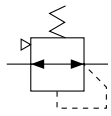


# Vacuum Regulator

## Series IRV1000/2000/3000

JIS Symbol



### Standard Specifications

Model	IRV1000	IRV2000	IRV3000
Fluid	Air		
Regulating pressure range <sup>(1)</sup>	-100 to -1.3 kPa		
Atmospheric intake consumption <sup>(2)</sup>	0.6 ℓ/min (ANR) or less		1.1 ℓ/min (ANR) or less
Knob resolution	Within 0.13 kPa		
Ambient and fluid temperature	5 to 60°C		
Port size	Rc 1/8	Rc 1/4	Rc 1/4, 3/8, 1/2
Pressure gauge port size	Rc 1/8 (2 locations)		
Weight (kg) [Without accessory]	0.12	0.27	0.7

Note 1) Use caution it varies depending on the pressure in vacuum pump side.  
 Note 2) Taking air from atmosphere all the time.

### How to Order

**IRV 1 000 - 01**

Vacuum regulator

**Body size**

1	IRV1000
2	IRV2000
3	IRV3000

**Thread type**

Nil	Rc
N*	NPT
F*	G

\* Option

**Suffix (Pressure gauge mounting)**

**Nil Standard**

**R Rear pressure gauge mounting**

**Accessory**

Nil	None
B	With bracket (Note)
G	With pressure gauge

Note) Brackets are shipped together, (but not assembled).

**Port size**

Symbol	Size	Application		
		IRV1000	IRV2000	IRV3000
01	1/8	●	—	—
02	1/4	—	●	●
03	3/8	—	—	●
04	1/2	—	—	●

### Specification Combinations

◎ Standard specification ○ Valid combination □ Invalid combination

Specifications	Symbol	Applicable model		
		IRV1000	IRV2000	IRV3000
Standard specifications	Connection Rc 1/8	◎		
	Connection Rc 1/4		◎	◎
	Connection Rc 3/8			◎
	Connection Rc 1/2			◎
Accessory	Bracket	○	○	○
	Pressure gauge	○	○	○
Option specifications	Pressure gauge reverse mounted	R	○	○
	Connection NPT 1/8	N01	○	
	Connection NPT 1/4	N02		○
	Connection NPT 3/8	N03		○
	Connection NPT 1/2	N04		○
	Connection G 1/8	F01	○	
	Connection G 1/4	F02		○
	Connection G 3/8	F03		○
Connection G 1/2	F04		○	

