CAT.ES60-16 A

SMC

Vacuum Regulator

Series IRV1000/2000/3000

Allows adjustment of vacuum line pressure

Series IRV1000/2000/3000

3 sizes offered in the series

Variations have been expanded to three sizes from only one in the previous series T203. Selection is possible to accommodate the applicable flow rate.

Note) Flow rate corresponds to VAC pressure of –101kPa, SET pressure of –80kPa, and initial flow rate setting of 0l/min(ANR).

IRV1000: 60 l/min (ANR) Note)
IRV2000: 100 l/min (ANR) Note)
IRV3000: 150 l/min (ANR) Note)

Compact

□35mm

Light weight

120g

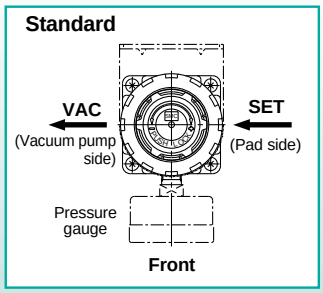
□50mm

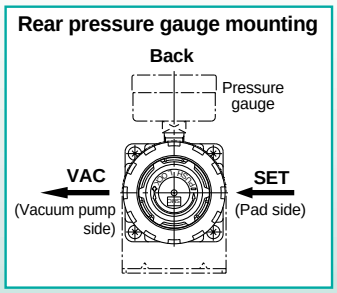
270g

□66mm

700g

■ Pressure gauge can be mounted from the front or rear



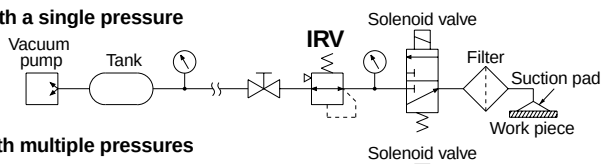


■ Panel mounting capability is standard

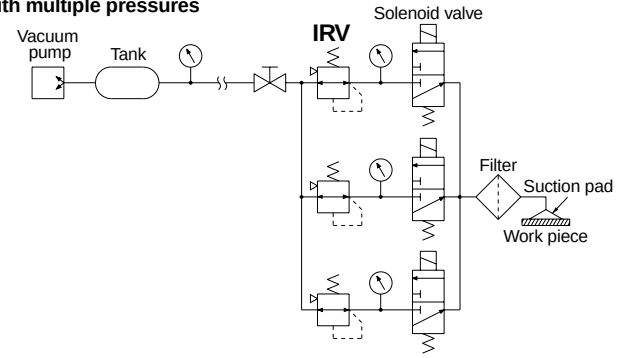
Applications

Lifting of work pieces

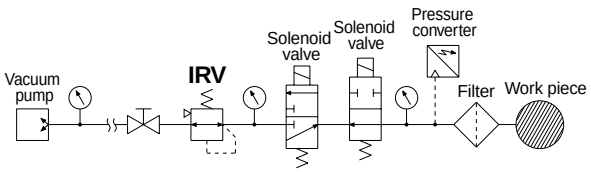
With a single pressure



With multiple pressures

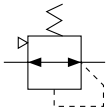


Leak tester



Vacuum Regulator
Series IRV1000/2000/3000

Symbol



Standard Specifications

Model	IRV1000	IRV2000	IRV3000
Fluid	Air		
Regulating pressure range Note 1)	–100 to –1.3kPa		
Atmospheric intake consumption Note 2)	0.6ℓ/min (ANR) or less		1.1ℓ/min (ANR) or less
Knob resolution	0.13kPa or less		
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) Note that the pressure range fluctuates depending on the vacuum pump pressure.
Note 2) Air is always supplied from the atmosphere.

