Precision Regulator

Series IR1000/2000/3000

	Series	Model	Regulating pressure range	Port size	Page
Basic Type	Series IR1000 	IR1000	0.005 to 0.2 MPa	1/8	717
		IR1010	0.01 to 0.4 MPa		
		IR1020	0.01 to 0.8 MPa		
	Series IR2000 	IR2000	0.005 to 0.2 MPa	1/4	717
		IR2010	0.01 to 0.4 MPa		
		IR2020	0.01 to 0.8 MPa		
	Series IR3000 	IR3000	0.01 to 0.2 MPa	1/4, 3/8, 1/2	717
		IR3010	0.01 to 0.4 MPa		
		IR2020	0.01 to 0.8 MPa		
Air Operated Type	Series IR2000 	IR2120	0.01 to 0.8 MPa	1/4	717
	Series IR3000 	IR3120	0.01 to 0.8 MPa	1/4, 3/8, 1/2	717

Precision Regulator

Series IR1000/2000/3000

Bracket and pressure gauge can be mounted from 2 directions

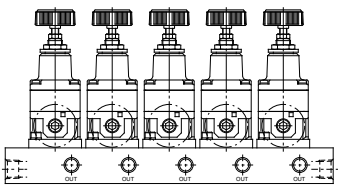
Mounting is possible on either the front or the back.

Expanded regulating pressure range

The maximum set pressure has been expanded from the conventional 0.7 MPa to 0.8 MPa.

Compact and lightweight

IR1000 width 35 mm weight 140 g
IR2000 width 50 mm weight 300 g
IR3000 width 66 mm weight 640 g



Manifolding is possible 8 stations at the maximum

Made to order specifications
(Except Series **IR2120, IR3000**)

Compatible with new modular connection brackets (-X170)

Can be combined with AF (Air filter) and AFM (Mist separator).

Attachments such as a pressure switch can be mounted as accessories

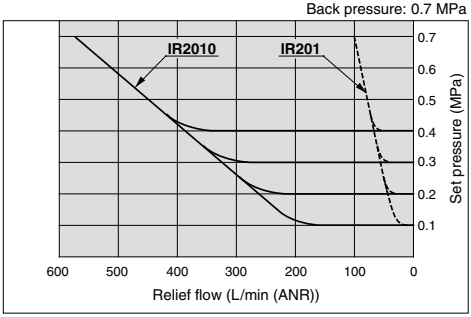
Applicable modular size **IR1000**: 20 type
IR2000: 30 type
IR3000: 40 type

∗ Mount the standard type with a conventional connection bracket.

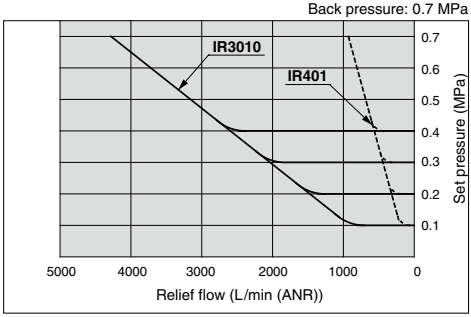
Relief flow characteristics

Possible to relieve (exhaust) air ranged 50 to 4000 L/min (ANR)

Back pressure: 0.7 MPa



Back pressure: 0.7 MPa



Series Variations

Specifications	Model	Basic type			Air operated type	
		IR10□0	IR20□0	IR30□0	IR2120	IR3120
Maximum set pressure	0.2 MPa	●	●	●	—	—
	0.4 MPa	●	●	●	—	—
	0.8 MPa	●	●	●	●	●
Port size	Rc 1/8	●	—	—	—	—
	Rc 1/4	—	●	●	●	●
	Rc 3/8	—	—	●	—	●
	Rc 1/2	—	—	●	—	●

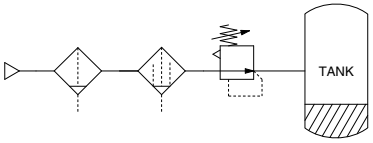
Made to Order Specifications

Symbol	Specifications/Content
10-	Clean Series
20-	Copper-free and fluorine-free
80-	Ozone resistant
-T	For high temperature
-L	For low temperature (Except IR1000 type)
-X1	Non-grease specifications
-X170	Compatible with modular connection brackets (With modular adapter)
-X465□	With digital pressure switch (ISE30A)
IRM□□	Manifold (Except Series IR2120, IR3000)

Note 1) For details, refer to page 724.
Note 2) For part number combinations, consult SMC or its sales representative.

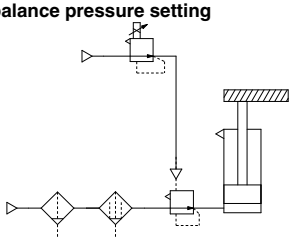
Application Example

Constant fluid pressure



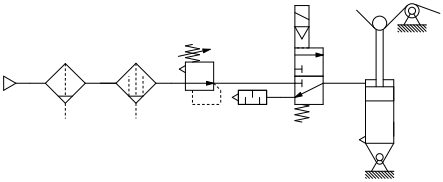
• Since there is a large effective area for supply and exhaust pressure, setting can be done quickly.

Balance and drive
Accurate balance pressure setting

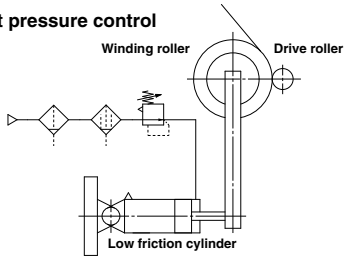


• Limits pressure fluctuation when driving a cylinder, maintaining excellent static and dynamic balance.

Accurate pressure setting — Sensitivity within 0.2% F.S. (Full Span) Tension control

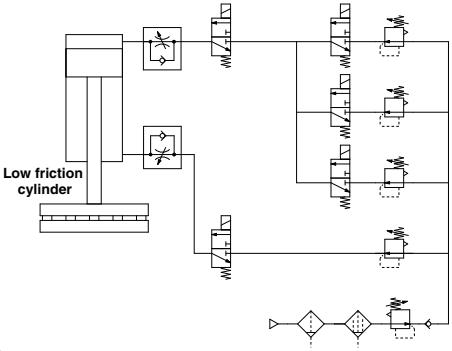


Contact pressure control

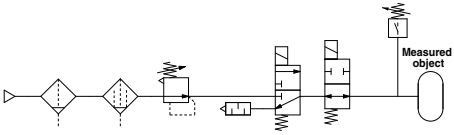


• Adapts to the cylinder's piston displacement, maintaining a constant pressure.

Multistage control of pressing force for workpiece (Wrapping machine)



Leak test circuit

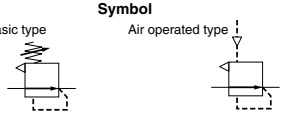


Precision Regulator

RoHS

Series IR1000/2000/3000

Symbol



Standard Specifications

Model	Basic type			Air operated type	
	IR10□0	IR20□0	IR30□0	IR2120	IR3120
Max. supply pressure	Max. 1.0 MPa				
Min. supply pressure (1)	Set pressure + 0.05 MPa		Set pressure + 0.1 MPa	Set pressure + 0.05 MPa	Set pressure + 0.1 MPa
Regulating pressure range	IR1000: 0.005 to 0.2 MPa IR1010: 0.01 to 0.4 MPa IR1020: 0.01 to 0.8 MPa	IR2000: 0.005 to 0.2 MPa IR2010: 0.01 to 0.4 MPa IR2020: 0.01 to 0.8 MPa	IR3000: 0.01 to 0.2 MPa IR3010: 0.01 to 0.4 MPa IR3020: 0.01 to 0.8 MPa	0.01 to 0.8 MPa	0.01 to 0.8 MPa
Input signal pressure (2)	———			0.01 to 0.8 MPa	0.01 to 0.8 MPa
Sensitivity (3)	Within 0.2% of full span				
Repeatability (3)	Within ±0.5% of full span				
Linearity (4)	———			Within ±1% of full span	
Air consumption (5) (At supply pressure of 1.0 MPa)	4.4 L/min (ANR) or less	4.4 L/min (ANR) or less	11.5 L/min (ANR) or less	4.4 L/min (ANR) or less	11.5 L/min (ANR) or less
Port size	Rc 1/8	Rc 1/4	Rc 1/4, 3/8, 1/2	Rc 1/4	Rc 1/4, 3/8, 1/2
Pressure gauge port	Rc 1/8 (2 locations)				
Ambient and fluid temperature	–5 to 60°C (No freezing)				
Weight (kg)	0.14	0.30	0.64	0.35	0.71

Note 1) With the condition of no flow on the output side. Together with the set pressure, be sure to maintain a minimum differntial pressure of 0.05 MPa for models IR1000 and IR2000, and 0.1 MPa for model IR3000.
Note 2) Applicable only to air operated types IR2120 and IR3120. The basic type is excepted.
Note 3) Characteristic values do not contain any secular change and temperature change.
Note 4) Indicates the linearity of the output pressure with respect to the input signal pressure.
Note 5) Air is normally being discharged to the atmosphere from a bleed hole or an exhaust port.

How to Order

IR 2 0 0 0 — □ 02 □ — □ — □ — □

Precision regulator

Body size

1	IR1000
2	IR2000
3	IR3000

Type of setting

0	Basic type (Handle)
1	Air operated type (Series IR2000/3000 only)

Regulating pressure range

For series IR1000/2000

0	0.005 to 0.2 MPa
1	0.01 to 0.4 MPa
2	0.01 to 0.8 MPa

Note) Air operated type is model IR2120 only.

For series IR3000

0	0.01 to 0.2 MPa
1	0.01 to 0.4 MPa
2	0.01 to 0.8 MPa

Note) Air operated type is model IR3120 only.

Thread type

Nil	Rc
N	NPT*
F	G*

* Option

Port size

Symbol	size	Application		
		IR1000	IR2000	IR3000
01	1/8	●		
02	1/4		●	●
03	3/8			●
04	1/2			●

Accessory

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

Note) For the low temperature environment, no combinations with the pressure gauge "G" are available.

* Pressure gauge is included, (but not assembled).

Suffix 1

Nil	—
T	For high temp. enviroments (–5 to 100°C) (Max. 80°C with pressure gauge.)
Note) L	For low temp. enviroments (–30 to 60°C)

Note) Except IR1000 type. For IR3000 type, the combination of "L" and "X1" is not available.

Suffix 2

Nil	—
Note) R	Pressure gauge, Bracket, Name plate, Mounting on the opposite side

Note) The standard mounting position of the pressure gauge is on the front, when viewing the regulator with the SUP side to the left and OUT side to the right.

Made to Order Specifications (Refer to page 724)

Symbol	Specifications/Content
X1	Non-grease specifications
X170	Compatible with modular connection brackets (Refer to page 718)
X465□	With digital pressure switch (ISE30A)

* 1 Add prefix (10-) for the clean room specification.
* 2 Add prefix (20-) for the copper-free and fluorine-free specification.
* 3 Add prefix (80-) for the ozone-resistant specification.
* 4 Manifold specification is available for IR1000 and IR2000. (Except IR2120 and IR3000)

Series IR3000

Series IR2000

Series IR1000

Specification Combinations

○: Standard specifications ○: Combination possible ▭: Combination not possible

Specifications		Symbol	Applicable model				
			IR1000 IR1010 IR1020	IR2000 IR2010 IR2020	IR2120	IR3000 IR3010 IR3020	IR3120
Standard specifications	Set pressure Max. 0.2 MPa	0	○	○		○	
	Set pressure Max. 0.4 MPa	1	○	○		○	
	Set pressure Max. 0.8 MPa	2	○	○	○	○	○
	Connection Rc 1/8	01	○				
	Connection Rc 1/4	02		○	○	○	○
	Connection Rc 3/8	03				○	○
	Connection Rc 1/2	04				○	○
Accessory	Bracket	B	○	○	○	○	○
	Pressure gauge	G	○	○	○	○	○
Option	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				○	○

Modular and Accessory Combinations

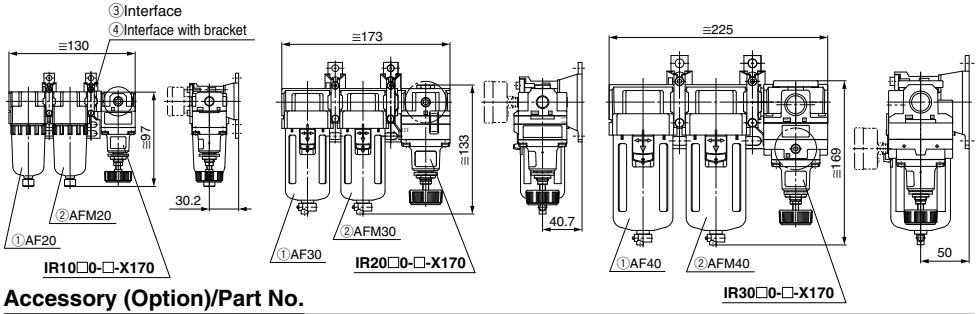
Description	Applicable model		
	IR10□0-□□-X170	IR20□0-□□-X170	IR30□0-□□-X170
1. Air filter	AF20	AF30	AF40
2. Mist separator	AFM20	AFM30	AFM40
3. Interface	Y200	Y300	Y400
4. Interface with bracket	Y200T	Y300T	Y400T

Note 1) Use the Made-to-Order product (IR□□□-X170) for modular connections.
The interface and interface with bracket listed above cannot be connected to the standard type. Use a conventional connection interface when connecting the standard type with modular connections.

Note 2) The Made-to-Order product (IR□□□-X170) is the product number with the modular adaptor attached to the standard product. The modular adaptor that has not been assembled to the product is shipped together. For the recommended tightening torque necessary to connect the modular adaptor, refer to page 591. When connecting the modular adaptor, please order applicable products or accessories separately.

Note 3) Product numbers with the bracket are not available for IR□□□□-X170. As the interface with the bracket is used, it is not necessary to attach the bracket to the IR.

<Combination example>



Accessory (Option)/Part No.

Description	Part no.								
	IR1000	IR1010	IR1020	IR2000	IR2010	IR2020/2120	IR3000	IR3010	IR3020/3120
Bracket	P36201023			P36202028			P362030-20*1		
Pressure gauge *2*3	G33-2-01	G33-4-01	G33-10-01	G43-2-01	G43-4-01	G43-10-01	G43-2-01	G43-4-01	G43-10-01

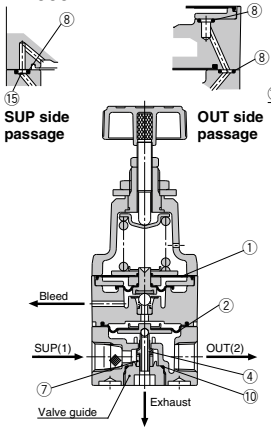
*1 A bracket and two mounting screws (M5 x 35)
To mount the bracket, remove two body screws (M5 x 30) on the name plate on the opposite side and replace the attached two bracket mounting screws (M5 x 35).

*2 Accuracy ±3% (Full span), Accuracy guarantee temperature range: 23±5°C

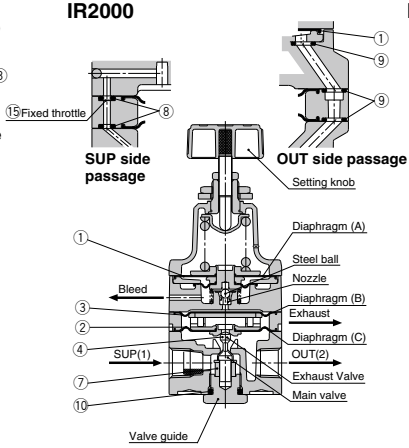
*3 When ordering this pressure gauge individually, the sealant is not applied to the connection male thread. So, apply the sealing tape or sealant to the screw thread before use.

Construction

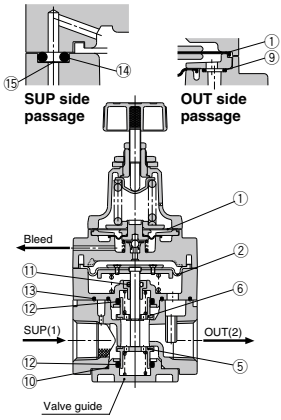
IR1000



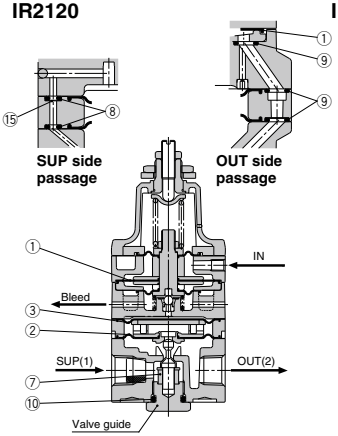
IR2000



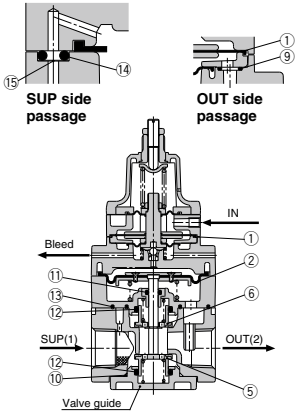
IR3000



IR2120



IR3120



Working principle (For IR2000)

When the setting knob is turned, the nozzle is closed by the flapper allowing the supply air that flows in from the upstream side to pass through the fixed throttle. It then acts on diaphragm B as nozzle back pressure, the main valve is pushed down by the generated force, and the supply pressure flows out to the downstream side. The air pressure that flows in acts on diaphragm C. While opposing the force generated by diaphragm B it also acts on diaphragm A, opposing the compression force of the setting spring and becomes the set pressure. If the set pressure rises too high, diaphragm A is pushed up, the interval between the flapper and the nozzle widens, the nozzle back pressure drops, the balance of diaphragms B and C is broken, the main valve closes, the exhaust valve opens and the excess pressure from the downstream side is discharged to the atmosphere. In this way fine pressure variations are detected by the nozzle/flapper type pilot mechanism, and precise pressure adjustment is performed.

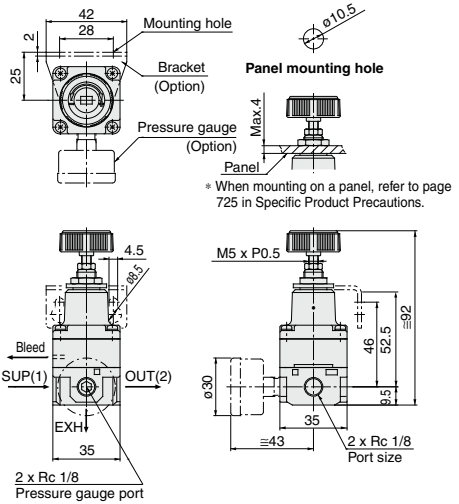
Replacement Parts

No.	Description	Material	IR10□0		IR20□0		IR30□0		IR2120		IR3120	
			Part no.	Qty.	Part no.	Qty.	Part no.	Qty.	Part no.	Qty.	Part no.	Qty.
1	**Diaphragm assembly**	NBR, other	P362010-1	1	P362020-2	1	P362020-2	1	P362020-13	1	P362020-13	1
2	**Diaphragm assembly**	NBR, other	P362010-2	1	P362020-5	1	P362030-1	1	P362020-5	1	P362030-1	1
3	**Diaphragm**	NBR, other	—	—	P36202019	1	—	—	P36202019	1	—	—
4	**Valve**	Stainless steel, NBR	P36201058	1	P36202068#1	1	—	—	P36202068#1	1	—	—
5	**Valve**	Brass, NBR	—	—	—	—	P36203009#1	1	—	—	P36203009#1	1
6	**Valve**	Brass, NBR	—	—	—	—	P36203010#1	1	—	—	P36203010#1	1
7	**Damper**	NBR, other	P36201021	1	P36202026	1	—	—	P36202026	1	—	—
8	**O-ring**	H-NBR	ø2.5 x 1.05	3	ø1.42 x 1.52	2	—	—	ø1.42 x 1.52	2	—	—
9	**O-ring**	NBR	—	—	ø4.5 x 1	3	ø4.5 x 1	1	ø4.5 x 1	3	ø4.5 x 1	1
10	**O-ring**	NBR	ø10 x 1.3	1	JISB2401P11	1	ø27.8 x 1.5	1	JISB2401P11	1	ø27.8 x 1.5	1
11	**O-ring**	NBR	—	—	—	—	JISB2401P5 Note 2)	1	—	—	JISB2401P5 Note 2)	1
12	**O-ring**	NBR	—	—	—	—	JISB2401P16 Note 2)	2	—	—	JISB2401P16 Note 2)	2
13	**Seal (A)**	NBR	—	—	—	—	P36203015	1	—	—	P36203015	1
14	**Seal (B)**	NBR	—	—	—	—	P36203016	3	—	—	P36203016	3
15	**Fixed throttle**	Stainless steel	P36202018	1	P36202018	1	P36203017	1	P36202018	1	P36203017	1
Repair kit no. (A set of above nos. ① to ⑮.)			KT-IR1000		KT-IR2000		KT-IR3000		KT-IR2120		KT-IR3120	

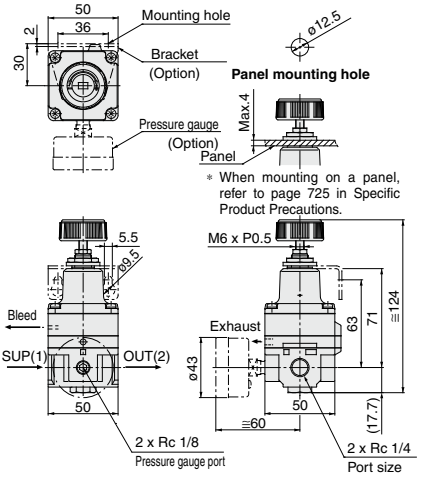
Note 1) The replacement parts are shipped with the repair kit number.
Note 2) Use mini-flick type.

Dimensions

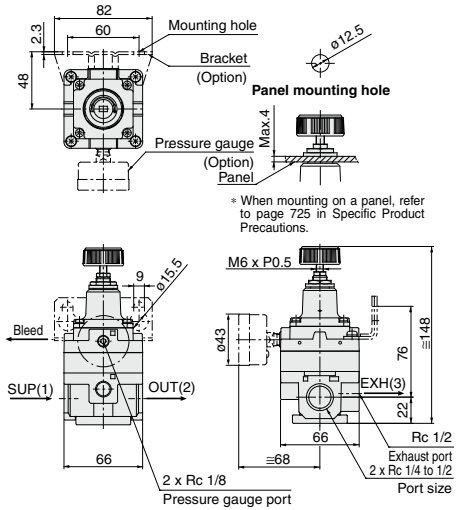
IR10□0-01□



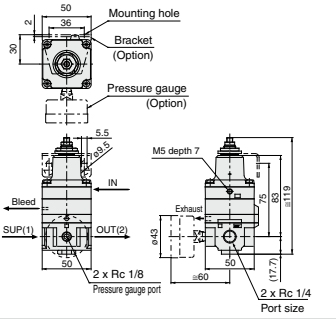
IR20□0-02□



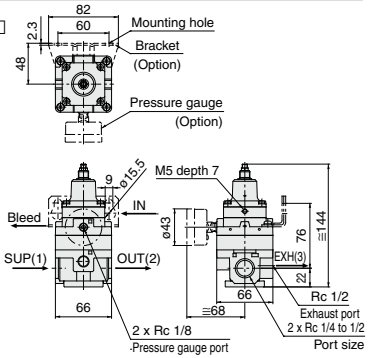
IR30□0-0□□



IR2120-02□



IR3120-0□□



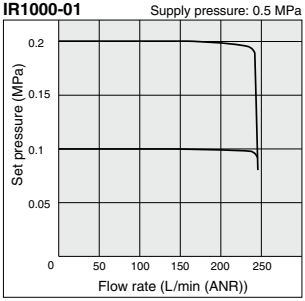
Series IR1000

∗ The operating conditions or external disturbance may affect each of the characteristics. So, the characteristic values shown below are not guaranteed.

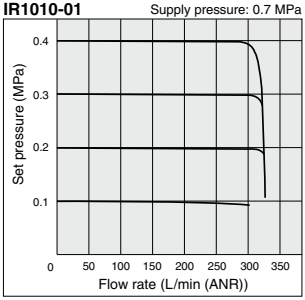
Flow Characteristics

∗ Testing methods conform to JIS B 8372.

