

# Cylinder Positioner *IP200 Series*

- Servo-mechanism allows precise and stable position control of cylinders.
- Can be used as a cylinder position control unit for general industrial machines.

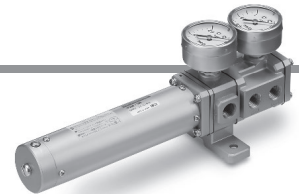
## How to Order

IP200 – **100**

• Applicable stroke

**25 to 300 mm**

\* Manufacture of strokes in 1 mm increments is possible.



## Specifications (No load) Note 1)

Supply pressure	0.3 to 0.7 MPa
Input pressure	0.02 to 0.1 MPa
Applicable bore size	Ø 50 or more
Applicable stroke	25 to 300 mm or less
Sensitivity <small>Note 2)</small>	Within 0.5 % F.S.
Linearity <small>Note 2)</small>	Within ±2 % F.S.
Hysteresis <small>Note 2)</small>	Within 1 % F.S.
Repeatability <small>Note 2)</small>	Within ±1 % F.S.
Air consumption <small>Note 3)</small>	18 l/min (ANR) or less (SUP = 0.5 MPa)
Influence by change in supply pressure	Within 1 % F.S./0.05 MPa
Ambient and fluid temperature	–5 °C to 60 °C
Port size	Rc1/4 (Gauge port Rc1/8)
Weight	Approx. 700 g (at 100 mm stroke)

## Replacement Parts

Part no.	Description	Note
IP200-02	Pilot valve unit	
39020-23	Seal kit	Ambient temperature: Standard (–5° to 60°)

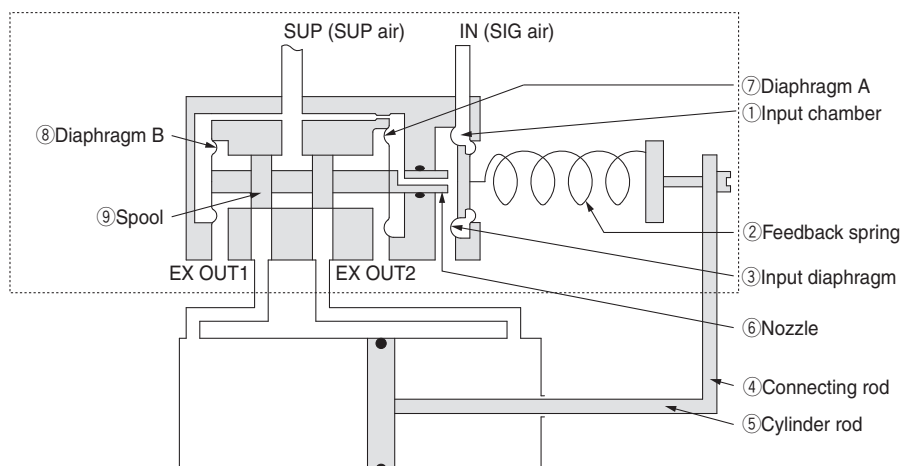
Note 1) Specification values are given at normal temperature (20 °C).

Note 2) Characteristics relating to accuracy differ depending on combination with other constituent loop equipment, such as positioners and actuators.