How to Order

IRV [1] **000** – [ ] [**01**] [ ] – [ ]

Vacuum regulator

Body size

1	IRV1000
2	IRV2000
3	IRV3000

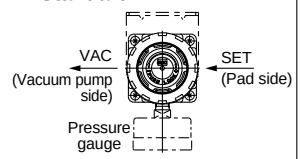
Thread type

Nil	Rc
N*	NPT
F*	G

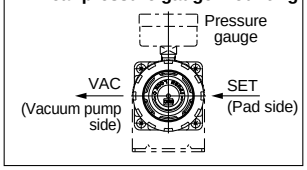
* Optional

Pressure gauge position

Nil Standard



R Rear pressure gauge mounting



Accessory

Nil	None
B	With bracket Note)
G	With pressure gauge

Note) Brackets are shipped with the package (unassembled).

Port size

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

Specification Combinations

● Standard specification ○ Valid combination
□ Invalid combination

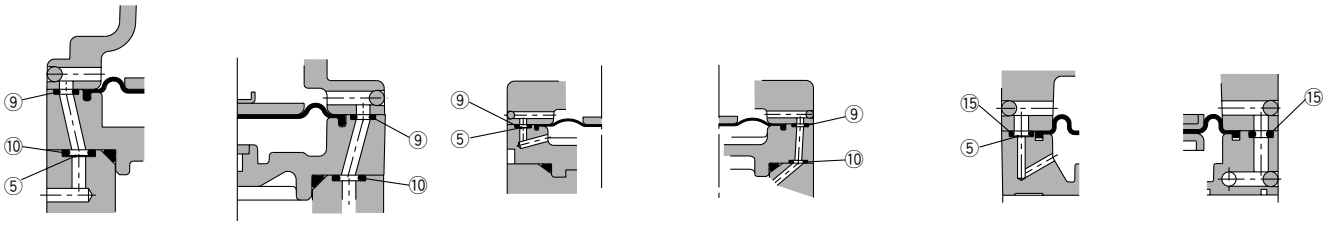
Specification		Symbol	Applicable model		
			IRV1000	**IRV2000**	**IRV3000**
Standard specifications	Connection Rc 1/8	**01**	●		
	Connection Rc 1/4	**02**		●	●
	Connection Rc 3/8	**03**			●
	Connection Rc 1/2	**04**			●
Accessories	Bracket	**B**	○	○	○
	Pressure gauge	**G**	○	○	○
Options	Rear pressure gauge mounting	**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**			○

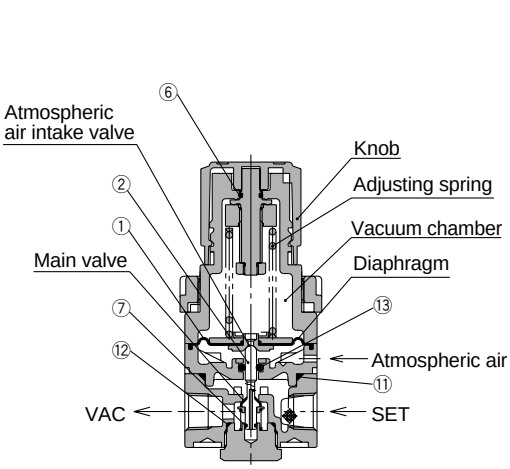
Accessory (Optional) Part Nos.

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

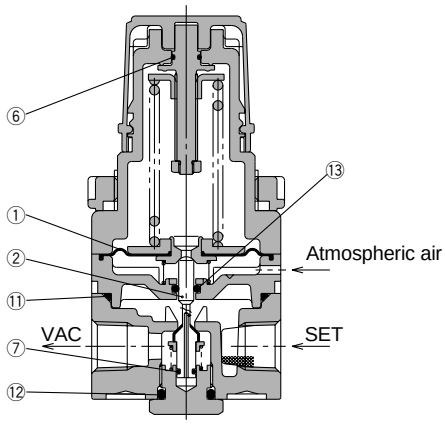
* Pressure gauge accuracy: ±3% (full span)