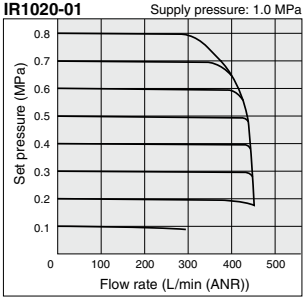
IR1000-01 Supply pressure: 0.5 MPa



IR1010-01 Supply pressure: 0.7 MPa

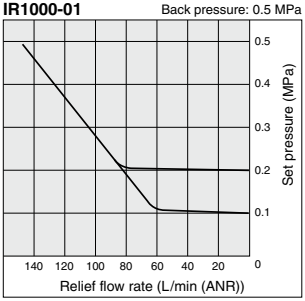


IR1020-01 Supply pressure: 1.0 MPa

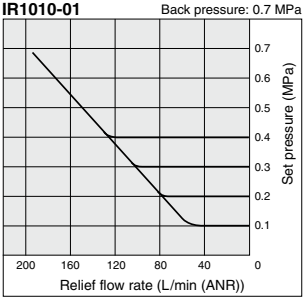


Relief Characteristics

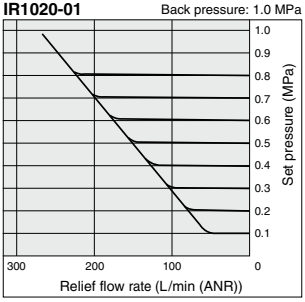
IR1000-01 Back pressure: 0.5 MPa



IR1010-01 Back pressure: 0.7 MPa



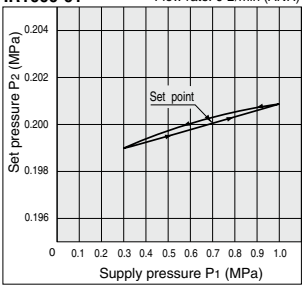
IR1020-01 Back pressure: 1.0 MPa



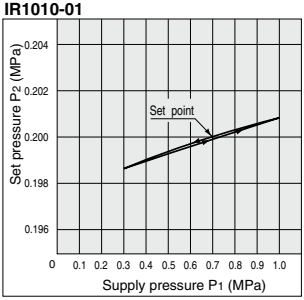
Pressure Characteristics

Supply pressure: 0.7 MPa
Set pressure: 0.2 MPa
Flow rate: 0 L/min (ANR)

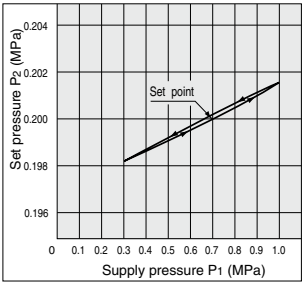
IR1000-01



IR1010-01



IR1020-01



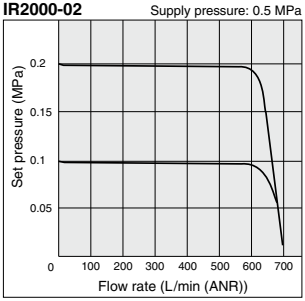
Series IR2000

∗ The operating conditions or external disturbance may affect each of the characteristics. So, the characteristic values shown below are not guaranteed.

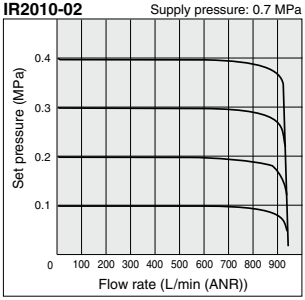
Flow Characteristics

∗ Testing methods conform to JIS B 8372.

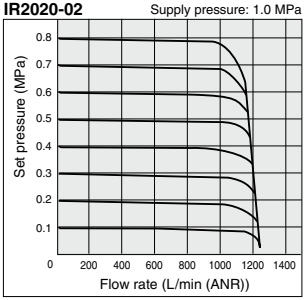
IR2000-02 Supply pressure: 0.5 MPa



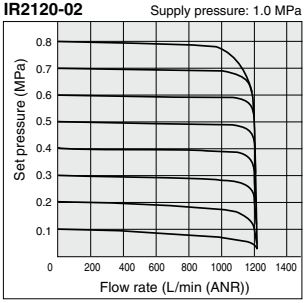
IR2010-02 Supply pressure: 0.7 MPa



IR2020-02 Supply pressure: 1.0 MPa

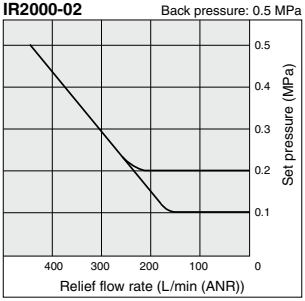


IR2120-02 Supply pressure: 1.0 MPa

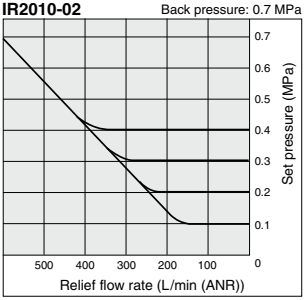


Relief Characteristics

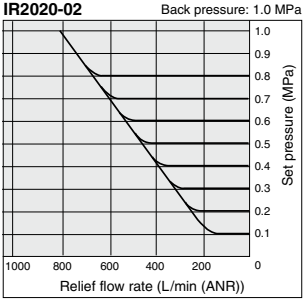
IR2000-02 Back pressure: 0.5 MPa



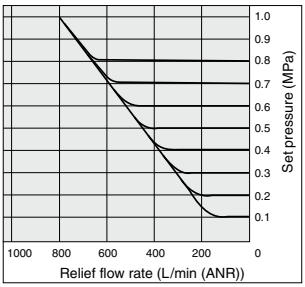
IR2010-02 Back pressure: 0.7 MPa



IR2020-02 Back pressure: 1.0 MPa



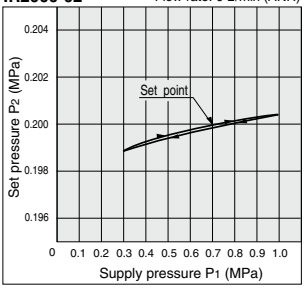
IR2120-02 Back pressure: 1.0 MPa



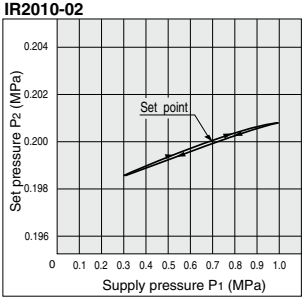
Pressure Characteristics

Supply pressure: 0.7 MPa
Set pressure: 0.2 MPa
Flow rate: 0 L/min (ANR)

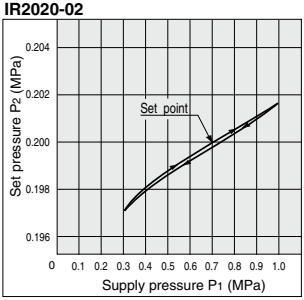
IR2000-02



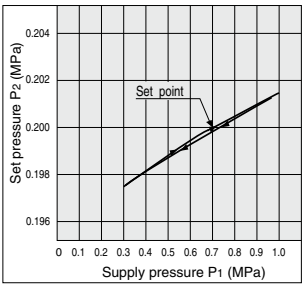
IR2010-02



IR2020-02



IR2120-02



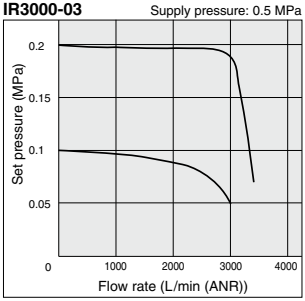
Series IR3000

∗ The operating conditions or external disturbance may affect each of the characteristics. So, the characteristic values shown below are not guaranteed.

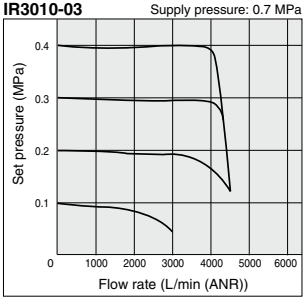
Flow Characteristics

∗ Testing methods conform to JIS B 8372.

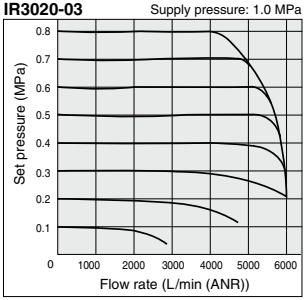
IR3000-03 Supply pressure: 0.5 MPa



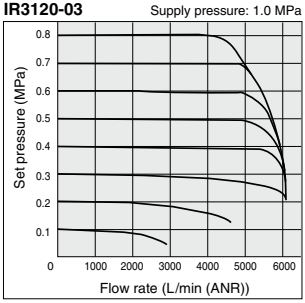
IR3010-03 Supply pressure: 0.7 MPa



IR3020-03 Supply pressure: 1.0 MPa

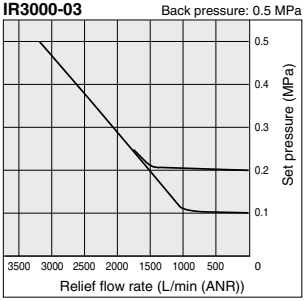


IR3120-03 Supply pressure: 1.0 MPa

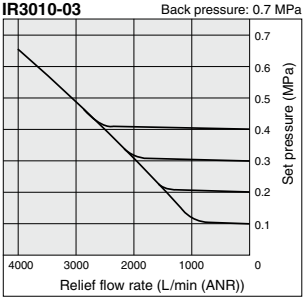


Relief Characteristics

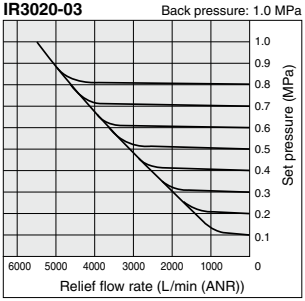
IR3000-03 Back pressure: 0.5 MPa



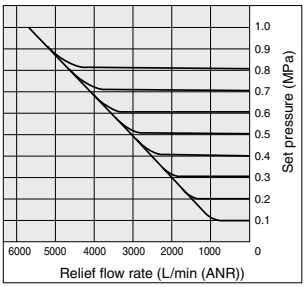
IR3010-03 Back pressure: 0.7 MPa



IR3020-03 Back pressure: 1.0 MPa



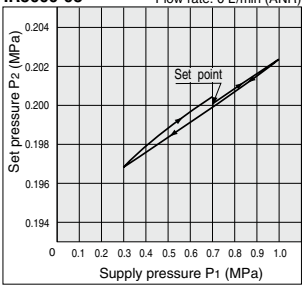
IR3120-03 Back pressure: 1.0 MPa



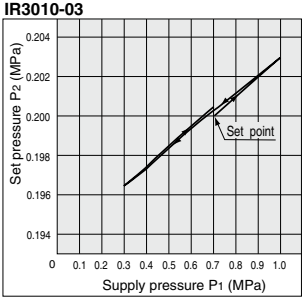
Pressure Characteristics

Supply pressure: 0.7 MPa
Set pressure: 0.2 MPa
Flow rate: 0 L/min (ANR)

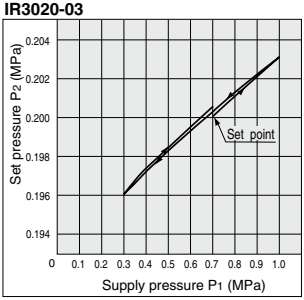
IR3000-03



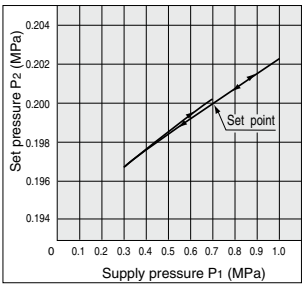
IR3010-03



IR3020-03



IR3120-03



Series IR1000/2000/3000
Made to Order Specifications:

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

Made to Order

1 Clean Series

10 — Standard model no.

Note) Please contact SMC if a product with pressure gauge is desired.

● **Clean Series**

Specifications

Cleanliness	Class 10000
Bleed hole	With M5 fitting (Applicable tubing O.D. ø6)
EXH port	IR1000/2000: With M5 fitting (Applicable tubing O.D. ø6) IR3000: Rc 1/2 female thread
Grease	Fluorine grease

2 Copper-free and Fluorine-free

External and internal copper parts are changed to stainless steel or aluminum.

20 — Standard model no.

Note) Please contact SMC if a product with pressure gauge is desired.

● **Copper-free and Fluorine-free**

3 Ozone Resistant

Fluoro rubber is used for rubber seal materials.

80 — Standard model no.

● **Ozone resistant**

4 For High/Low Temperature Environments

Standard model no. — T

● **For high/low temperature environments**

T	For high temperature
L Note)	For low temperature

Note) Except IR1000 type. For IR3000 type, the combination of "L" and "X1" is not available.

Specifications

Symbol	T	L
Environment	For high temp. environments	For low temp. environments
Ambient temperature	–5 to 100°C (Max. 80°C with pressure gauge)	–30 to 60°C
Rubber material	Fluororubber	Special NBR

5 Non-grease Specifications

Assembly is performed in an ordinary environment without using grease. However, since parts are not washed, they are not completely oil-free.

Standard model no. — X1

● **Non-grease specifications**

6 With Digital Pressure Switch

With digital pressure switch (model no: ISE30A-01-□-ML). Mount a digital pressure switch into the connection port for pressure gauge, as it is not mounted at the time of shipment.

Specifications

Made to order part no.		–X465□
Pressure switch	**Set pressure range (MPa)**	–0.1 to 1
	Desolution of setting and display (MPa)	0.001
	Power supply voltage	12 to 24 VDC ±10%, Ripple (p-p) 10% or less (With reverse connection protection)
	Current consumption	40 mA or less

How to Order

Standard model no. Note) **— X465 A**

Note) Except for symbol "G"

● **With digital pressure switch**

● **Switch specifications**

Symbol	Output specifications
A	NPN open collector 1 output
B	PNP open collector 1 output
C	NPN open collector 1 output + Analog voltage output
D	NPN open collector 1 output + Analog current output

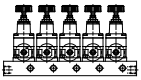
Note 1) Please contact SMC separately for details about the external dimensions, etc.

Note 2) For details on handling digital pressure switch and specifications, refer to page 767 of Best Pneumatics No.6.

Note 3) Digital pressure switch is packed togther.

7 Manifold Specifications (Except type IR2120 and series IR3000)

2 to 8 station manifold type regulators.
(Please contact SMC regarding 9 or more stations.)



IRM 10 — □ □ G — □

● **Set pressure and quantity**

0□	0.2 MPa setting 1 to n pcs.
1□	0.4 MPa setting 1 to n pcs.
2□	0.8 MPa setting 1 to n pcs.

Example 1) 0.4 MPa setting with 6 stations
IRM10-6G-16
Example 2) 0.2 MPa setting 2 pcs.,
0.4 MPa setting 2 pcs.,
0.8 MPa setting 1 pc.
with 5 stations
IRM20-5G-021221

● **Stations**

2	2 stations
⋮	⋮
8	8 stations

● **Accessory (Pressure gauge)***

Nil	None
G	IR1000: G33-□-01 IR2000: G43-□-01

* Accessory (pressure gauge) is included, (but not assembled).

● **Body size**

10	IR1000
20	IR2000

● **Thread type (Thread on the manifold base)**

Nil	Rc
N	NPT
F	G

● **Manifold type regulator**

Specifications

Stations	2 to 8 stations	
Port	Common SUP	IR1000: 1/4, IR2000: 1/2
	Individual OUT	IR1000: 1/8, IR2000: 1/4
	Individual EXH (From IR body)	
Set pressure	0.2 MPa, 0.4 MPa and 0.8 MPa settings can be combined.	
Accessory (Pressure gauge)	G33-□-01 (IR1000), G43-□-01 (IR2000)	

Note 1) Regulators to be manifolded are counted starting from stations 1 on the left side with the OUT ports in front.

Note 2) When regulators with a different set pressure are manifolded, viewing OUT ports from front, the low pressure range is installed on the left side and high pressure range is on the right side. In case of the "Example 2)" above mentioned, stations 1 and 2 are of 0.2 MPa setting, stations 3 and 4 are of 0.4 MPa setting, and station 5 is of 0.8 MPa setting.

Note 3) Please consult with SMC when a blanking plate is needed.

Series IR1000/2000/3000
Specific Product Precautions

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

Air Supply

⚠ Warning

1. If the drain removal from air filter and mist separator is missed, drain will be flown out to the outlet side and may result in a malfunction of the pneumatic equipment.

When removing drain is difficult, use of a filter with an auto-drain is recommended.

⚠ Caution

1. If the supply pressure line contains drain or particlate, etc., the fixed throttle can become clogged leading to malfunction, and therefore, in addition to an air filter (SMC Series AF) be sure to use a mist separator (SMC Series AM, AFM).

Refer to pages 2 and 3 regarding air quality.

2. Never use a lubricator on the supply side of the regulator, as this will positively cause the fixed throttle to become clogged and result in a malfunction. If lubrication is required for terminal devices, connect a lubricator on the output side of the regulator.

Maintenance

⚠ Warning

1. When the valve guide (refer to construction drawing on page 719) is to be removed during maintenance, first reduce the set pressure to "0" and completely shut off the supply pressure.

2. When a pressure gauge is to be mounted, remove the plug after reducing the set pressure to "0".

Precautions for IR10□0 only

⚠ Warning

1. When remounting the valve guide after removing it for maintenance, use a tightening torque of no more than 0.6 N·m.

Since the valve guide on this product is made of resin, there is a danger of damage if tightened with a torque exceeding the prescribed value.

Handling

⚠ Caution

1. Do not apply force when transferring, mounting and dropping the regulator with a pressure gauge.

This may cause misalignment of the pressure gauge pointer.

Operation

⚠ Caution

1. Do not use a precision regulator outside the range of its specifications as this can cause failure. (Refer to specifications.)

2. When mounting is performed, make connections while confirming port indications.

3. Screw a panel nut with the recommended proper torque when mounting onto a panel.

Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Recommended Proper Torque (N·m)

IR1000	IR2000	IR3000
12.5	21	21

4. If a directional switching valve (solenoid valve, mechanical valve, etc.) is mounted on the supply side of the regulator and repeatedly switched ON and OFF, wear of the nozzle/flapper section will be accelerated and a discrepancy in the setting value may occur. Therefore, avoid using a directional switching valve on the supply side. In the event a directional switching valve will be used, install it on the output side of the regulator.

5. The accessory pressure gauge is supplied with the regulator in the unassembled status. Before using the regulator, be sure to install the pressure gauge at the gauge port of the regulator. At this time, the recommended tightening torque of the pressure gauge is 7 to 9 N·m.

6. Air is normally released from the bleed hole (the hole on the side of the body's mid-section). This is a necessary consumption of air based on the construction of the precision regulator, and is not an abnormality.

7. Make sure to tighten the lock nut after pressure adjustment.

Precautions for IR30□0, IR3120 only

⚠ Caution

1. The supply pressure is relatively high (approx. 0.5 MPa or more), the set pressure is low (approx. 0.1 MPa or less), and when operated with the output side released to the atmosphere, there may be pulsations in the setting pressure. In this kind of situation, operate with the supply pressure reduced as much as possible, or increase the set pressure somewhat and restrict the output line (add and adjust a stop valve, etc.).

2. The capacity of the output side is large, and when used for the purpose of a relief function, the exhaust sound will be loud when being relieved. Therefore, operate with a silencer (SMC Series AN) mounted on the exhaust port (EXH port). The connection is Rc 1/2.

Precautions for IR2120, IR3120 (air operated type) only

⚠ Caution

1. Since the output types of IR2120 and IR3120 are the same pressure as the input signal pressure, select a type of regulator (general purpose or precision type) for input signal pressure adjustment according to the application.

2. The screw on the topmost section is a zero point adjustment screw which is locked at the factory and requires no adjustment for operation.

Precision Regulator

New RoHS

Air consumption

Reduced by Up to approx. 90%*

scfm [L/min (ANR)]

New IR	Current model	Series
0.04 [1] or less	0.16 [4.4]	IR1000-A/IR2000-A
0.04 [1] or less	0.41 [11.5]	IR3000-A

* Compared with the current IR1000/2000/3000

High flow rate

Up to approx. twice*

scfm [L/min (ANR)]

New IR	Current model	Series
25.4 [720]	11.3 [320]	IR1000-A
67.1 [1900]	33.2 [940]	IR2000-A

* Compared with the current IR1000/2000

Lightweight

Reduced by up to approx. 27%*

[kg]

New IR	Current model	Series
0.13	0.14	IR1000-A
0.23	0.30	IR2000-A
0.47	0.64	IR3000-A

* Compared with the current IR1000/2000/3000

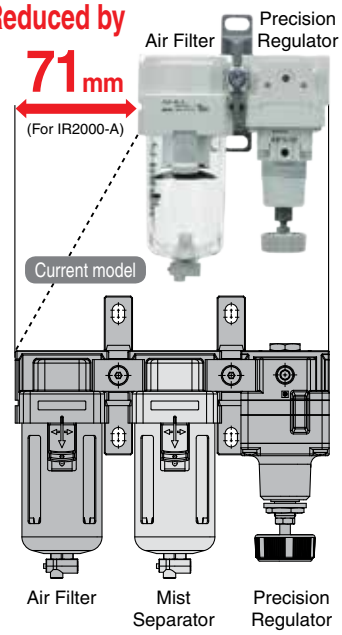
Sensitivity: 0.2% (Full span)

Repeatability: ±0.5% (Full span)

Space saving

New structure without fixed throttle does not require a mist separator.

Reduced by 71 mm (For IR2000-A)



Series IR1000-A/2000-A/3000-A

SMC

CAT.NAS60-22A

Reduction in air consumption

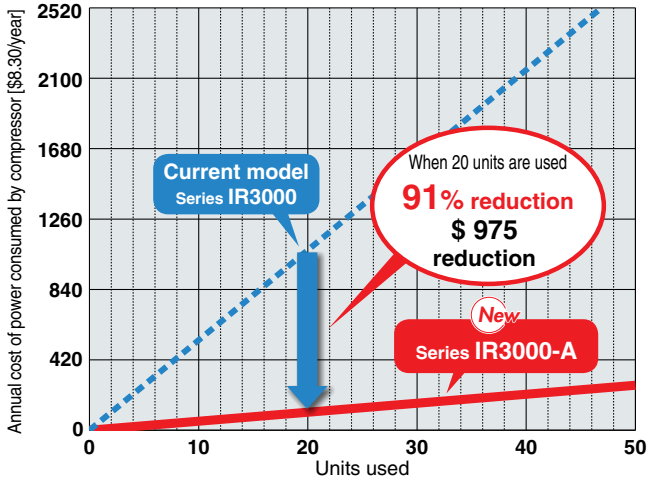
Air consumption is reduced with a new original structure.

With this new original structure, running costs are reduced.

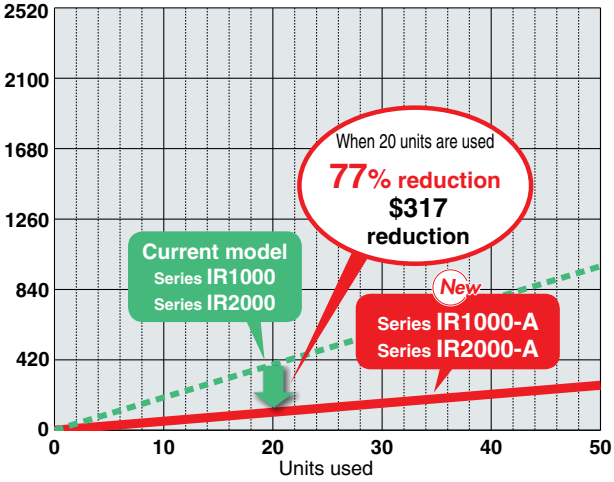
[Calculation conditions] Electric power cost: $0.013/ft³
[Work model] Working hours: 6000 h (250 days/year)
Supply pressure: 145 psi [1.0 MPa]
Set pressure: 29 psi [0.2 MPa]

Annual cost reduction effect

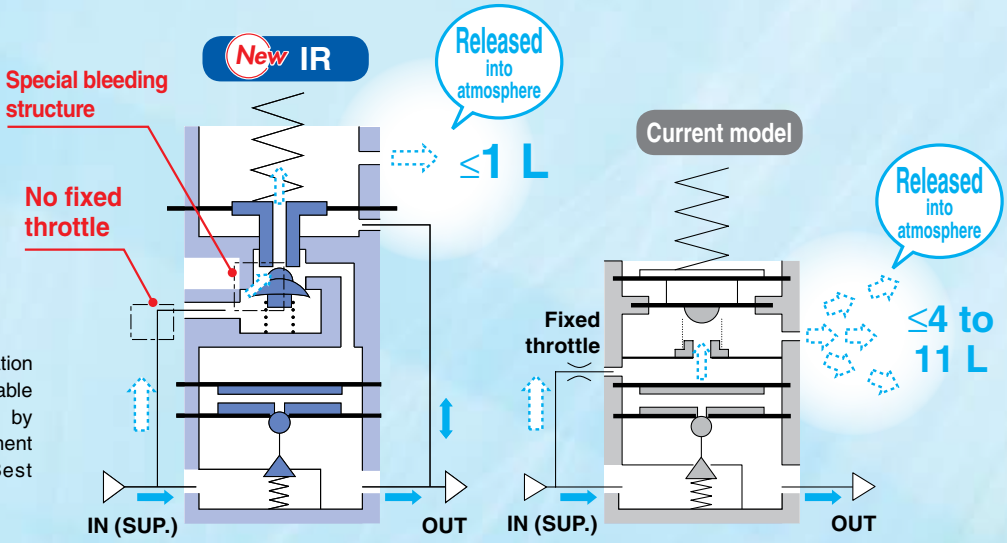
New Comparison between IR3000-A and the current IR3000



New Comparison between IR1000-A/IR2000-A and the current IR1000/IR2000



No fixed throttle in the new design.



* Poor quality of air may cause operation failure. Select a model that is suitable for the desired air cleanliness by referring to "Air Preparation Equipment Model Selection Guide" (Best Pneumatics No. 5) for air quality.

