

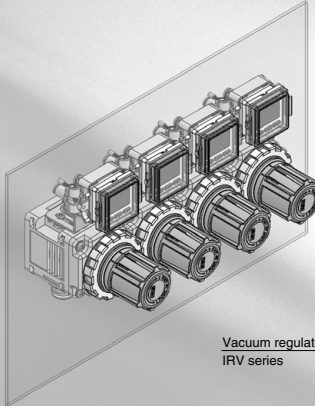
# Vacuum Regulator

## IRV10/20 Series

RoHS

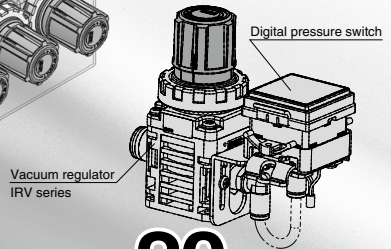
### Single Sided Connections Series

For ease of installation and panel mounting



Integrated digital pressure switch for panel mounting

(Made to Order)



Weight reduced by **20%**

(Compared with the current IRV2000 with IRV20 fitting)

Max. flow

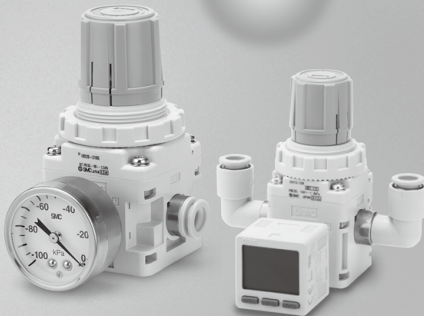
(Over twice the flow of the current models)

**140** L/min (ANR)      **240** L/min (ANR)

Current IRV1000:  
60 L/min (ANR)

Current IRV2000:  
100 L/min (ANR)

Standard connections



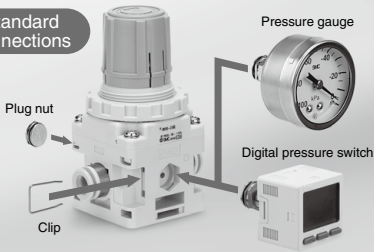
IRV10 Series



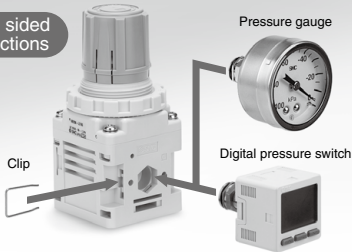
Easy to attach/detach the pressure gauge or digital pressure switch due to attachment by clip.

Mounting direction of the pressure gauge or digital pressure switch can be changed. (Standard connections only)

**Standard connections**



**Single sided connections**



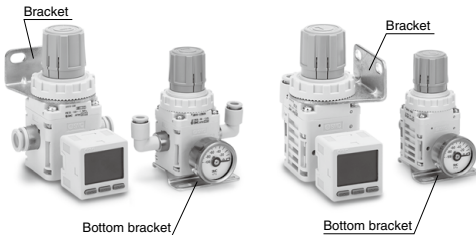
Mounting angle of the pressure gauge or digital pressure switch can be changed easily (in 60 degree increments).



**Mounting Variations**

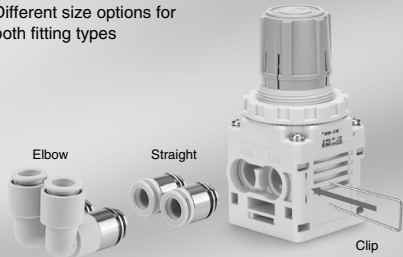
**Standard connections**

**Single sided connections**



**Built-in One-touch fittings**

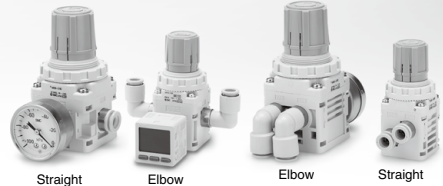
Different size options for both fitting types



Fitting type	Applicable tubing O.D. (mm)	Model	
		IRV10	IRV20
Straight	ø6	●	●
	ø8	●	●
Elbow	ø10	—	●
	ø1/4"	●	●
	ø5/16"	●	●
	ø3/8"	—	●

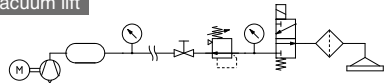
**Standard connections**

**Single sided connections**

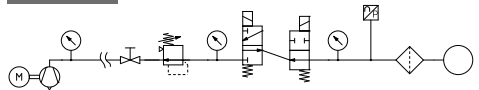


**Applications**

**Vacuum lift**



**Leak tester**



# Vacuum Regulator

# IRV10/20 Series

RoHS

## How to Order

### Standard connections

IRV 20 - [ ] C08 [ ] [ ]

#### Body size

10	Max. flow 140 L/min (ANR)
20	Max. flow 240 L/min (ANR)

#### Fittings

Nil	Straight
L	Elbow



Straight

Elbow

#### Connection tubing O.D.

Symbol	Tubing O.D.	IRV10	IRV20
C06	Metric	ø6	●
		ø8	●
		ø10	—
N07	ø1/4"	●	●
N09	ø5/16"	●	●
N11	ø3/8"	—	●

#### Accessory ② [Supplied with product]

Nil	None Note 1)	
GN	Gauge nut assembly Note 2)	
G	Pressure gauge Note 3) Note 4)	
	(IRV10: GZ33-K-01, IRV20: GZ43-K-01)	
ZN	NPV open collector 1 output	With ZSE20-N-M-01-L
ZP	NPV open collector 1 output	With ZSE20-P-M-01-L
ZA	NPV open collector 2 outputs + Copy function	With ZSE20A-X-M-01-J
ZB	PNP open collector 2 outputs + Copy function	With ZSE20A-Y-M-01-J

Note 1) Two plug nuts are mounted on the gauge port. When the Rc1/8 port is required, please order the optional gauge nut assembly P601010-18 separately. (Refer to page 1122.)

