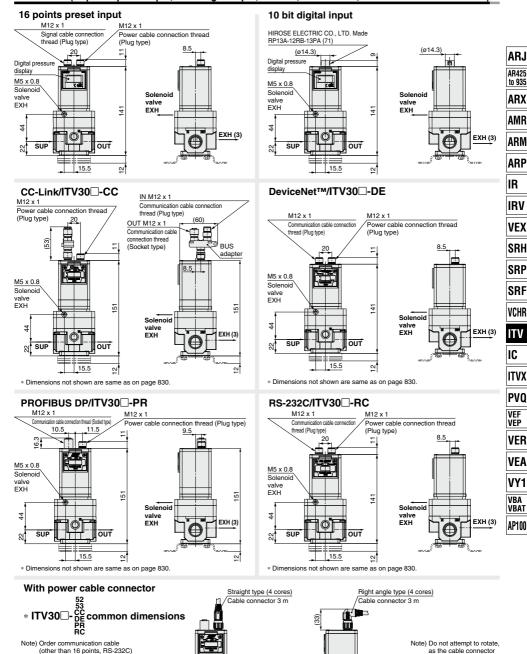


L-bracket





Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)



SMC

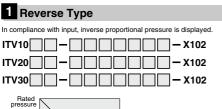
separately. (Refer to page 814.)

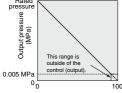
does not turn.

Series ITV1000/2000/3000 Made to Order Specifications 1 Please contact SMC for detailed dimensions, specifications and lead times.







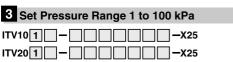


Input signal (%F.S.)

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 and digital input type.

Note 3) For communication models, consult SMC for availability.



Note 1) For preset input type, digital input type and communication models, consult SMC for availability.

2 High Pressure Type (SUP 1.2 MPa, OUT 1.0 MPa)
ITV105 — X224
ITV205 — X224
ITV305 — X224

Note 1) For preset input type, digital input type and communication models, consult SMC for availability.

Series ITV1000/2000/3000 **Made to Order Specifications 2** Please contact SMC for detailed dimensions, specifications and lead times

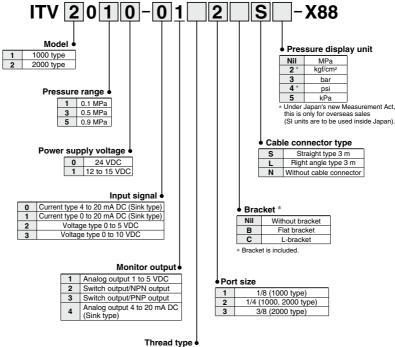
(E CAL US ROHS

4 High-Speed Response Time Type

Pressure response with no load is approx. 0.1 sec.

Note 1) This is not a guaranteed value as it depends on the operating environment.

Note 2) When the input signal is at 0%, the exhaust solenoid valve is controlled to reduce the outlet pressure to zero. For this reason, a noise may be generated. This noise is normal and does not indicate a fault.



• • • • • • • • • • • • • • • • •			
Nil	Rc		
N NPT			
Т	NPTF		
F	G		

ARJ

AR425 to 935

ARX AMR

ARM

ARP IR

IRV

VEX

SRH

SRP SRF

VCHR

ITV

IC

ITVX PVQ

VEF VEP

VER

VEA VY1

VBA VBAT AP100



(E CAL US ROHS Series ITV1000/2000/3000 **Made to Order Specifications 3**

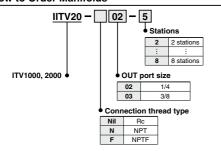
Please contact SMC for detailed dimensions, specifications and lead times



5 Manifold Specifications (Except Series ITV3000)

2 through 8 station manifold.

How to Order Manifolds



How to Order for Manifold Mounted

ITV 1 0		1	– X26
ITV 2 0	101-0	2	— X26

Note 1) \(\subseteq \) in part number is the same model no, for the standard products.

Note 2) For communication models, consult SMC for availability.

Note 3) The thread type is Rc only.

Note 4) For Series ITV1000, the port size is 1/8 only.

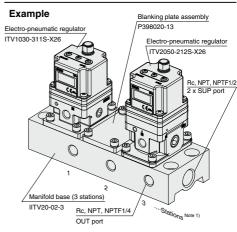
Note 5) For Series ITV2000, the port size is 1/4 only. Note 6) The bracket accessory can not be selected.

Note 7) Not applicable to Series ITV3000

IITV20-02-31 set (3 station manifold base part no.)
*ITV1030-311S-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

How to Order Manifold Assemblies



Note) Refer to the table below for possible mixed combination

Note; Field to the table below for possible mixed combination.						
Model	ITV101□	ITV103□	ITV105□	ITV201□	ITV203□	ITV205□
ITV101□	•	_	_	•	_	_
ITV103□	_	•	•	_	•	•
ITV105□	_	•	•	_	•	•
ITV201□	•	_	_	•	_	_
ITV203□	_	•	•	_	•	•
ITV205□	_	•	•	_	•	•

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.

ARJ

AR425 to 935

ARX AMR

ARM ARP IR

IRV VEX

SRH

SRP SRF

VCHR

ITV IC

ITVX PVO

VEF VEP

VER

VEA VY1

VBA VBAT AP100

Series ITV1000/2000/3000 **Made to Order Specifications 4**

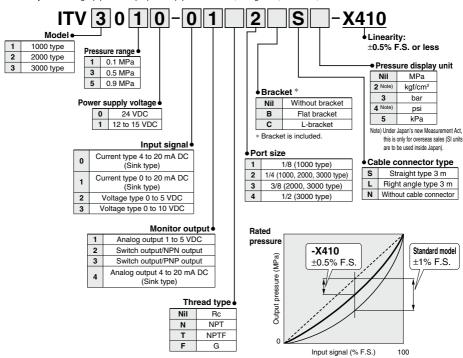
(E CAL US ROHS





6 Linearity: $\pm 0.5\%$ F.S. or Less

Application examples: Polishing equipment and peripheral equipment for wafers, LCD glasses, color filters, etc.



The graph shown above is a typical example. (This graph shows that the output pressure curve is in a negative range when compared to the ideal line.)