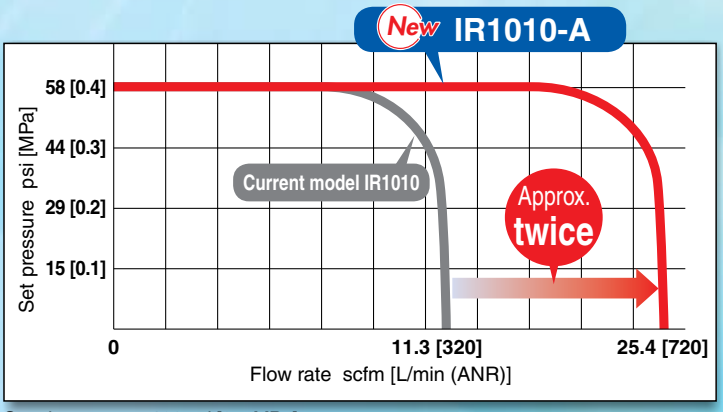
Flow rate: Up to approx. twice

(Compared to the current SMC product)

scfm [L/min(ANR)]

New IR	Current model	Series
25.4 [720]	11.3 [320]	IR1000-A
67.1 [1900]	33.2 [940]	IR2000-A

Supply pressure: 102 psi [0.7 MPa]



Supply pressure: 102 psi [0.7 MPa]

SMC

Weight

Reduced by up to approx. 27% [kg]

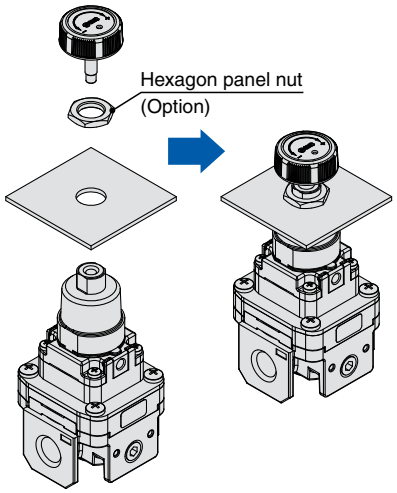
New IR	Current model	Series
0.13	0.14	IR1000-A
0.23	0.30	IR2000-A
0.47	0.64	IR3000-A

Digital pressure switch standardized

Pressure gauge

Hexagon panel nut mounting

* Interchangeable with the current SMC product

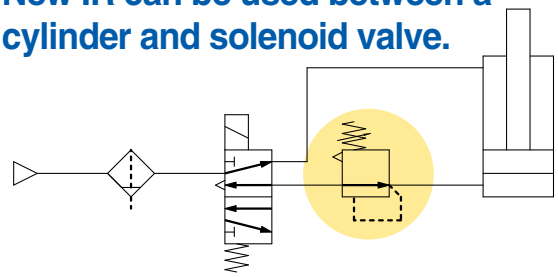


Sensitivity: 0.2% (Full span)

Repeatability: ±0.5% (Full span)

Mounting is interchangeable with the current SMC model.

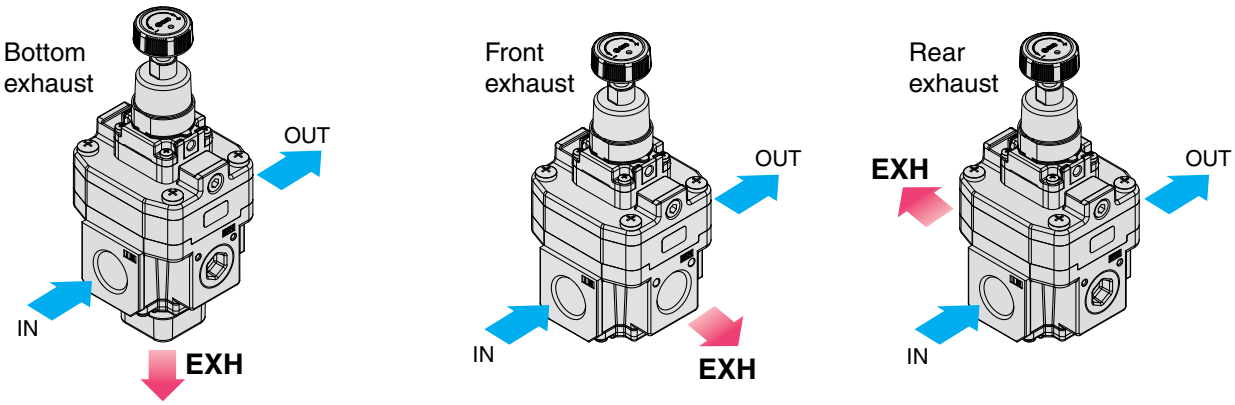
New IR can be used between a cylinder and solenoid valve.



Note) The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.

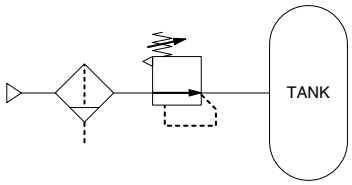
Exhaust (EXH) directions can be selected. (Series IR3000-A)

New Bottom and front exhaust added.



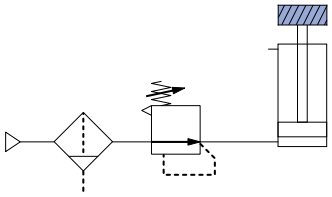
Application Examples

Constant fluid pressure Note)



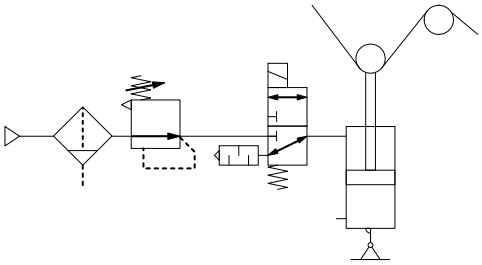
- Since there is a large effective area for supply and exhaust pressure, setting can be done quickly.

Balance and drive
Accurate balance pressure setting Note)

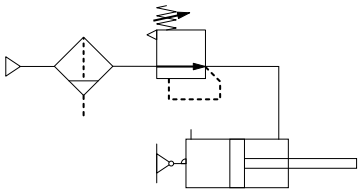


- Limits pressure fluctuation when driving a cylinder, maintaining excellent static and dynamic balance.

Accurate pressure setting
Sensitivity within 0.2% F.S. (Full Span)
Tension control Note)

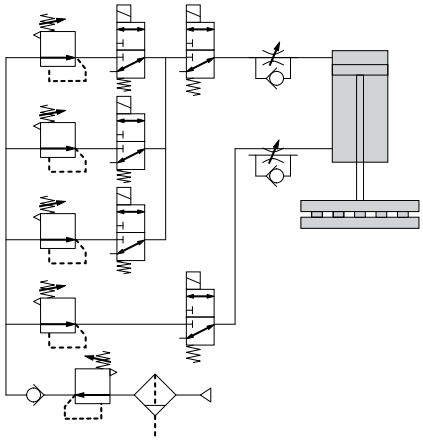


Contact pressure control Note)

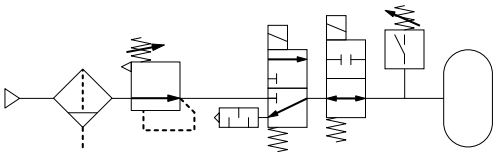


- Adapts to the cylinder's piston displacement, maintaining a constant pressure.

Multistage control of pressing force for workpiece (Wrapping machine) Note)

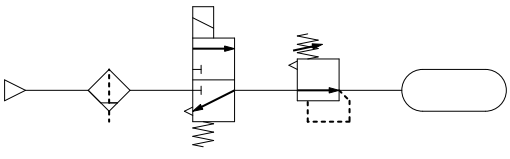


Leak test circuit Note)



Residual pressure relief Note)

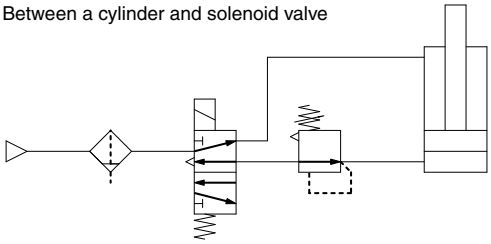
Ex.) Backflow from the tank



- Residual pressure is exhausted by relief function.

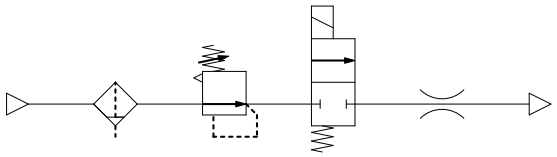
Usage between a cylinder and solenoid valve Note)

Ex.) Between a cylinder and solenoid valve



- It can be used between a cylinder and solenoid valve.

Adjustment of blow-line pressure Note)



•Outlet pressure is less affected by fluctuation of inlet pressure. New IR offers consistent pressure control.

Note) The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.

Series Variations

Basic Type (Knob)

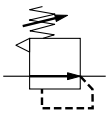
Series	Model	Set pressure range psi (MPa)	Port size
IR1000-A 	**IR1000-A**	0.73 to 29 [0.005 to 0.2]	1/8
	IR1010-A	1.5 to 58 [0.01 to 0.4]	
	IR1020-A	1.5 to 116 [0.01 to 0.8]	
IR2000-A 	**IR2000-A**	0.73 to 29 [0.005 to 0.2]	1/4
	IR2010-A	1.5 to 58 [0.01 to 0.4]	
	IR2020-A	1.5 to 116 [0.01 to 0.80	
IR3000-A 	**IR3000-A**	1.5 to 29 [0.01 to 0.2]	1/4, 3/8, 1/2
	IR3010-A	1.5 to 58 [0.01 to 0.4]	
	IR3020-A	1.5 to 116 [0.01 to 0.8]	

RoHS

Precision Regulator

Series IR1000-A/2000-A/3000-A

Symbol



Basic type
(Knob)

Standard Specifications

Model	Basic type (Knob)		
	IR10□0-A	**IR20□0-A**	**IR30□0-A**
Fluid	Air		
Proof pressure	218 psi [1.5 MPa]		
Max. supply pressure	145 psi [1.0 MPa]		
Min. supply pressure Note 1)	Set pressure + 7.3 psi [0.05 MPa]		Set pressure + 15 psi [0.1 MPa]
Set pressure range psi [MPa]	IR1000-A: 0.73 to 29 [0.005 to 0.2]	IR2000-A: 0.73 to 29 [0.005 to 0.2]	IR3000-A: 1.5 to 29 [0.01 to 0.2]
	IR1010-A: 1.5 to 58 [0.01 to 0.4]	IR2010-A: 1.5 to 58 [0.01 to 0.4]	IR3010-A: 1.5 to 58 [0.01 to 0.4]
	IR1020-A: 1.5 to 116 [0.01 to 0.8]	IR2020-A: 1.5 to 116 [0.01 to 0.8]	IR3020-A: 1.5 to 116 [0.01 to 0.8]
Sensitivity	Within 0.2% of full span		
Repeatability Note 2)	Within ±0.5% of full span		
Air consumption Note 3)	0.04 scfm [1 L/min (ANR)] or less		
Port size	1/8	1/4	1/4, 3/8, 1/2
Pressure gauge port	1/8 (2 locations)		
Ambient and fluid temperature Note 4)	23 to 140°F [–5 to 60°C] (No freezing)		
Weight (kg) Note 5)	0.13	0.23	0.47

Note 1) When there is no flow rate on the outlet.
Note 2) Other characteristics such as aging deterioration and temperature characteristics are not included.
Note 3) Measuring conditions: supply pressure 145 psi [1.0 MPa], set pressure 29 psi [0.2 MPa]
Note 4) 23 to 140°F [–5 to 60°C] for the products with the digital pressure switch
Note 5) Without accessories

Accessories (Option)/Part No.

Description		**IR10□0-A**	**IR20□0-A**	**IR30□0-A**
Bracket assembly Note 1)		IR10P-501AS	IR20P-501AS	IR30P-501AS
Hexagon panel nut		IR10P-600S	IR20P-600S	IR20P-600S
Round type pressure gauge Note 2)	**0.2 MPa setting**	G33-2-□01	G43-2-□01	G43-2-□01
	0.4 MPa setting	G33-4-□01	G43-4-□01	G43-4-□01
	0.8 MPa setting	G33-10-□01	G43-10-□01	G43-10-□01
Digital pressure switch Note 3)	**NPN 1 output**	ISE30A-□01-N-ML		
	PNP 1 output	ISE30A-□01-P-ML		
	NPN 1 output/ Voltage output	ISE30A-□01-C-ML		
	NPN 1 output/ Current output	ISE30A-□01-D-ML		

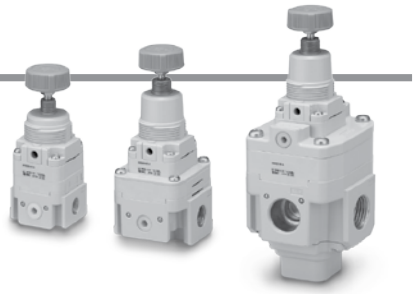
Note 1) This is an assembly of the bracket and resin panel nut.
Note 2) □ in part numbers for a round type pressure gauge indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT.
A 1.0 MPa pressure gauge is fitted for 0.8 MPa setting.
Please contact SMC regarding the supply of pressure gauge with psi unit specifications.
Note 3) □ in part numbers for a digital pressure switch indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT. For details on handling digital pressure switch and specifications, refer to the **WEB catalog** or the Best Pneumatics No. 6.
Please contact SMC regarding the supply of digital pressure switch with unit conversion function.

Modular Products and Accessories

Applicable products and accessories	Applicable size		
	Series IR1000-A	**Series IR2000-A**	**Series IR3000-A**
Filter	AF20-A	AF30-A	AF40-A
Spacer	Y200-A	Y300-A	Y400-A
Spacer with bracket	Y200T-A	Y300T-A	Y400T-A

Refer to the **WEB catalog** for details of the modular applicable products and accessories. The former modular and mounting brackets can be used.

How to Order



IR 1 0 0 0 – ❑ 01 BG – ❑ – A

❶ ❷ ❸ ❹ ❺ ❻ ❼

- Option/Semi-standard: Select one each for **a** to **f**.
- Option/Semi-standard symbol: When more than one specification is required, indicate in alphanumeric order.

		Symbol	Description	❶ Body size 1	2	3
❷	Set pressure range	**0**	0.73 to 29 psi (0.005 to 0.2 MPa)	●	●	—
			1.5 to 29 psi (0.01 to 0.2 MPa)	—	—	●
		1	1.5 to 58 psi (0.01 to 0.4 MPa)	●	●	●
		2	1.5 to 116 psi (0.01 to 0.8 MPa)	●	●	●
		+				
❸	Exhaust direction	**0**	Bottom exhaust	●	●	●
		1	Front exhaust	—	—	●
		2	Rear exhaust	—	—	●
		+				
❹	Pipe thread type	**Nil**	Rc	●	●	●
		N	NPT	●	●	●
		F	G	●	●	●
		+				
❺	Port size	**01**	1/8	●	—	—
		02	1/4	—	●	●
		03	3/8	—	—	●
		04	1/2	—	—	●
		+				
❻	Option Note 1)	**a** Mounting	**Nil**	Without mounting option	●	●	●
			B Note 2)	With bracket	●	●	●
			H	With hexagon panel nut (for panel mount)	●	●	●
		+					
		b Pressure gauge	**Nil**	Without pressure gauge	●	●	●
			G	Round type pressure gauge	●	●	●
		c With digital pressure switch	**EA**	NPN open collector 1 output	●	●	●
			EB	PNP open collector 1 output	●	●	●
			EC	NPN open collector 1 output + Analog voltage output	●	●	●
			ED	NPN open collector 1 output + Analog current output	●	●	●
		+					
❼	Semi-standard	**d** Flow direction	**Nil**	Flow direction: Left to right	●	●	●
			R	Flow direction: Right to left	●	●	●
		+					
		e Knob	**Nil**	Upward	●	●	●
			V	Downward	●	●	●
		+					
		f Pressure unit Note 3)	**Nil**	Name plate and pressure gauge in imperial units: MPa	●	●	●
			Z	Name plate and pressure gauge in imperial units: psi	●	●	●
			ZA	Digital pressure switch: With unit conversion function	●	●	●

Note 1) Options are shipped together with the product, but not assembled. B and H cannot be selected at the same time. The current bracket cannot be used for this product.
Note 2) Assembly of a bracket and set nuts.
Note 3) See pressure unit table below.

	Pipe thread type	Name plate in imperial units	Pressure gauge in imperial units: G	Pressure gauge in imperial units: EA, EB, EC, ED	Sales Note 6)
Nil	Rc	MPa	MPa	Fixed SI unit	Japan, Overseas
	NPT				
	G				
Z Note 4)	Rc	—	—	—	Only overseas
	NPT	psi	psi	With unit conversion function (Initial value psi)	
	G	—	—	—	
ZA Note 5)	Rc	MPa	—	With unit conversion function	Only overseas
	NPT				
	G				

Note 4) For pipe thread type: NPT
Note 5) For options: EA, EB, EC, ED
Note 6) According to the new Measurement Law, only the SI unit type is provided for use in Japan.

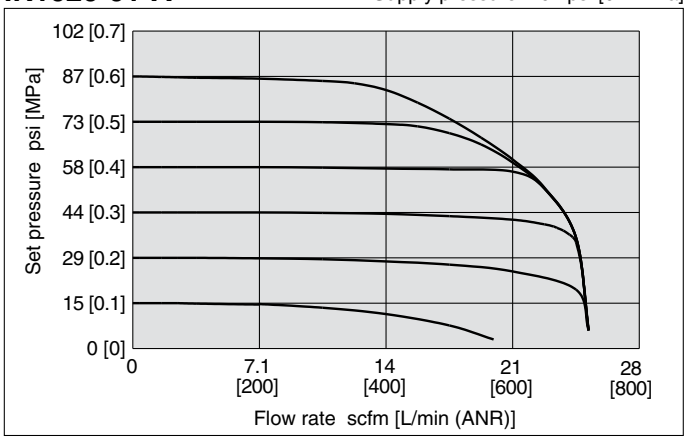
Series IR1000-A

∗ The data shown below are representative values, and are not guaranteed.

Flow-rate Characteristics

IR1020-01-A

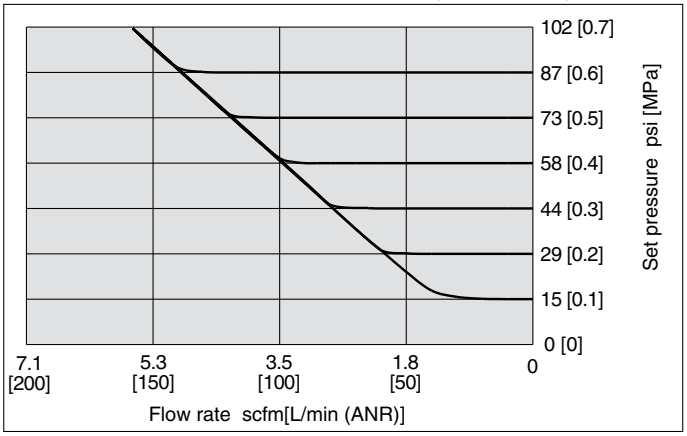
Supply pressure: 102 psi [0.7 MPa]



Relief Characteristics

IR1020-01-A

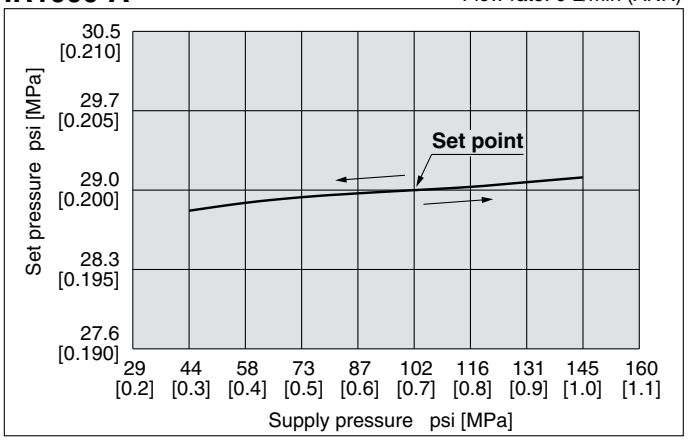
Back pressure: 102 psi [0.7 MPa]



Pressure Characteristics

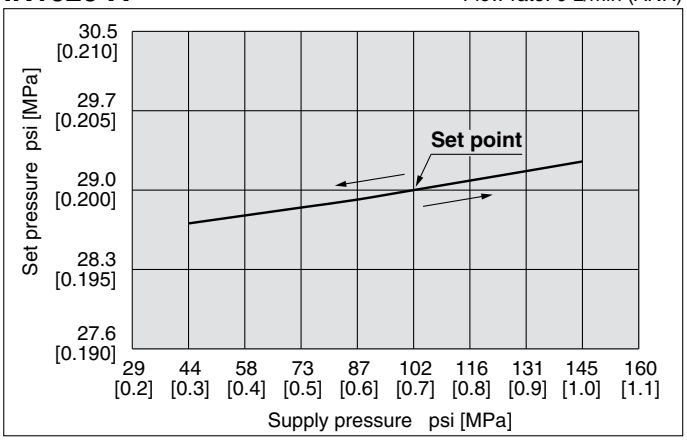
IR1000-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



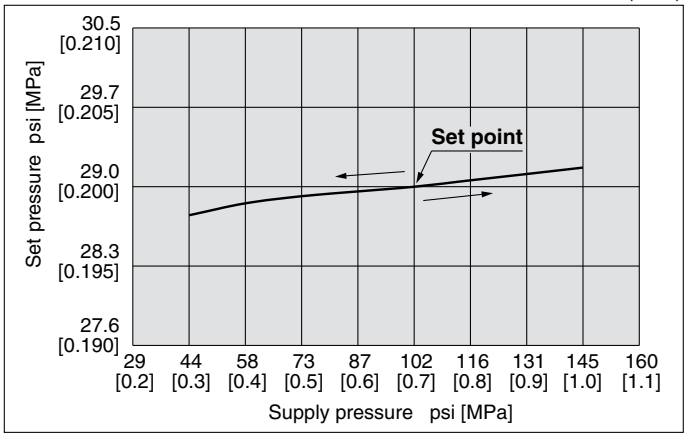
IR1020-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



IR1010-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



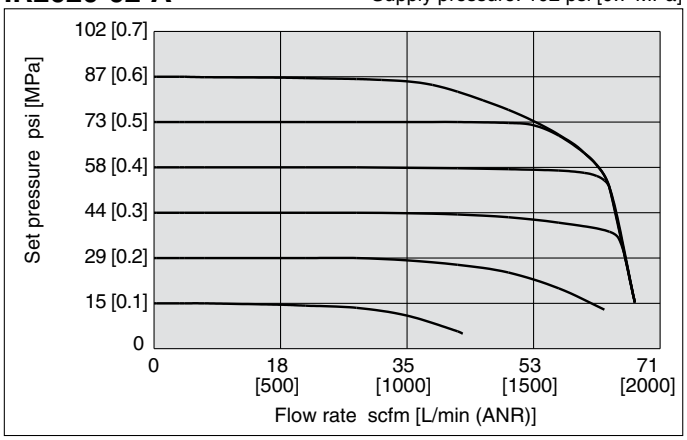
Series IR2000-A

∗ The data shown below are representative values, and are not guaranteed.