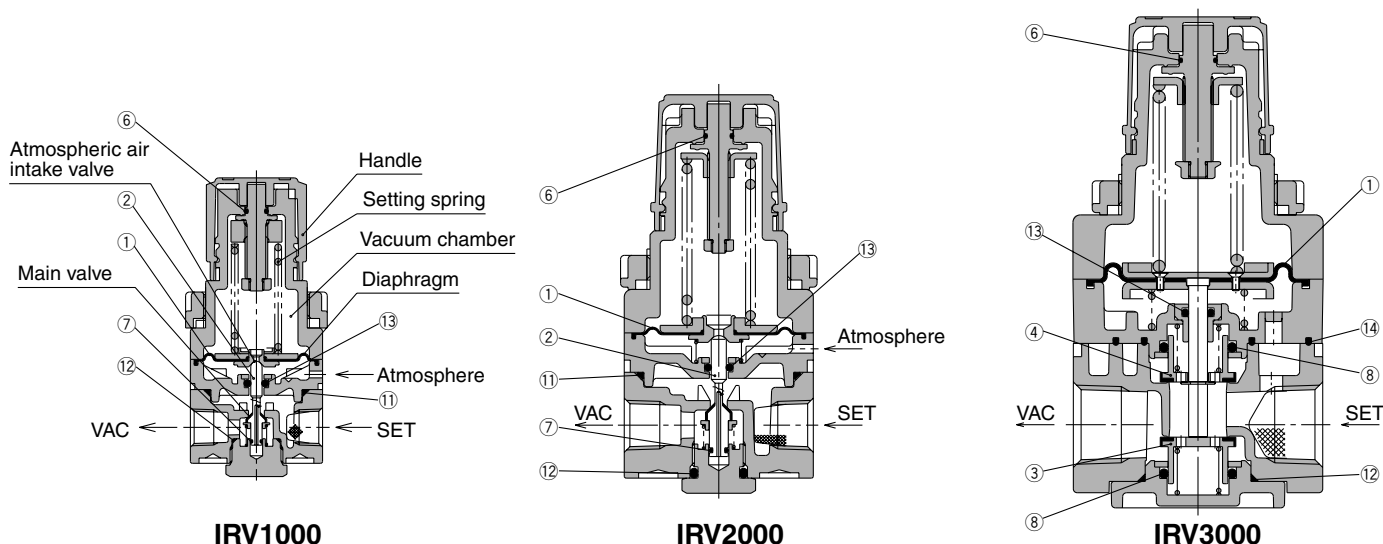
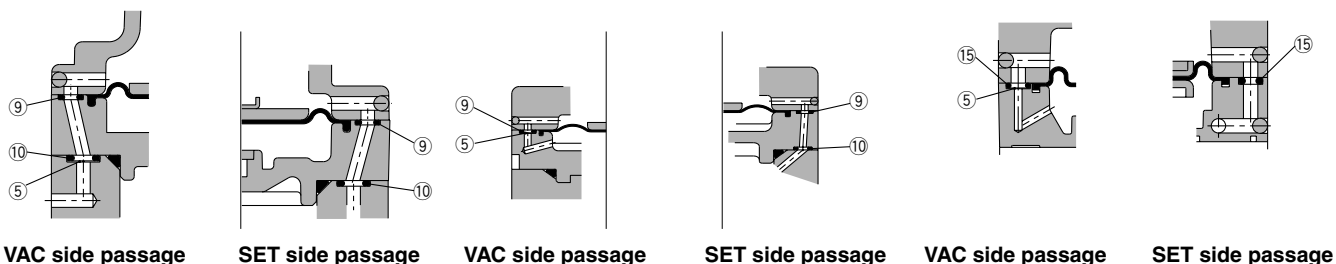
### Accessory (Option) Part No.

Description	Part no.		
	IRV1000	IRV2000	IRV3000
Bracket	P53801018	P53802016	P53803013
Pressure gauge *	GZ33-K-01	GZ43-K-01	GZ43-K-01

\* Precision of pressure gauge within ±3% (Full span)

# Series IR1000/2000/3000

## Construction



### Working principle (For IR1000)

When the handle is turned to the right, the adjusting spring's generated force pushes down the diaphragm and the main 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 main 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 SET side pressure of the vacuum chamber is lost, and the diaphragm is pushed down. This causes the atmospheric intake valve to close and the main 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.		
			IRV1000	IRV2000	IRV3000
①	Diaphragm assembly	HNBR, etc.	P538010-6	P538020-3	P538030-5
②	Valve	Stainless steel, HNBR	P53801005	P53802005	—
③	Valve	Brass, HNBR	—	—	P53803015
④	Valve	Brass, HNBR	—	—	P53803016
⑤	Fixed throttle	SUS304	P36202018	P36202018	P36203017
⑥	O-ring	HNBR	ø4.35 x 1	ø6 x 1	ø8.31 x 1
⑦	O-ring	HNBR	ø2 x 0.6	ø3.2 x 1	—
⑧	O-ring	NBR	—	—	JIS B 2401 P16 <sup>(1)</sup>
⑨	O-ring	NBR	ø1.7 x 0.85	ø2.5 x 1	—
⑩	O-ring	NBR	ø2.5 x 1	ø3 x 1	—
⑪	O-ring	NBR	ø24 x 1.5	ø39.5 x 2	—
⑫	O-ring	NBR	ø10 x 1.3	JIS B 2401 P11	ø27.8 x 1.5
⑬	O-ring	NBR	JIS B 2401 P3 <sup>(1)</sup>	JIS B 2401 P4 <sup>(1)</sup>	JIS B 2401 P5 <sup>(1)</sup>
⑭	Seal (A)	NBR	—	—	P36203015
⑮	Seal (B)	NBR	—	—	P36203016
Repair kit no. (A set of above nos. ① to ⑮.)			KT-IRV1000	KT-IRV2000	KT-IRV3000