Specifications

Fluid		Air
Minimum supply	pressure	Set pressure +0.1 MPa
Maximum supply	pressure	1.0 MPa (Pressure range 0.1 MPa type: 0.2 MPa)
Proof pressure (Supply side)	(Supply side)	1.5 MPa (Pressure range 0.1 MPa type: 0.3 MPa)
rioui piessuie	(Output side)	1 MPa (Pressure range 0.1 MPa type: 0.2 MPa)
Set pressure rang	je	1: 0.005 to 0.1 MPa, 3: 0.005 to 0.5 MPa, 5: 0.005 to 0.9 MPa
Power supply vol	tage	0: 24 VDC ±10%, 1: 12 to 15 VDC
Current consump	tion	0.12 A or less (24 VDC ±10% type)
Current consump	illon	0.18 A or less (12 to 15 VDC type)
Input signal		0: 4 to 20 mA, 1: 0 to 20 mA, 2: 0 to 5 VDC, 3: 0 to 10 VDC
Input impedance Voltage type: Approx. $6.5 \text{ k}\Omega$, Current type: 250Ω or less		Voltage type: Approx. 6.5 kΩ, Current type: 250 Ω or less
Output signal Analog output: 1 to 5 VDC/4 to 20 mA DC, Switch output (NPN/PNP)		Analog output: 1 to 5 VDC/4 to 20 mA DC, Switch output (NPN/PNP)
Linearity ±0.5%		±0.5% F.S. or less
Hysteresis		0.5% F.S. or less
Repeatability ±0.5% F.S. or less		±0.5% F.S. or less
Sensitivity		0.2% F.S. or less
Temperature char	racteristics	±0.12% F.S./°C or less
Outnut pressure display	Accuracy	±2% F.S. ±1 digit or less
Output pressure display	Minimum unit	MPa: 0.001, kgf/cm²: 0.01, bar: 0.01, psi: 0.1, kPa: 1
Ambient and fluid	Ambient and fluid temperature 0 to 50°C (No condensation)	
Enclosure IP65		IP65
Weight		ITV10□□: Approx. 250 g, ITV20□□: Approx. 350 g, ITV30□□: Approx. 645 g (without brackets)
		and the state of t

The above characteristics (specifications) are confined to the static state. When air is consumed on the output side, the pressure may fluctuate.



Series ITV1000/2000/3000 Made to Order Specifications 5 Please contact SMC for detailed dimensions, specifications, and lead times.

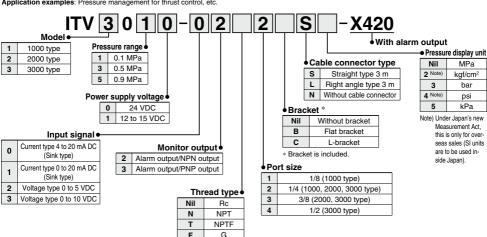
(E CAL US ROHS



7 With Alarm Output

Alarm is output if the set pressure is not reached or maintained for 5 seconds or more

Application examples: Pressure management for thrust control, etc.



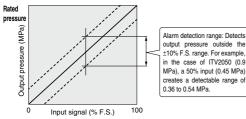


Figure 1. Alarm output range

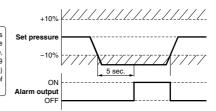


Figure 2. Relationship between output pressure and alarm output

Specifications

Fluid		Air
Minimum supply	pressure	Set pressure +0.1 MPa
Maximum supply	pressure	1.0 MPa (Pressure range 0.1 MPa type: 0.2 MPa)
Proof pressure (Supply side)		1.5 MPa (Pressure range 0.1 MPa type: 0.3 MPa)
Proof pressure	(Output side)	1 MPa (Pressure range 0.1 MPa type: 0.2 MPa)
Set pressure range	ge	1: 0.005 to 0.1 MPa, 3: 0.005 to 0.5 MPa, 5: 0.005 to 0.9 MPa
Power supply vol	Itage	0: 24 VDC ±10%, 1: 12 to 15 VDC
Current consump	tion	0.12 A or less (24 VDC ±10% type)
Current consump	Juon	0.18 A or less (12 to 15 VDC type)
Input signal 0: 4 to 20 mA, 1: 0 to 20 mA, 2: 0 to 5 VDC, 3: 0 to 10 VDC		0: 4 to 20 mA, 1: 0 to 20 mA, 2: 0 to 5 VDC, 3: 0 to 10 VDC
Input impedance Voltage type: Approx. 6.5 kΩ, Current type: 250 Ω o		Voltage type: Approx. 6.5 k Ω , Current type: 250 Ω or less
Output signal Alarm output (NPN/PNP)		
Linearity		±1.0% F.S. or less
Hysteresis		0.5% F.S. or less
Repeatability		±0.5% F.S. or less
Sensitivity		0.2% F.S. or less
Temperature cha	racteristics	±0.12% F.S./°C or less
Output pressure display Accuracy		±2% F.S. ±1 digit or less
Output pressure display	Minimum unit	MPa: 0.001, kgf/cm²: 0.01, bar: 0.01, psi: 0.1, kPa: 1
Ambient and fluid	temperature	0 to 50°C (No condensation)
Enclosure		IP65
Weight		ITV10□□: Approx. 250 g, ITV20□□: Approx. 350 g, ITV30□□: Approx. 645 g (without brackets)

The above characteristics (specifications) are confined to the static state. When air is consumed on the output side, the pressure may fluctuate.



ARJ AR425 to 935

ARX

AMR ARM

ARP

IRV VEX

SRH

SRP

SRF

VCHR

ITV IC

ITVX

PVO VEF

VEP VER

VEA

VY1 VBA VBAT

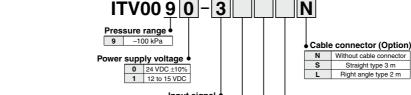
AP100

Compact Vacuum Regulator

Series ITV009

RoHS

How to Order



Input signal Current type 4 to 20 mA DC (Sink type)

 0
 Current type 4 to 20 mA DC (Sink type)

 1
 Current type 0 to 20 mA DC (Sink type)

 2
 Voltage type 0 to 5 VDC

 3
 Voltage type 0 to 10 VDC

Built-in One-touch fittings type •

For single unit Symbol

For single unit and single unit for manifold

Symbol		VAC1 OUT2 ATM3	
Nil	Metric size (Light gray)	ø4	
U	Inch size (Orange)	ø5/32"	

For manifold

Symbol		VAC1	OUT2	ATM3
Nil	Metric size (Light gray)	ø6	ø4	ø6
U	Inch size (Orange)	ø1/4"	ø5/32"	ø1/4"

How to Order Manifold Assembly (Example)

Bracket/Option for single unit only

Without bracket

Nil

В

C

Base type

Flat

Bracket

L-bracket

Indicate the part numbers of electro-pneumatic regulators 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.)