Flow-rate Characteristics

IR2020-02-A

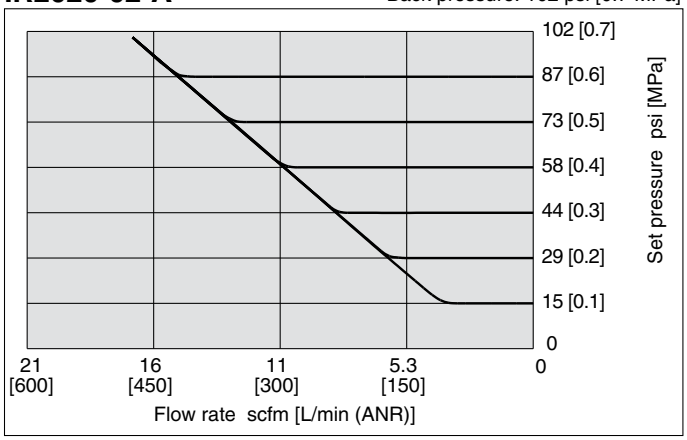
Supply pressure: 102 psi [0.7 MPa]



Relief Characteristics

IR2020-02-A

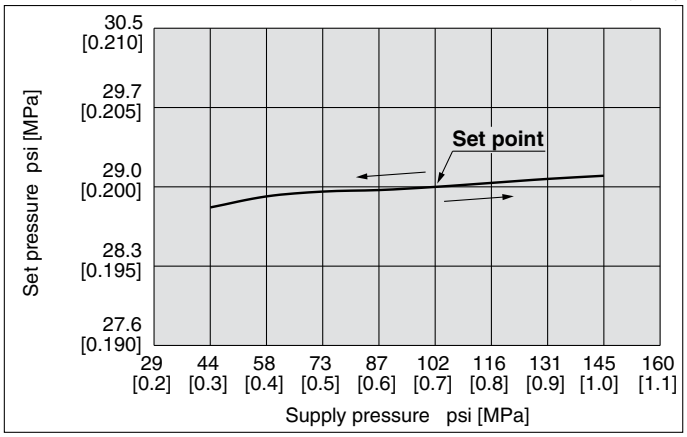
Back pressure: 102 psi [0.7 MPa]



Pressure Characteristics

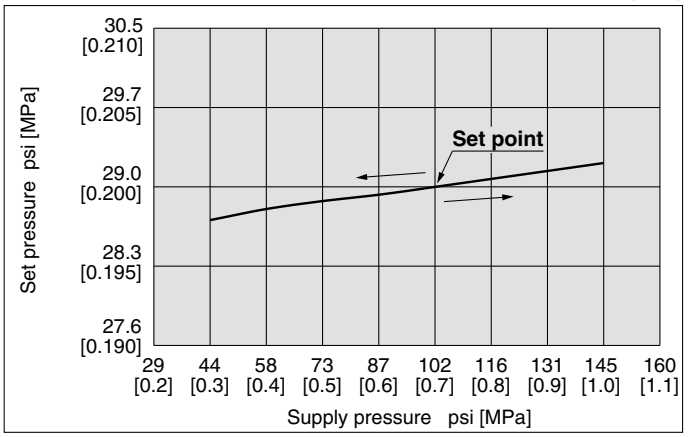
IR2000-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



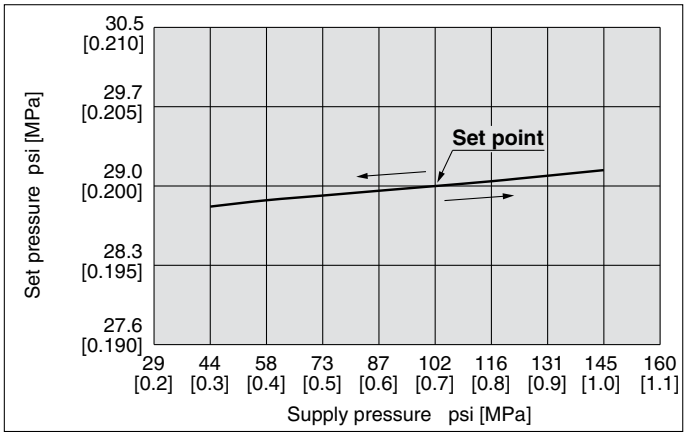
IR2020-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



IR2010-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



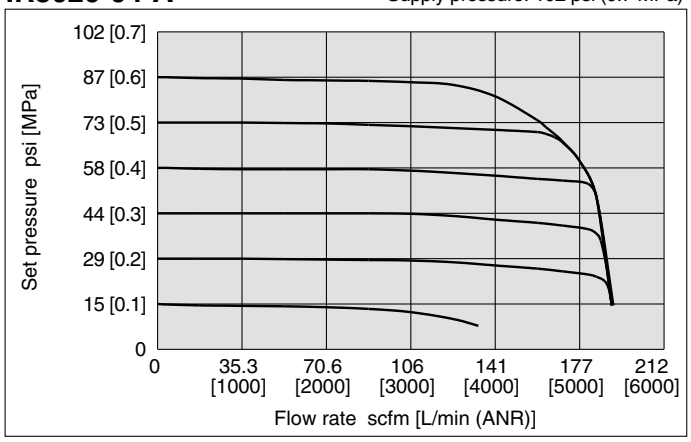
Series IR3000-A

∗ The data shown below are representative values, and are not guaranteed.

Flow-rate Characteristics

IR3020-04-A

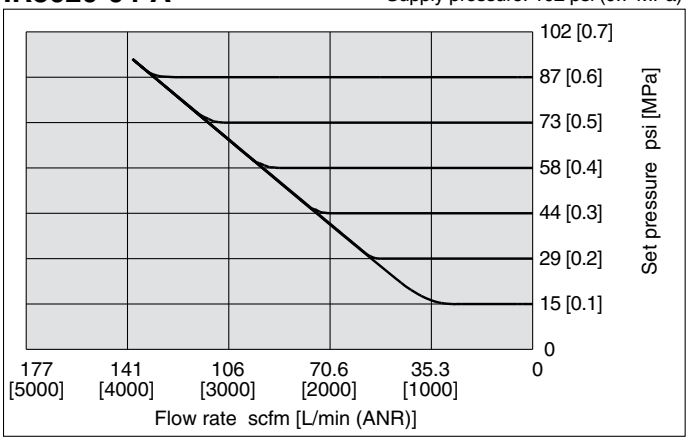
Supply pressure: 102 psi (0.7 MPa)



Relief Characteristics

IR3020-04-A

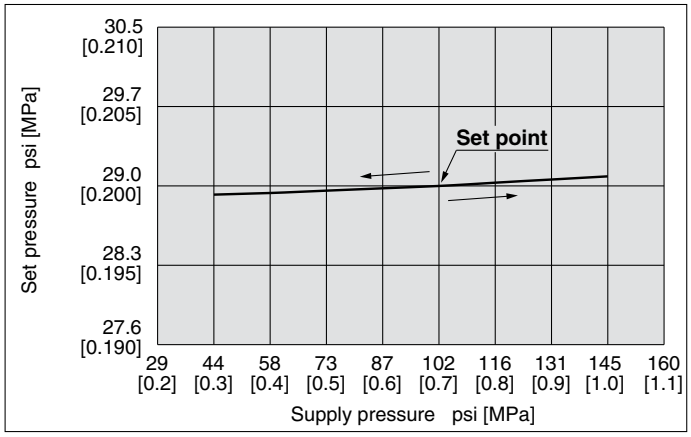
Supply pressure: 102 psi (0.7 MPa)



Pressure Characteristics

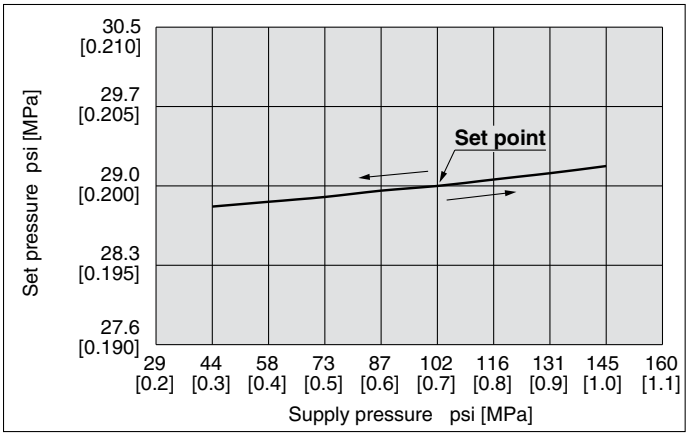
IR3000-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



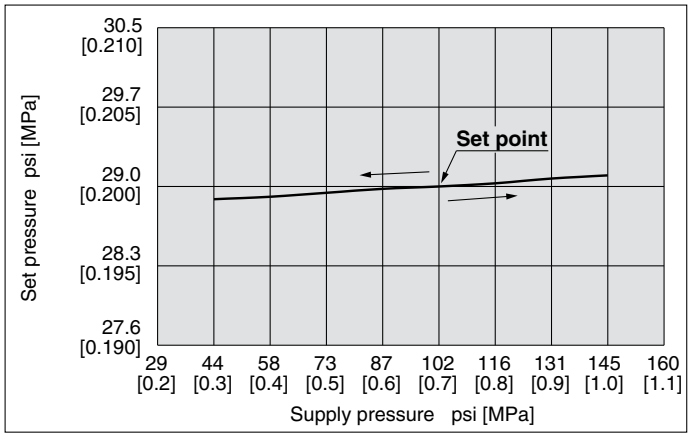
IR3020-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



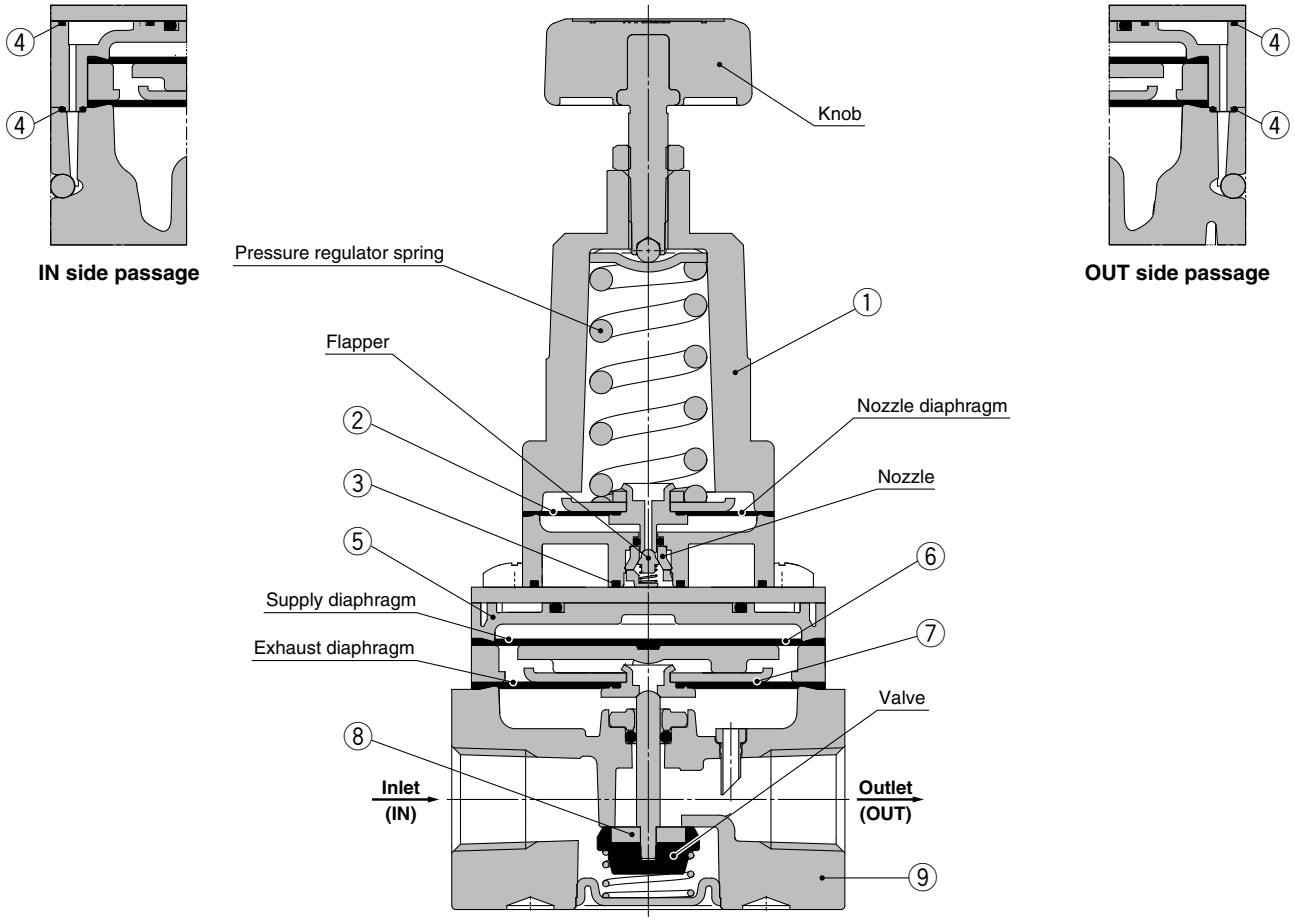
IR3010-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0 L/min (ANR)



Construction

Basic type (Knob): IR20□0-A



Working principle

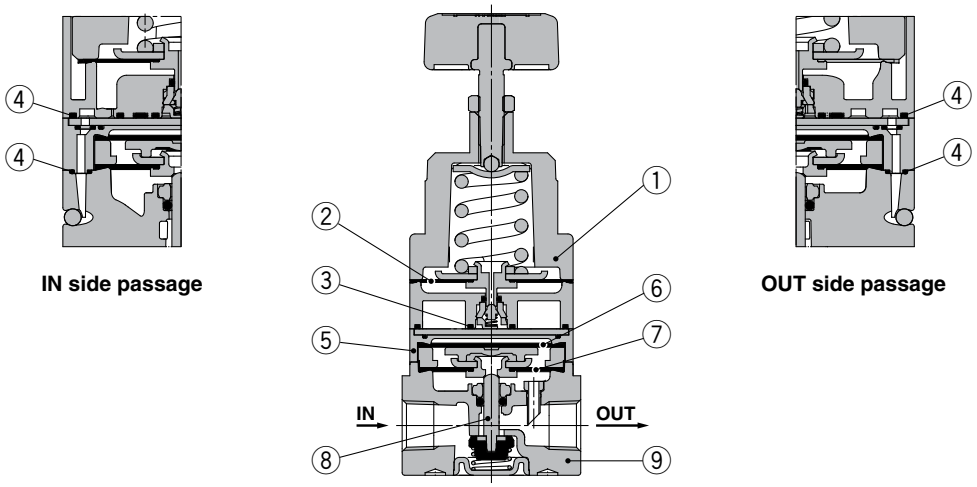
When the knob is rotated, the flapper is pushed through the spring, and a gap is generated between the nozzle and flapper. The supply pressure flows to the inlet passes through the path between the nozzle and flapper and acts on the supply diaphragm as nozzle back pressure. The force generated by the diaphragm pushes down the valve, and the supply pressure flows to the outlet. The discharged air pressure acts on the exhaust diaphragm, and counteracts against the force generated by the supply diaphragm. The air pressure acts on the nozzle diaphragm at the same time, and counteracts against the compression force of the spring to adjust the set pressure. When the set pressure increases too much, the nozzle diaphragm is pushed up, and a gap is generated between the flapper and nozzle diaphragm after the flapper is closed. The balance of the supply diaphragm and exhaust diaphragm is lost when the nozzle back pressure flows into the atmosphere. The exhaust valve is open after the valve is closed, and excess pressure on the outlet is released to the air. Due to this pilot mechanism, fine pressure variations are detected and precise pressure adjustment is possible.

Component Parts

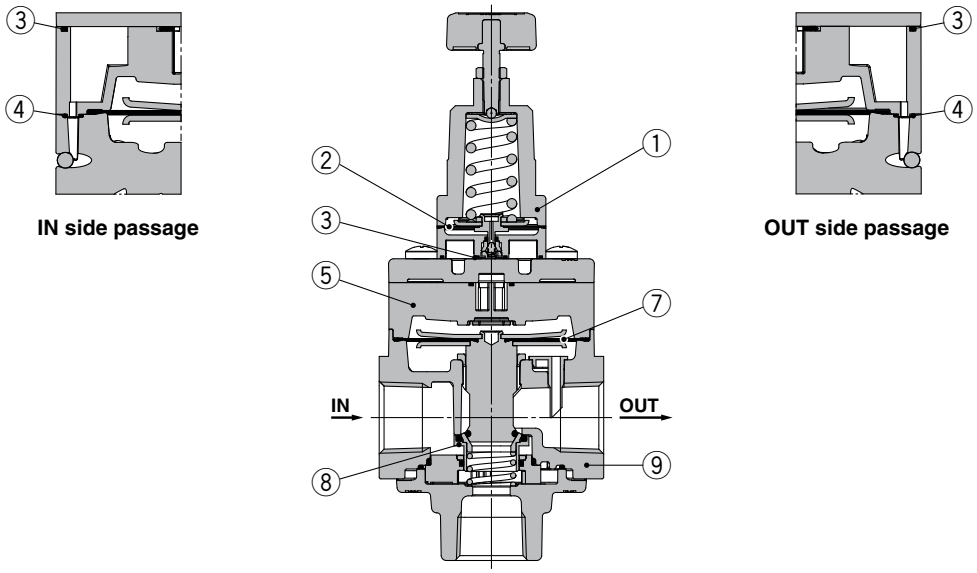
No.	Description	Material		
		IR1000-A	**IR2000-A**	**IR3000-A**
1	**Bonnet**	Aluminum die-casted		
2	**Nozzle diaphragm assembly**	Aluminum, Weather resistant NBR		
3	**Seal**	HNBR		
4	**Seal**	NBR		
5	**Diaphragm spacer**	Polyacetal		
6	**Supply diaphragm**	Weather resistant NBR		—
7	**Exhaust diaphragm assembly**	Steel, Aluminum, Weather resistant NBR		Aluminum, Weather resistant NBR, HNBR
8	**Valve assembly**	Stainless steel, Aluminum, HNBR		Aluminum, HNBR
9	**Body**	Aluminum die-casted		

Construction

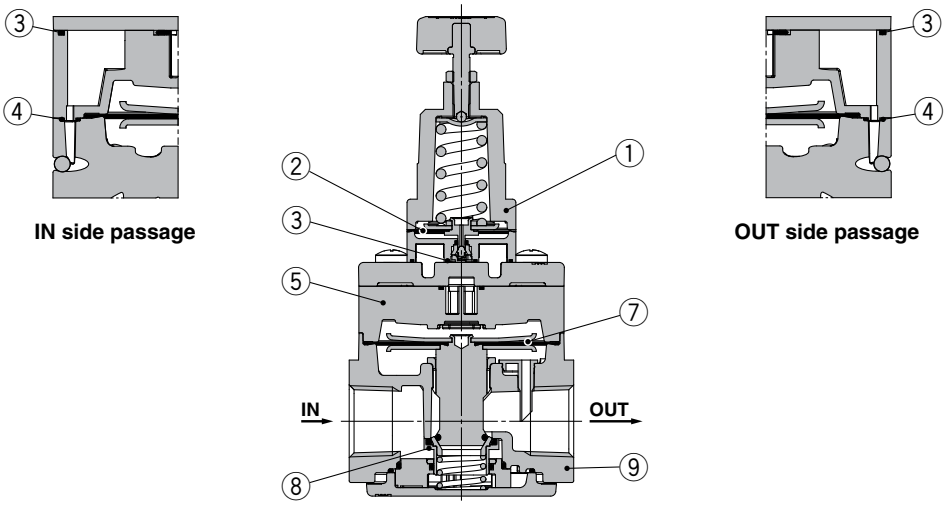
Basic type (Knob): IR10□0-A



Basic type (Knob): IR30□0-A

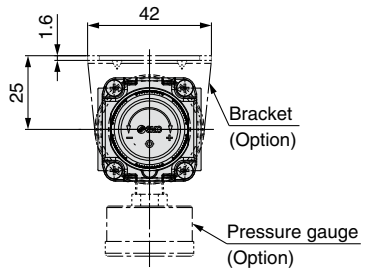


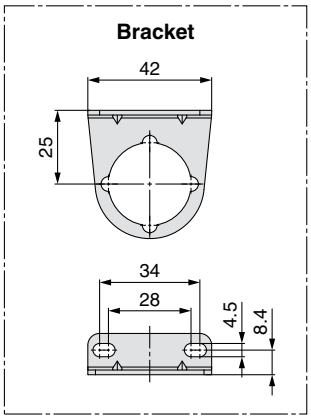
Basic type (Knob): IR30□$\frac{1}{2}$-A

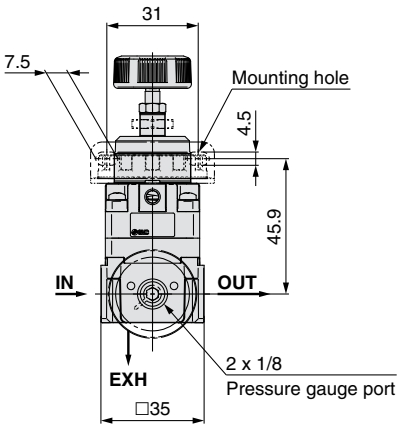


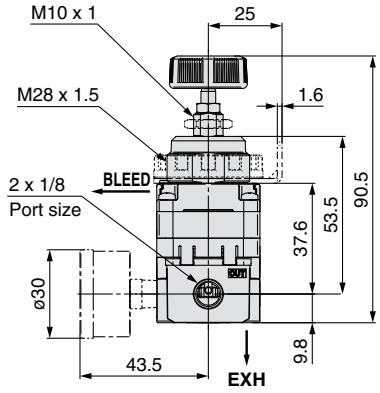
Dimensions

Basic type (Knob): IR10□0-01□-A



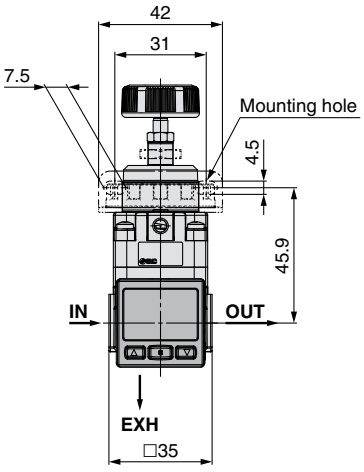


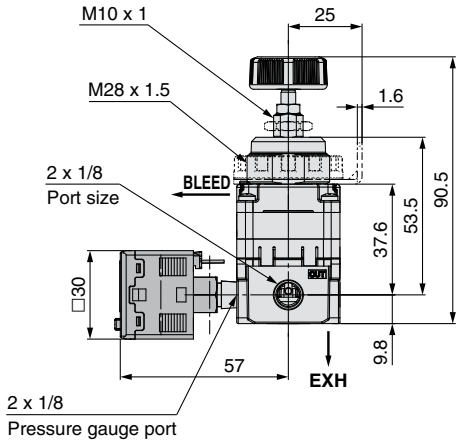




When connecting to the EXH port, contact your SMC sales representative separately.

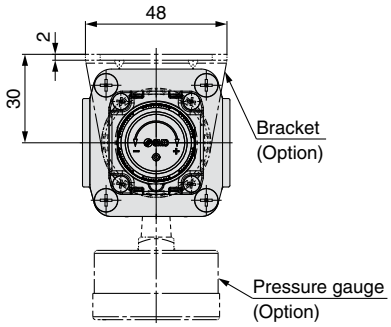
With digital pressure switch: IR10□0-01□E□-A

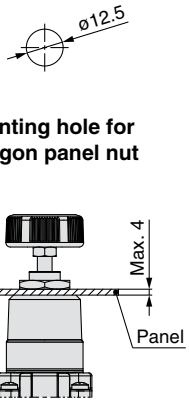


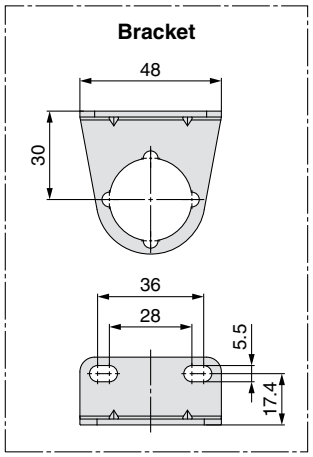


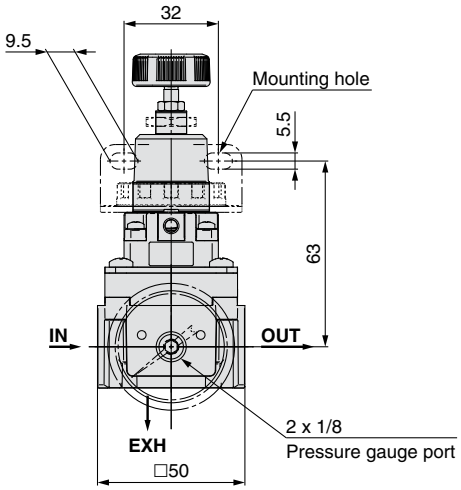
Dimensions

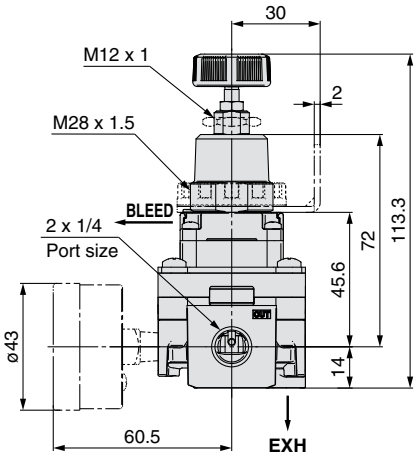
Basic type (Knob): IR20□0-02□-A





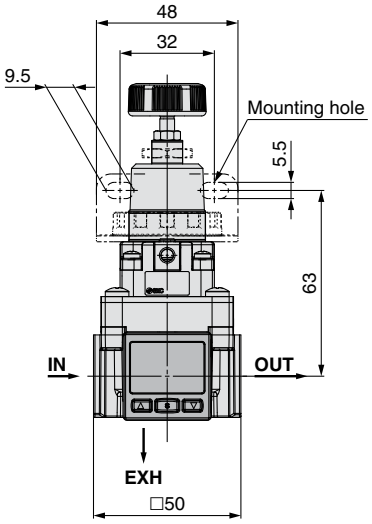


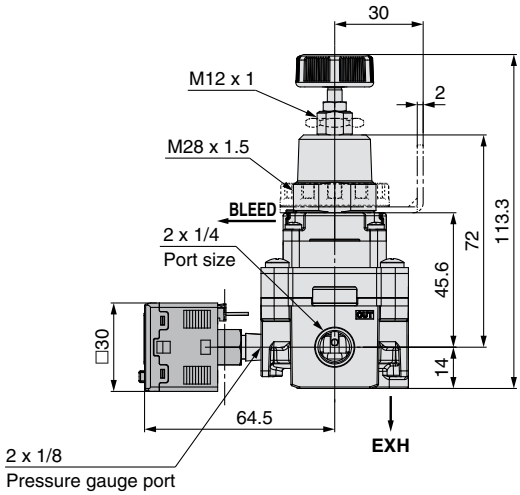




When connecting to the EXH port, contact your SMC sales representative separately.

