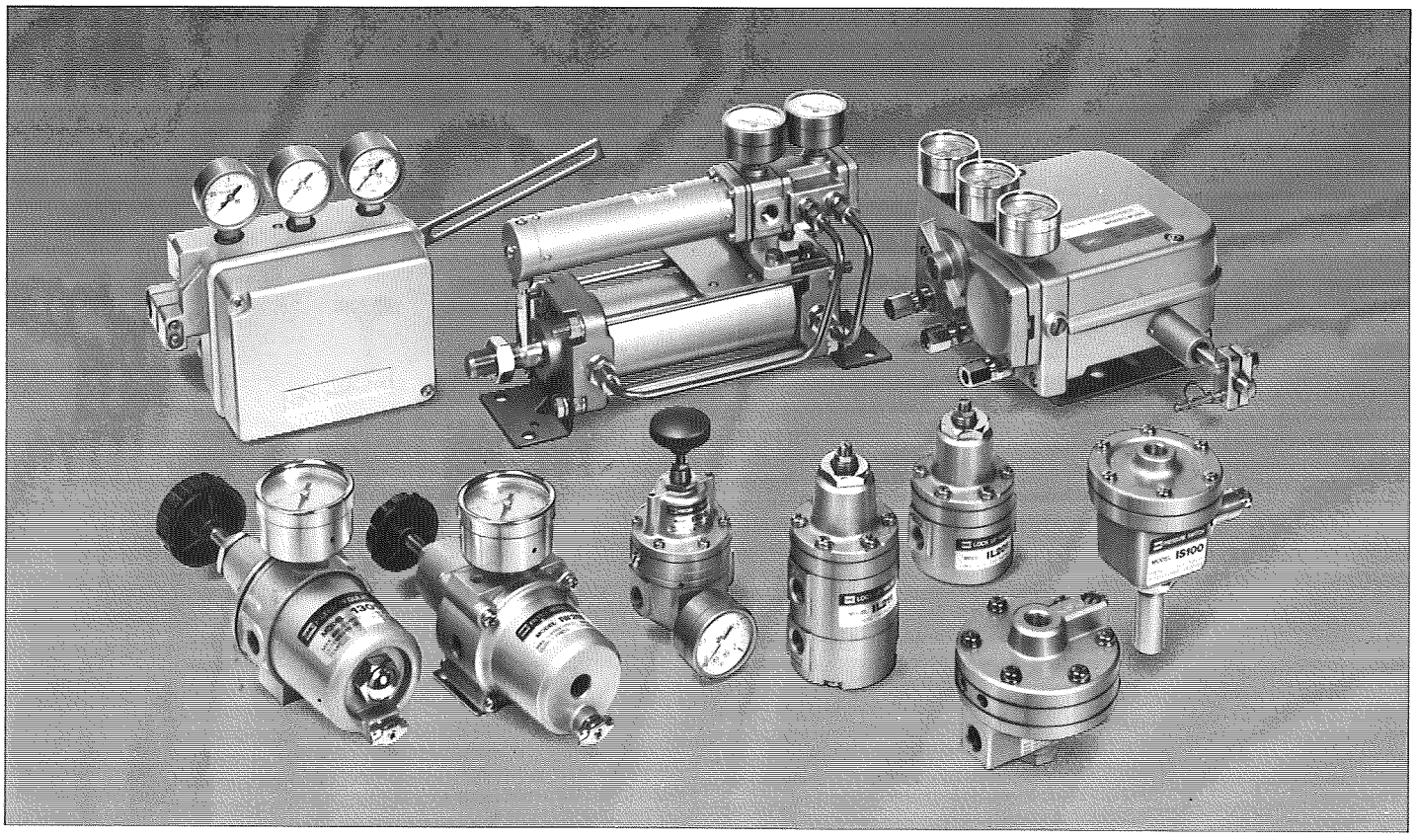
CAT. E6G-Ⓐ

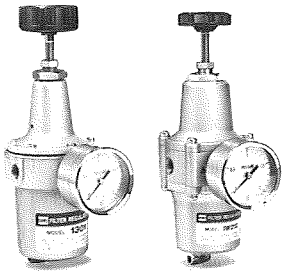
SMC

Pneumatic Instrumentation Equipment



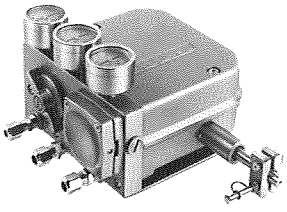
Index

Pneumatic Instrumentation Equipment

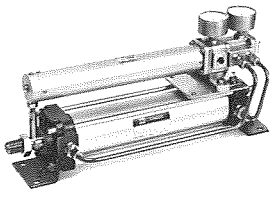


Filter regulator

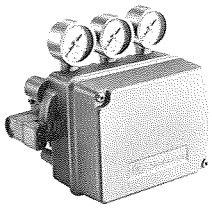
Precision regulator



Valve positioner

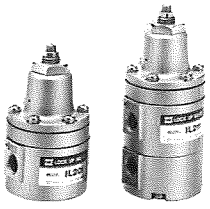


Cylinder positioner

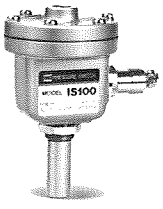


Dual positioner

Booster relay



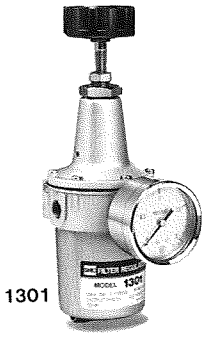
Lock-up valve

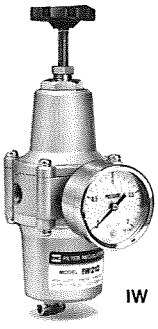


Pressure switch

SMC Filter Regulator
Series 1301, IW

Prevents moisture and dust in the compressed air line while maintaining pressure at a stable level, in spite of variations of both air consumption and air source pressure.


1301


IW

Specifications