For single unit

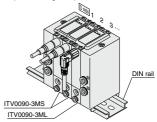
* ITV0090-3MS-----2 sets (Vacuum regulator part no. (1, 2 stations))

* ITV0090-3ML-----1 set (Vacuum regulator part no. (3 stations))

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

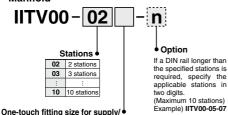
Note)Combination with having different pressure ranges is not available due to common supply/exhaust features.

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



Manifold

exhaust parts (End plate)



ø6 (Light gray) ø1/4" (Orange)

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.

Compact Vacuum Regulator Series ITV009

Specifications



Model		ITV009□		
Minimum supply pressure		Set pressure –1 kPa		
Maximum supply p	ressure	-101 kPa		
Set pressure range)		-1 to -100 kPa	
	Voltage		24 VDC ±10%, 12 to 15 VDC	
Power supply	Current consumption		oply voltage 24 VDC type: 0.12 A or less y voltage 12 to 15 VDC type: 0.18 A or less	
Input signal	Voltage type		0 to 5 VDC, 0 to 10 VDC	
input signai	Current type	4 to 20	0 mA DC, 0 to 20 mA DC (Sink type)	
Input impedance	Voltage type		Approx. 10 kΩ	
input impedance	Current type		Approx. 250 Ω	
Output signal Note 4)	Analog output	1 to 5 VDC (Output impedance: Approx. 1 kΩ) Output accuracy: ±6% F.S. or less		
Linearity		±1% F.S. or less		
Hysteresis		0.5% F.S. or less		
Repeatability		±0.5% F.S. or less		
Sensitivity		0.2% F.S. or less		
Temperature chara	cteristics	±0.12% F.S./°C or less		
Operating tempera	ture range	0 to 50°C (No condensation)		
Enclosure			IP65 equivalent *	
Connection type		Built-in One-touch fittings		
	For single	Metric size	1, 2, 3: ø4	
Connection size	unit	Inch size	1, 2, 3: ø5/32"	
Connection size	Manifold	Metric size	1, 3: ø6, 2: ø4	
		Inch size	1, 3: ø1/4", 2: ø5/32"	
Weight Note 1)			100 g or less (without option)	

Note 1) Indicates the weight of a single unit.

For IITV00-n

Total weight (g) Stations (n) x 100 + 130 (Weight of end block A, B assembly) + Weight (g) of DIN rail

Note 2) When there is a downstream flow consumption, pressure may become unstable depending on piping conditions.

Note 3) When the power is turned on, a noise may be generated. This noise is normal and does not indicate a fault.

Note 4) When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than

106 4) When measuring ITV analog output from 1 to 5 VDC, it the load impedance is less than 100 kΩ, the analog output monitor accuracy of ±6% F.S. or less may not be available. The product with the accuracy of within ±6% is supplied upon your request. Output pressure remains unaffected.

* When using under the conditions equivalent to IP65, connect the fitting or tube to the breathing hole prior to use. (For details, refer to "Specific Product Precautions 1" on page 849)

Accessories (Option)

Bracket

Flat bracket assembly (including 2 mounting screws) P39800022



L-bracket assembly (including 2 mounting screws) P39800023



Tighting torque when assembling is 0.3 N·m.

Cable connector



Right angle type P398000-501-2

ØSMC



ARJ AR425 to 935

ARX AMR

ARM

IRV

VEX

SRH

SRF

VCHR

IC

ITVX

PVQ

VEF VEP

VER

VEA

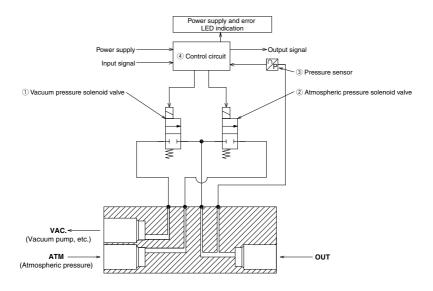
VY1

Series ITV009

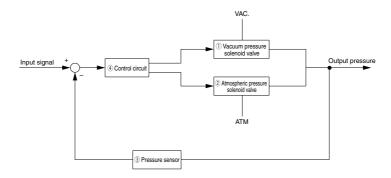
Working Principle

When the input signal rises, the vacuum pressure soloenoid valve ① turns ON. Due to this, part of the vacuum pressure (VAC.) passes through the vacuum pressure solenoid valve ① and changes to a vacuum pressure. This vacuum pressure feeds back to the control circuit ④ via the pressure sensor ③. Here, the vacuum pressure soloenoid valve and the atmospheric pressure soloenoid valve work alternately to make continuous pressure corrections until vacuum pressure becomes proportional to the input signal, thus, supplying vacuum pressure that is consistently proportional to the input signal.

Working Principle Diagram

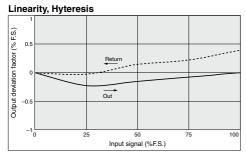


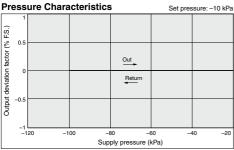
Block Diagram

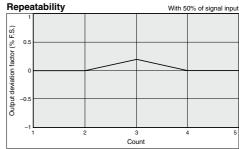


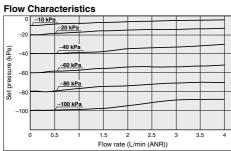
Compact Vacuum Regulator $Series\ ITV009$