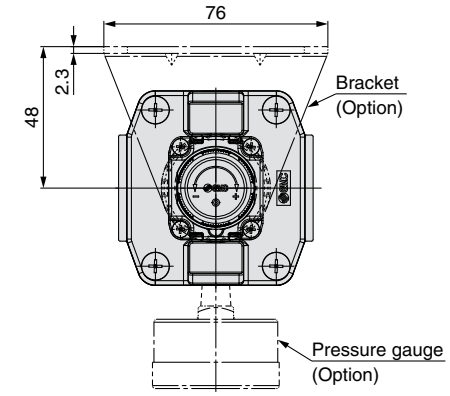
With digital pressure switch: IR20□0-02□E□-A

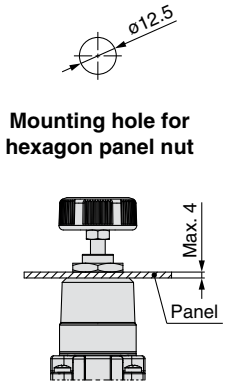


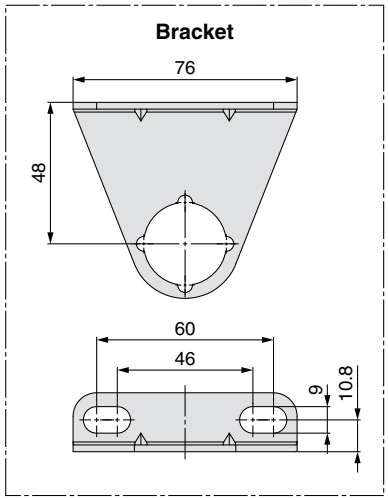


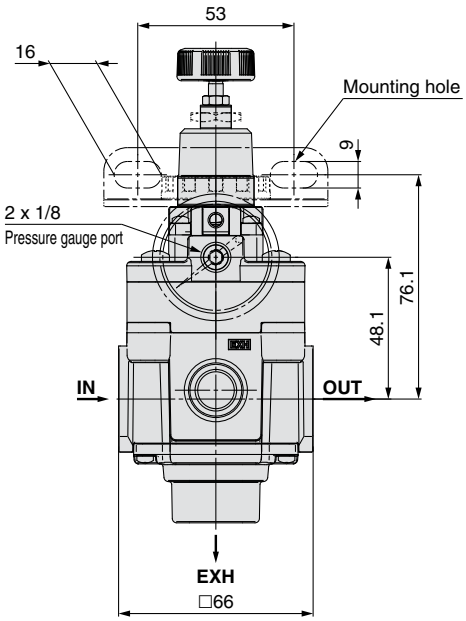
Dimensions

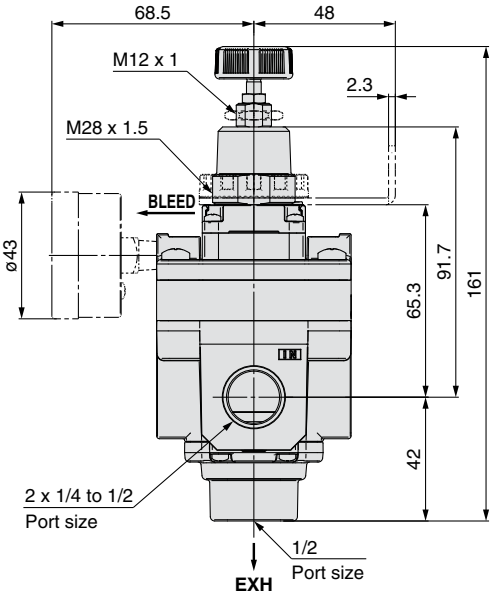
Basic type (Knob): IR30□0-0□□-A



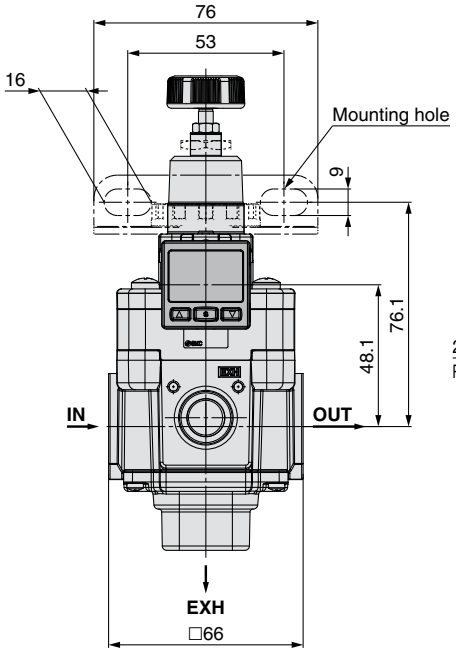


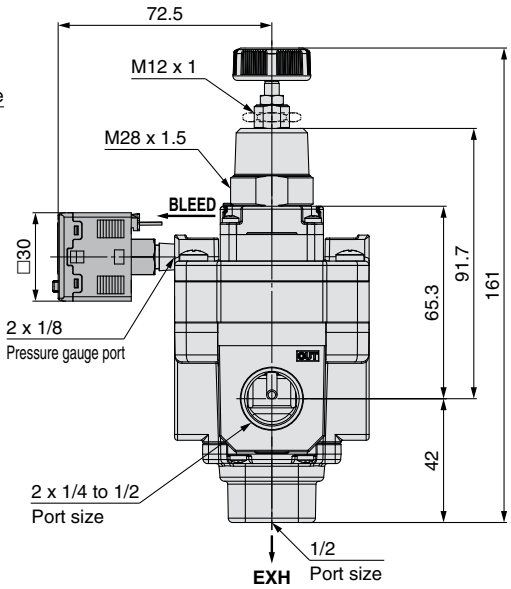






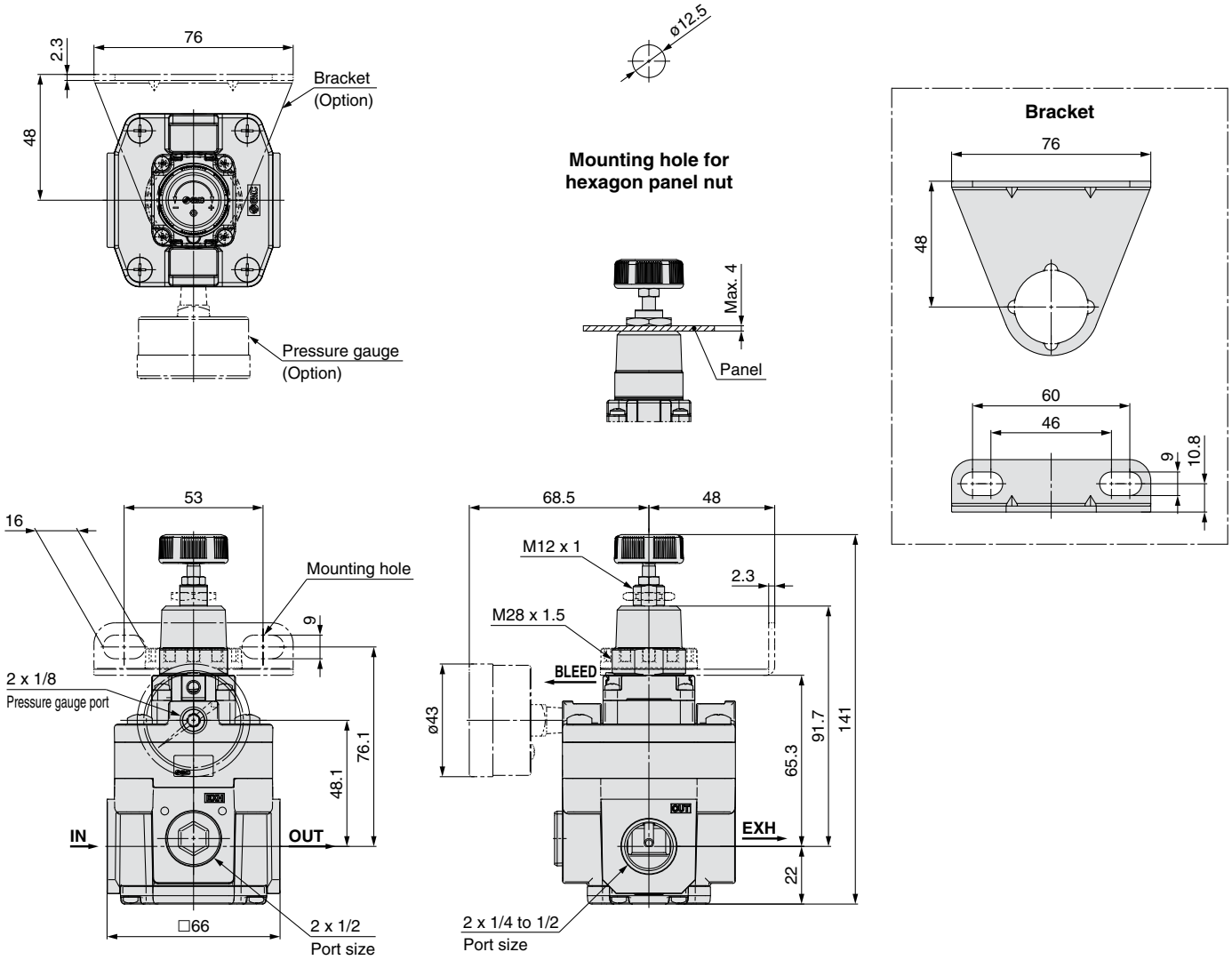
With digital pressure switch: IR30□0-0□□E□-A



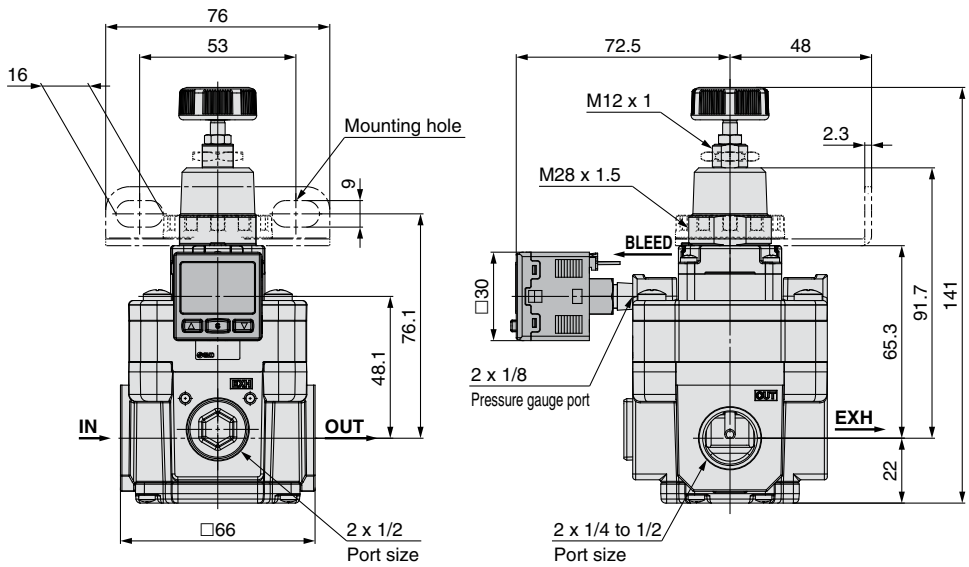


Dimensions

Basic type (Knob): IR30□$\frac{1}{2}$-0□□-A



With digital pressure switch: IR30□$\frac{1}{2}$-0□□E□-A



Specific Product Precautions 1

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For F.R.L. Units Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, http://www.smcworld.com

Piping

⚠Warning

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

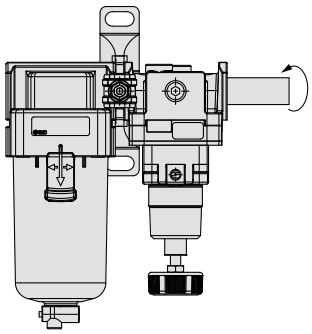
Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Furthermore, if the side with the female threads is not held while tightening, excessive force will be applied directly to piping brackets, etc., causing damage or other problems.

Recommended Proper Torque lbf·ft [N·m]

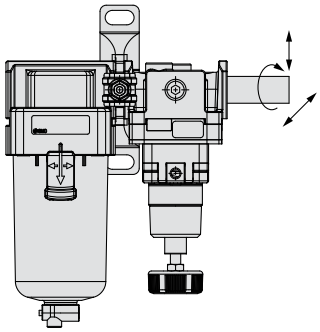
Connection thread	1/8	1/4	3/8	1/2 Note)
Torque	5.2 to 6.6 [7 to 9]	8.9 to 10.3 [12 to 14]	16.2 to 17.7 [22 to 24]	20.7 to 22.1 [28 to 30]

Note) Tightening force for connecting to the EXH port of IR30□$^{1}_{2}$-A is 5.9 to 7.4 lbf·ft (8 to 10 N·m).



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

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



3. Piping materials without flexibility such as steel tube piping are prone to be effected by excess moment load and vibration from the piping side. Use flexible tubing in between to avoid such an effect.

⚠Caution

1. Preparation before piping

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

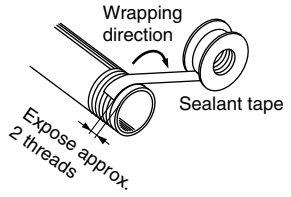
Piping

⚠Caution

2. Wrapping of sealant tape

When screwing piping or fittings into ports, ensure that metal chips from the pipe threads or sealing material do not enter the piping.

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



Operating Environment

⚠Warning

1. 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.

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

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

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

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

Air Supply

⚠Warning

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

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

3. If condensate in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensate to enter the outlet side. This will cause a malfunction of pneumatic equipment.

When removing drain is difficult, use of a filter with an auto drain is recommended.

⚠Caution

1. Condensate or dust, etc. in the supply pressure line can cause malfunctions. In addition to an air filter (SMC Series AF, etc.), please use a mist separator (SMC Series AM, AFM) depending on the conditions.

Refer to "Air Preparation Equipment Model Selection Guide" (Best Pneumatics No. 5) for air quality.

2. When a lubricator is used at the supply side of the product, it can cause malfunctions. Do not use a lubricator at the supply side of the product.

If lubrication is required for terminal devices, connect a lubricator on the output side of the regulator.

Series IR1000-A/2000-A/3000-A
Specific Product Precautions 2

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For F.R.L. Units Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, http://www.smcworld.com

Maintenance

⚠Warning

1. **When the product is removed for maintenance, reduce the set pressure to "0" and shut off the supply pressure completely beforehand.**
2. **When a pressure gauge is to be mounted, remove the plug after reducing the set pressure to "0".**
3. **When using the regulator between a solenoid valve and an actuator, check the pressure gauge periodically. Sudden pressure fluctuations may shorten the durability of the pressure gauge.**
   A digital pressure gauge is recommended for such situation or as deemed necessary.

Handling

⚠Caution

1. **When the precision regulator with pressure gauge is used, do not apply impact to the product by dropping it, etc. during transportation or installation.**
   This may cause misalignment of the pressure gauge pointer.

Operation

⚠Caution

1. **Do not use a precision regulator outside the range of its specifications as this can cause failure. (Refer to the specifications.)**
2. **When mounting is performed, make connections while confirming port indications.**
3. **When mounting the bracket or tightening the hexagon panel nut on the panel, tighten them to the recommended proper torque.**
   Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Recommended Proper Torque lbf·ft (N·m)

Set nut (for bracket)

IR10□0-A	IR20□0-A	IR30□□-A
1.5±0.15 (2.0±0.2)		

Hexagon panel nut (for knob type only)

IR10□0-A	IR20□0-A	IR30□□-A
2.6±0.39 (3.5±0.5)		

4. **After pressure adjustment, be sure to tighten the lock nut. When tightening the nut, tighten so that the knob does not move due to friction caused by tightening.**

Operation

⚠Caution

5. **When pressure is applied to the inlet of a regulator, make sure that the output is connected to the circuit. Air blow occurs from the outlet and it depends on the operating conditions.**
6. **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.**
7. **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.**
8. **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.
9. **The capacity of the output side is large, and when used for the purpose of a relief function, the exhaust sound will be loud when being relieved. Therefore, operate with a silencer (SMC Series AN, etc.) mounted on the exhaust port (EXH port).**
   When using the IR1000-A and 2000-A series, contact your SMC sales representative.
10. **When installing a pressure gauge to the product, do not apply pressure more than the maximum display pressure. This will cause a malfunction.**

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Global Manufacturing, Distribution and Service Network

Worldwide Subsidiaries

EUROPE

AUSTRIA
SMC Pneumatik GmbH (Austria)

BELGIUM
SMC Pneumatics N.V./S.A.

BULGARIA
SMC Industrial Automation Bulgaria EOOD

CROATIA
SMC Industrijska Automatika d.o.o.

CZECH
SMC Industrial Automation CZ s.r.o.

DENMARK
SMC Pneumatik A/S

ESTONIA
SMC Pneumatics Estonia

FINLAND
SMC Pneumatics Finland OY

FRANCE
SMC Pneumatique S.A.

GERMANY
SMC Pneumatik GmbH

GREECE
SMC Hellas EPE

HUNGARY
SMC Hungary Ipari Automatizálási Kft.

IRELAND
SMC Pneumatics (Ireland) Ltd.

ITALY
SMC Italia S.p.A.

LATVIA
SMC Pneumatics Latvia SIA

LITHUANIA
SMC Pneumatics Lietuva, UAB

NETHERLANDS
SMC Pneumatics BV

NORWAY
SMC Pneumatics Norway A/S

POLAND
SMC Industrial Automation Polska Sp.z.o.o.

ROMANIA
SMC Romania S.r.l.

RUSSIA
SMC Pneumatik LLC.

SLOVAKIA
SMC Priemyselná Automatizáciá, s.r.o.

SLOVENIA
SMC Industrijska Avtomatika d.o.o.

SPAIN / PORTUGAL
SMC España, S.A.

SWEDEN
SMC Pneumatics Sweden AB

SWITZERLAND
SMC Pneumatik AG

UK
SMC Pneumatics (U.K.) Ltd.

ASIA

CHINA
SMC (China) Co., Ltd.

HONG KONG
SMC Pneumatics (Hong kong) Ltd.

INDIA
SMC Pneumatics (India) Pvt. Ltd.

JAPAN
SMC Corporation

MALAYSIA
SMC Pneumatics (S.E.A.) Sdn. Bhd.

PHILIPPINES
SMC Pneumatics (Philippines), Inc.

SINGAPORE
SMC Pneumatics (S.E.A.) Pte. Ltd.

SOUTH KOREA
SMC Pneumatics Korea Co., Ltd.

TAIWAN
SMC Pneumatics (Taiwan) Co., Ltd.

THAILAND
SMC Thailand Ltd.

NORTH AMERICA

CANADA
SMC Pneumatics (Canada) Ltd.

MEXICO
SMC Corporation (Mexico) S.A. DE C.V.

USA
SMC Corporation of America

SOUTH AMERICA

ARGENTINA
SMC Argentina S.A.

BOLIVIA
SMC Pneumatics Bolivia S.R.L.

BRAZIL
SMC Pneumaticos do Brazil Ltda.

CHILE
SMC Pneumatics (Chile) S.A.

PERU
SMC Corporation Peru S.A.C.

VENEZUELA
SMC Neumatica Venezuela S.A.

OCEANIA

AUSTRALIA
SMC Pneumatics (Australia) Pty. Ltd.

NEW ZEALAND
SMC Pneumatics (N.Z.) Ltd.

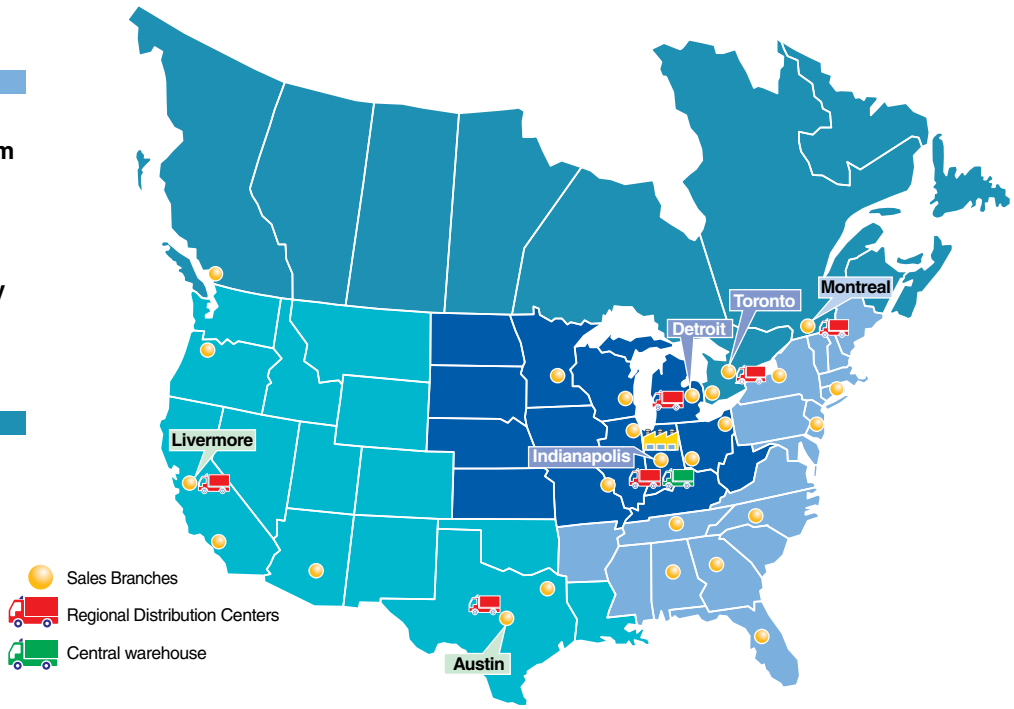
U.S. & Canadian Sales Offices

WEST
- Austin
- Dallas
- Los Angeles
- Phoenix
- Portland
- San Francisco

CENTRAL
- Chicago
- Cincinnati
- Cleveland
- Detroit
- Indianapolis
- Milwaukee
- Minneapolis
- St. Louis

EAST
- Atlanta
- Birmingham
- Boston
- Charlotte
- Nashville
- New Jersey
- Rochester
- Tampa

CANADA
- Montreal
- Toronto
- Vancouver
- Windsor



SMC Corporation of America
10100 SMC Blvd., Noblesville, IN 46060
www.smcusa.com

SMC Pneumatics (Canada) Ltd.
www.smcpneumatics.ca

(800) SMC.SMC1 (762-7621)
e-mail: **sales@smcusa.com**
International inquiries: **www.smcworld.com**

© 2015 SMC Corporation of America, All Rights Reserved.
All reasonable efforts to ensure the accuracy of the information detailed in this catalog were made at the time of publishing.
However, SMC can in no way warrant the information herein contained as specifications are subject to change without notice.

Regulator

New
RoHS

Air consumption
Air Bleed "0"

Lightweight
Reduced by up to approx. 27%*

[kg]

New IR	Current model	Series
0.13	0.14	IR1200-A
0.23	0.30	IR2200-A
0.47	0.64	IR3200-A

* Compared with the current IR1000/2000/3000

High flow rate
Up to approx. twice*

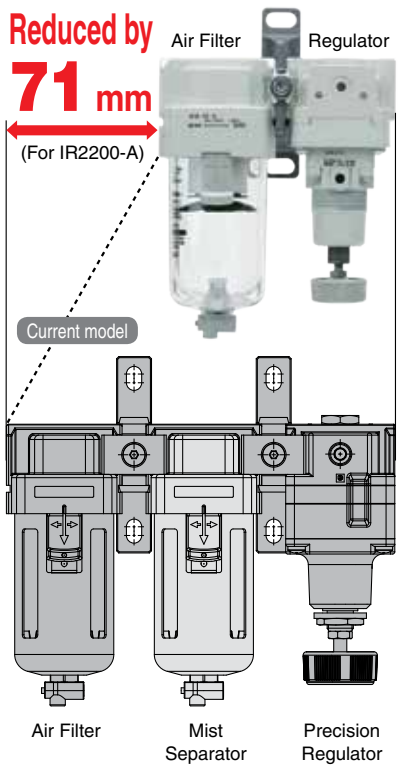
scfm [L/min (ANR)]

New IR	Current model	Series
25.4 [720]	11.3 [320]	IR1200-A
67.1 [1900]	33.2 [940]	IR2200-A
177 [5000]	141 [4000]	IR3200-A

* Compared with the current IR1000/2000/3000

Space saving

New structure without fixed throttle does not require a mist separator.