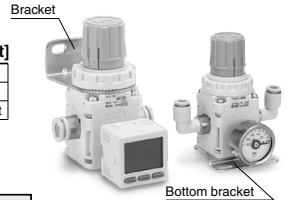
Note 2) One plug nut, one gauge nut (Rc1/8), and two clips are included. The pressure gauge and digital pressure switch are not included.

Note 3) Pressure gauge accuracy: Within ±3% of full scale

Note 4) Plug nut and gauge nut are included. (For details, refer to page 1125.)

#### Accessory ① [Supplied with product]

Nil	None
B	With bracket
L	With bottom bracket



Bottom bracket

### Single sided connections

IRV 20 A - [ ] C08 [ ] [ ] - [ ]

#### Body size

10	Max. flow 140 L/min (ANR)
20	Max. flow 240 L/min (ANR)

#### Single sided connections

A	Single sided connections
---	--------------------------

#### Fittings

Nil	Straight
L	Elbow



Elbow

Straight

#### Connection tubing O.D.

Symbol	Tubing O.D.	IRV10A	IRV20A
C06	Metric	ø6	●
		ø8	●
		ø10	—
N07	ø1/4"	●	●
N09	ø5/16"	●	●
N11	ø3/8"	—	●

#### Made to Order

For details, refer to page 1124.

Symbol	Specification
X1	Integrated digital pressure switch for panel mounting

#### Accessory ② [Supplied with product]

Nil	None Note 1)	
GN	Gauge nut assembly Note 2)	
G	Pressure gauge Note 3) Note 4)	
	(IRV10A: GZ33-K-01, IRV20A: GZ43-K-01)	
ZN	NPV open collector 1 output	With ZSE20-N-M-01-L
ZP	NPV open collector 1 output	With ZSE20-P-M-01-L
ZA	NPV open collector 2 outputs + Copy function	With ZSE20A-X-M-01-J
ZB	PNP open collector 2 outputs + Copy function	With ZSE20A-Y-M-01-J

Note 1) Two plug nuts are mounted on the gauge port. When the Rc1/8 port is required, please order the optional gauge nut assembly P601010-18 separately. (Refer to page 1122.)

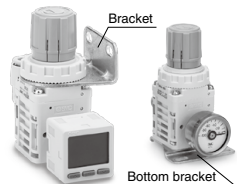
Note 2) One gauge nut (Rc1/8) and one clip are included. The pressure gauge and digital pressure switch are not included.

Note 3) Pressure gauge accuracy: Within ±3% of full scale

Note 4) Gauge nut is included. (For details, refer to page 1125.)

#### Accessory ① [Supplied with product]

Nil	None
B	With bracket
L	With bottom bracket



Bottom bracket

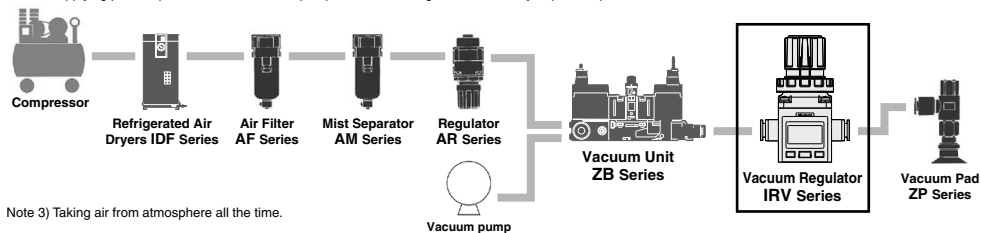
# IRV10/20 Series

## Standard Specifications

Model	IRV10	IRV20
Fluid	Air	
Set pressure range <sup>Note 1)</sup>	-100 to -1.3 kPa	
Withstand pressure <sup>Note 2)</sup>	100 kPa (Except with pressure gauge)	
Atmospheric intake consumption <sup>Note 3)</sup>	0.6 L/min (ANR) or less	
Knob resolution	0.13 kPa or less	
Ambient and fluid temperature	5 to 60°C	
VAC side tubing O.D.	ø6, ø8	ø6, ø8, ø10
SET side tubing O.D.	ø1/4", ø5/16"	ø1/4", ø5/16", ø3/8"
Weight (Without accessories)	Standard connections	250 g (IRV20-C10)
	Single sided connections	250 g (IRV20A-C10)
	135 g (IRV10-C08)	125 g (IRV10A-C08)

Note 1) Use caution it varies depending on the pressure in vacuum pump side.

Note 2) For vacuum regulators with a pressure gauge, the pressure gauge will be damaged if positive pressure is supplied. In the event that positive pressure is applied, the vacuum regulator will not be damaged; however, the main valve will open and positive pressure will enter the vacuum pump. This may cause malfunction of the vacuum pump, when the vacuum regulator is used in the adsorbing and transferring system, refer to the following piping example and avoid supplying positive pressure to the vacuum pump. The vacuum regulator cannot adjust positive pressure.

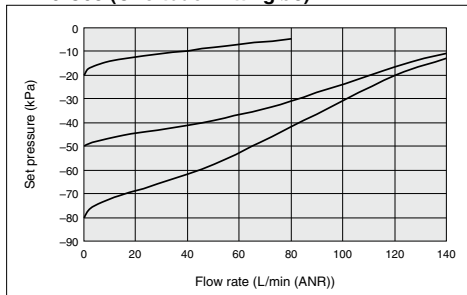


Note 3) Taking air from atmosphere all the time.