Series ITV009□









IR IRV VEX SRH SRP SRF

ITV IC

VCHR

ARJ

AR425 to 935

AMR

ARM

ITVX

PVQ

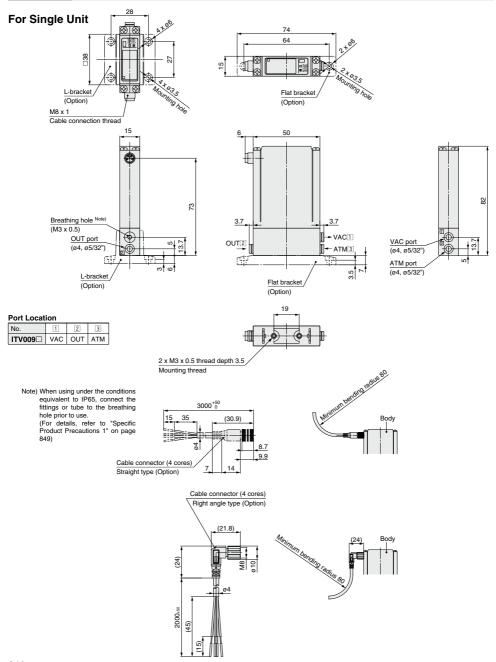
VEF VEP

VER VEA

VY1

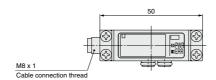
Series ITV009

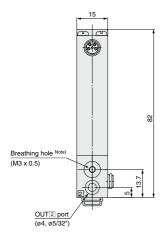
Dimensions

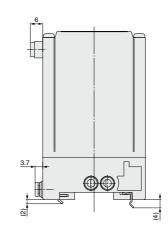


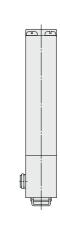
Dimensions

Single unit for manifold



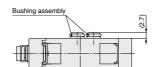






Note) When using under the conditions equivalent to IP65, connect the fittings or tube to the breathing hole prior to use. (For details, refer to "Specific

(For details, refer to "Specific Product Precautions 1" on page 849)



Note) For dimensions of the cable connector, refer to single unit on page 840.

ARJ

AR425 to 935

AMR

ARM

ARP IR

IRV

VEX

SRH

SRP SRF

VCHR

ITV IC

ITVX

PVQ

VEF VEP

VER

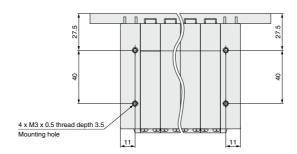
VEA

VY1

Series ITV009□

Dimensions

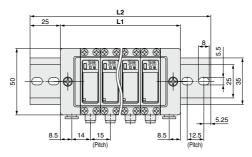
Manifold

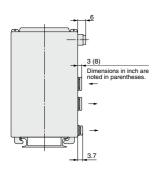


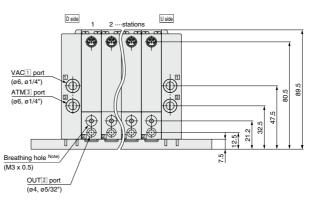
Port Location

No.	1	2	3
ITV009□	VAC	OUT	ATM

Note) Stations are counted starting from the D side.







Note) For dimensions of the cable connector, refer to single unit on page 840.

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

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 1" on page 849)

Electronic Vacuum Regulator

Series ITV2090/2091

CE CRUSUS ROHS



AR425

to 935 ARX

AMR

ARM

ARP

IR

IRV

VEX

SRH

SRP

SRF

VCHR

ITV

IC

ITVX

PVQ

VEF

VEP

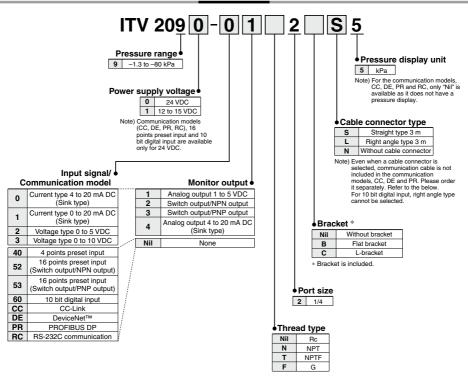
VER

VEA

VY1

VBA VBAT AP100

How to Order



For communications cables, use the parts listed below (refer to M8/M12 connector in Best Pneumatics No.1 for details)

or order the product certified for the respective protocol (with M12 connector) separately

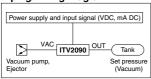
or order the product continue for the respective protector (with mile continuetor) coparatory.					
Application	Communication cable part number	Note			
CC-Link compatibility	PCA-1567720 (Socket type)	Dedicated Bus adapter supplied			
CC-Link compatibility	PCA-1567717 (Plug type)	with the product.			
DeviceNet™	PCA-1557633 (Socket type)	T-branch connector not supplied.			
compatibility	PCA-1557646 (Plug type)	1-branch connector not supplied.			
PROFIBUS DP	PCA-1557688 (Socket type)	T-branch connector not supplied.			
compatibility	PCA-1557691 (Plug type)	1-branch connector not supplied.			

Stepless control of vacuum pressure proportional to an electrical signal





Piping/Wiring Diagram



Standard Specifications

Mod	iol .	ITV2090	ITV2091	
Minimum supply vacuum pressure Note 1)		Set pressure –13.3 kPa		
Maximum supply va		–101 kPa		
Set pressure rand	•	-1.3 to	-80 kPa	
	Voltage	24 VDC ±10%	12 to 15 VDC	
Power supply	Current	Power supply voltage 24 VD	OC type: 0.12 A or less Note 7)	
	consumption	Power supply voltage 12 to	15 VDC type: 0.18 A or less	
	Current type Note 2)	4 to 20 mA DC, 0 to 2	20 mA DC (Sink type)	
Input signal Note 7)	Voltage type	0 to 5 VDC,	0 to 10 VDC	
input signal ·····	Preset input	4 points (Negative common), 1	6 points (No common polarity)	
	Digital input	10 bit (F		
	Current type	250 Ω or	less Note 3)	
Input	Voltage type	Approx	. 6.5 kΩ	
impedance	Preset input	Power supply voltage 24 VDC type: Approx. 4.7 k Power supply voltage 12 VDC type: Approx. 2.0 k		
	Digital input	Approx. 4.7 kΩ		
Output signal	Analog output	1 to 5 VDC (Output impedance: Approx. 1 k Ω) 4 to 20 mA DC (Sink type) (Output impedance: 250 Ω or Output accuracy \pm 6% F.S. or less		
(Monitor output)	Switch output	NPN open collector output: Max. 30 V, 80 mA PNP open collector output: Max. 80 mA		
Linearity		± 1% F.S. or less		
Hysteresis		0.5% F.S	S. or less	
Repeatability		± 0.5% F.S. or less		
Sensitivity		0.2% F.S. or less		
Temperature characteristics		± 0.12% F.S		
Output pressure	Accuracy	± 2% F.S. ± 1 digit or less		
display	Units	kPa Note 5) Minimum display: 1		
Ambient and fluid	I temperature	0 to 50°C (No condensation)		
Enclosure		IP65		
Weight Note 7, 8)		390 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 DC is not possible with the 2-wire type. Power supply voltage (24 VDC or 12 to 15 VDC) is required. Note 3) Value for the state with no over current circuit included. If an allowance is provided for an over current circuit, the input impedance varies depending on the input power supply. This is 350 Ω or less

for an input current of 20 mA DC.