Series IR1200-A/2200-A/3200-A

SMC
CAT.NAS60-24A

Reduction in air consumption

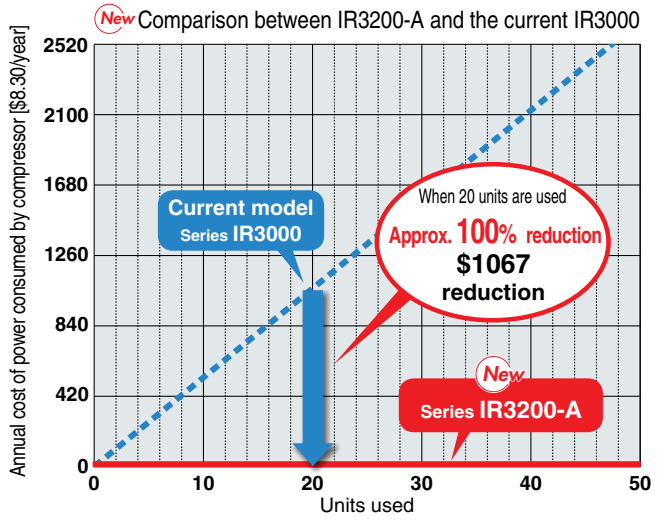
Air consumption is reduced with a new original structure.

With this new original structure, running costs are reduced.

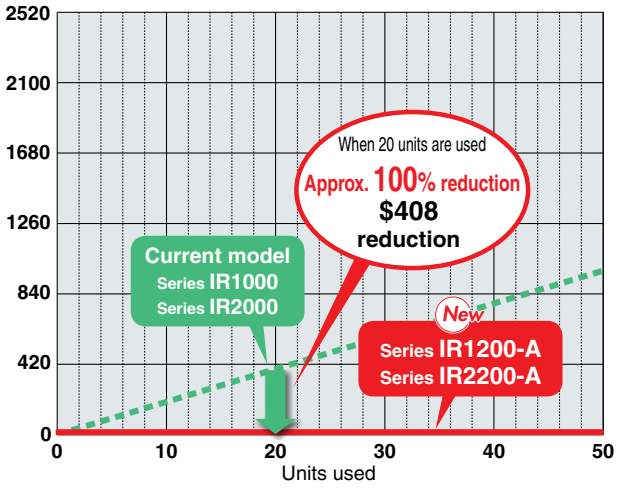
[Calculation conditions] Electric power cost: $0.013/ft³
[Work model] Working hours: 6000 h (250 days/year)
Supply pressure: 145 psi (1.0 MPa)
Set pressure: 29 psi (0.2 MPa)

Annual cost reduction effect

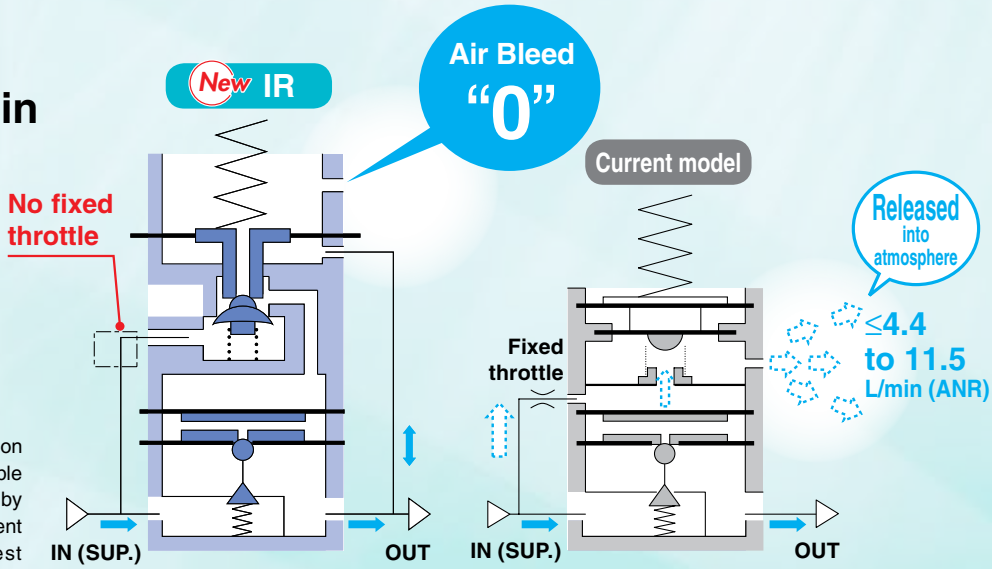
New Comparison between IR3200-A and the current IR3000



New Comparison between IR1200-A/IR2200-A and the current IR1000/IR2000



No fixed throttle in the new design.



* Poor quality of air may cause operation failure. Select a model that is suitable for the desired air cleanliness by referring to "Air Preparation Equipment Model Selection Guide" (Best Pneumatics No. 5) for air quality.

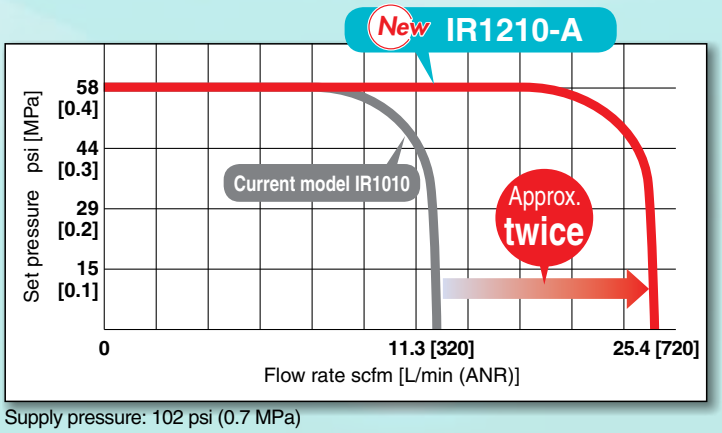
Flow rate: Up to approx. twice

(Compared to the current SMC product)

scfm [L/min (ANR)]

New IR	Current model	Series
25.4 [720]	11.3 [320]	IR1200-A
67.1 [1900]	33.2 [940]	IR2200-A
177 [5000]	141 [4000]	IR3200-A

Supply pressure: 102 psi (0.7 MPa)



Supply pressure: 102 psi (0.7 MPa)

Weight Reduced by up to approx. 27%

[kg]

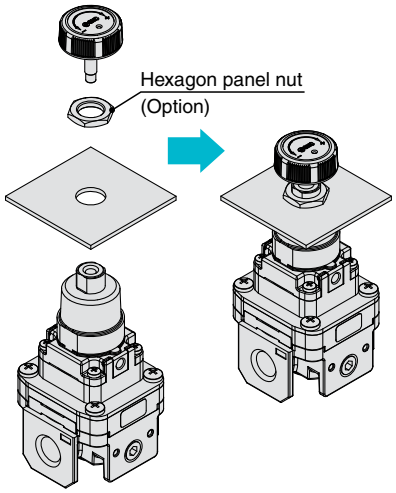
New IR	Current model	Series
0.13	0.14	IR1200-A
0.23	0.30	IR2200-A
0.47	0.64	IR3200-A

Digital pressure switch standardized

Pressure gauge

Hexagon panel nut mounting

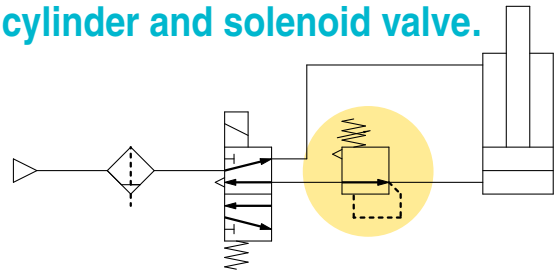
∗ Interchangeable with the current SMC product



Repeatability: ±1% (Full span)

Mounting is interchangeable with the current SMC model.

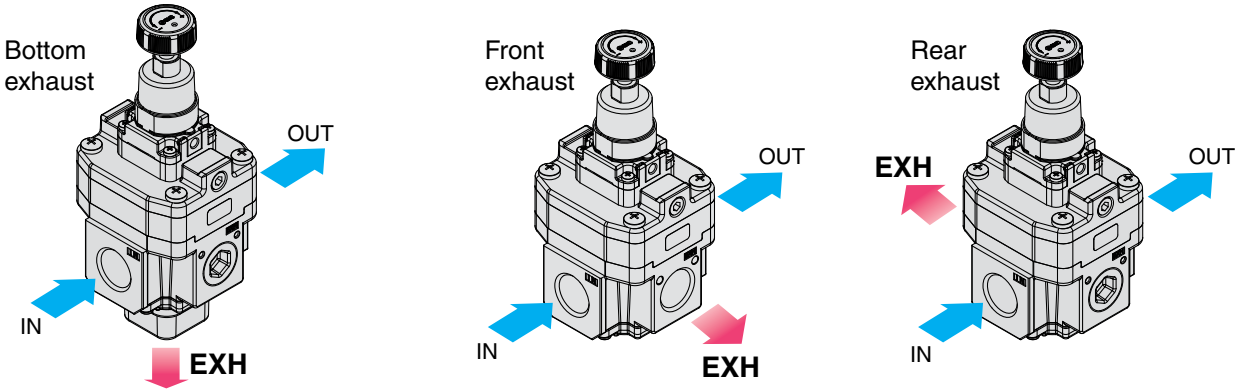
New IR can be used between a cylinder and solenoid valve.



Note) The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.

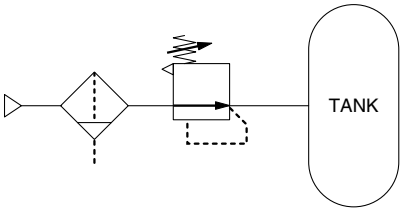
Exhaust (EXH) directions can be selected. (Series IR3200-A)

New Bottom and front exhaust added.



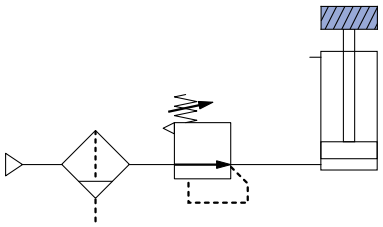
Application Examples

Constant fluid pressure Note)



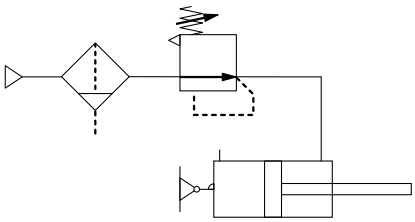
- Since there is a large effective area for supply and exhaust pressure, setting can be done quickly.

Balance and drive Accurate balance pressure setting Note)



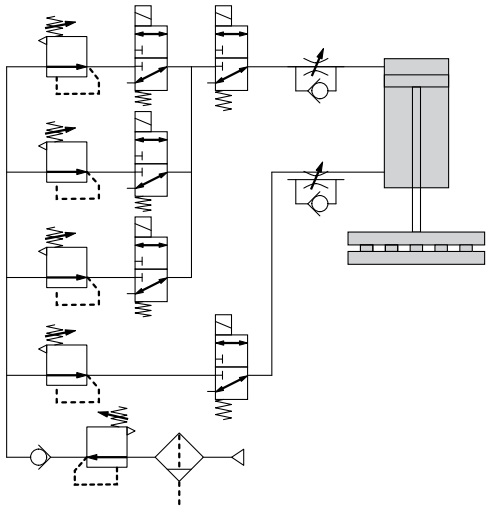
- Limits pressure fluctuation when driving a cylinder, maintaining excellent static and dynamic balance.

Contact pressure control Note)



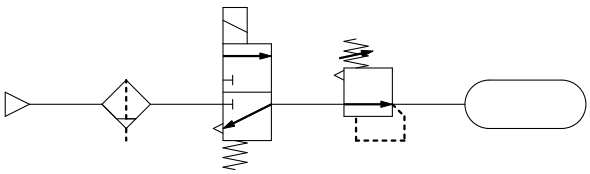
- Adapts to the cylinder's piston displacement, maintaining a constant pressure.

Multistage control of pressing force for workpiece (Wrapping machine) Note)



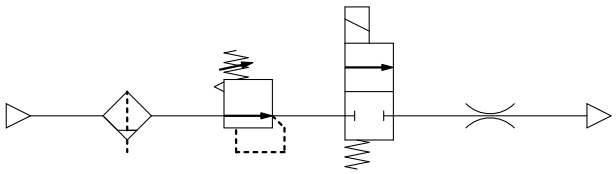
Residual pressure relief Note)

Ex.) Backflow from the tank



- Residual pressure is exhausted by relief function.
- It can be used between a cylinder and solenoid valve.

Adjustment of blow-line pressure Note)



- Outlet pressure is less affected by fluctuation of inlet pressure. New IR offers consistent pressure control.

Note) The set pressure may vary depending on the elapsed time and change in ambient temperature after pressure setting. If the setting value varies, adjust the pressure with the knob.

Series Variations

Basic Type (Knob)

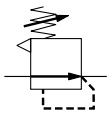
Series	Model	Set pressure range psi (MPa)	Port size
IR1200-A 	**IR1200-A**	2.9 to 29 [0.02 to 0.2]	1/8
	IR1210-A	2.9 to 58 [0.02 to 0.4]	
	IR1220-A	2.9 to 116 [0.02 to 0.8]	
IR2200-A 	**IR2200-A**	2.9 to 29 [0.02 to 0.2]	1/4
	IR2210-A	2.9 to 58 [0.02 to 0.4]	
	IR2220-A	2.9 to 116 [0.02 to 0.8]	
IR3200-A 	**IR3200-A**	2.9 to 29 [0.02 to 0.2]	1/4, 3/8, 1/2
	IR3210-A	2.9 to 58 [0.02 to 0.4]	
	IR3220-A	2.9 to 116 [0.02 to 0.8]	

Regulator

Series IR1200-A/2200-A/3200-A

RoHS

Symbol



Basic type
(Knob)

Standard Specifications

Model	Basic type (Knob)		
	IR12□0-A	**IR22□0-A**	**IR32□0-A**
Fluid	Air		
Proof pressure	218 psi (1.5 MPa)		
Max. supply pressure	145 psi (1.0 MPa)		
Min. supply pressure Note 1)	Set pressure + 7.3 psi (0.05 MPa)		Set pressure + 15 psi (0.1 MPa)
Set pressure range	IR1200-A: 2.9 to 29 psi (0.02 to 0.2 MPa)	IR2200-A: 2.9 to 29 psi (0.02 to 0.2 MPa)	IR3200-A: 2.9 to 29 psi (0.02 to 0.2 MPa)
	IR1210-A: 2.9 to 58 psi (0.02 to 0.4 MPa)	IR2210-A: 2.9 to 58 psi (0.02 to 0.4 MPa)	IR3210-A: 2.9 to 58 psi (0.02 to 0.4 MPa)
	IR1220-A: 2.9 to 116 psi (0.02 to 0.8 MPa)	IR2220-A: 2.9 to 116 psi (0.02 to 0.8 MPa)	IR3220-A: 2.9 to 116 psi (0.02 to 0.8 MPa)
Repeatability Note 2)	Within ±1% of full span		
Port size	1/8	1/4	1/4, 3/8, 1/2
Pressure gauge port	1/8 (2 locations)		
Ambient and fluid temperature Note 3)	23 to 140°F (–5 to 60°C) (No freezing)		
Weight (kg) Note 4)	0.13	0.23	0.47

Note 1) When there is no flow rate on the outlet.
Note 2) Other characteristics such as aging deterioration and temperature characteristics are not included.
Note 3) 23 to 140°F (–5 to 60°C) for the products with the digital pressure switch
Note 4) Without accessories

Accessories (Option)/Part No.

Description		**IR12□0-A**	**IR22□0-A**	**IR32□0-A**
Bracket assembly Note 1)		IR10P-501AS	IR20P-501AS	IR30P-501AS
Hexagon panel nut		IR10P-600S	IR20P-600S	IR20P-600S
Round type pressure gauge Note 2)	**0.2 MPa setting**	G33-2-□01	G43-2-□01	G43-2-□01
	0.4 MPa setting	G33-4-□01	G43-4-□01	G43-4-□01
	0.8 MPa setting	G33-10-□01	G43-10-□01	G43-10-□01
Digital pressure switch Note 3)	**NPN 1 output**	ISE30A-□01-N-ML		
	PNP 1 output	ISE30A-□01-P-ML		
	NPN 1 output/ Voltage output	ISE30A-□01-C-ML		
	NPN 1 output/ Current output	ISE30A-□01-D-ML		

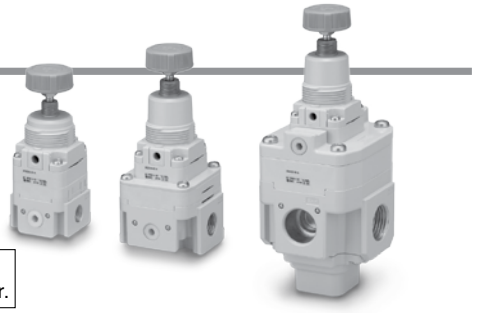
Note 1) This is an assembly of the bracket and resin panel nut.
Note 2) □ in part numbers for a round type pressure gauge indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT.
A 145 psi (1.0 MPa) pressure gauge is fitted for 116 psi (0.8 MPa) setting.
Please contact SMC regarding the supply of pressure gauge with psi unit specifications.
Note 3) □ in part numbers for a digital pressure switch indicates a type of connection thread. No indication is necessary for R; however, indicate N for NPT. For details on handling digital pressure switch and specifications, refer to the WEB catalog or the Best Pneumatics No. 6.
Please contact SMC regarding the supply of digital pressure switch with unit conversion function.

Modular Products and Accessories

Applicable products and accessories	Applicable size		
	Series IR1200-A	**Series IR2200-A**	**Series IR3200-A**
Filter	AF20-A	AF30-A	AF40-A
Spacer	Y200-A	Y300-A	Y400-A
Spacer with bracket	Y200T-A	Y300T-A	Y400T-A

Refer to the **WEB catalog** for details of the modular applicable products and accessories. The former modular and mounting brackets can be used.

How to Order



IR 1 2 0 0 – ❹ 01 BG – ❼ – A

❶ ❷ ❸ ❹ ❺ ❻ ❼

- Option/Semi-standard: Select one each for **a** to **f**.
- Option/Semi-standard symbol: When more than one specification is required, indicate in alphanumeric order.

		Symbol	Description	❶ Body size 1	2	3
❷	Set pressure range	**0**	2.9 to 29 psi (0.02 to 0.2 MPa)	●	●	●
		1	2.9 to 58 psi (0.02 to 0.4 MPa)	●	●	●
		2	2.9 to 116 psi (0.02 to 0.8 MPa)	●	●	●
		+				
❸	Exhaust direction	**0**	Bottom exhaust	●	●	●
		1	Front exhaust	—	—	●
		2	Rear exhaust	—	—	●
		+				
❹	Pipe thread type	**Nil**	Rc	●	●	●
		N	NPT	●	●	●
		F	G	●	●	●
		+				
❺	Port size	**01**	1/8	●	—	—
		02	1/4	—	●	●
		03	3/8	—	—	●
		04	1/2	—	—	●
		+				
❻	Option Note 1)	**a** Mounting	**Nil** Without mounting option	●	●	●
			B Note 2) With bracket	●	●	●
			H With hexagon panel nut (for panel mount)	●	●	●
		+				
		b Pressure gauge	**Nil** Without pressure gauge	●	●	●
			G Round type pressure gauge	●	●	●
		c With digital pressure switch	**EA** NPN open collector 1 output	●	●	●
			EB PNP open collector 1 output	●	●	●
			EC NPN open collector 1 output + Analog voltage output	●	●	●
			ED NPN open collector 1 output + Analog current output	●	●	●
		+				
❼	Semi-standard	**d** Flow direction	**Nil** Flow direction: Left to right	●	●	●
			R Flow direction: Right to left	●	●	●
		+				
		e Knob	**Nil** Upward	●	●	●
			V Downward	●	●	●
		+				
		f Pressure unit Note 3)	**Nil** Name plate and pressure gauge in imperial units: MPa	●	●	●
			Z Name plate and pressure gauge in imperial units: psi	●	●	●
			ZA Digital pressure switch: With unit conversion function	●	●	●

Note 1) Options are shipped together with the product, but not assembled. B and H cannot be selected at the same time. The current bracket cannot be used for this product.
Note 2) Assembly of a bracket and set nuts.
Note 3) See pressure unit table below.

	Pipe thread type	Name plate in imperial units	Pressure gauge in imperial units: G	Pressure gauge in imperial units: EA, EB, EC, ED	Sales Note 6)
Nil	Rc	MPa	MPa	Fixed SI unit	Japan, Overseas
	NPT				
	G				
Z Note 4)	Rc	—	—	—	Only overseas
	NPT	psi	psi	With unit conversion function (Initial value psi)	
	G	—	—	—	
ZA Note 5)	Rc	MPa	—	With unit conversion function	Only overseas
	NPT				
	G				

Note 4) For pipe thread type: NPT
Note 5) For options: EA, EB, EC, ED
Note 6) According to the new Measurement Law, only the SI unit type is provided for use in Japan.

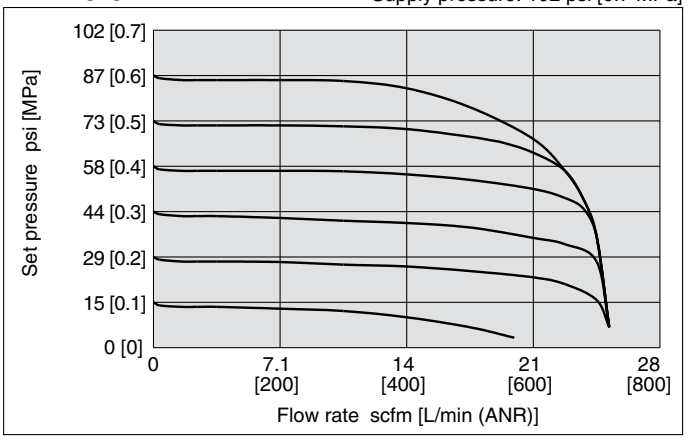
Series IR1200-A

∗ The data shown below are representative values, and are not guaranteed.

Flow-rate Characteristics

IR1220-01-A

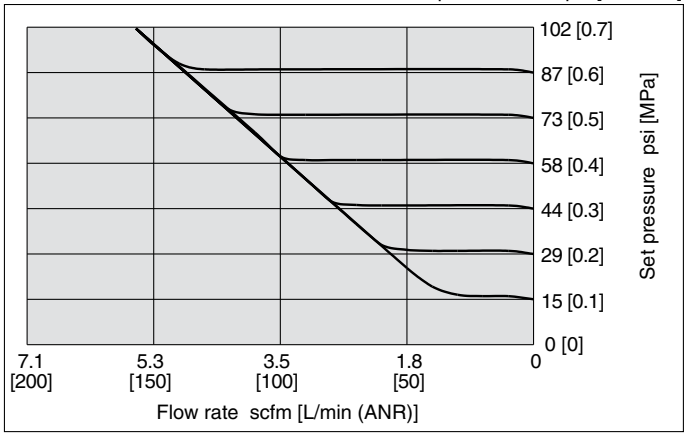
Supply pressure: 102 psi [0.7 MPa]



Relief Characteristics

IR1220-01-A

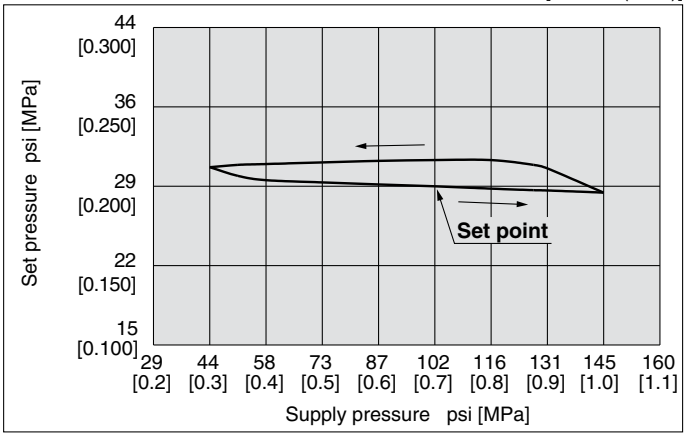
Back pressure: 102 psi [0.7 MPa]



Pressure Characteristics

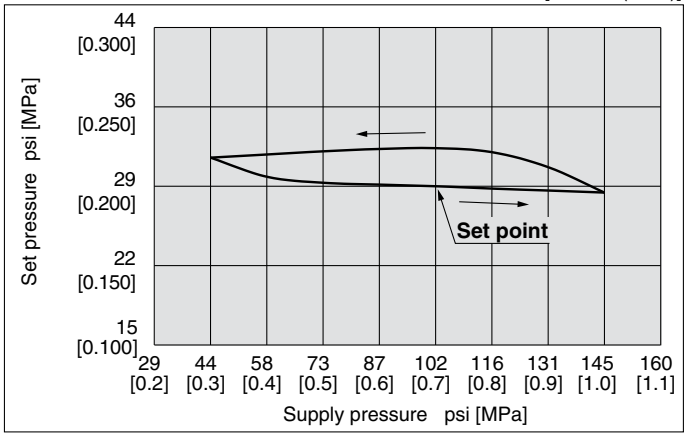
IR1200-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



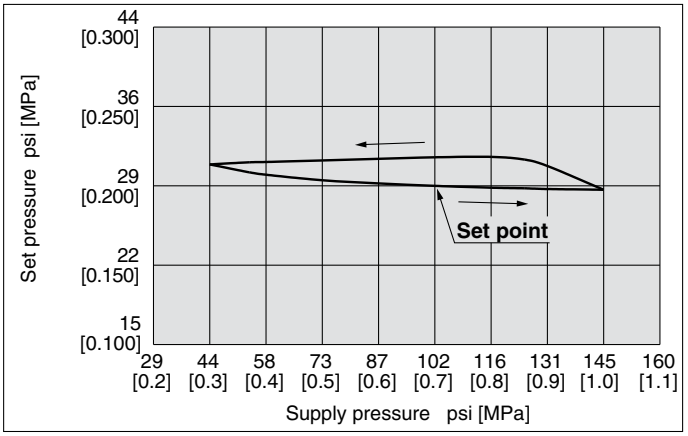
IR1220-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



IR1210-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



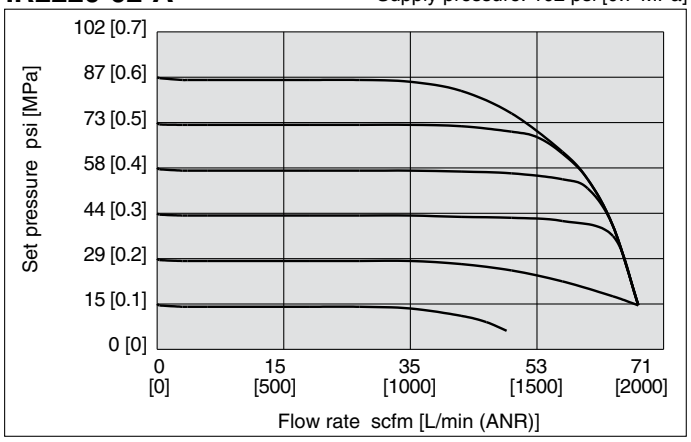
Series IR2200-A

∗ The data shown below are representative values, and are not guaranteed.