Construction

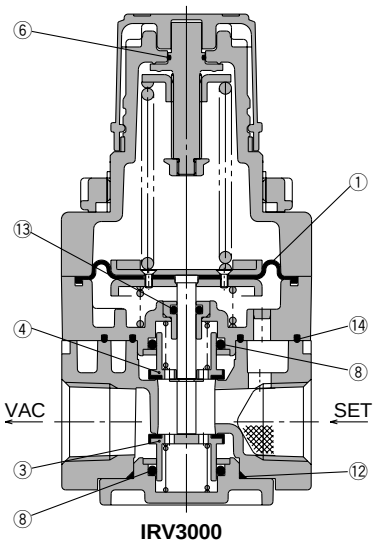




IRV1000



IRV2000



IRV3000

Working principle (for IRV1000)

When the knob 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.

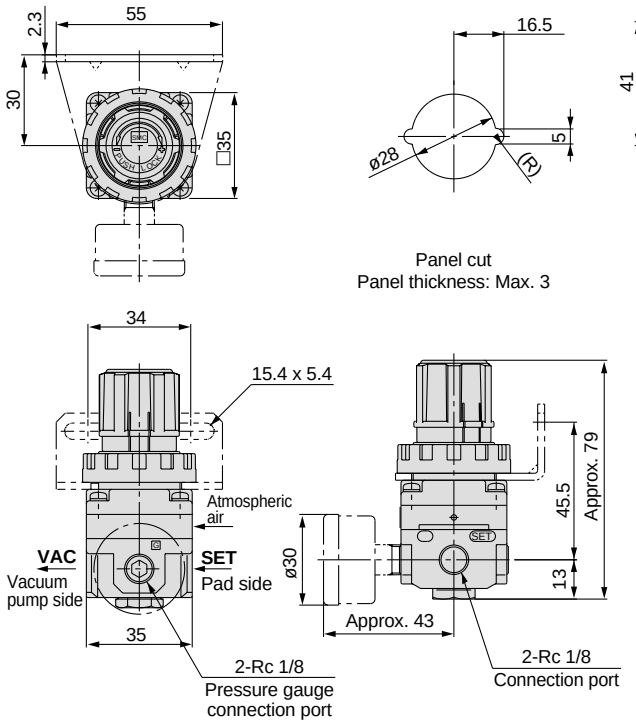
Replacement parts

No.	Description	Material	Part no.		
			IRV1000	**IRV2000**	**IRV3000**
1	**Diaphragm assembly**	H-NBR, etc.	P538010-6	P538020-3	P538030-5
2	**Valve**	Stainless steel, H-NBR	P53801005	P53802005	—
3	**Valve**	Brass, H-NBR	—	—	P53803015
4	**Valve**	Brass, H-NBR	—	—	P53803016
5	**Fixed orifice**	SUS304	P36202018	P36202018	P36203017
6	**O-ring**	H-NBR	ø4.35 x 1	ø6 x 1	ø8.31 x 1
7	**O-ring**	H-NBR	ø2 x 0.6	ø3.2 x 1	—
8	**O-ring**	NBR	—	—	JISB2401 P16 Note 1)
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	JISB2401 P11	ø27.8 x 1.5
13	**O-ring**	NBR	JISB2401 P3 Note 1)	JISB2401 P4 Note 1)	JISB2401 P5 Note 1)
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