Conditions:  
 Vacuum pump exhaust speed:  
 2500 L/min  
 VAC side pressure:  
 -101 kPa (At initial setting)

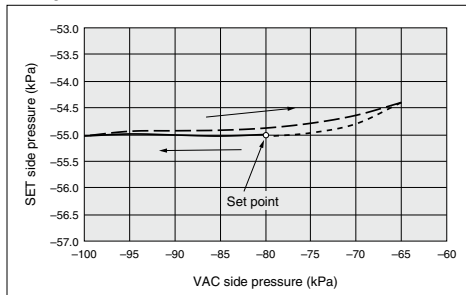
## Flow Rate Characteristics (Representative Value)

### IRV10-C08 (One-touch fitting ø8)

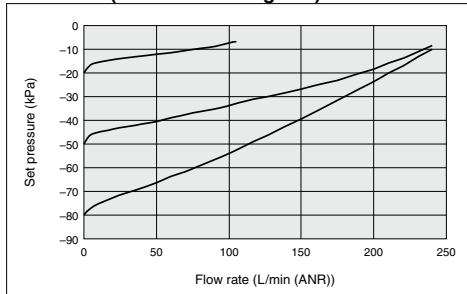


## Pressure Characteristics (Representative Value)

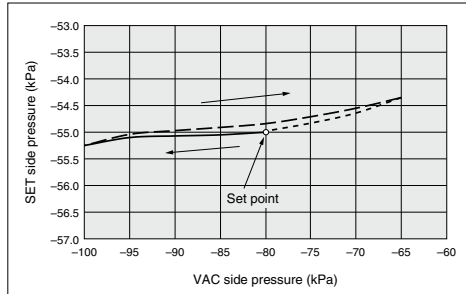
### IRV10



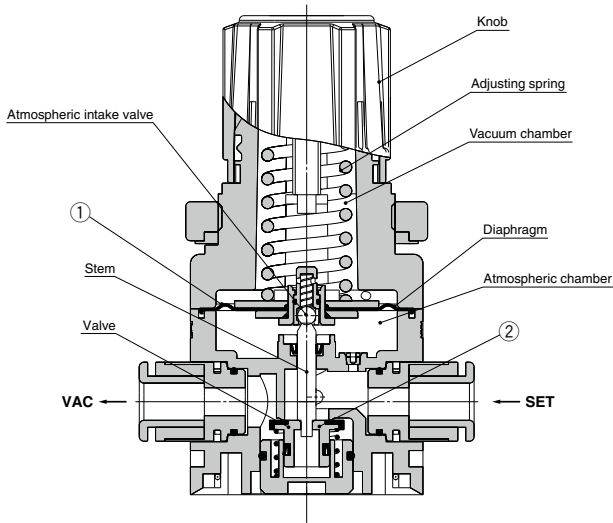
### IRV20-C10 (One-touch fitting ø10)



### IRV20



## Construction



## Working principle

When the knob is turned to the right (clockwise), the adjusting spring's generated force pushes down the diaphragm and the valve. This connects the VAC side and SET side, and the degree of vacuum on the SET side increases (becomes closer to an absolute vacuum). Furthermore, the SET side vacuum pressure moves through the air passage into the vacuum chamber, where it is applied to the top side of the diaphragm and counters the adjusting spring's compression force; and this adjusts the SET side pressure. When the degree of vacuum on the SET side is higher than the designated setting value (becomes closer to an absolute vacuum), the balance between the adjusting spring and the SET side pressure in the vacuum chamber is lost, and the diaphragm is pushed up. This causes the valve to close and the atmospheric intake valve to open, which lets atmospheric air into the SET side. When the adjusting spring's compression force and the SET side pressure are balanced, the SET side pressure is set. Also, when the degree of vacuum of the SET side pressure is lower than the designated setting value (becomes closer to the atmosphere), the balance between the adjusting spring and the vacuum chamber is lost, and the diaphragm is pushed down. This causes the atmospheric intake valve to close and the valve to open, which lets air into the VAC side. When the adjusting spring's compression force and the SET side pressure are balanced, the SET side pressure is set.

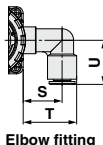
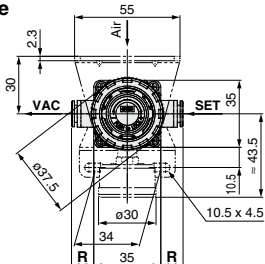
## Replacement Parts

No.	Description	Material	Part no.	
			IRV10	IRV20
1	Diaphragm assembly	HNBR, etc.	P601010-2	P601020-2
2	Valve assembly	HNBR, etc.	P601010-3	P601020-3

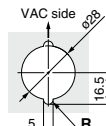
# IRV10/20 Series

## Dimensions/IRV10: Standard Connections

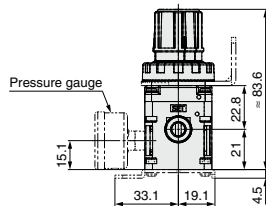
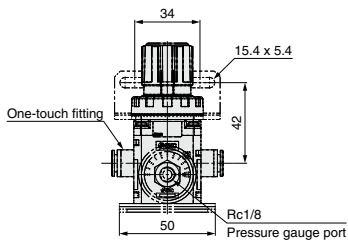
### IRV10-□□□G: With pressure gauge



Elbow fitting



Panel cut  
Panel plate thickness: Max. 3



### Fitting Part Dimensions

(mm)

Fitting size	VAC/SET			
	R	S	T	U
ø6	9.9	19.1	25.5	20
ø8	11.6	20.3	27.9	23
ø1/4"	9.9	19.3	25.9	20.5
ø5/16"	11.6	20.3	27.9	23

### IRV10-□□□Z<sup>N</sup><sub>P</sub><sub>A</sub>: With digital pressure switch

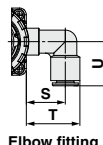
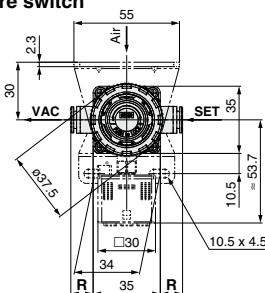
N

P

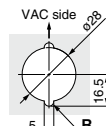
A

Z

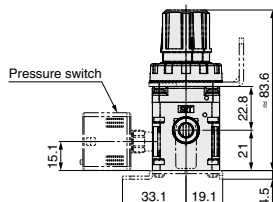
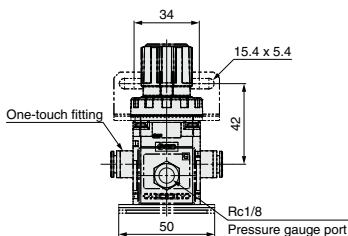
B



Elbow fitting



Panel cut  
Panel plate thickness: Max. 3



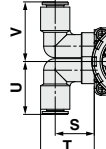
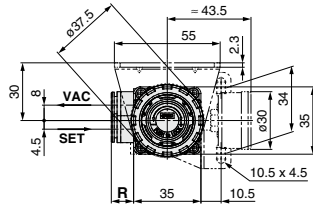
### Fitting Part Dimensions