When measuring ITV analog output from 1 to 5 VDC, if the load impedance is less than 100 k Ω , the analog output monitor accuracy of within ±6% (full span) may not be available. The product with the accuracy of within ±6% is supplied upon your request. Output pressure remains unaffected.

Note 4) 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 5) Please contact SMC regarding indication with other units of pressure.

Note 6) The product characteristics are confined to the static state.

Pressure may fluctuate when air is consumed at the output side. Note 7) Refer to the table below for communication specifications.

Note 8) Add 50 g for digital input type, 70 g for 16 points preset input type respectively.

Communication Specifications (CC, DE, PR, RC)

Model ITV□0□0-CC□□		ITV□0□0-DE□□	ITV□0□0-PR□□	ITV□0□0-RC□□
Protocol CC-Link		DeviceNet™	PROFIBUS DP	RS-232C
Version Note 1)	Ver 1.10	Volume1 (Edition3.8), Volume3 (Edition1.5)	DP-V0	_
Communication 156 k/625 k speed 2.5 M/5 M/10 M bps		125 k/250 k/500 k bps	9.6 k/19.2 k/45.45 k 93.75 k/187.5 k/500 k 1.5 M/3 M/6 M/12 M bps	9.6 kbps
Configulation file Note 2)	_	EDS	GSD	_
I/O occupation area (input/output data)	4 word/4 word, 32 bit/32 bit (per station, remote device station)	16 bit/16 bit	16 bit/16 bit	_
Communication data resolution	12 bit (4096 resolution)	12 bit (4096 resolution)	12 bit (4096 resolution)	10 bit (1024 resolution)
Fail safe	HOLD Note 3)/CLEAR (Switch setting)	HOLD/CLEAR (Switch setting)	CLEAR	HOLD
Electric insulation Note 4)	Insulation	Insulation	Insulation	Non-insulation
Terminating resistor	Built into the product (Switch setting)	Not built into the product	Built into the product (Switch setting)	_
Current consumption	0.16 A or less	0.14 A or less	0.16 A or less	0.12 A or less
Weight ITV2090	470	460	490	460

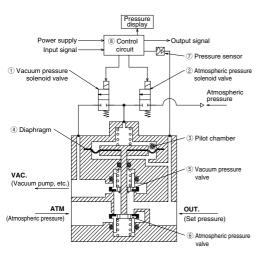
Note 1) Note that version information is subject to change.

Note 2) Configuration files can be downloaded from the operation manual page on SMC's website: http://www.smcworld.com
Note 3) The output HOLD value when a CC-Link communications error occurs can be set based on the bit area data.

Note 4) The insulation between the electrical signal of the communication system and ITV power supply

Electronic Vacuum Regulator Series ITV209

Working Principle

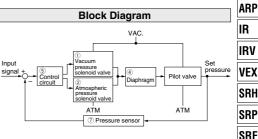


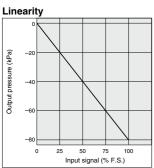
Working Principle

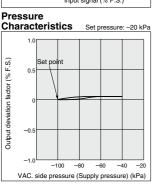
When the input signal increases, the vacuum pressure solenoid valve (1) turns ON, and the atmospheric pressure solenoid valve ② turns OFF. Because of this, VAC. and the pilot chamber ③ are connected, the pressure in the pilot chamber 3 becomes negative and acts on the top of the diaphragm 4

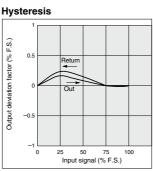
As a result, the vacuum pressure valve (§) which is linked to the diaphragm (4) opens, VAC. and OUT. are connected, and the set pressure becomes negative.

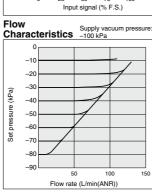
This negative pressure feeds back to the control circuit ® via the pressure sensor 7. Then, a correct operation works until a vacuum pressure proportional to the input signal is reached, and a vacuum pressure is obtained which is always proportional to the input signal.

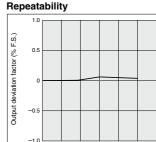


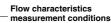












0 2 4

- · Exhaust flow rate of the vacuum pump
- used for measurement: 500 L/min (ANR)

8 10

Count

- 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)

ØSMC

845

ARJ AR425

to 935 ARX

AMR

ARM ARP

IR

IRV

VEX

SRP

VCHR

ITV

IC ITVX

PVO VEF

VEP VER

VEA VY1

VBA VBAT AP100

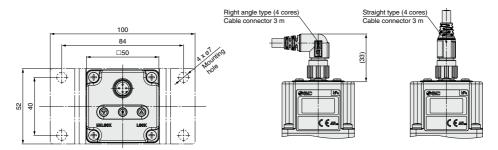
Series ITV209□

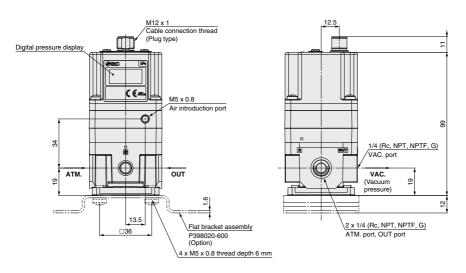
Dimensions

ITV209□

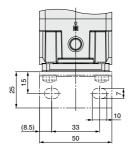
Flat bracket

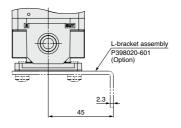
Note) Do not attempt to rotate the cable connector, as it does not turn.