Series	1301	IW
Supply pressure	Max. 9.9kgf/cm²	Max. 9.9kgf/cm²
Flow rate [1]	300Nℓ/min	400Nℓ/min
Air consumption [2]	6Nℓ/min or less [3]	1Nℓ/min or less
Ambient and fluid temperature	−5 ~60°C	−5 ~60°C
Filtration	5μm	5μm
Port size (Gauge port)	¼ (⅛)	¼ (¼)
Weight	1.07kgf	0.7kgf
Body material	Zinc alloy	Alminum alloy

1) At 5kgf/cm² of supply pressure.
2) At Max. set pressure.
3) For 1301-002.

Model

Model	Set pressure	Note
1301-002	0.2~2kgf/cm²	Standard
1301-902	0.2~2kgf/cm²	External main parts: Stainless steel
1301-1202	0.2~3kgf/cm²	
1301-2502	0.2~5kgf/cm²	
IW212-02	0.2~2kgf/cm²	
IW213-02	0.2~3kgf/cm²	
IW215-02	0.2~5kgf/cm²	

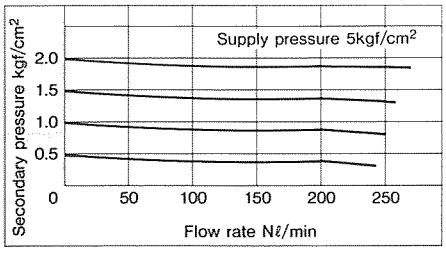
Options

Description	Part No.	Note
Bracket	130184	
Pressure gauge	G51-2※	2kgf/cm²
	G51-4※	4kgf/cm²
	G51-7※	7kgf/cm²

※Please specify port size: 01 (⅛) for series 1301, or 02 (¼) for series IW.