(mm)

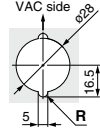
Fitting size	VAC/SET			
	R	S	T	U
ø6	9.9	19.1	25.5	20
ø8	11.6	20.3	27.9	23
ø1/4"	9.9	19.3	25.9	20.5
ø5/16"	11.6	20.3	27.9	23

## Dimensions/IRV10A: Single Sided Connections

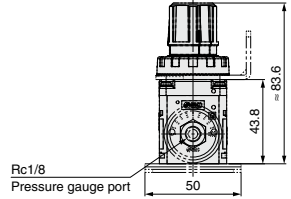
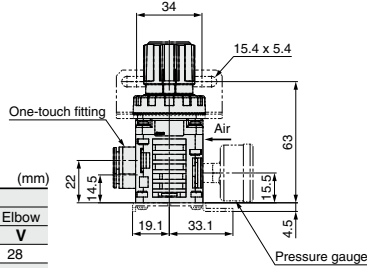
### IRV10A-□□□G: With pressure gauge



Elbow fitting



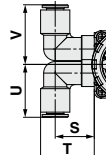
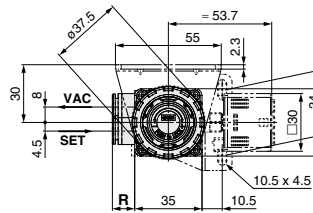
Panel cut  
Panel plate thickness:  
Max. 3



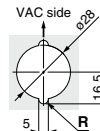
#### Fitting Part Dimensions (mm)

Fitting size	VAC/SET				
	R	S	T	U	V
ø6	9.9	19.1	25.5	24.5	28
ø8	11.6	20.3	27.9	27.5	31
ø1/4"	9.9	19.3	25.9	25	28.5
ø5/16"	11.6	20.3	27.9	27.5	31

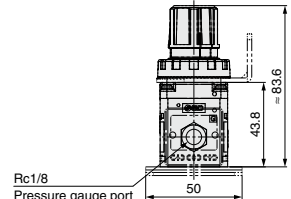
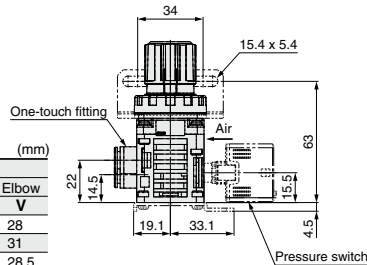
### IRV10A-□□□Z<sup>N</sup><sub>P</sub><sub>A</sub><sup>B</sup>: With digital pressure switch



Elbow fitting



Panel cut  
Panel plate thickness:  
Max. 3



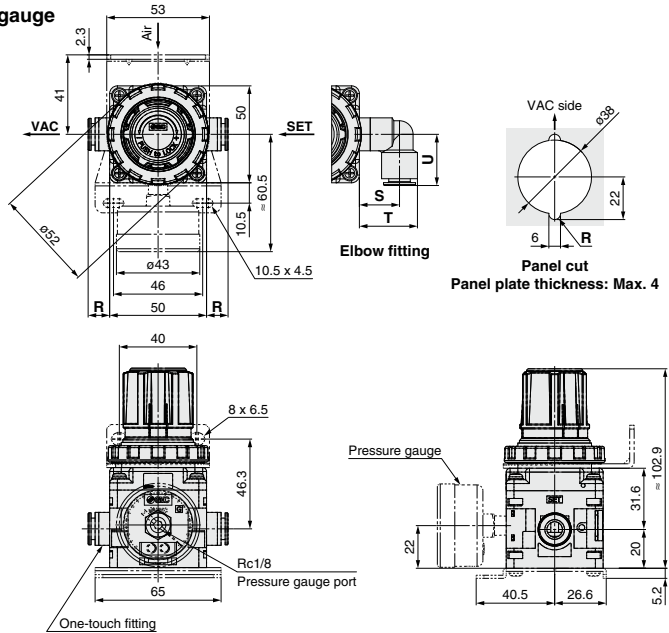
#### Fitting Part Dimensions (mm)

Fitting size	VAC/SET				
	R	S	T	U	V
ø6	9.9	19.1	25.5	24.5	28
ø8	11.6	20.3	27.9	27.5	31
ø1/4"	9.9	19.3	25.9	25	28.5
ø5/16"	11.6	20.3	27.9	27.5	31

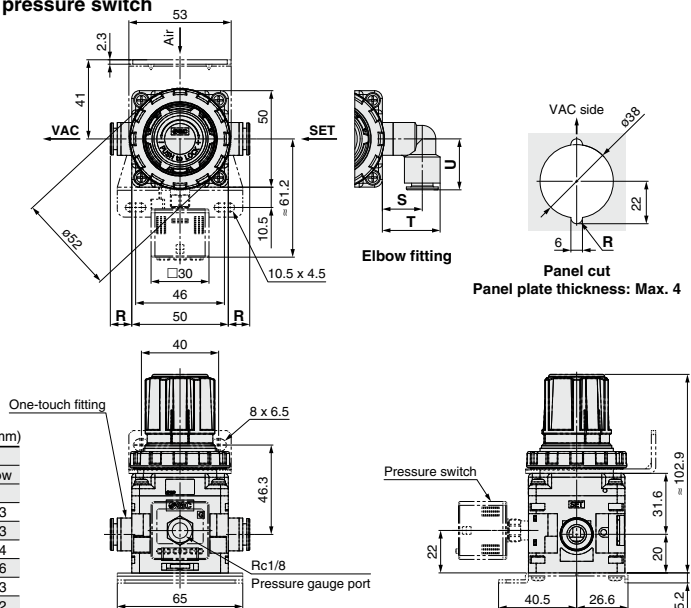
# IRV10/20 Series

## Dimensions/IRV20: Standard Connections

### IRV20-□□□G: With pressure gauge



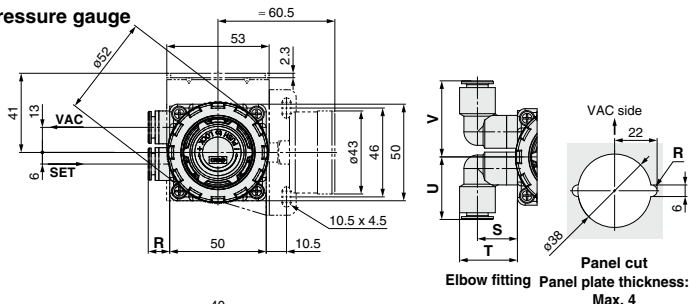
### IRV20-□□□Z<sup>N</sup><sub>P</sub><sup>B</sup>: With digital pressure switch