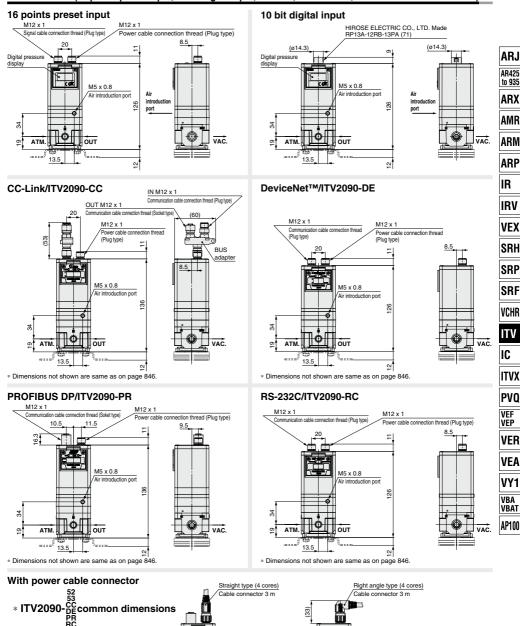
L-bracket





Electronic Vacuum Regulator Series ITV209

Dimensions (16 points preset input, 10 bit digital input, CC-Link, DeviceNet™, PROFIBUS DP and RS-232C)



SMC

Note) Order communication cable (other than 16 points. RS-232C) separately. (Refer to page 814.)

Note) Do not attempt to rotate the cable

connector, as it does not turn.

to 935

ARX

VEX

VCHR

VER VEA

VY1

Series ITV209

Accessories (Option)/Part No.

[Bracket]

Description	Part No.
Flat bracket assembly (including mounting screws)	P398020-600
L-bracket assembly (including mounting screws)	P398020-601

[Cable connector]

[edble cellifocter]					
Applicable model	Descrip	otion	Part No.		
Current type	Cable samuester (4 sames)	Straight type 3 m	P398020-500-3		
Voltage type 4 points preset input	Cable connector (4 cores)	Right angle type 3 m	P398020-501-3		
	Power cable (4 cores)	Straight type 3 m	P398020-500-3		
16 points preset input	rower capie (4 cores)	Right angle type 3 m	P398020-501-3		
16 points preset input	Ol	Straight type 3 m	P398020-502-3		
	Signal cable (5 cores)		P398020-503-3		
10 bit digital input	Cable connector (13 cores)	Straight type 3 m	INI-398-0-59		
CC-Link PROFIBUS DP	Power cable (4 cores)	Straight type 3 m	P398020-500-3		
DeviceNet™	rower cable (4 cores)	Right angle type 3 m	P398020-501-3		
	Dower cable (4 cores)	Straight type 3 m	P398020-500-3		
	Power cable (4 cores)	Right angle type 3 m	P398020-501-3		
RS-232C	Communication cables	Straight type 3 m	P398020-502-3		
connector (5 cores)		Right angle type 3 m	P398020-503-3		

Note 1) For the 10-bit digital type, there is no right angle type cable connector.

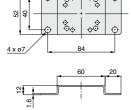
Note 2) Even when "with cable connector" is selected the communication cable is not included in the communication model (CC, DE, PR). Please order separately.

[Bus adapter]

[Dus adapter]		
Applicable model	Description	Part No.
CC-Link	Bus adapter (Bus adapter supplied with the product.)	EX9-ACY00-MJ

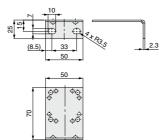
Dimensions





100

L-bracket



Model	Bracket tightening torque
ITV1000	0.76 ± 0.05N·m
ITV2000/3000	1.5 ± 0.05N·m
11 7 2 0 0 0 / 3 0 0 0	1.5 ± 0.05(N·11)



Be sure to read before handling. Refer to front matter 43 for Safety Instructions and pages 365 to 369 for Common Precautions.

Series ITV0000/009 ☐ Precautions

Air Supply

- 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.

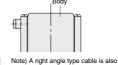
For details on the above compressed air quality, refer to SMC's "Air Preparation Systems".

Wiring

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.







4: (Black

3: (Blue)

available. The entry direction for the right angle type connector is to downwards (SUP port side). Never turn the connector as it



Wiring Diagrams

1: (Brown)

Current signal type



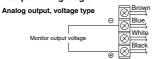
Vs: Power Supply 24 VDC ±10% 12 to 15 VDC A : Input signals 4 to 20 mA DC 0 to 20 mA DC

Voltage signal type



Vs : Power Supply 24 VDC ±10% 12 to 15 VDC Vin: Input signals 0 to 5 VDC 0 to 10 VDC

Monitor output wiring diagram



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.
- 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. 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.
- 6. 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.
- 7. Please note that the right angle cable does not rotate and is limited to only one entry direction.
- 8. 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 in-
 - duction loads (solenoid valves, relays, etc.).
- 9. The product characteristics are confined to the static state. When air is consumed on the output side, and especially used in the system with large leakage, pressure cannot approach the set pressure and the service life is drastically shortened with a humming noise of the solenoid valve.
- 10. For details on the handling of this product, refer to the operation manual which is included with the product.
- 11. In locations where the body is exposed to water, dust, etc., there is a possibility that moisture or dust could enter the body through the breathing hole.

Mount a fitting and tube (M-3AU-3 fitting and TIU01m-mm tube recommended) onto the breathing hole and run the tube to a location not exposed to moisture or dust, etc.

Breathing hole M3 x 0.5

12. If this product will be used in a sealed environment, such as inside an inspection box, a ventilation fan should be installed to ensure adequate ventilation as this product can generate heat in some operating conditions.

When the power is turned on, a noise may be generated as a means of checking the operating condition of the solenoid valve. This noise is normal and does not indicate a fault.

- 13. Each product needs to be powered by one power supply unit. The wiring of this product has the same common between the GND for power and the signals; there is a possibility that a wrong current occurs and prevents a proper operation if one power supply unit controls multiple electro-pneumatic regulators.
- 14. This product does not have a shut-off valve function. If air pressure is supplied without electric power being applied, output pressure may increase to the pressure equivalent of the supply pressure. Operate the system to shut off the supply pressure when not operating the product.

ARJ

AR425 to 935 ARX

AMR

ARM

ARP

IRV VEX

SRH

SRP

SRF **VCHR**

ITV

IC ITVX

PVQ

VER

VEA

VY1 VBA VBAT



Be sure to read before handling. Refer to front matter 43 for Safety Instructions and pages 365 to 369 for Common Precautions.

Series ITV1000/2000/3000/209 ☐ Precautions

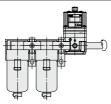
Piping

⚠ Warning

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

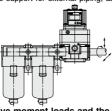
Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive. Furthermore, if the side with the female threads is not held while tightening, excessive force will be applied directly to piping brackets, etc. causing damage or other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

		Recomme	ended proper	torque: N · m
Connection thread	1/8	1/4	3/8	1/2
Torque	3 to 5	8 to 12	15 to 20	20 to 25



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.