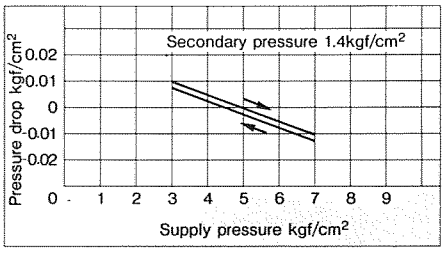
Flow Characteristics

1301, IW



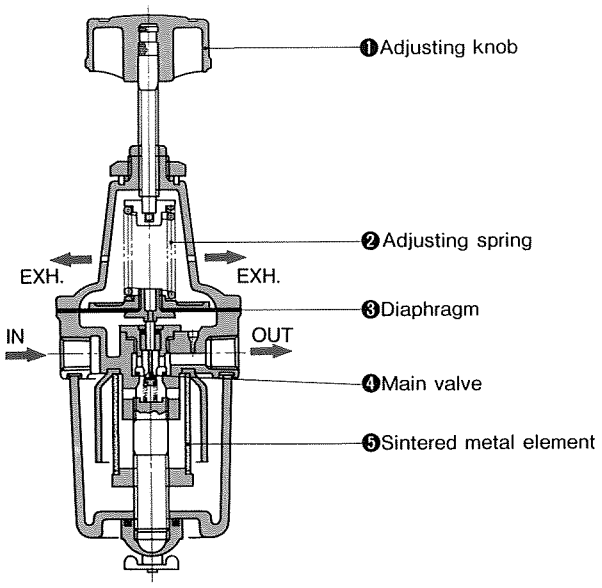
Pressure Characteristics

1301, IW



Series 1301, IW

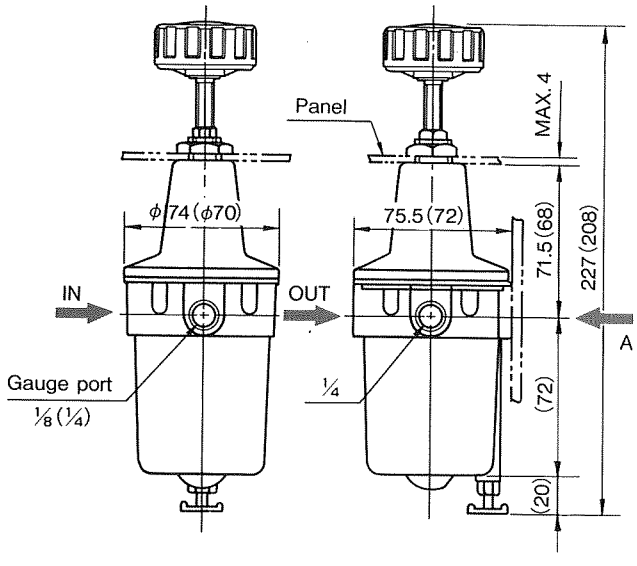
Construction



Operation

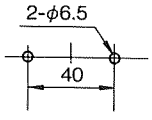
Air flow from the inlet passes through element ❺ where solids are removed. When adjusting knob ❶ is adjusted downwards, adjusting spring ❷ is compressed. The main valve ❹ is opened allowing air flow to the outlet. Air outlet pressure balances against diaphragm ❸ and adjusting spring ❷. When the outlet pressure is higher than the set pressure, the main valve ❹ is closed and exhaust of the excess outlet pressure takes place through the adjusting spring cover bleed. This ensures constant outlet pressure is maintained.

Dimensions (mm)

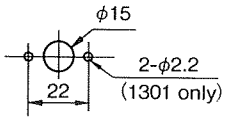


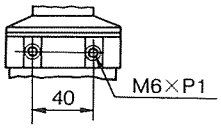
Panel mounting hole

〈Vertical surface〉



〈Horizontal mount〉





View A

※Mount holes on both sides for series IW.

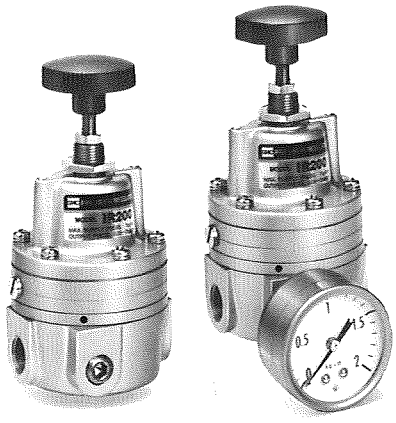
( ) series IW.

SMC Precision Regulator
Series IR 200

High sensitivity, excellent pressure and flow characteristics.

Designed for a degree of accuracy beyond the scope of standard regulators.

Suitable for applications requiring extremely precise pressure control.



Specifications

Supply pressure	Max. 7kgf/cm² [1]
Flow rate	400Nℓ/min[2]
Air consumption[3]	3Nℓ/min or less[4]
Sensitivity	0.001~0.005kgf/cm²
Ambient and fluid temperature	−5~60°C.
Port size	¼ (Gauge port ⅛)
Weight	290gf

1) Max. 9.9kgf/cm² for IR202-02. 2) At 5kgf/cm² of supply pressure.
3) Air consumption is due to exhaust from nozzle. 4) At 7kgf/cm² of supply pressure.