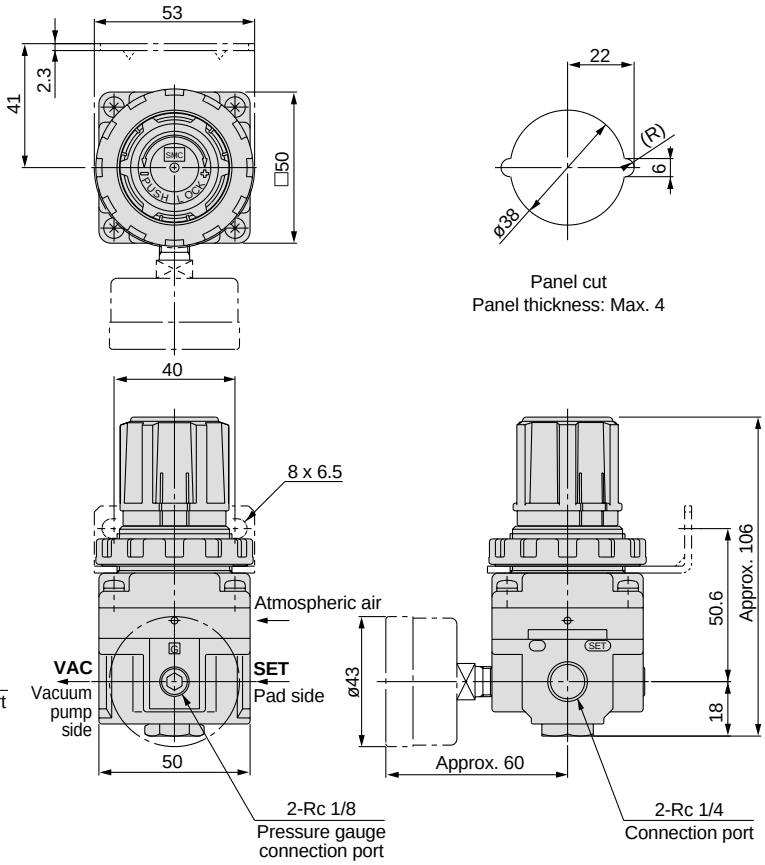
Note 1) For O-ring numbers 8 and 13, use mini-flicking type.
Note 2) Replacement part numbers correspond to the item numbers in the figures.