Flow-rate Characteristics

IR2220-02-A

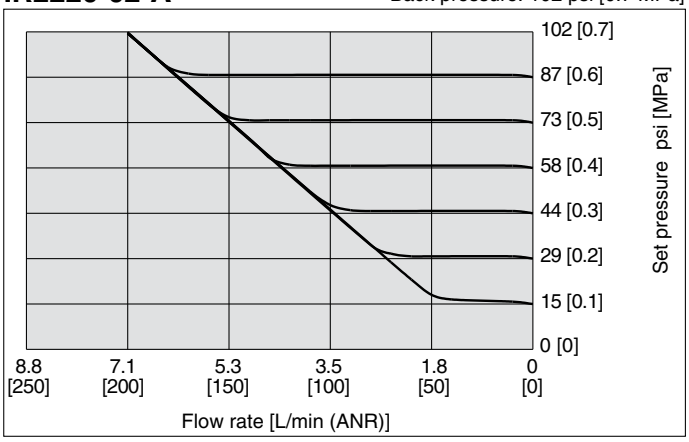
Supply pressure: 102 psi [0.7 MPa]



Relief Characteristics

IR2220-02-A

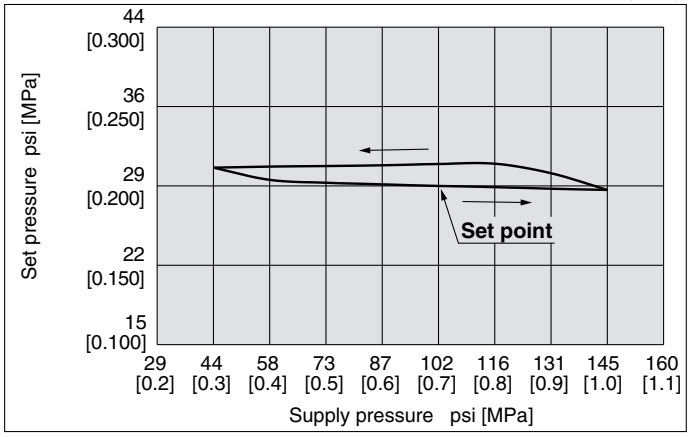
Back pressure: 102 psi [0.7 MPa]



Pressure Characteristics

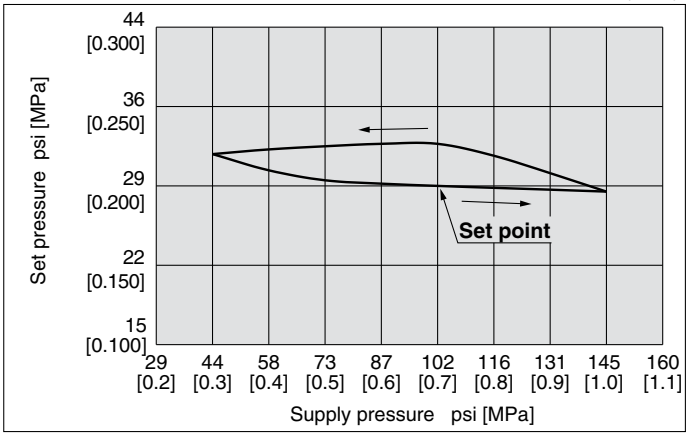
IR2200-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



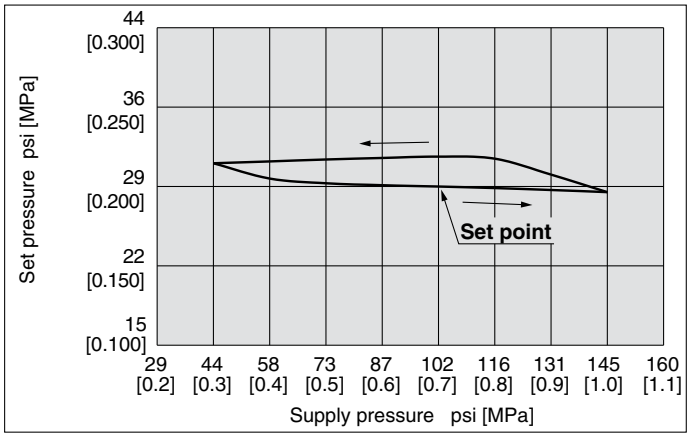
IR2220-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



IR2210-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



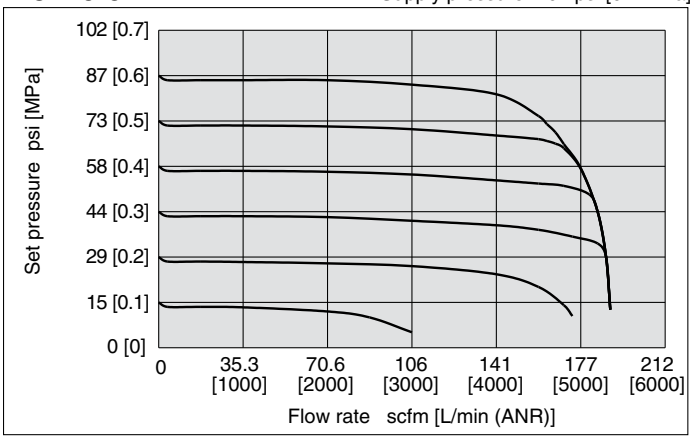
Series IR3200-A

∗ The data shown below are representative values, and are not guaranteed.

Flow-rate Characteristics

IR3220-04-A

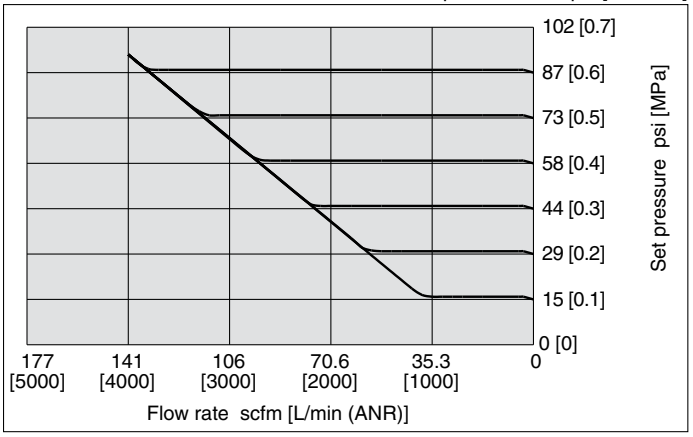
Supply pressure: 102 psi [0.7 MPa]



Relief Characteristics

IR3220-04-A

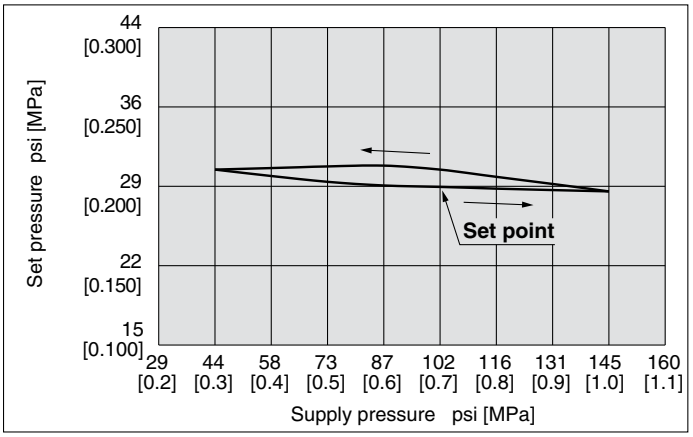
Back pressure: 102 psi [0.7 MPa]



Pressure Characteristics

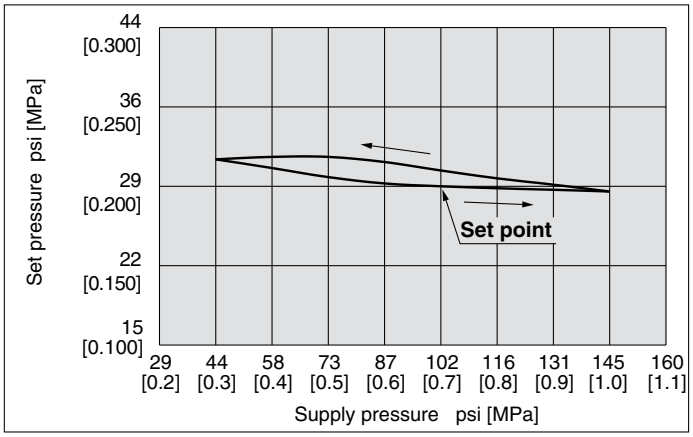
IR3200-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



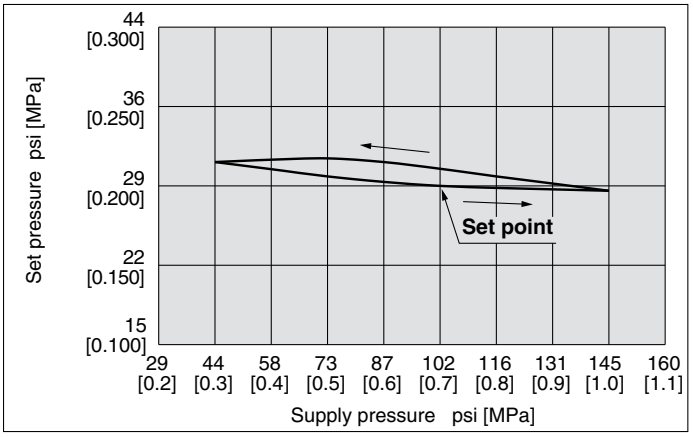
IR3220-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



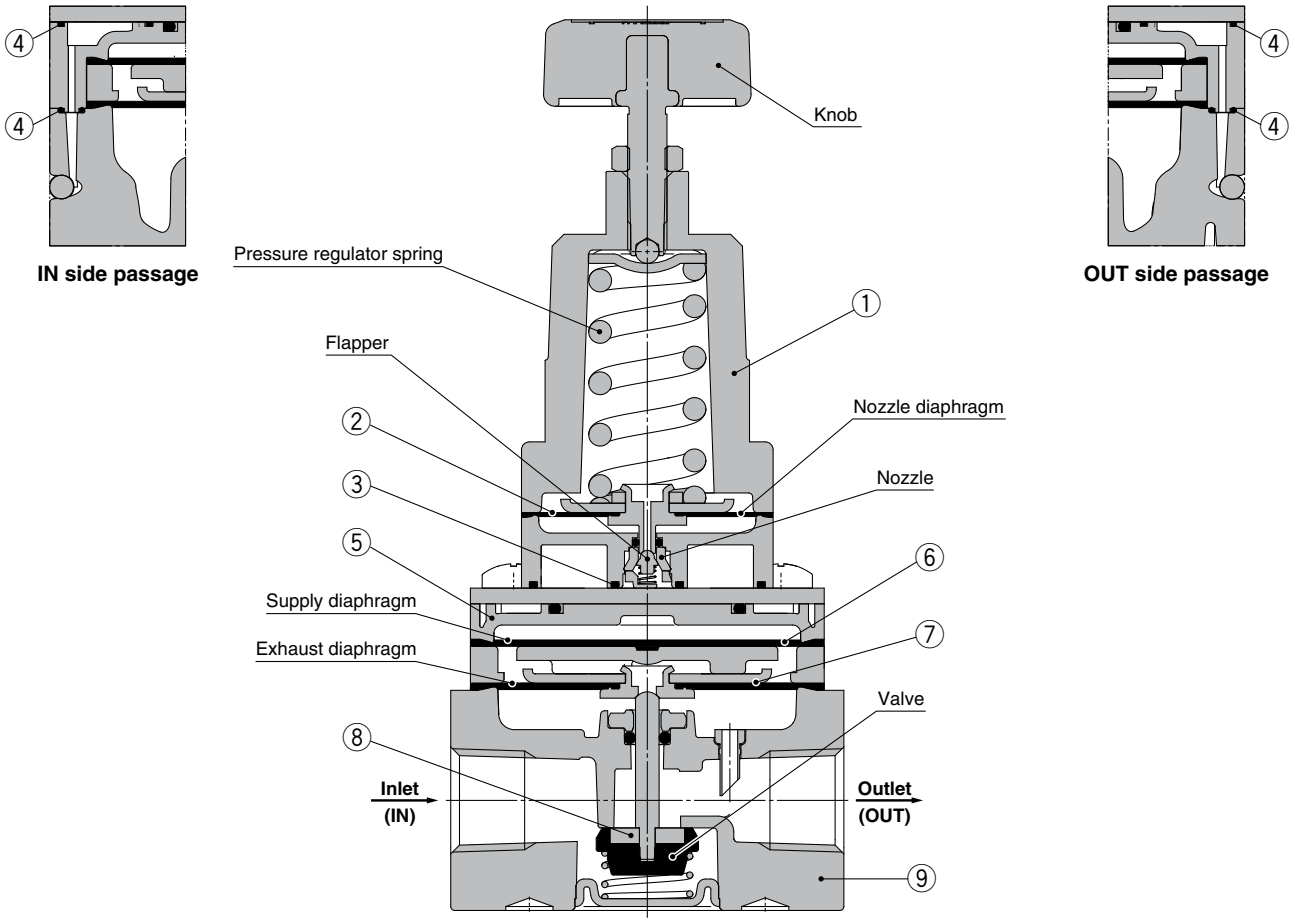
IR3210-A

Supply pressure: 44 to 145 psi [0.3 to 1.0 MPa]
Set pressure: 29 psi [0.2 MPa]
Flow rate: 0.71 scfm [0 L/min (ANR)]



Construction

Basic type (Knob): IR22□0-A



Working principle

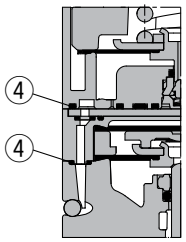
When the knob is rotated, the flapper is pushed through the spring, and a gap is generated between the nozzle and flapper. The supply pressure flows to the inlet passes through the path between the nozzle and flapper and acts on the supply diaphragm as nozzle back pressure. The force generated by the diaphragm pushes down the valve, and the supply pressure flows to the outlet. The discharged air pressure acts on the exhaust diaphragm, and counteracts against the force generated by the supply diaphragm. The air pressure acts on the nozzle diaphragm at the same time, and counteracts against the compression force of the spring to adjust the set pressure. When the set pressure increases too much, the nozzle diaphragm is pushed up, and a gap is generated between the flapper and nozzle diaphragm after the flapper is closed. The balance of the supply diaphragm and exhaust diaphragm is lost when the nozzle back pressure flows into the atmosphere. The exhaust valve is open after the valve is closed, and excess pressure on the outlet is released to the air. Due to this pilot mechanism, pressure variations are detected and pressure adjustment is possible.

Component Parts

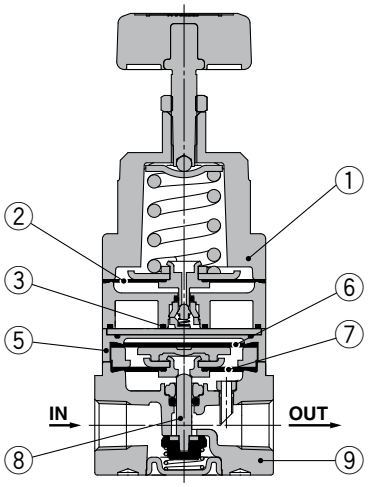
No.	Description	Material		
		IR1200-A	**IR2200-A**	**IR3200-A**
1	**Bonnet**	Aluminum die-casted		
2	**Nozzle diaphragm assembly**	Aluminum, Weather resistant NBR		
3	**Seal**	HNBR		
4	**Seal**	NBR		
5	**Diaphragm spacer**	Polyacetal		
6	**Supply diaphragm**	Weather resistant NBR		—
7	**Exhaust diaphragm assembly**	Steel, Aluminum, Weather resistant NBR		Aluminum, Weather resistant NBR, HNBR
8	**Valve assembly**	Stainless steel, Aluminum, HNBR		Aluminum, HNBR
9	**Body**	Aluminum die-casted		

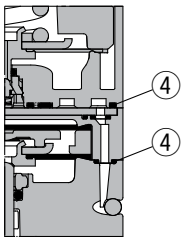
Construction

Basic type (Knob): IR12□0-A



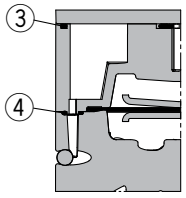
IN side passage



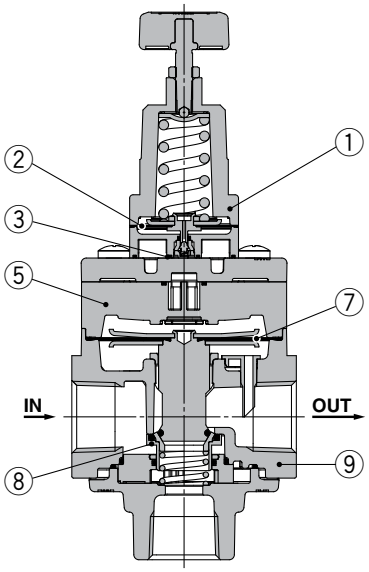


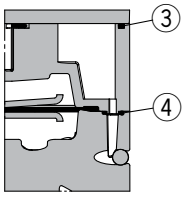
OUT side passage

Basic type (Knob): IR32□0-A



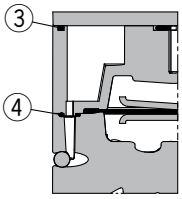
IN side passage



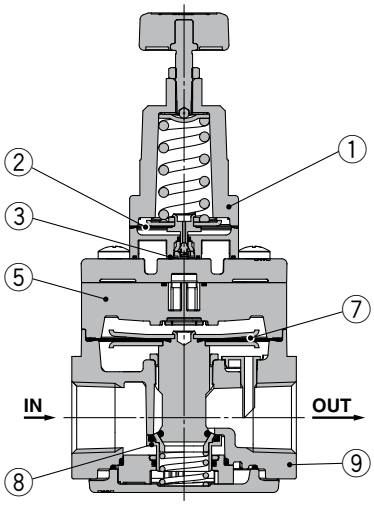


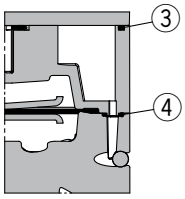
OUT side passage

Basic type (Knob): IR32□$\frac{1}{2}$-A



IN side passage

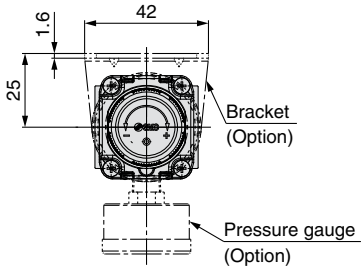


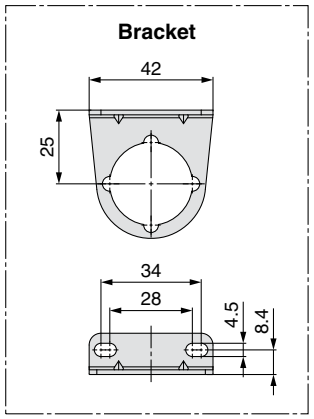


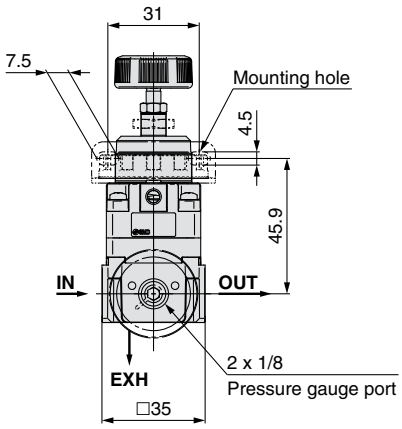
OUT side passage

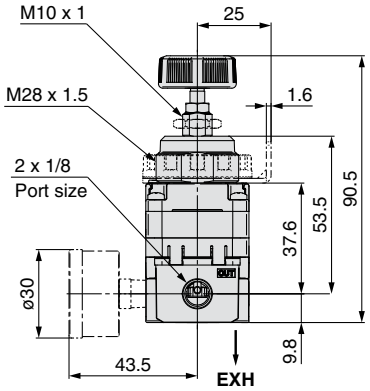
Dimensions

Basic type (Knob): IR12□0-01□-A



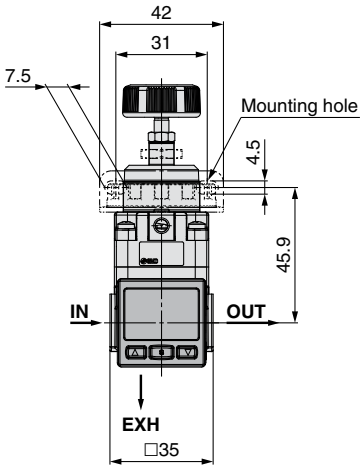


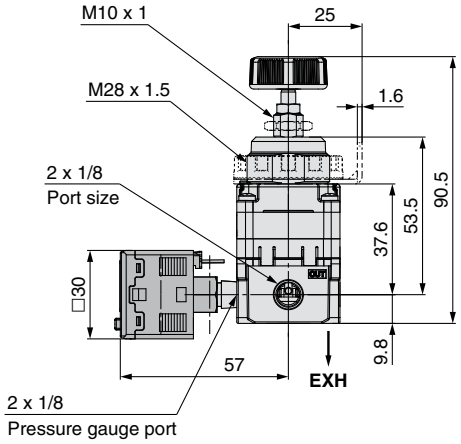




When connecting to the EXH port, contact your SMC sales representative separately.