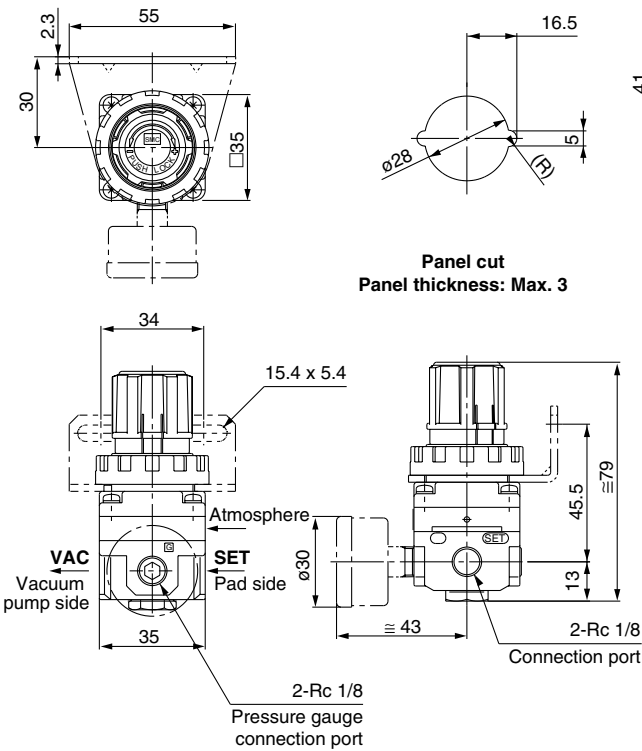
Note 1) For O-ring numbers 8 and 13, use mini-flicking type.

Note 2) Replacement part numbers correspond to the item numbers in the figures.

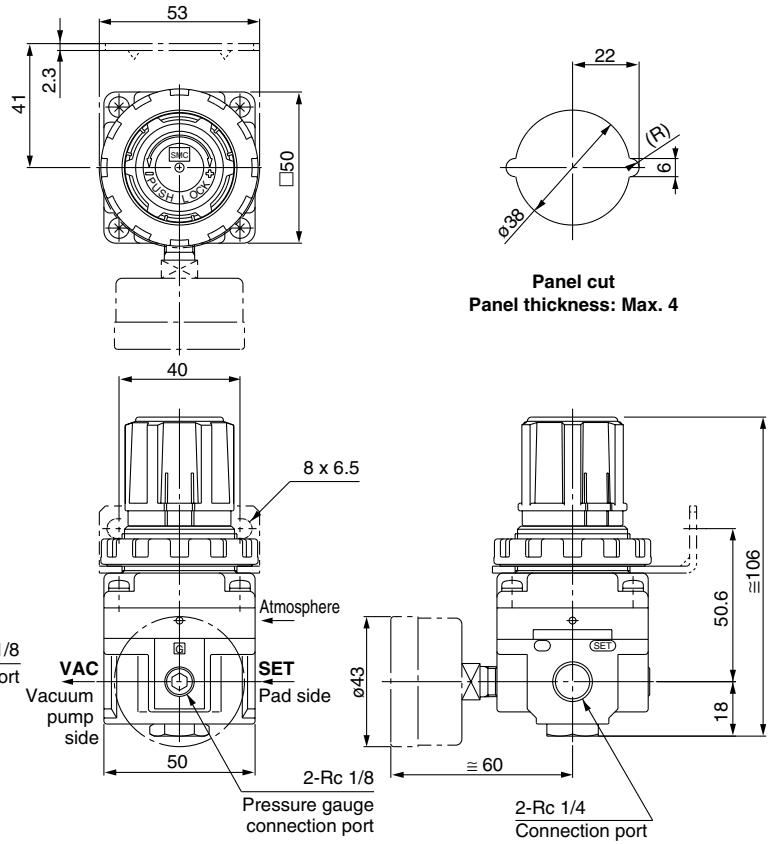
# Precision Regulator Series IR1000/2000/3000