 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.

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.

If chips, sealing material or other debris enter into this product, the solenoid valve may buzz, or the outlet pressure may not be output normally.

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



Operating Environment

⚠ Warning

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

- 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.
- 2. 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.
- Do not operate in locations where vibration or impact occurs.
- In locations which receive direct sunlight, provide a protective cover, etc.
- In locations near heat sources, block off any radiated heat.
- In locations where there is contact with spatter from water, oil or solder etc., implement suitable protective measures.

Air Supply

⚠ Warning

1. Type of fluids

Please consult with SMC when using the product in applications other than compressed air.

Do not use compressed air that contains chemicals, synthetic oils including organic solvents, salt or corrosive gases, etc., as it can cause malfunction.

∧ Caution

- 1. Install an air filter near this product on the supply side. Select a filtration degree of 5 μ m or less.
- 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.
- If large amounts of carbon dust are generated by the compressor, it can accumulate inside this product and cause malfunction. For details on the above compressed air quality, refer to SMC's "Air Preparation Systems".



Be sure to read before handling. Refer to front matter 43 for Safety Instructions and pages 365 to 369 for Common Precautions.

Series ITV1000/2000/3000/209 ☐ Precautions

Handling

- 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.
- 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. The setting side pressure cannot be completely released from this product in the range below 0.005 MPa (or -1.3 kPa for Vacuum models). In cases where the pressure needs to be reduced completely to 0 MPa, install a 3 port valve, etc. on the setting side to discharge the residual pressure.
- 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.
- When connecting the cable to this product, turn the lock ring of the cable. If a portion other than the lock ring of the cable is turned, it may damage the connector on the body. Turn the lock ring by hand without using a tool.
- The right angle cable does not rotate and is limited to only one entry direction. If the right angle cable is rotated forcibly, the cable may be broken or damaged, or may damage the connector on the body.
- 10. 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.
 - 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.).
- 11. 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 AN20 or AN40) on the exhaust port (EXH port). The port sizes are Rc 1/8, Rc 1/4 and Rc 1/2.
- Specifications on page 815 and 844 is in case of static environment. Pressure may fluctuate when air is consumed at the output side.

Handling

↑ Caution

- For details on the handling of this product, refer to the operation manual which is included with the product.
- 14. This product does not have a shut-off valve function. If air pressure is supplied without electric power being applied, output pressure may increase to the pressure equivalent of the supply pressure. Operate the system to shut off the supply pressure when not operating the product.
- 15. The solenoid valves built into this product are consumables. Perform periodic maintenance in environments where the solenoid valves are operated at a high frequency. The parts can be replaced with a solenoid valve assembly. Please contact SMC for the part number.

Design and Selection

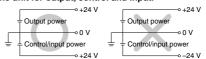
⚠ Caution

 Use the following UL approved products for DC power supply combinations.

- (1) Limited voltage current circuit in accordance with UL 508. A circuit in which power is supplied by the secondary coil of a transformer that meets the following conditions.
 - Maximum voltage (with no load): 30 Vrms (42.4 V peak) or less
 - 30 Vrms (42.4 V peak) or less
 Maximum current:
 - (1) 8 A or less (including when short circuited)
 - (2) limited by circuit protector (such as fuse) with the following ratings.

No load voltage (V peak)	Max. current rating
0 to 20 [V]	5.0
Over 20 and 30 or less [V]	100
Over 20 and 30 or less [v]	Peak voltage

- (2) A circuit (class 2 circuit) with maximum 30 Vrms (42.4 V peak) or less, and a power supply consisting of a class 2 power supply unit confirming to UL1310, or a class 2 transformer confirming to UL1585.
- Operate these products only within the specified voltage.
 Using voltages beyond the specified levels could cause faults or malfunctions.
- Use 0 V as the baseline for the power supplied to the unit for output, control and input.



4. Each product needs to be powered by one power supply unit.

The wiring of this product has the same common between the GND for power and the signals; there is a possibility that a wrong current occurs and prevents a proper operation if one power supply unit controls multiple electro-pneumatic regulators.

5. Consult SMC for the usage when the downstream side is released to atmosphere.

This product is a pressure controller. The downstream side being released to atmosphere makes the inlet valve full open, allowing a large amount of atmosphere flow into the body. Consult SMC for the appropriate usage when you use the product under such condition since the product may not meet the specification or the life of the product may be shortened.

AR425 to 935

ARJ

ARX

AMR

ARP

IR IRV

VEX

SRH SRP

SRF

VCHR

IC IC

ITVX

PVQ VEF

VEP

VER VEA

VY1

VBA VBAT



Be sure to read before handling. Refer to front matter 43 for Safety Instructions and pages 365 to 369 for Common Precautions.

Series ITV1000/2000/3000/209 ☐ Precautions

Wiring

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
I	3	Blue	GND (COMMON
	4	Black	Monitor output
٩			

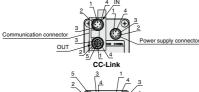
Communication con

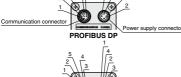


Preset Input Type

ı	1	Brown	Power supply
	2		Input signal 1
	3	Blue	GND (COMMON)
	4	Black	Input signal 2
j	I IN	1	

wer supply connector





Signal connector DeviceNet™, RS-232C, 16 points preset

	IN/	OUT commun	ication conne	Signal connector	
Pin No.	CC-Link	DeviceNet™	PROFIBUS DP	RS-232C	16 points preset
1	SLD [-]	DRAIN [-]	No connection	No connection	Input signal 1 [Brown]
2	DB [White]	V+ [Red]	RxD/TxD-N [Green]	TxD [White]	Input signal 2 [White]
3	DG [Yellow]	V- [Black]	No connection	RxD [Blue]	Input signal 3 [Blue]
4	DA [Blue]	CAN_H [White]	RxD/TxD-P [Red]	GND [Black]	Input signal 4 [Black]
5	No connection	CAN_L [Blue]	No connection	No connection	Common [Gray]

		Power supply connector							
Pin No.	CC-Link	DeviceNet™	PROFIBUS DP	RS-232C	16 points preset				
1 [Brown]	Vcc	Vcc	Vcc	Vcc	Vcc				
2 [White]	FG	Can not connect	FG	No connection	No connection				
3 [Blue]	GND	GND	GND	GND	GND				
4 [Black]	No connection	Can not connect	No connection	FG	Monitor output				

Note 1) The indicated wire colors are when a cable connector made by SMC is used. Note 2) The cable is also available in a right angle type. (Communication cable: straight type only)

A right angle type connector is attached facing left (towards the SUP port). On communication models, the connector faces backwards (towards the EXH port). Do not attempt to rotate, as the connector does not turn.