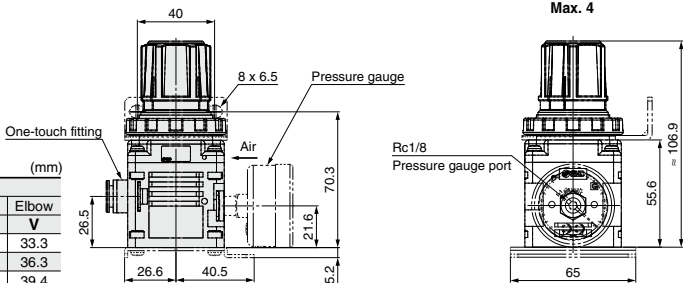
## Dimensions/IRV20A: Single Sided Connections

### IRV20A-□□□G: With pressure gauge

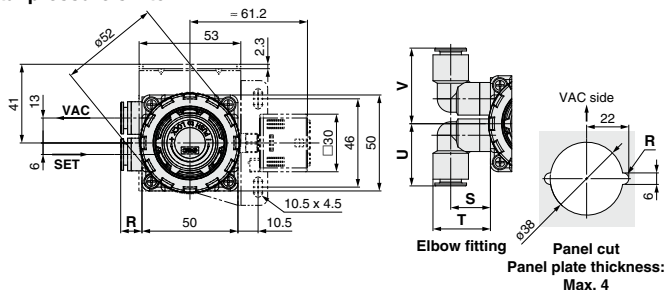


### Fitting Part Dimensions

Fitting size	VAC/SET (mm)				
	R	S	T	U	V
ø6	9.1	18	24.4	26.3	33.3
ø8	10.5	19.2	26.8	29.3	36.3
ø10	11.1	20.7	30	32.4	39.4
ø1/4"	8.8	18.2	24.8	26.6	33.6
ø5/16"	10.5	19.2	26.8	29.3	36.3
ø3/8"	11	20.4	29.4	32.2	39.2

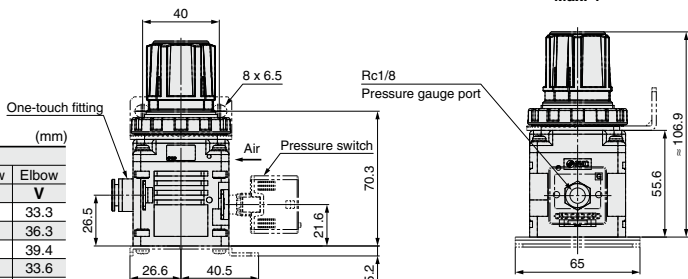


### IRV20A-□□□Z<sup>N</sup><sub>P</sub><sub>A</sub><sup>B</sup>: With digital pressure switch



### Fitting Part Dimensions

Fitting size	VAC/SET (mm)				
	R	S	T	U	V
ø6	9.1	18	24.4	26.3	33.3
ø8	10.5	19.2	26.8	29.3	36.3
ø10	11.1	20.7	30	32.4	39.4
ø1/4"	8.8	18.2	24.8	26.6	33.6
ø5/16"	10.5	19.2	26.8	29.3	36.3
ø3/8"	11	20.4	29.4	32.2	39.2



# IRV10/20 Series Options

## One-touch Fittings for Vacuum Regulator



One-touch fitting for IRV10(A)

VVQ1000-51A-□ C6

Fitting type	
Nil	Straight
L1	Elbow

Fitting size	
Symbol	Size
C6	ø6
C8	ø8
N7	ø1/4"
N9	ø5/16"

One-touch fitting for IRV20(A)

VVQ2000-51A-□ C6

Fitting type	
Nil	Straight
L1	Elbow

Fitting size	
Symbol	Size
C6	ø6
C8	ø8
C10	ø10
N7	ø1/4"
N9	ø5/16"
N11	ø3/8"

## Plug Nut Assembly

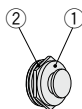


Plug unused pressure gauge port(s).

P601010-11

### Included Parts

No.	Description
1	Plug nut
2	O-ring



## Gauge Nut Assembly

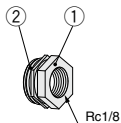


Used to connect the pressure gauge and pressure switch.

P601010-18

### Included Parts

No.	Description
1	Gauge nut
2	O-ring

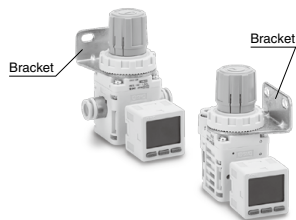


Rc1/8

## Bracket Assembly

For IRV10(A) P601010-17

For IRV20(A) P601020-17



## Bottom Bracket Assembly

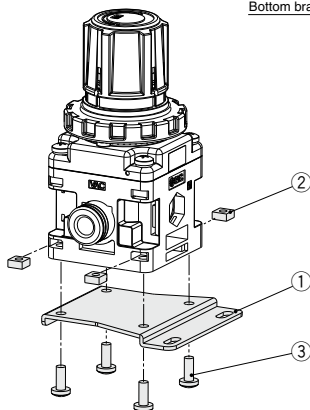
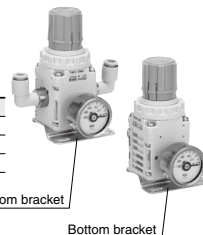
For IRV10(A) P601010-14

For IRV20(A) P601020-14

### Included Parts

No.	Description
1	Bottom bracket
2	Square nut x 4
3	Phillips screw x 4

Note) No. 1 to 3 are shipped together.