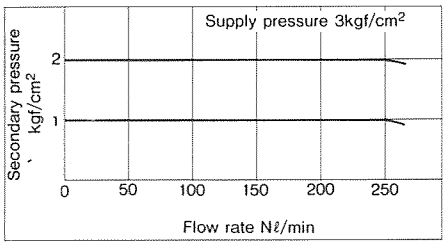
Model

Model	Set pressure
IR200-02	0.05~2kgf/cm²
IR201-02	0.05~4kgf/cm²
IR202-02	0.05~7kgf/cm²

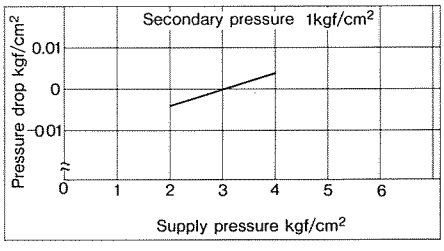
Options

Description	Part No.	Note
Bracket	230451	
Pressure gauge	G43-2-01	2kgf/cm²
	G43-4-01	4kgf/cm²
	G43-10-01	10kgf/cm²

Flow Characteristics

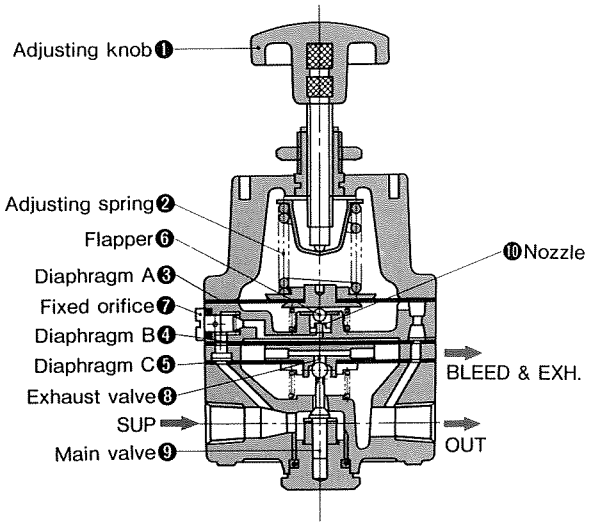


Pressure Characteristics



Series IR200

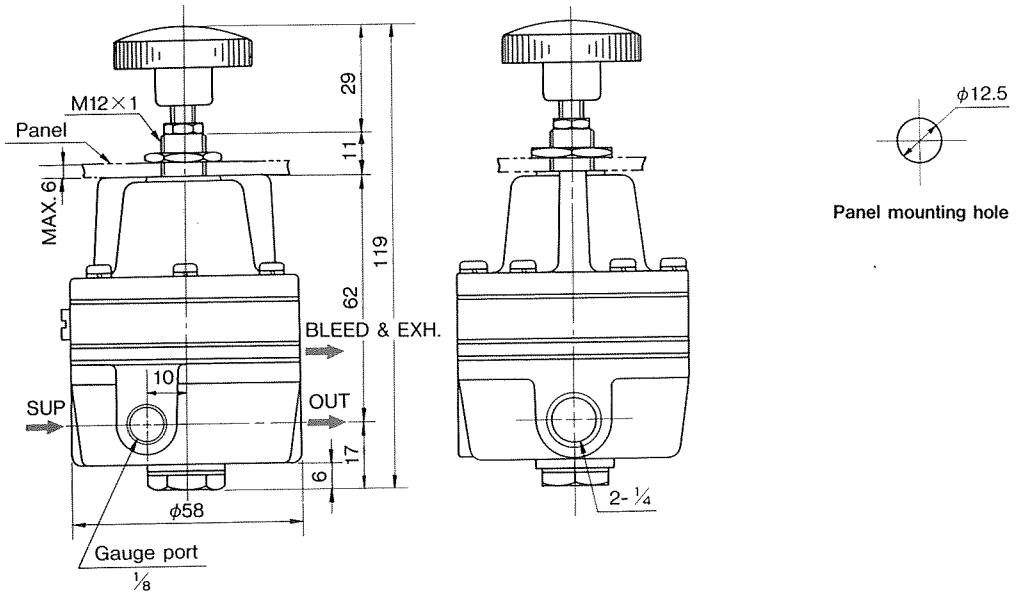
Construction



Operation

When knob ❶ is turned downwards movement of adjusting spring ❷ and diaphragm A ❸ closes nozzle ❿. Air flow from fixed orifice ❼ causes a back pressure of nozzle ❿ which acts on diaphragm B ❹. This causes downward movement of main valve ❾. Supply pressure can then flow to secondary supply. Pressure on diaphragm C ❺ results in upward balancing movement of diaphragm B ❹ and then A ❸ against the spring force. When the secondary pressure increases, diaphragm A ❸ is pushed upwards causing clearance between the flapper ❻ and nozzle ❿. Back pressure before nozzle is lowered. The imbalance of diaphragms B and C closes main valve ❾ and opens exhaust allowing vent of excess pressure through exhaust valve ❽. The above combination ensures high sensitivity and precision regulation of the secondary supply.