Dimensions

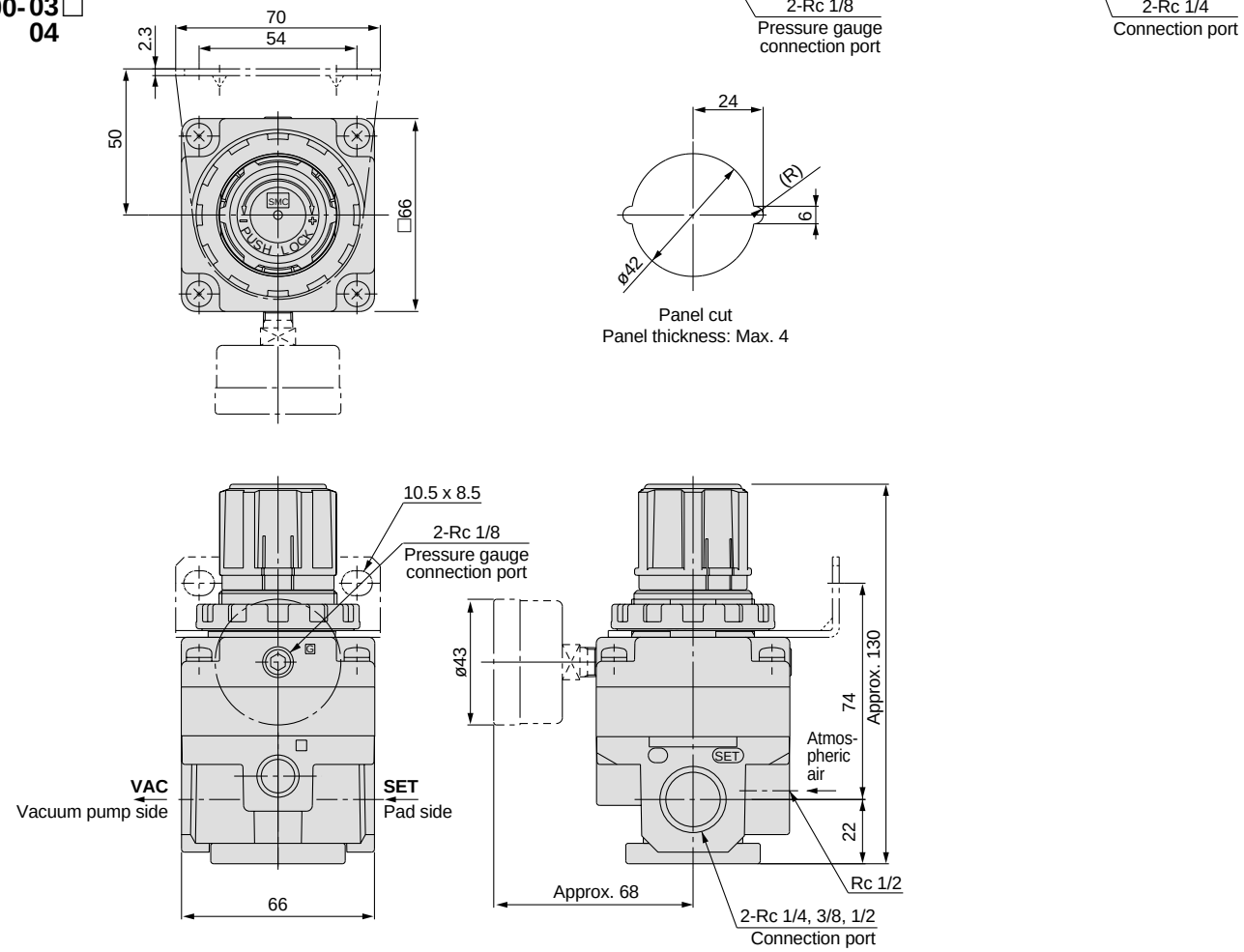
IRV1000-01□



IRV2000-02□



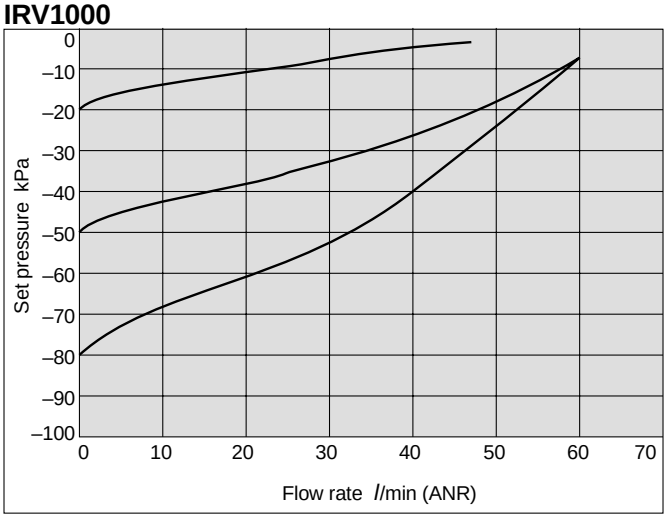
IRV3000-02 03 04□



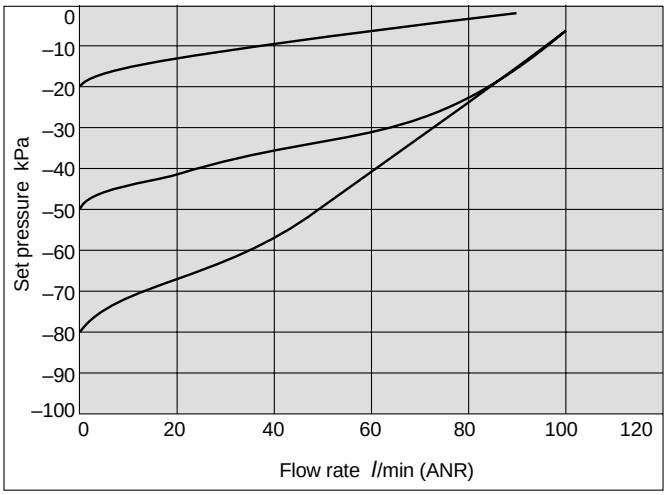
Flow Characteristics

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