### Phillips Screw Tightening Torque

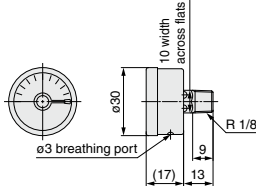
For IRV10(A): M3	0.32 ±0.03 N·m
For IRV20(A): M4	0.76 ±0.05 N·m

## Pressure Gauge for Vacuum



Part no.	GZ33-K-01	GZ43-K-01
Applicable model	IRV10	IRV20
Indicated pressure range	-100 to 0 kPa	
Unit display	kPa	
Scale range	180°	270°

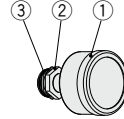
### GZ33-K-01



### Pressure Gauge GZ33 Assembly P601010-12

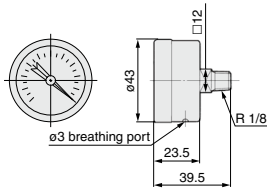
#### Included Parts

No.	Description
1	Pressure gauge
2	Gauge nut
3	O-ring



\* 1 to 3 are assembled before shipment.

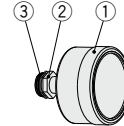
### GZ43-K-01



### Pressure Gauge GZ43 Assembly P601020-12

#### Included Parts

No.	Description
1	Pressure gauge
2	Gauge nut
3	O-ring



\* 1 to 3 are assembled before shipment.

## 2-Color Display High Precision Digital Pressure Switch



### Part No.

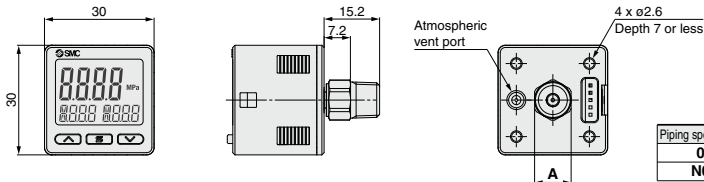
Part no.	Applicable model
ZSE20-N-M-01-L (NPN open collector 1 output)	IRV10 IRV20
ZSE20-P-M-01-L (PNP open collector 1 output)	
ZSE20A-X-M-01-J	
ZSE20A-Y-M-01-J	
(NPN open collector 2 outputs + Copy function)	

### Specifications

Refer to the [Web Catalog](#) for details.

Model	ZSE20A (Vacuum pressure)
Applicable fluid	Air, Non-corrosive gas, Non-flammable gas
Rated pressure range	0.0 to -101.0 kPa
Set pressure range	10.0 to -105.0 kPa
Smallest settable increment	0.1 kPa
Withstand pressure	500 kPa
Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less
Current consumption	35 mA or less
Max. load current	80 mA
Max. applied voltage (NPN only)	28 V
Internal voltage drop (Residual voltage)	1 V or less (at load current of 80 mA)
Delay time*1	1.5 ms or less (with anti-chattering function: 20, 100, 500, 1000, 2000, 5000 ms)
Short circuit protection	Yes

\*1 Value without digital filter (at 0 ms)



Piping specification	Port size	A
01	R1/8	Width across flats 10
N01	NPT1/8	Width across flats 12

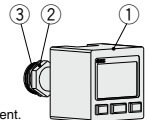
### Digital Pressure Switch ZSE20(A) Assembly

## P601010-160-□

Symbol	Digital pressure switch part no.	Digital pressure switch specifications
1	ZSE20-N-M-01-L	NPN open collector 1 output, Lead wire with connector (Length 2 m)
2	ZSE20-P-M-01-L	PNP open collector 1 output, Lead wire with connector (Length 2 m)
3	ZSE20A-X-M-01-J	NPN open collector 2 outputs + Copy function, Lead wire with connector (Length 2 m)
4	ZSE20A-Y-M-01-J	PNP open collector 2 outputs + Copy function, Lead wire with connector (Length 2 m)

#### Included Parts

No.	Description
1	Digital pressure switch
2	Gauge nut
3	O-ring



\* 1 to 3 are assembled before shipment.

# IRV10/20 Series Made to Order

Please contact SMC for detailed dimensions, specifications and lead times.



## 1 Integrated Digital Pressure Switch for Panel Mounting

Symbol  
**X1**

### How to Order

Single sided connections

**IRV 20 A - C08 - X1**

**Body size**

10	Max. flow 140 L/min (ANR)
20	Max. flow 240 L/min (ANR)

**Single sided connections**  
A Single sided connections

**Made to Order**  
X1 Integrated digital pressure switch for panel mounting

**Fittings**

Nil	Straight
L	Elbow

**Connection tubing O.D.**

Symbol	Tubing O.D.	IRV10A	IRV20A
C06	ø6	●	●
C08	Metric ø8	●	●
C10	ø10	—	●
N07	ø1/4"	●	●
N09	ø5/16"	●	●
N11	ø3/8"	—	●

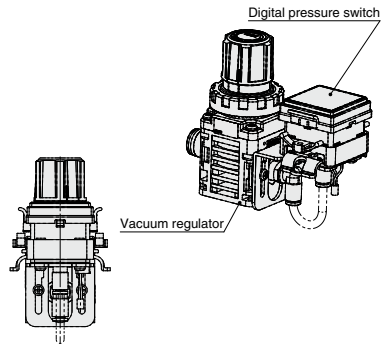
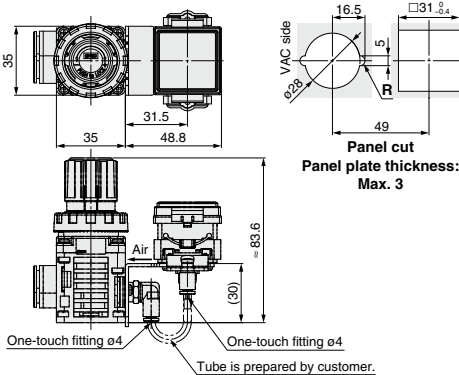
**Digital pressure switch type** Note