Dimensions (mm)



SMC Cylinder Positioner
Series IP200

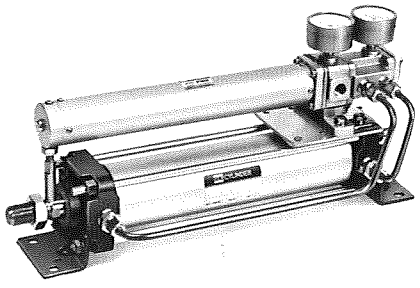
Easy to operate and mount.

For precise and stable position control of small bore cylinder.

Compact size.

Can be used as cylinder position control.

Unit for process control, servomechanism, and general industrial machines.

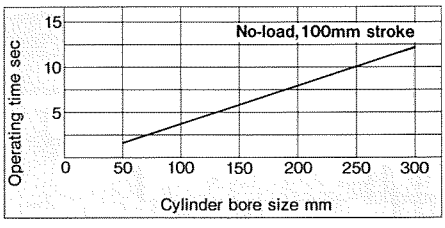


Specifications

Supply pressure	3~7kgf/cm²
Signal pressure	0.2~1.0kgf/cm²
Cylinder bore	50~300mm
Cylinder stroke	25~300mm
Ambient and fluid temperature	−5~60°C
Port size	¼ (Gauge port ⅛)
Weight	700gf
Sensitivity	Within 0.5% of full span
Linearity	Within ±2% of full stroke
Hysteresis	Within 1% of full stroke
Repeatability	Within 1% of full stroke
Air consumption*	22Nℓ/min or less**
Influence by change in supply pressure	Within 1%/0.5kgf/cm²

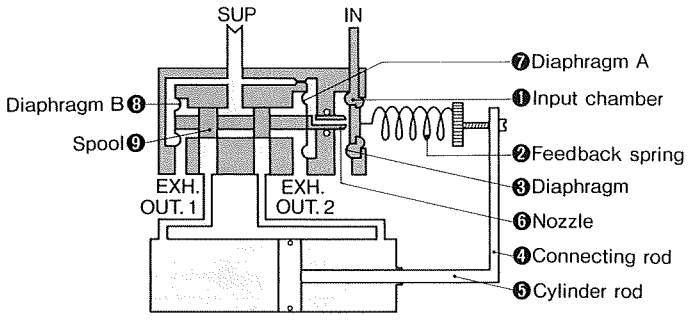
※Air consumption is due to exhaust from nozzle.
※※At 5kgf/cm² of supply pressure.

Response time



Series IP200

Construction

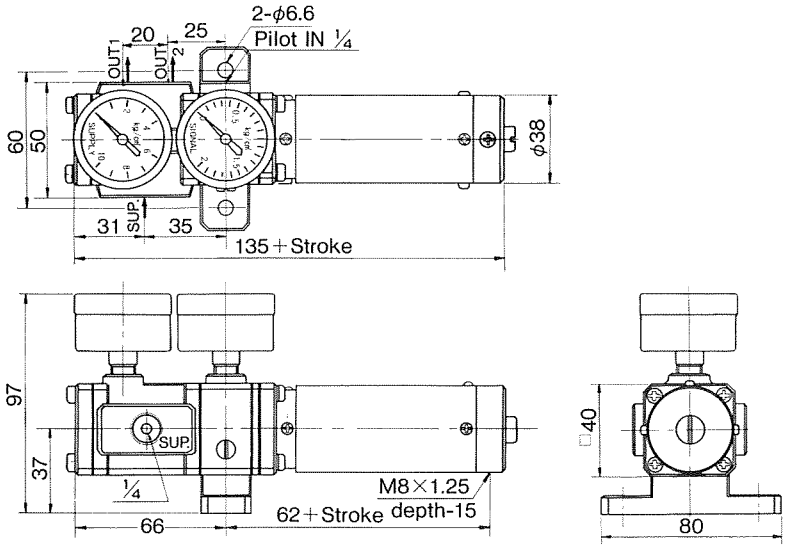


Above condition is at constant signal pressure i.e. cylinder is stopped.