## Dimensions

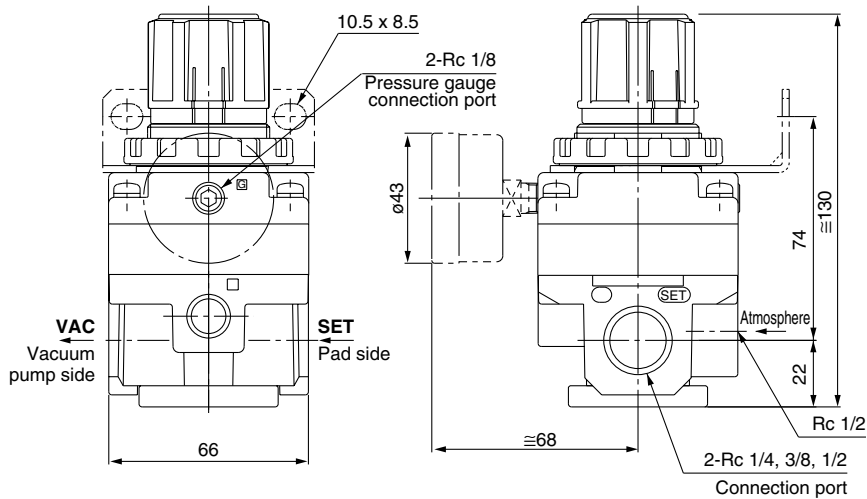
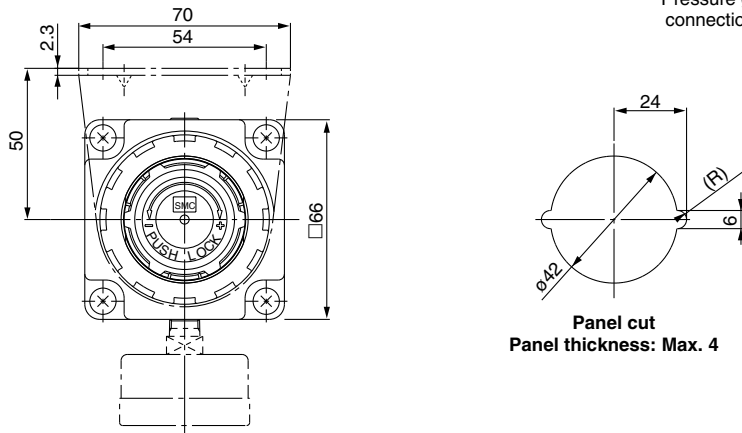
IRV1000-01 □



IRV2000-02 □



IRV3000-02 □  
03 □  
04 □



F.R.L.