Symbol	Output specifications	Part no.
ZN	NPN open collector 1 output	ZSE20-N-M-C4H-LD
ZP	PNP open collector 1 output	ZSE20-P-M-C4H-LD
ZA	NPN open collector 2 outputs + Copy function	ZSE20A-X-M-C4H-JD
ZB	PNP open collector 2 outputs + Copy function	ZSE20A-Y-M-C4H-JD

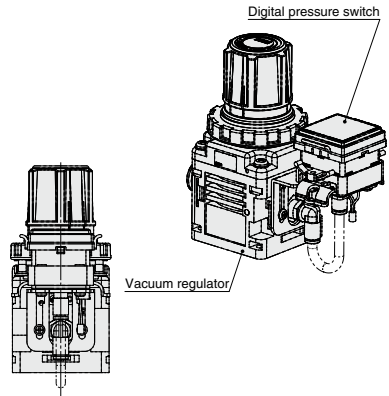
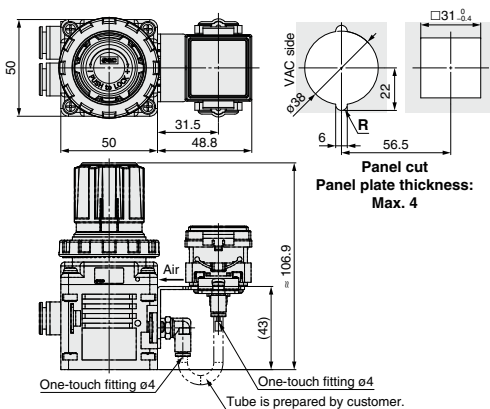
Note) Gauge nut is included. Accessories are included in the same container.  
\* Refer to the digital pressure switch specifications on page 1123.

### Dimensions

#### IRV10A



#### IRV20A





# IRV10/20 Series

## Specific Product Precautions 1

Be sure to read this before handling the products.

Refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: <https://www.smcworld.com>

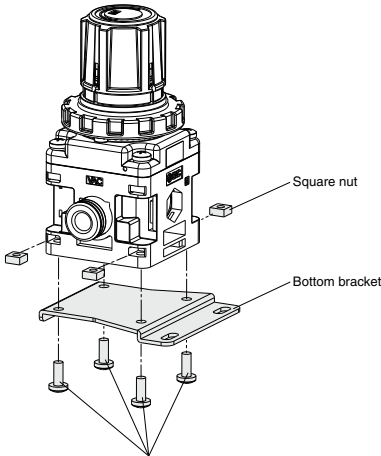
### Handling

#### Warning

1. When a system hazard can be expected due to a drop in vacuum pressure caused by power loss or vacuum pump trouble, install a safety circuit and configure the system so that it can avoid the danger.
2. When a system hazard can be expected with trouble with the vacuum regulator, install a safety circuit and configure the system so that it can avoid the danger.
3. Observe the proper screw tightening torque.

If torque is exceeded, damage to the mounting screw or main body may occur. Also, if the screws are not tightened enough, the screws may come loose during operation.

#### Tightening torque of Phillips screw for mounting bottom bracket



#### Phillips Screw Tightening Torque

For IRV10(A): M3	0.32 ±0.03 N·m
For IRV20(A): M4	0.76 ±0.05 N·m

#### Caution

1. When installing a pressure gauge or pressure switch on an existing regulator, be sure to reduce the set pressure to 0 (atmospheric pressure) before removing the plug.

1. Purchased with the pressure gauge or pressure switch
  - 1-1. Accessories

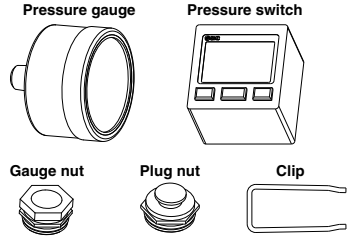
- Pressure gauge or pressure switch ..... 1 pc.
- Gauge nut (with O-ring) ..... 1 pc.

Note) Gauge nut is mounted to the pressure gauge or pressure switch.

- Plug nut (with O-ring) ..... 1 pc.
- Clip ..... 2 pcs.

Note) One clip is included for single sided connections. Plug nut is not included.

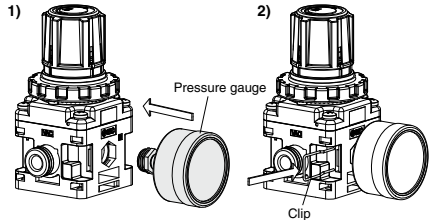
#### Caution



- 1-2. Mounting of the pressure gauge or pressure switch

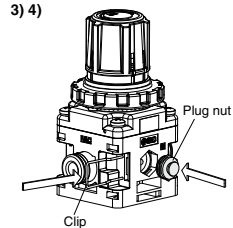
- 1) Confirm the direction of VAC side and SET side. Insert the pressure gauge to the gauge port sufficiently (until the gauge nut of the pressure gauge is level with the product surface.) Insert the pressure gauge to the end on the opposite side of the connecting port for single sided connections.

- 2) Insert the clip from the left side (viewed from the pressure gauge side, as shown in the drawing) until the top of the clip is level with the product surface. This completes the mounting procedure for single sided connections.



- 3) Insert the plug nut to the gauge port on the opposite side of the pressure gauge until the top of the plug nut is level with the product surface.

- 4) Insert the clip from the left side (viewed from the plug nut side) to the end in the same way as 2).



Note) To remove the pressure gauge or pressure switch, remove the clip, then remove the pressure gauge or pressure switch straight out. Do not apply torque, as the body is made of resin.



# IRV10/20 Series

## Specific Product Precautions 2

Be sure to read this before handling the products.

Refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: <https://www.smcworld.com>

### Handling

#### ⚠ Caution

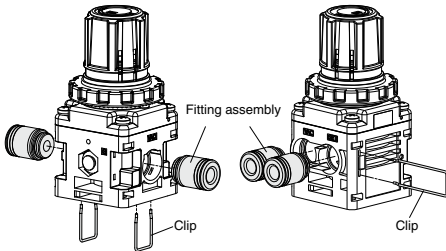
- Do not remove the body screw while the vacuum pressure is applied.
- Before removing the valve guide for inspection, reduce the set pressure to 0 (atmospheric pressure) and also shut down the vacuum pump pressure completely.
- For ease of replacement, One-touch fittings are installed as the cassette type. One-touch fittings are retained with clips inserted from the directions illustrated below. Remove the clips with a flat head screwdriver to replace the One-touch fittings. (Refer to "Procedure to remove the clip.") When installing, insert each One-touch fitting deeply to the end and reinsert the clip to the specified position.