Operation

When signal pressure enters input chamber ❶ the diaphragm B ❸ is deflected left. Clearance of the nozzle ❻ is reduced causing higher back pressure at diaphragm A ❼.
This diaphragm A ❼ has larger area than diaphragm B ❽ resulting in movement of the spool to the left. Supply pressure then flows to OUT 1 ❶ and partial exhaust from OUT 2 takes place resulting in cylinder rod ❺ movement to the right. The movement is linked via rod ❹ and feedback spring ❷ to the input diaphragm ❸ balancing the higher pressure. When this occurs nozzle ❻ clearance increases allowing centralizing of the spool ❾ to take place. This holds the piston rod in the new position. Input signal increase results in proportional movement of the piston rod.

Dimensions (mm)



SMC Pressure Switch
Series IS

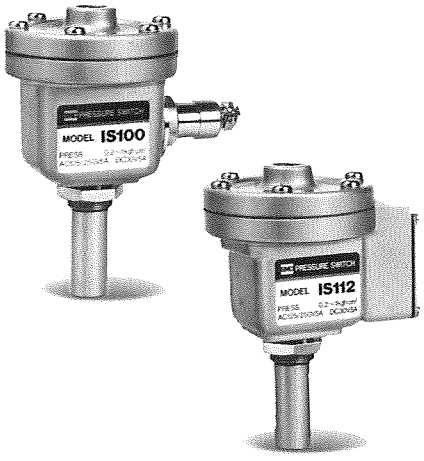
Receives an input of 0.2 to 1 kgf/cm² and transmits an electric output at the set point.

Can be used for pneumatic instrument process control with a combined function of controller and telemeter.

High performance.

Can be mounted in any position.

Compact and light weight.



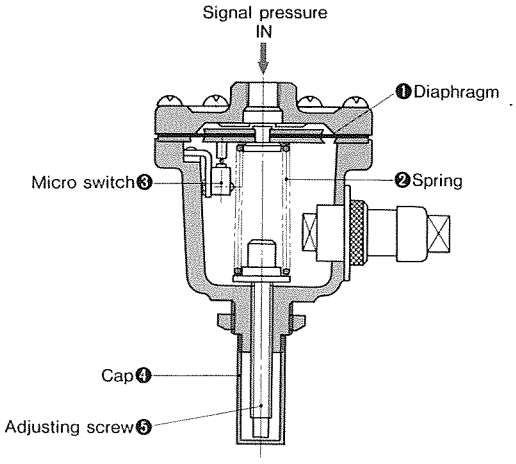
Specifications

Set pressure range	0.2～1kgf/cm²
Differential	Within 12mm Hg (Fixed)
Ambient and fluid temperature	−5～60°C
Contact	N.O. or N.C. 2 contacts
Capacity	AC125/250V5A, DC30V5A
Connection	¼

Model

Model	Electrical connection
IS100-02	3-pin plug and socket (Std).
IS101-02	External terminals
IS101-02J	External terminal and fitting on inlet
IS112-02	Enclosed terminals (Wire through bushing)
IS113-02	Enclosed terminals (Cable glands for electric appliance)
IS114-02	Enclosed terminals (Conduit entry)

Construction

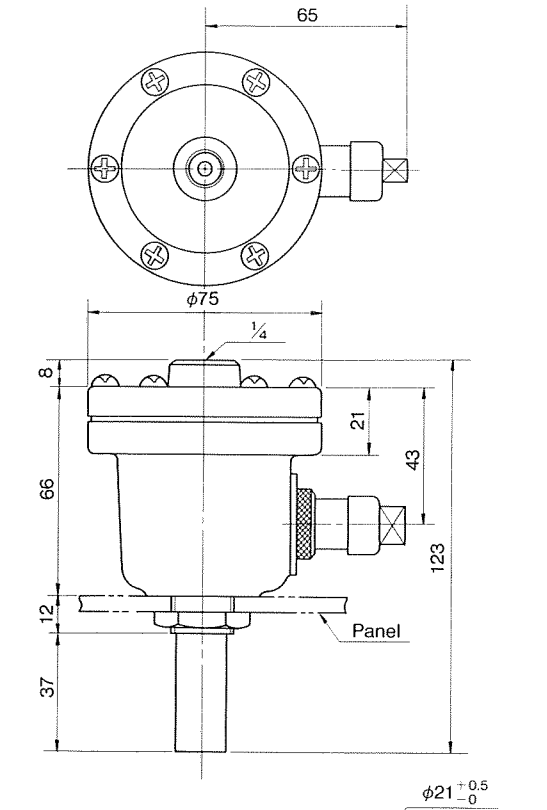


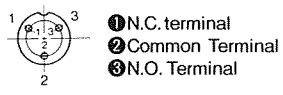
Operation

Signal pressure enters the chamber above diaphragm ❶ and exerts downward force compressing spring ❷. After sufficient deflection, contact with the plunger of the micro switch ❸ is made operating the electrical circuit. As overtravel of diaphragm is prevented by an internal stop the micro switch is not subject to extra load with increased pressure. On decrease of signal pressure the electrical circuit function is reversed. Contacts are available for N.C. or N.O. operation. Adjustment is carried out by removing cap ❹ and rotating adjusting screw as required changing spring load.