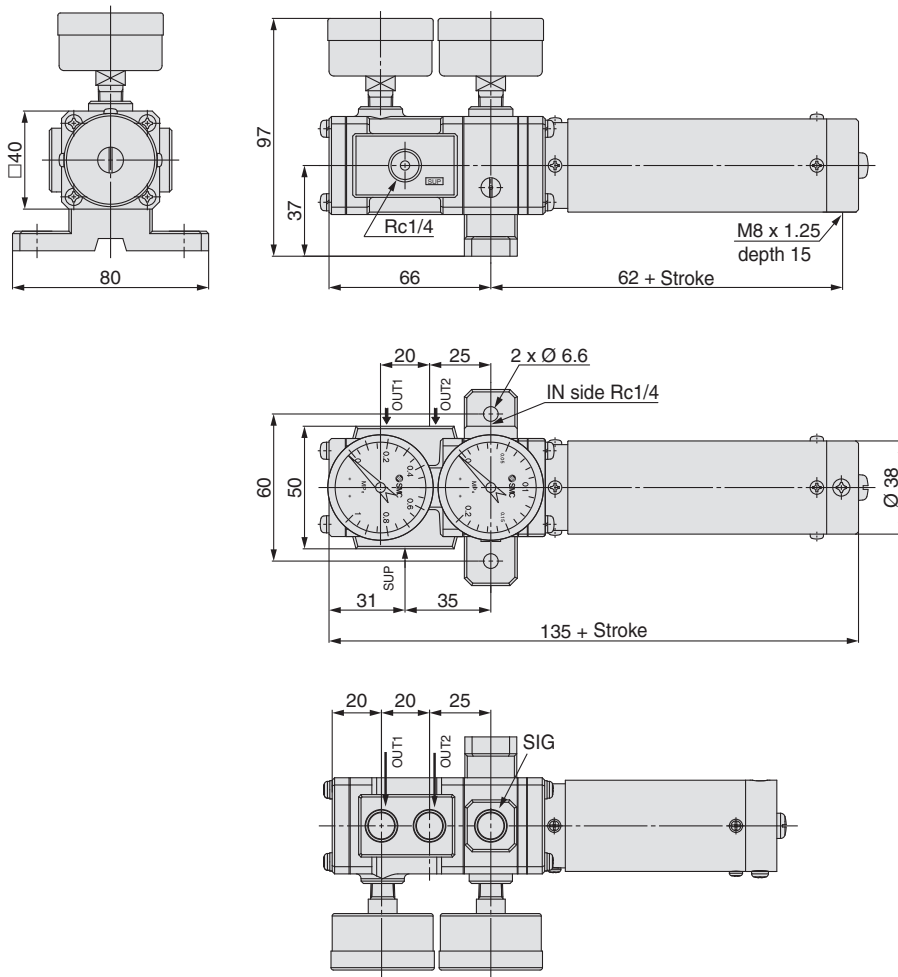
Note 3) Air consumption is due to exhaust from nozzle. And (ANR) indicates JIS B0120 standard air.

## Construction/Principle of Operation

When signal pressure enters input chamber ①, the input diaphragm ③ is deflected left. Clearance of the nozzle ⑥ is reduced causing higher back pressure at diaphragm A ⑦. This diaphragm A ⑦ has larger area than diaphragm B ⑧ resulting in movement of the spool to the left. Supply pressure then flows to OUT1 ① and partial exhaust from OUT2 takes place resulting in cylinder rod ⑤ movement to the right. The movement is linked via connecting rod ④ and feedback spring ② to the input diaphragm ③ balancing the higher pressure. When this occurs nozzle ⑥ clearance increases allowing Centralising of the spool ⑨ to take place. This holds the piston rod in the new position. Input signal increase results in proportional movement of the piston rod.



## Dimensions



## Precautions

### Caution




**Caution**

- 1. As the positioner contains extra-fine orifices such as restrictor and nozzle, if drain or dust is present in the supply pressure line, malfunction (\*1) may result. In addition to an air filter (SMC AF series), it is recommended to use a mist separator (SMC AM, AFM series) and a micro mist separator (SMC AMD, AFD series).  
Also, refer to “SMC Air Preparation System” for air quality.**
- 2. Never use a lubricator, as this can cause a malfunction (\*1).**
- 3. Be sure to flush the piping to prevent foreign matter from entering the positioner before connecting them.**

\*1 If the restrictor is clogged, the cylinder rod may not perform a stroke or hunching and overshoot may occur.

## 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) <sup>1)</sup>, 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 catalogue 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 catalogue.
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. <sup>2)</sup> 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 catalogue 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.

## Safety Instructions

Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

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