Modular Type Relief Valve

New

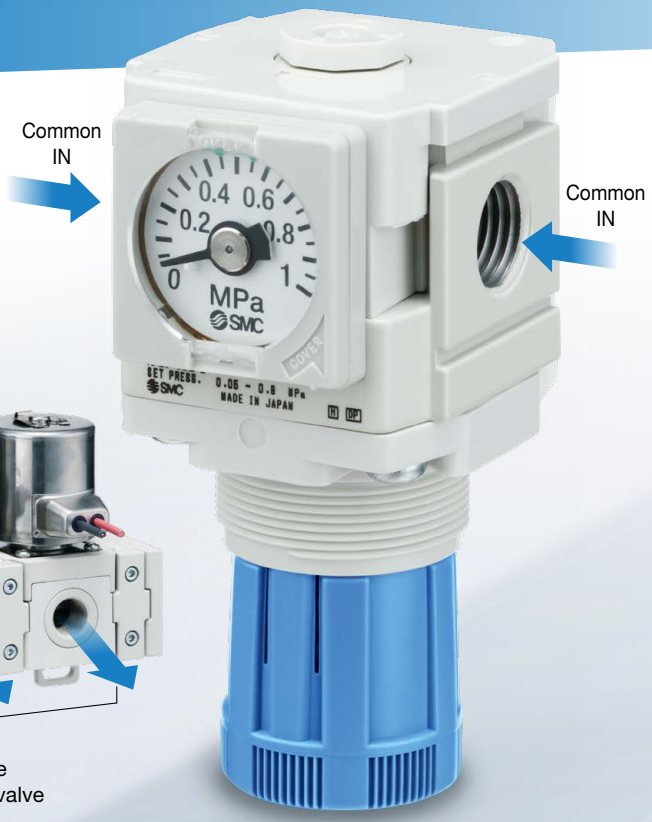
RoHS

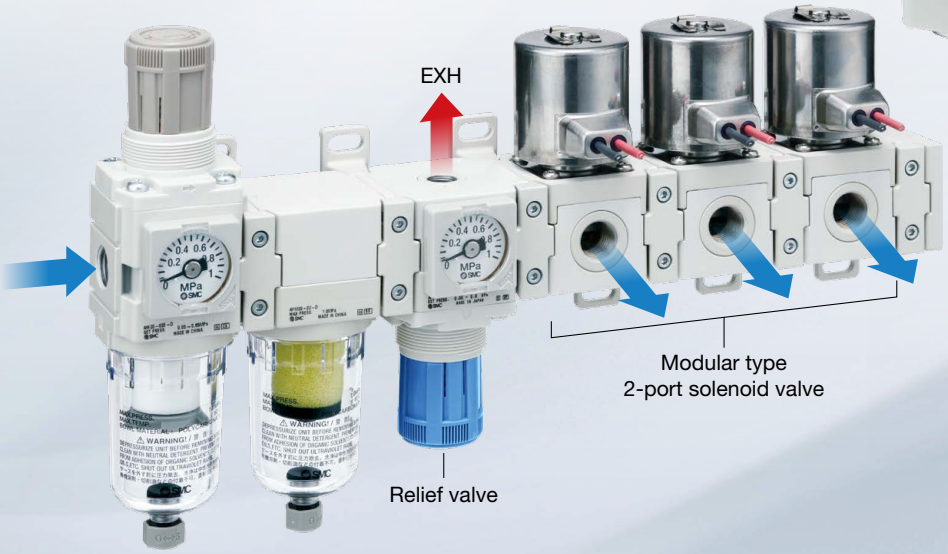
Releases pressure over the set range into the atmosphere and constantly maintains the pressure in a pipe

Set pressure: 0.05 to 0.8 MPa

Modular connection is possible.