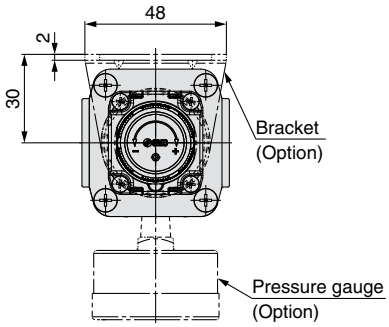
With digital pressure switch: IR12□0-01□E□-A

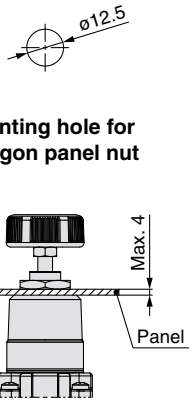


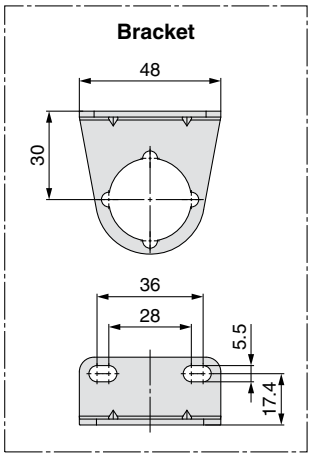


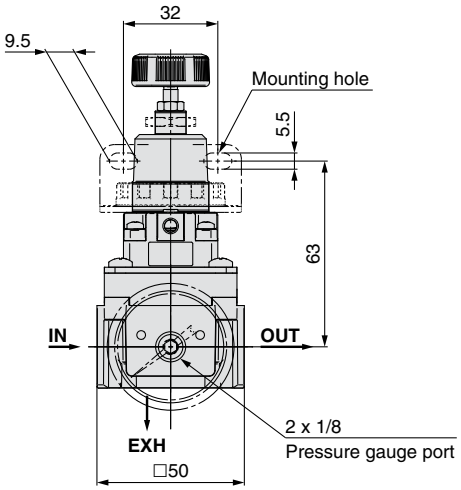
Dimensions

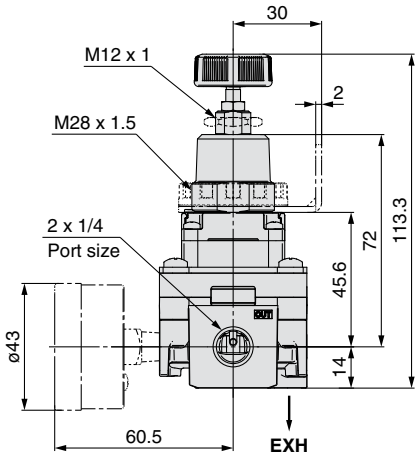
Basic type (Knob): IR22□0-02□-A





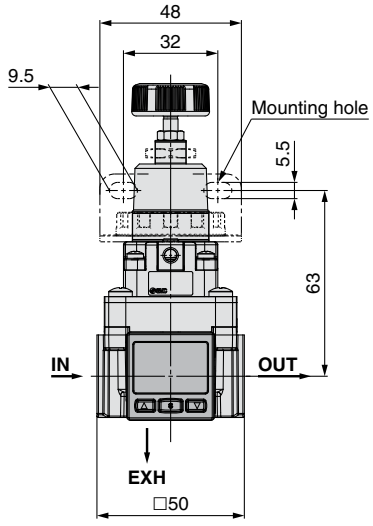


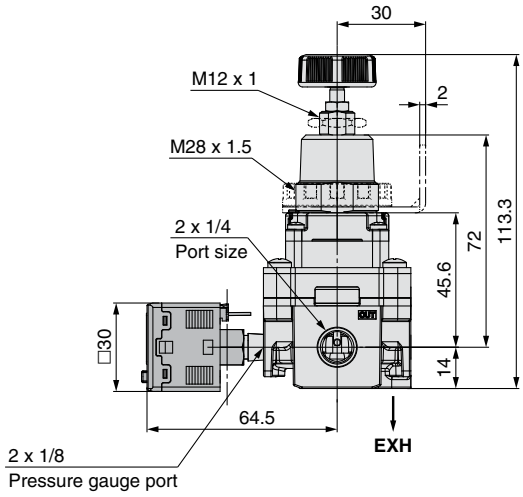




When connecting to the EXH port, contact your SMC sales representative separately.

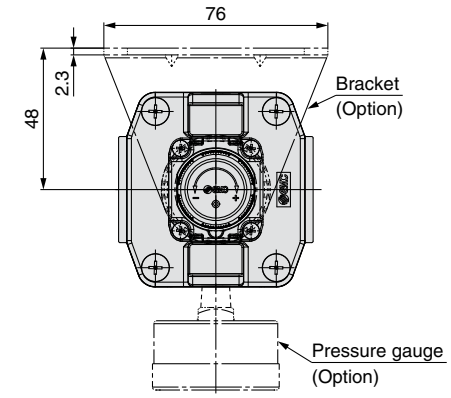
With digital pressure switch: IR22□0-02□E□-A

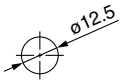




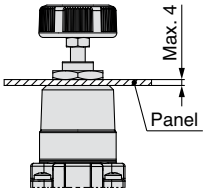
Dimensions

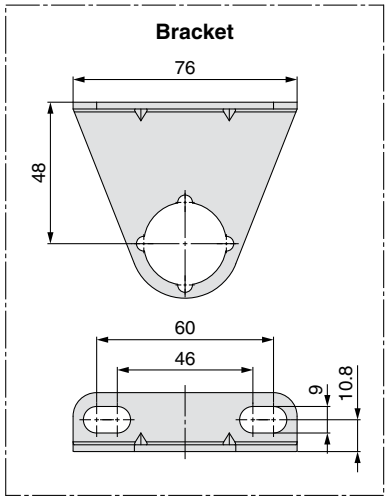
Basic type (Knob): IR32□0-0□□-A

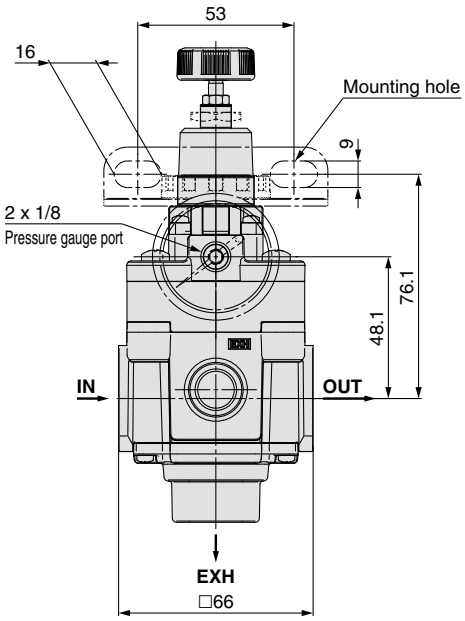


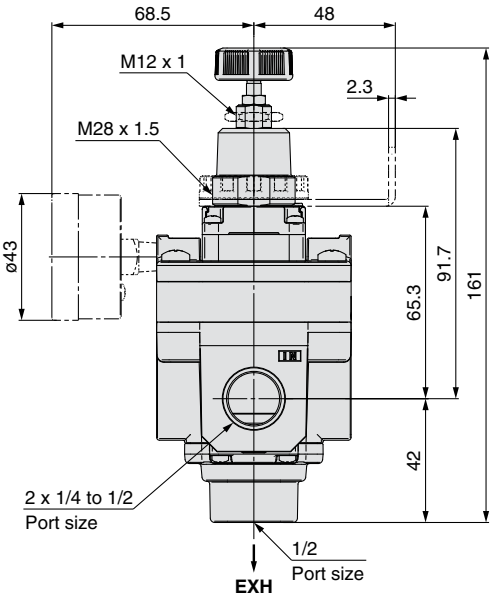


Mounting hole for hexagon panel nut

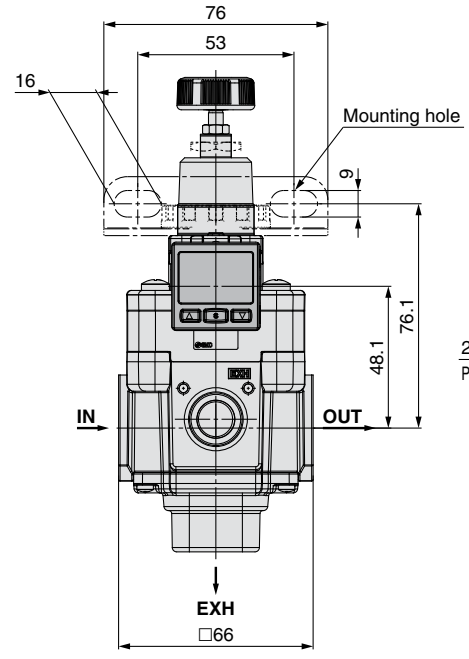


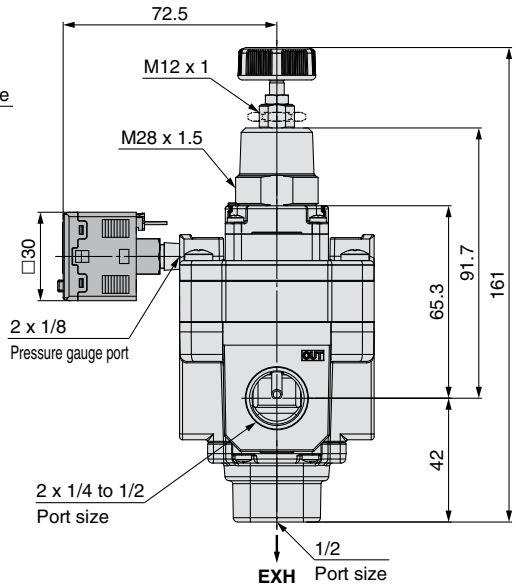






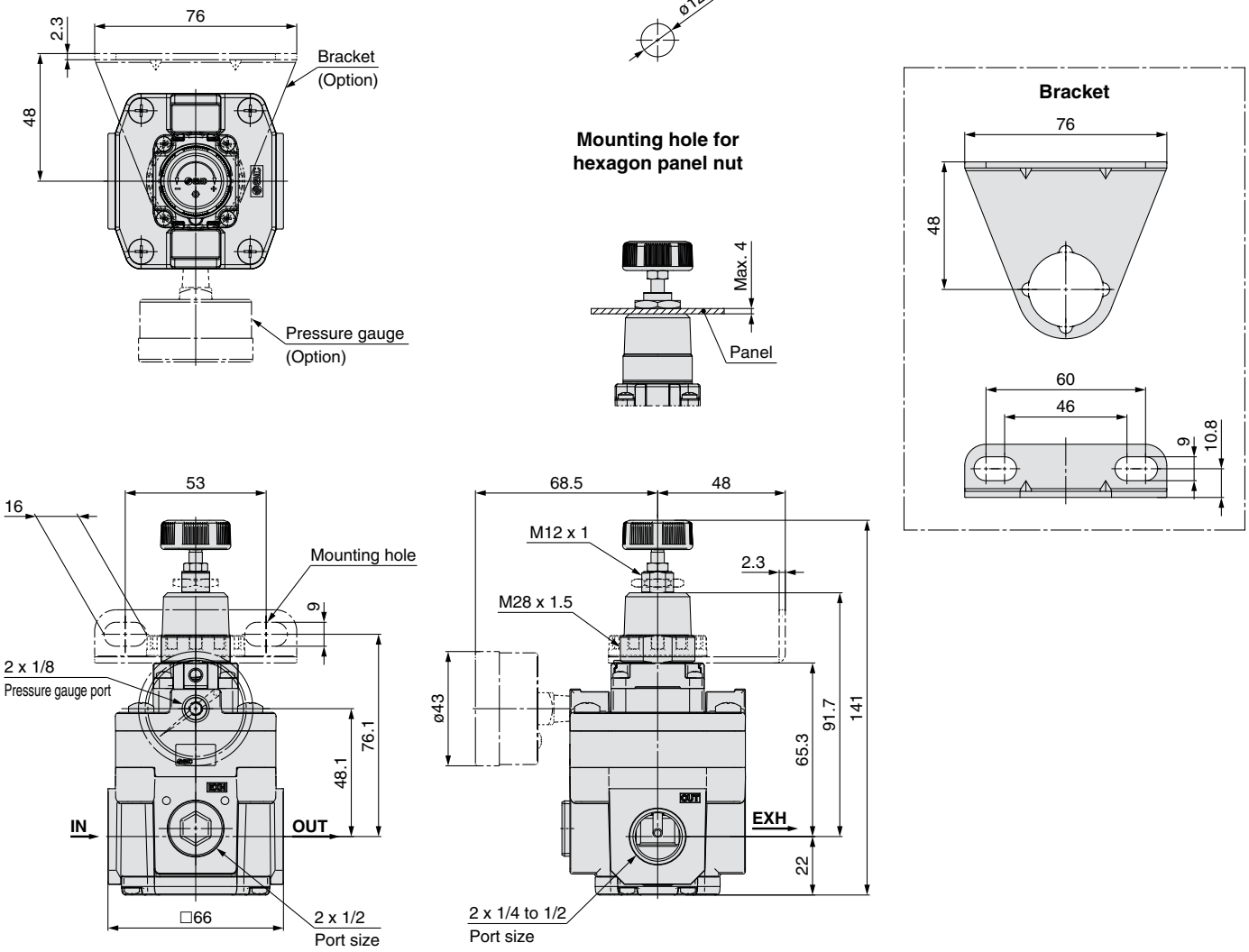
With digital pressure switch: IR32□0-0□□E□-A



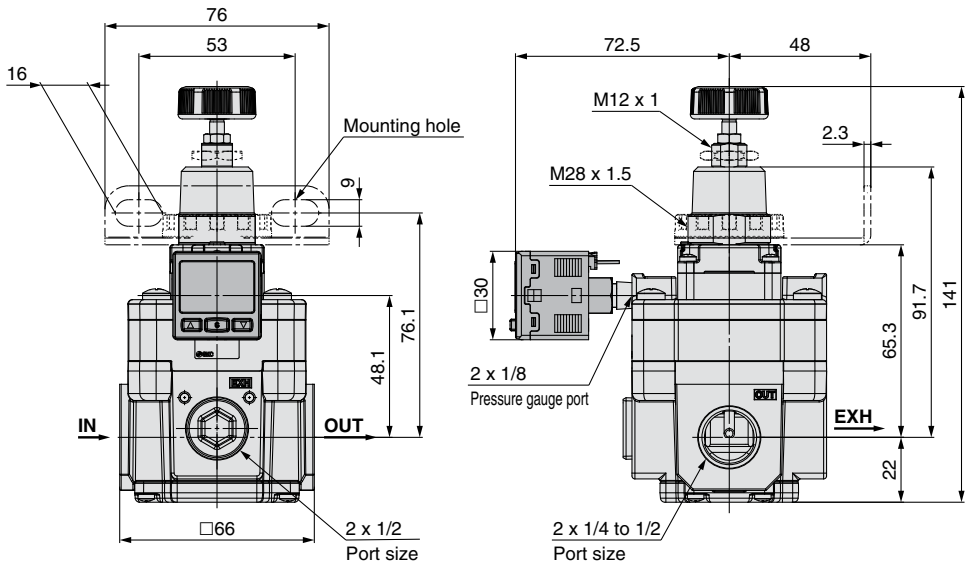


Dimensions

Basic type (Knob): IR32□$^{1}_{2}$-0□□-A



With digital pressure switch: IR32□$^{1}_{2}$-0□□E□-A



Series IR1200-A/2200-A/3200-A
Specific Product Precautions 1

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For F.R.L. Units Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, http://www.smcworld.com

Piping

⚠Warning

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

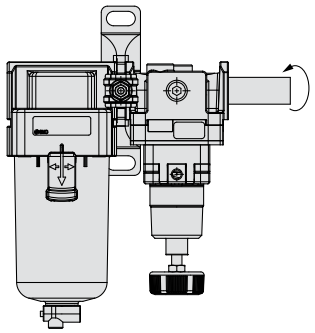
Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Furthermore, if the side with the female threads is not held while tightening, excessive force will be applied directly to piping brackets, etc., causing damage or other problems.

Recommended Proper Torque lbf·ft [N·m]

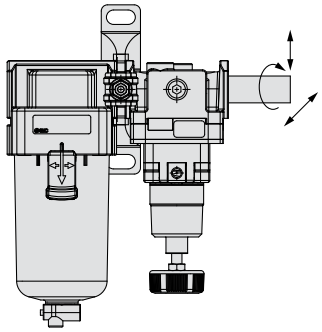
Connection thread	1/8	1/4	3/8	1/2 Note)
Torque	5.2 to 6.6 [7 to 9]	8.9 to 10.3 [12 to 14]	16.2 to 17.7 [22 to 24]	20.7 to 22.1 [28 to 30]

Note) Tightening force for connecting to the EXH port of IR32□$^{1}_{2}$-A is 5.9 to 7.4 lbf·ft (8 to 10 N·m).



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

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



3. Piping materials without flexibility such as steel tube piping are prone to be effected by excess moment load and vibration from the piping side. Use flexible tubing in between to avoid such an effect.

⚠Caution

1. Preparation before piping

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

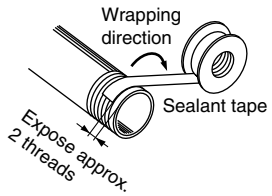
Piping

⚠Caution

2. Wrapping of sealant tape

When screwing piping or fittings into ports, ensure that metal chips from the pipe threads or sealing material do not enter the piping.

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



Operating Environment

⚠Warning

1. 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.

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

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

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

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

Air Supply

⚠Warning

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

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

3. If condensate in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensate to enter the outlet side. This will cause a malfunction of pneumatic equipment.

When removing drain is difficult, use of a filter with an auto drain is recommended.

⚠Caution

1. Condensate or dust, etc. in the supply pressure line can cause malfunctions. In addition to an air filter (SMC Series AF, etc.), please use a mist separator (SMC Series AM, AFM) depending on the conditions.

Refer to "Air Preparation Equipment Model Selection Guide" (Best Pneumatics No. 5) for air quality.

2. When a lubricator is used at the supply side of the product, it can cause malfunctions. Do not use a lubricator at the supply side of the product.

If lubrication is required for terminal devices, connect a lubricator on the output side of the regulator.

Series IR1200-A/2200-A/3200-A
Specific Product Precautions 2

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For F.R.L. Units Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, http://www.smcworld.com

Maintenance

⚠Warning

1. **When the product is removed for maintenance, reduce the set pressure to "0" and shut off the supply pressure completely beforehand.**
2. **When a pressure gauge is to be mounted, remove the plug after reducing the set pressure to "0".**
3. **When using the regulator between a solenoid valve and an actuator, check the pressure gauge periodically. Sudden pressure fluctuations may shorten the durability of the pressure gauge.**
   A digital pressure gauge is recommended for such situation or as deemed necessary.

Handling

⚠Caution

1. **When the regulator with pressure gauge is used, do not apply impact to the product by dropping it, etc. during transportation or installation.**
   This may cause misalignment of the pressure gauge pointer.

Operation

⚠Caution

1. **Do not use a regulator outside the range of its specifications as this can cause failure. (Refer to the specifications.)**
2. **When mounting is performed, make connections while confirming port indications.**
3. **When mounting the bracket or tightening the hexagon panel nut on the panel, tighten them to the recommended proper torque.**
   Looseness or faulty sealing will occur if tightening torque is insufficient, while thread damage will result if the torque is excessive.

Recommended Proper Torque lbf·ft (N·m)

Set nut (for bracket)

IR12□0-A	IR22□0-A	IR32□□-A
1.5±0.15 (2.0±0.2)		

Hexagon panel nut (for knob type only)

IR12□0-A	IR22□0-A	IR32□□-A
2.6±0.37 (3.5±0.5)		

Operation

⚠Caution

4. **To set the pressure using the knob, turn the knob in the direction that increases pressure and be sure to tighten the lock nut after the pressure is adjusted. When tightening the nut, tighten so that the knob does not move due to friction caused by tightening.**
5. **If the pressure is set in the direction that decreases pressure, the pressure may drop from the original set pressure. Turning the knob clockwise increases the outlet pressure, and turning it counterclockwise reduces the pressure.**
6. **When pressure is applied to the inlet of a regulator, make sure that the output is connected to the circuit. Air blow occurs from the outlet and it depends on the operating conditions.**
7. **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.**
8. **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.**
9. **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.
10. **The capacity of the output side is large, and when used for the purpose of a relief function, the exhaust sound will be loud when being relieved. Therefore, operate with a silencer (SMC Series AN, etc.) mounted on the exhaust port (EXH port).**
    When using the IR1200-A and 2200-A series, contact your SMC sales representative.
11. **When installing a pressure gauge to the product, do not apply pressure more than the maximum display pressure. This will cause a malfunction.**

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/ equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

⚠ Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Global Manufacturing, Distribution and Service Network

Worldwide Subsidiaries

EUROPE

AUSTRIA
SMC Pneumatik GmbH (Austria)
BELGIUM
SMC Pneumatics N.V./S.A.
BULGARIA
SMC Industrial Automation Bulgaria EOOD
CROATIA
SMC Industrijska Automatika d.o.o.
CZECH
SMC Industrial Automation CZ s.r.o.
DENMARK
SMC Pneumatik A/S
ESTONIA
SMC Pneumatics Estonia
FINLAND
SMC Pneumatics Finland OY
FRANCE
SMC Pneumatique S.A.
GERMANY
SMC Pneumatik GmbH
GREECE
SMC Hellas EPE
HUNGARY
SMC Hungary Ipari Automatizálási Kft.
IRELAND
SMC Pneumatics (Ireland) Ltd.
ITALY
SMC Italia S.p.A.
LATVIA
SMC Pneumatics Latvia SIA
LITHUANIA
SMC Pneumatics Lietuva, UAB
NETHERLANDS
SMC Pneumatics BV
NORWAY
SMC Pneumatics Norway A/S
POLAND
SMC Industrial Automation Polska Sp.z.o.o.
ROMANIA
SMC Romania S.r.l.
RUSSIA
SMC Pneumatik LLC.
SLOVAKIA
SMC Priemyselná Automatizáciá, s.r.o.
SLOVENIA
SMC Industrijska Avtomatika d.o.o.
SPAIN / PORTUGAL
SMC España, S.A.
SWEDEN
SMC Pneumatics Sweden AB
SWITZERLAND
SMC Pneumatik AG
UK
SMC Pneumatics (U.K.) Ltd.

ASIA

CHINA
SMC (China) Co., Ltd.
HONG KONG
SMC Pneumatics (Hong kong) Ltd.
INDIA
SMC Pneumatics (India) Pvt. Ltd.
JAPAN
SMC Corporation
MALAYSIA
SMC Pneumatics (S.E.A.) Sdn. Bhd.
PHILIPPINES
SMC Pneumatics (Philippines), Inc.
SINGAPORE
SMC Pneumatics (S.E.A.) Pte. Ltd.
SOUTH KOREA
SMC Pneumatics Korea Co., Ltd.
TAIWAN
SMC Pneumatics (Taiwan) Co., Ltd.
THAILAND
SMC Thailand Ltd.

NORTH AMERICA

CANADA
SMC Pneumatics (Canada) Ltd.
MEXICO
SMC Corporation (Mexico) S.A. DE C.V.
USA
SMC Corporation of America

SOUTH AMERICA

ARGENTINA
SMC Argentina S.A.
BOLIVIA
SMC Pneumatics Bolivia S.R.L.
BRAZIL
SMC Pneumaticos do Brazil Ltda.
CHILE
SMC Pneumatics (Chile) S.A.
PERU
SMC Corporation Peru S.A.C.
VENEZUELA
SMC Neumatica Venezuela S.A.

OCEANIA

AUSTRALIA
SMC Pneumatics (Australia) Pty. Ltd.
NEW ZEALAND
SMC Pneumatics (N.Z.) Ltd.

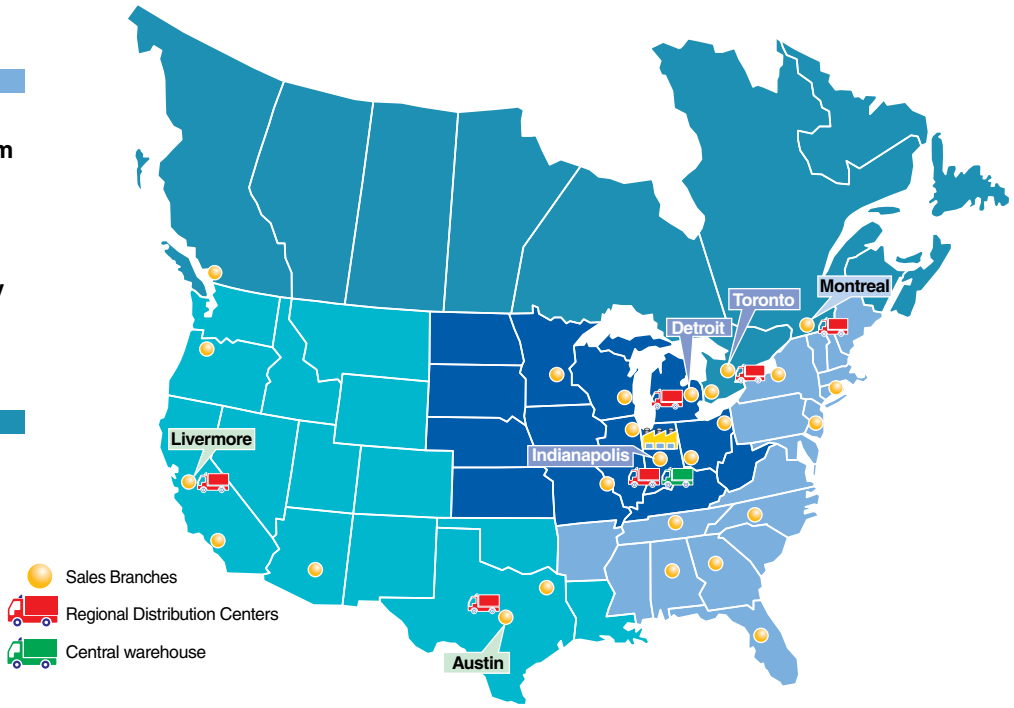
U.S. & Canadian Sales Offices

WEST
- Austin
- Dallas
- Los Angeles
- Phoenix
- Portland
- San Francisco

CENTRAL
- Chicago
- Cincinnati
- Cleveland
- Detroit
- Indianapolis
- Milwaukee
- Minneapolis
- St. Louis

EAST
- Atlanta
- Birmingham
- Boston
- Charlotte
- Nashville
- New Jersey
- Rochester
- Tampa

CANADA
- Montreal
- Toronto
- Vancouver
- Windsor



SMC Corporation of America
10100 SMC Blvd., Noblesville, IN 46060
www.smcusa.com

SMC Pneumatics (Canada) Ltd.
www.smcpneumatics.ca

(800) SMC.SMC1 (762-7621)
e-mail: **sales@smcusa.com**
International inquiries: **www.smcworld.com**

© 2015 SMC Corporation of America, All Rights Reserved.
All reasonable efforts to ensure the accuracy of the information detailed in this catalog were made at the time of publishing.
However, SMC can in no way warrant the information herein contained as specifications are subject to change without notice.

TT-RRD-5M