■ Trademark Information

DeviceNet™ is a trademark of ODVA

Knock-down connectors * Order separately.

Application	CC- compa	Link atibility		eviceNet ¹ ompatibili		PROFIBUS DP compatibility			
Part number	Plug PCA- 1557617	Socket PCA- 1557620	Plug PCA- 1557659	Socket PCA- 1557662	Terminal Plug PCA- 1557675	Plug PCA- 1557701	Socket PCA- 1557714	Terminal Plug PCA- 1557727	

Wiring diagram

Current signal type



Vs : Power supply 24 VDC 12 to 15 VDC

4 to 20 mA DC A : Input signal 0 to 20 mA DC

Voltage signal type



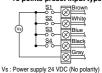
Vs : Power supply 24 VDC 12 to 15 VDC Vin: Input signal 0 to 5 VDC 0 to 10 VDC

4 points preset input type



Vs : Power supply 24 VDC 12 to 15 VDC (Negative common)

16 points preset input type



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

S1	OFF	ON	OFF	ON	OFF	ON	OFF	ON
S2	OFF	OFF	ON	ON	OFF	OFF	ON	ON
S3	OFF	OFF	OFF	OFF	ON	 ON	ON	ON
S4	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
Preset pressure	P01	P02	P03	P04	P05	P14	P15	P16

- * For safety reasons, it is recommended that one of the preset pressures be set to 0 MPa.
- * Preset pressures are set based on the minimum unit for output display.

MPa	kgf/cm ²	bar	psi	kPa
0.001	0.01	0.01	0.1	1

· Note that this is 1 psi for 130 psi types.

.

10 bit digital input type						
Wire Color	Signal name					
Pink-Black 2	Power supply (24 VDC)					
Green-Black 2	Power supply (GND)					
Blue	Signal Common (No Polarity)					
Blue-Black 2	MSB 10 bit					
Gray-Black 1	9 bit					
Orange-Black 1	8 bit					
Green-Black 1	7 bit					
Pink-Black 1	6 bit					
Blue-Black 1	5 bit					
Gray	4 bit					
Orange	3 bit					
Green	2 bit					
Pink	LSB 1 bit					

Note) The wire color is shown for when an option cable





Load

Series ITV0000/1000/2000/3000 **Specific Product Precautions 5**

Be sure to read before handling. Refer to front matter 43 for Safety Instructions and pages 365 to 369 for Common Precautions.

Series ITV1000/2000/3000/209 ☐ Precautions Wiring Monitor output wiring diagram Analog output: Voltage type Analog output: Current type (Sink type) Monitor output voltage Monitor output voltage Switch output: NPN type Switch output: PNP type

*When 80 mA DC or more is applied, detecting device for overcurrentstarts activating and then emits an error signal. (Error number "5")

Load

Set Pressure Range

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

Set pressure range, by unit of standard measured pressure

Unit		Set pressure range								
Unit	ITV□01□		ITV□03□		ITV□05□			ITV209□		
MPa	0.005	to	0.1	0.005	to	0.5	0.005	to	0.9	_
kgf/cm ²	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	−1.3 to −80

CE	Marking	

• Series ITV0000		
Model	Ferrite core necessity	Recommended power supply cable
ITV0000-□□-Q	Unnecessary	M8-4DSX3MG4 (Straight type) P398000-501-2 (Right angle type)

Note) Recommended power supply cable length is 3 m. (P398000-501-2 is 2 m.) If any other length is desired, please consult with SMC.

Series ITV1000/2000/3000

Model	Ferrite core necessity	Recommended power supply cable		
ITV==-==		-	P398020-500-3 (Straight type) P398020-501-3 (Right angle type)	
ITV□□-52□		Power	P398020-500-3 (Straight type) P398020-501-3 (Right angle type)	
ITV□□-53□		Signal	P398020-502-3 (Straight type) P398020-503-3 (Right angle type)	
ITV□□-60□		_	INI-398-0-59 (Straight type)	
ITV	Unnecessary	Power	P398020-500-3 (Straight type) P398020-501-3 (Right angle type)	
Note 2) Note 3)		Communication	PCA-1567720 (Socket type) PCA-1567717 (Plug type)	
ITV - DF		Power	P398020-500-3 (Straight type) P398020-501-3 (Right angle type)	
Note 2) Note 4)		Communication	PCA-1557633 (Socket type) PCA-1557646 (Plug type)	
ITV□□-PR□		Power	P398020-500-3 (Straight type) P398020-501-3 (Right angle type)	
Note 2) Note 4)		Communication	PCA-1557688 (Socket type) PCA-1557691 (Plug type)	
ITV□□-RC□		Power	P398020-500-3 (Straight type) P398020-501-3 (Right angle type)	
III VUU-RCU		Communication	P398020-502-3 (Straight type) P398020-503-3 (Right angle type)	

Note 1) Recommended power supply cable length is 3 m. If any other length is desired, please consult with SMC.

Note 2) Even when the "with cable connector" type is selected, the communication connector is not included. Refer to the catalog [M8/M12 Connector] CAT.ES100-73 for the details of the communication cable.

Note 3) For CC-Link compatible products, a dedicated Bus adapter is included with the product.

Note 4) For DeviceNet™ compatible products, and PROFIBUS DP compatible products, a T-branch connector is not included with the product.

ARJ AR425 to 935

ARX AMR

ARM

ARP

IR IRV

VEX

SRH SRP

SRF

VCHR

IC ITVX

PVO VEF

VEP VER

VEA VY1

VBA VBAT



Be sure to read before handling. Refer to front matter 43 for Safety Instructions and pages 365 to 369 for Common Precautions.

Series ITV009□/209□ Precautions

Handling

∕ Caution

- Connect the vacuum pump to the port, which is labeled "VAC".
- 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.
- When adjusting the vacuum pressure, be careful not to block the atmospheric pressure inlet port labeled "ATM".
- 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.
 - 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.
 - Make sure to take protective measures against load surge for an induction load (solenoid valves, relays, etc.).
- Refer to the operation manual included with the product for details on its handling.