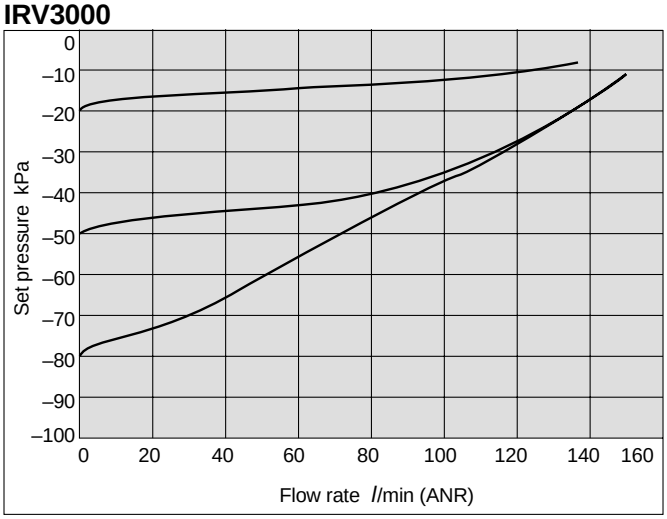
IRV1000



IRV2000



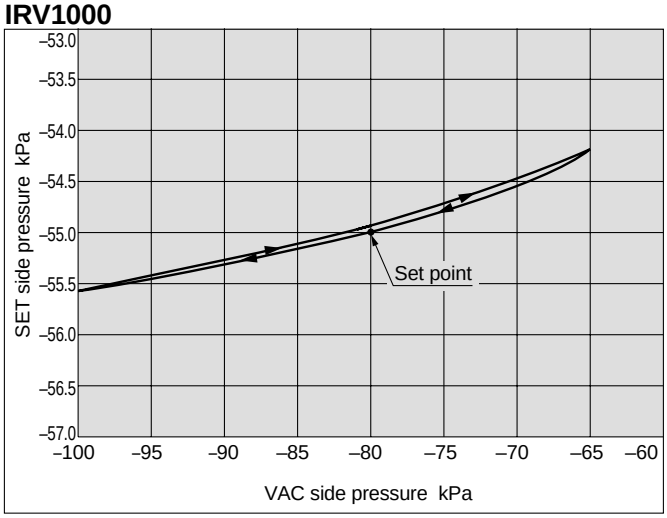
IRV3000



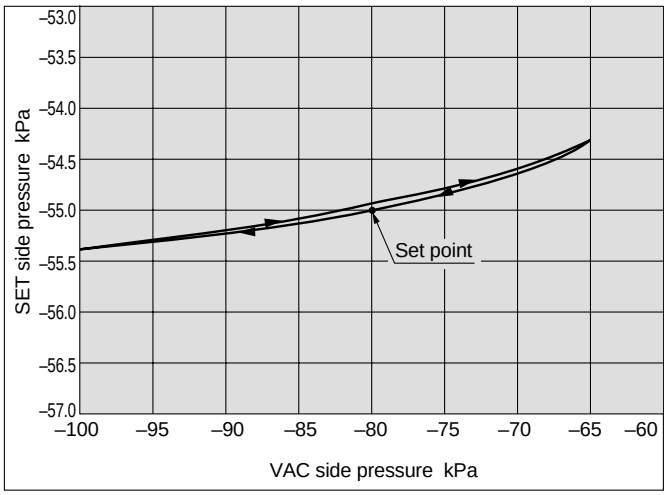
Pressure Characteristics

Conditions: Vacuum pump exhaust speed 500//min

IRV1000



IRV2000



IRV3000