Reduced piping labor,
Branch piping is not required. p. 1





Model	Set pressure [MPa]	Common IN port size (Rc, NPT, G)	Options (p. 4)
AP20-D 	0.05 to 0.8 0.02 to 0.2	1/8, 1/4	Bracket With set nut (for panel mount) Square embedded type pressure gauge (with limit indicator) Round type pressure gauge (with limit indicator) Round type pressure gauge (with color zone) With plug (for common IN port) Built-in silencer Knob cover*1

*1 To be ordered and assembled separately by the customer

AP20-D Series

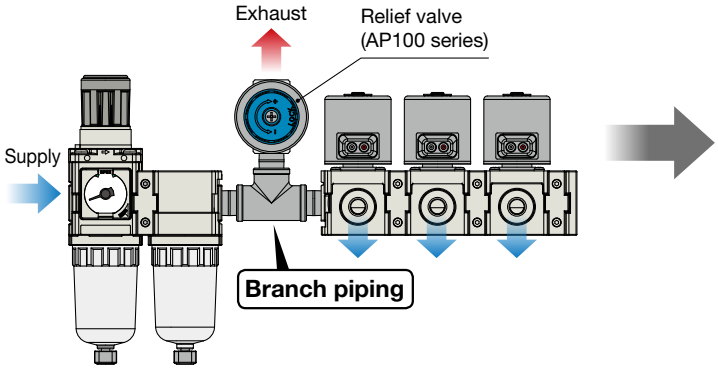
SMC

CAT.ES40-84A

Reduced piping labor

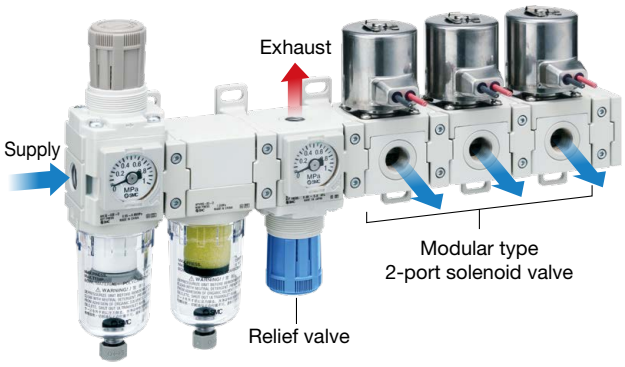
Existing type

Branch piping is required for connection to downstream equipment as the IN port and EXH port are in a straight line.



Modular connection

Reduced piping labor, Branch piping is not required.



Selection of pressure gauges, Easy to handle

Selection of pressure gauges

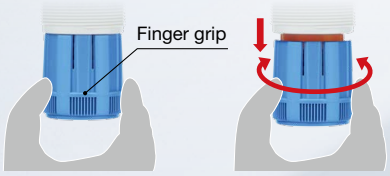
Square embedded type pressure gauge

Round type pressure gauge

Round type pressure gauge (with color zone)

Easy to handle

Easy to hold when unlocked

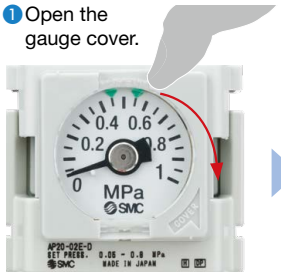


Locked

Pressure regulation while unlocked

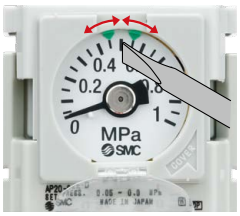
Open/close type gauge cover

❶ Open the gauge cover.



Open the gauge cover in the direction of the arrow with your fingertips.

❷ Adjust the indicator to a specified position.



Adjust the indicator using a flat blade screwdriver.

❸ Close the gauge cover.

Close the gauge cover in the direction of the arrow and push it in until it clicks in place.

Options

With built-in silencer (for EXH port)

No need to order a silencer separately

With a built-in silencer option

When a silencer is mounted externally (AN10)

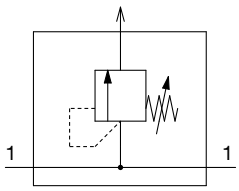
Knob cover

Prevents careless knob operation

Modular Type Relief Valve
AP20-D

RoHS

Symbol



AP20-D

How to Order

AP 20 – ❶ 02 BENS – ❹ ❺ ❻ – D

Body size

❶ Pipe thread type

Symbol	Type
Nil	Rc
N	NPT
F	G

❷ Port size

Symbol	Type
01	1/8
02	1/4

❹ Set pressure*1

Symbol	Type
Nil	0.05 to 0.8 MPa setting
1*2	0.02 to 0.2 MPa setting

*1 Pressure can be set higher than the specification pressure in some cases, but use pressure within the specification range.
*2 When the pressure gauge is attached, the maximum operating pressure is 0.4 MPa.