Series IS

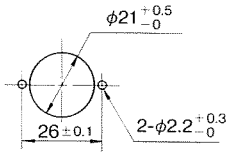
Dimensions (mm)





❶N.C. terminal
❷Common Terminal
❸N.O. Terminal

Plug pin arrangement



Panel mounting hole

SMC Booster Relay
Series IL100

Used when the piping between instrumentation and operational area is long, or when operational area has large capacity.

Can help accelerate actuation speed considerably.

Specifications

Supply pressure	Max. 9.9kgf/cm²
Signal pressure	Max. 7kgf/cm²
Output pressure	Max. 7kgf/cm²
Flow rate	600Nℓ/min※/
Air consumption	3Nℓ/min or less※※
Linearity	Within ±1%
Hysteresis	Within 1%
Cv factor	1.1
Pressure ratio	1:1
Ambient and fluid temperature	−5~60°C
Port size	¼, ⅜
Weight	560gf

※At 5kgf/cm² of supply pressure.
※※At 1kgf/cm² of output pressure.

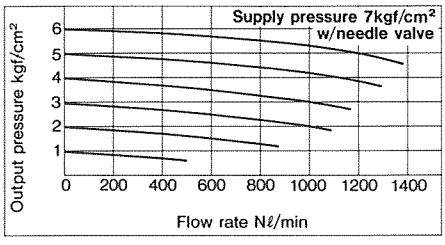
Model

Model	Port size
IL100-02	¼
IL100-03	⅜

Option

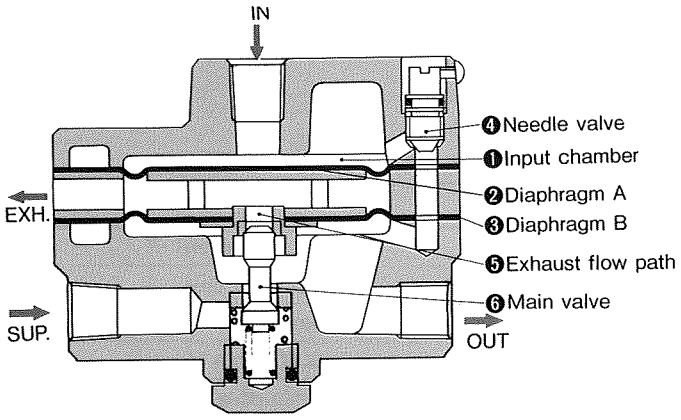
Description	Part No.
Bracket	261022

Flow Characteristics



Series IL100

Construction

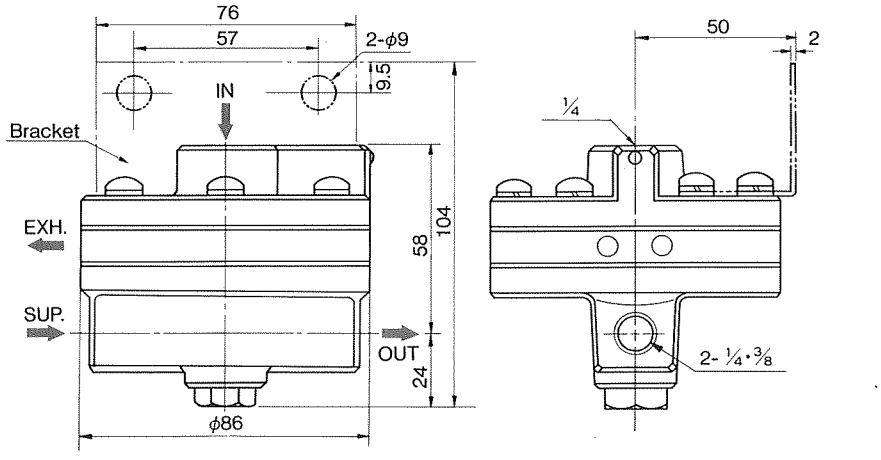


Operation

Signal pressure enters the input chamber ❶ and diaphragm A ❷ and exerts a downward force on diaphragm B ❸. When the force of the input chamber ❶ exceeds the force of diaphragm B ❸, main valve ❻ is inseated allowing air flow out the secondary supply port. On signal pressure exhaust the supply valve closes and exhaust flow path ❺ is opened to allow vent of the secondary air supply to atmosphere.