Note 1) Before replacement, confirm VAC/SET pressure is not applied and start operation after the internal pressure becomes atmospheric pressure. Operation with VAC/SET pressure is dangerous.

Note 2) To remove the clip, hold the clip with your fingers, then slowly pull out the clip. Do not pull out the clip by force. Otherwise, the clip may spring out and it is dangerous.

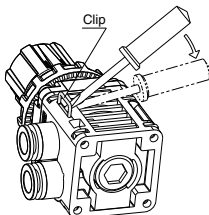
Note 3) Insert the clip to the end after confirming the replacement parts are inserted to the end. The clip may spring out if it is not inserted sufficiently.

Note 4) Hold the fitting in your hand when inserting the tube to elbow type One-touch fitting. Insertion of the tube without holding the fitting in your hand will apply excess force to blocks or One-touch fitting, which may lead to air leakage or breakage.



#### Procedure to remove the clip

Apply the tip of a flat head screwdriver to the inclined part where the clip is inserted. Lift the clip by moving the screwdriver as illustrated below.



Insert the tip of the screwdriver to the root of the clip.

### Operating Environment

#### ⚠ Warning

- Do not use in an atmosphere having corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.
- Do not use in locations influenced by vibrations or impacts.
- This vacuum regulator always uses atmospheric air, therefore, do not use in dusty environments.
- In locations which receive direct sunlight, provide a protective cover, etc.
- In locations near heat sources, block off any radiated heat.

### Vacuum Supply

#### ⚠ Caution

- This vacuum regulator does not control pressure by connecting with the exhaust side of the vacuum pump.
- Note that the ejector is not applicable to "vacuum supply" since the flow rate of the ejector is smaller than that of this vacuum regulator and changes in pressure by the flow rate are large. For details about ejector characteristics, refer to relevant ejector catalog.

### Air Supply

#### ⚠ Caution

- These products are designed for use with air. Please contact SMC if any other fluid will be used.
- Do not use air which includes chemicals, synthetic oils containing organic solvents, salt, or corrosive gases, etc., as this can cause malfunction.



## IRV10/20 Series

# Specific Product Precautions 3

Be sure to read this before handling the products.

Refer to the “Handling Precautions for SMC Products” and the “Operation Manual” on the SMC website: <https://www.smcworld.com>

### Precautions

#### ⚠ Caution

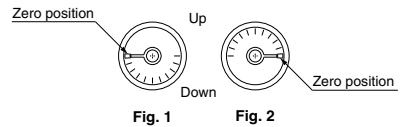
1. Connect piping to the port with “VAC” indication for connection to the vacuum pump.
2. To adjust the pressure, turn the knob to the right (clockwise) for changing “atmospheric pressure to vacuum pressure” and to the left (counterclockwise) for changing “vacuum pressure to atmospheric pressure”.
3. Pressure cannot be controlled if the air intake hole (hole on the side of the body) is blocked. Do not block the air intake hole by hand or with an object during pressure adjustment.
4. When locking the knob after setting the pressure, press down the knob until the orange band is hidden and a click is heard. On the other hand, when unlocking the knob, pull it up until the orange band is visible and a click is heard.
5. Maximum settable vacuum pressure is affected by the atmospheric pressure where the vacuum regulator is used. Atmospheric pressure varies depending on the altitude and weather. Actual maximum settable vacuum pressure may not reach the value in the specification.
6. When the vacuum pump capacity is relatively small or when the inside diameter of the piping is small, a change in the set pressure (the pressure difference between the non-flow and flow conditions) may be large. In this case, change the vacuum pump or the inside diameter of the piping. When changing the vacuum pump is not possible, add a capacity tank (the capacity depends on the operating conditions) to the VAC side.
7. The pressure response time after opening and closing of valves (such as solenoid valves) is influenced in large and small measures by the internal capacity (includes piping capacity) of the set side. Since the vacuum pump capacity also affects the response time, consider all these points before operations.
8. As the vacuum regulator intakes atmospheric pressure all the time, the vacuum pressure cannot be maintained if the vacuum pump or valve is stopped. If vacuum pressure needs to be retained, it is necessary to continuously run the vacuum pump.
9. The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust with the knob.
10. If the directional control valve (solenoid valve, mechanical valve, etc.) is mounted and ON-OFF is repeated for a long time, the set pressure may vary. If the setting value varies, adjust with the knob.
11. If there is a possibility that the vacuum regulator takes in the dust and water droplets in the ambient environment through the SET port of the vacuum regulator, install a vacuum filter or a vacuum drain separator to avoid the entry of these.

### Return of Product

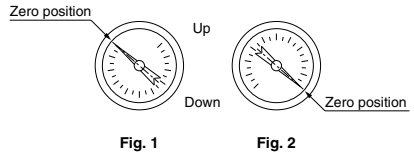
#### ⚠ Caution

12. There may be pulsation or noise depending on the pressure conditions, piping conditions and ambient environment. In this case, it is possible to improve the problem by changing the pressure conditions and piping conditions. If the problem is not improved, contact your SMC sales representative.
13. When using a pressure gauge upside down like Fig. 1, it may result in a shifting of the zero point reading. Make sure to use it in the direction like Fig. 2. Gravity will affect the zero point of the gauge which is why it needs to be positioned properly.

#### IRV10



#### IRV20



#### ⚠ Warning

If the product to be returned is contaminated or is possibly contaminated with substances that are harmful to humans, for safety reasons, please contact SMC beforehand and then employ a specialist cleaning company to decontaminate the product. After the decontamination prescribed above has been carried out, submit a Product Return Request Sheet or the Detoxification/Decontamination Certificate to SMC and await SMC's approval and further instructions before attempting to return the item.

Please refer to the International Chemical Safety Cards (ICSC) for a list of harmful substances.

If you have any further questions, please don't hesitate to contact your SMC sales representative.