AV

AU

AF

AR

**IR**

VEX

AMR

ITV

IC

VBA

VE □

VY1

G

PPA

AL

# Series IR1000/2000/3000

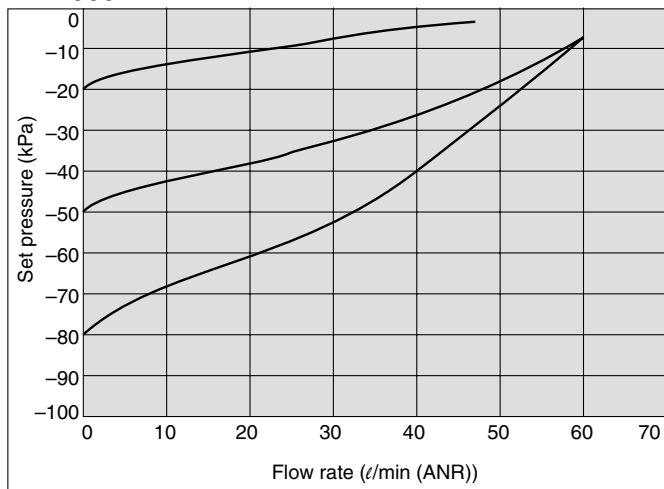
## Flow Characteristics

Vacuum pump exhaust speed: 500 ℓ/min  
VAC side pressure: -101 kPa at initial setting