Input and output ports are connected by a needle valve ❹. Adjustment ensures that exact equalization occurs between the signal and output supply. The above function allows a low volume signal to provide high volume output with pressure ratio remaining (1 : 1) for signal to output.

Dimensions (mm)



SMC Lock-Up Valve
Series IL200

When accident takes place on air operated process control line due to air source or air supply piping line, lock-up valve retains pressure at the tool end until restored to normal condition.

IL201 IL211

Specifications

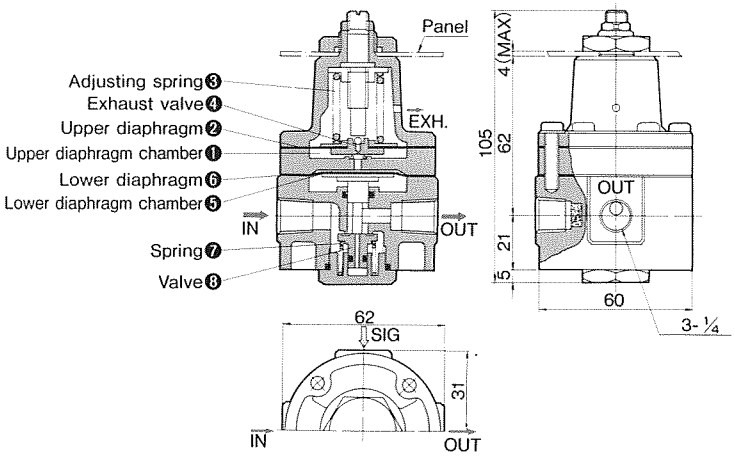
Proof pressure	Max. 9.9kgf/cm²
Signal pressure	1.4～7kgf/cm²
Line pressure	Max. 7kgf/cm²
Effective orifice (Cv)	17mm² (0.9)
Ambient and fluid temperature	−5 ～60°C
Connections	¼
Hysterisis	Within 0.1 kgf/cm²

Model

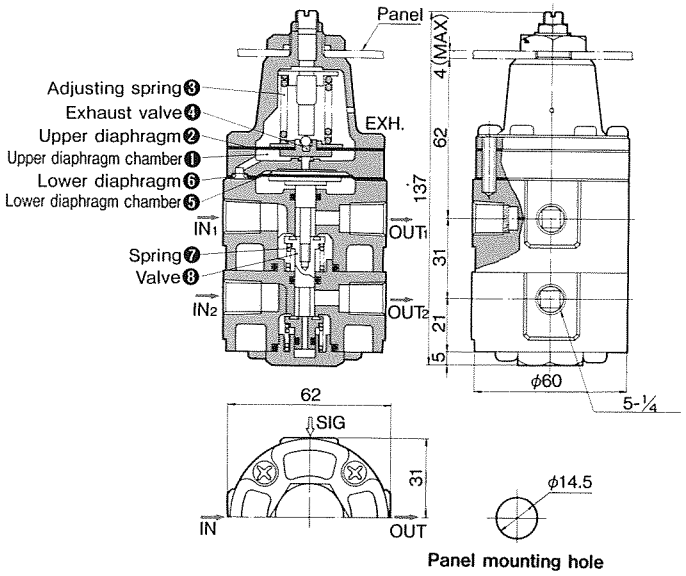
Model	Weight	Note
IL201-02	430gf	Single acting
IL211-02	640gf	Double acting

Construction/Dimensions (mm)

Single Acting/IL201



Double Acting/IL211



Panel mounting hole

Operation

Safe signal pressure enters the upper diaphragm chamber ❶ and compresses the adjusting spring ❸ and moves the upper diaphragm ❷ upward. It also closes the exhaust valve ❹. Signal pressure also enters the lower diaphragm chamber ❺ and exerts a downward force on the valve ❽. This opens the flow path from 'IN' and 'OUT' ports for flow in either direction.

When malfunction in the control signal circuit occurs pressure holding the lower diaphragm downwards is lost through the exhaust valve ❹. Valve ❽ closes with spring return and the circuit is sealed. For double acting lock-up valve above operation is extended by an extra valve movement allow two separate circuits to be protected.

Precautions

- Blow out air lines and fittings before installation.
- Use dry and oil-free air. Recommend use of SMC AM Mist Separator.