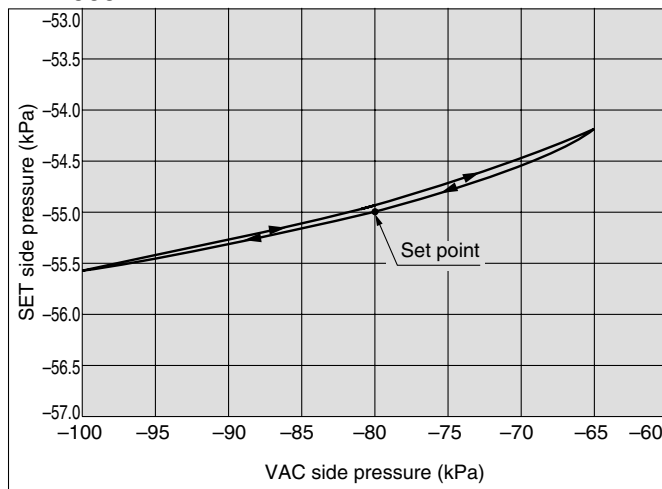
## Pressure Characteristics

Vacuum pump exhaust speed: 500 ℓ/min

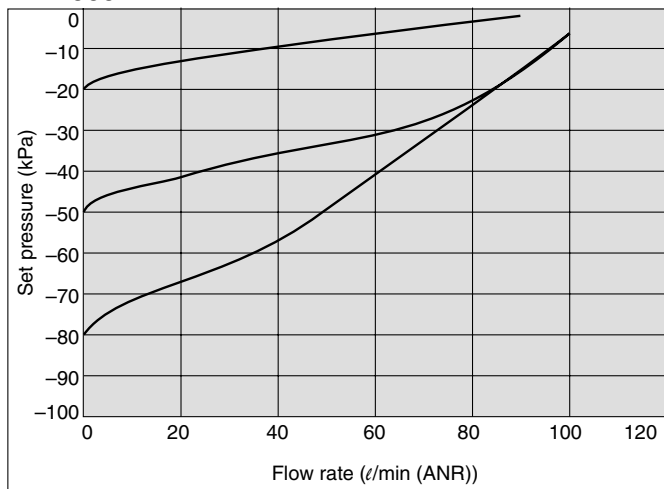
**IRV1000**



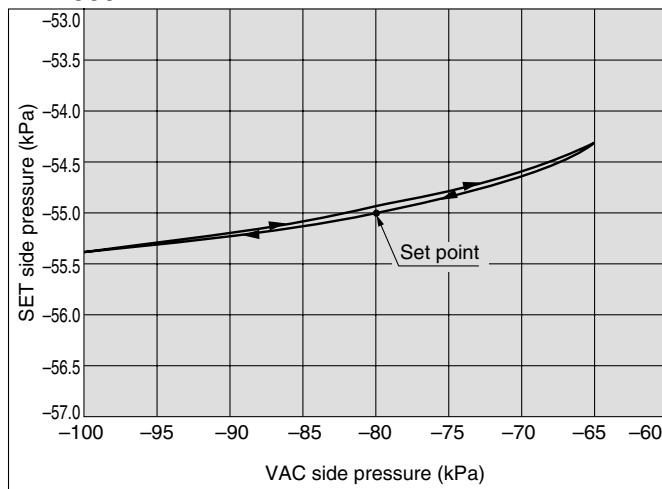
**IRV1000**



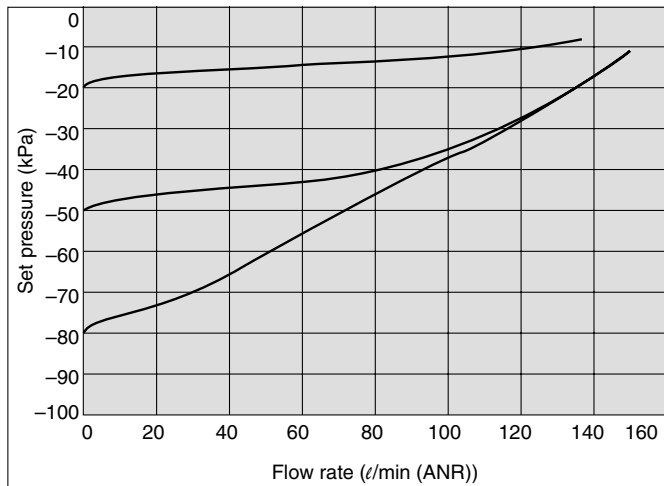
**IRV2000**



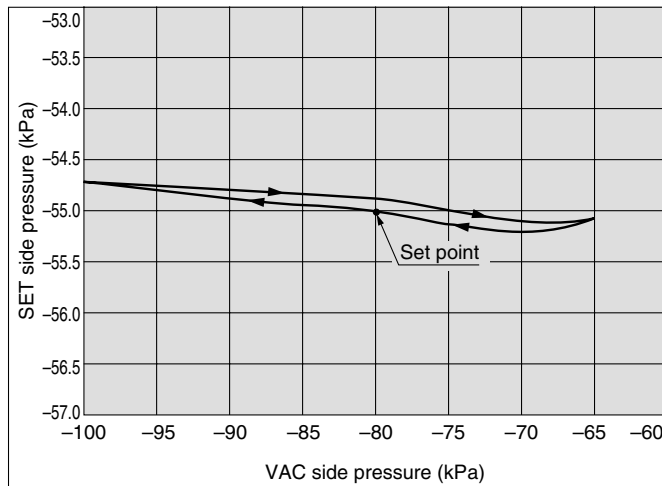
**IRV2000**



**IRV3000**



**IRV3000**



# Series IRV1000/2000/3000

## Made to Order Specifications:

Please contact SMC regarding detailed dimensions, specifications, and delivery times.

### 1. With Digital Pressure Switch

With digital pressure switch (Model: ZSE30-01-□□-ML). But, note that it is not assembled at the time of shipment from factory. Mount a digital pressure switch to the connecting port for pressure gauge.

### Specifications

Made to order part no.		-X465□
Pressure gauge	Set pressure range (kPa)	-101 to 101
	Resolution of set and display (kPa)	0.2
	Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less (With reverse connection protection)
	Current consumption	45 mA or less (but 70 mA or less at current output)

### How to Order

**Standard model no.** Note) — **X465** **A**  
Note) Except symbol G

● **Switch specifications**

Symbol	Output specifications
<b>A</b>	NPN output
<b>B</b>	PNP output
<b>C</b>	1 to 5 V output
<b>D</b>	4 to 20 mA output

● **With digital pressure switch**

- Note 1) Please contact SMC separately for details about the external dimensions, etc.
- Note 2) For details on handling digital pressure switch and its specifications, refer to pages of ZSE30 series digital pressure switch in Best Pneumatics Vol. 16.
- Note 3) Do not apply positive pressure on vacuum regulator Series IRV, because it is dedicated for negative pressure, while it is able to apply positive pressure on digital pressure switch.
- Note 4) Digital pressure switch is enclosed in a single container.

- F.R.L.
- AV
- AU
- AF
- AR
- IR
- VEX
- AMR
- ITV
- IC
- VBA
- VE□
- VY1
- G
- PPA
- AL