❸ Option*3

		Symbol	Type
a	Mounting	**Nil**	Without mounting bracket
		B*4	With bracket
		H	With set nut (for panel mount)
		+	
b	Pressure gauge*5	**Nil**	Without pressure gauge
		E	Square embedded type pressure gauge (with limit indicator)
		G	Round type pressure gauge (with limit indicator)
		M	Round type pressure gauge (with color zone)
		+	
c	Plug	**Nil**	Without plug
		N*6	With plug (for IN port)
		+	
d	Silencer	**Nil**	Without silencer
		S	With built-in silencer (for EXH port)

*3 Options B, G, H, M, and S are not assembled and supplied loose at the time of shipment.
*4 The assembly consists of a bracket and a set nut.
*5 When the pressure gauge is attached, a 1.0 MPa pressure gauge will be fitted for standard (0.8 MPa) type. 0.4 MPa pressure gauge for 0.2 MPa type.
*6 Including one plug. Used to block the IN port on one side when this product is used at the end of a circuit.

· Option: Select one each for **a** to **d**.
· Option symbol: When more than one specification is required, indicate in alphabetical order.
Example) AP20-N02BENS-1YZ-D

❺ Knob

Symbol	Type
Nil	Downward
Y	Upward

❻ Unit

Symbol	Type
Nil	Unit on product label: MPa Pressure gauge in SI units: MPa
Z*7	Unit on product label: psi Pressure gauge: MPa/psi dual scale

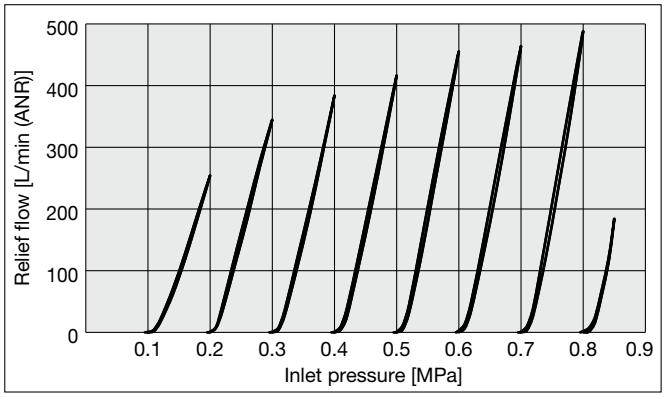
*7 For the pipe thread type: NPT
This product is for overseas use only according to the New Measurement Act. (The SI unit type is provided for use in Japan.)
Cannot be used with M: Round type pressure gauge (with color zone)

Standard Specifications

Model	AP20-D
Port size	1/8, 1/4
EXH port size	1/8
Pressure gauge port size	1/8
Fluid	Air
Ambient and fluid temperatures	–5 to 60°C (No freezing)
Proof pressure	1.3 MPa
Max. operating pressure	0.85 MPa
Set pressure range	0.05 to 0.8 MPa
Weight	0.12 kg

Relief Characteristics

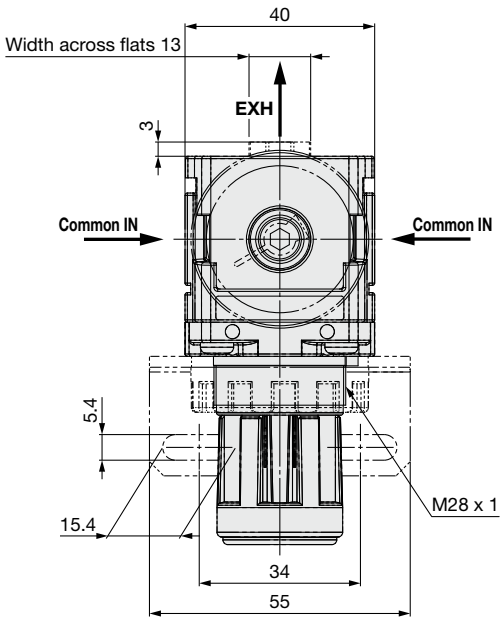
AP20-D

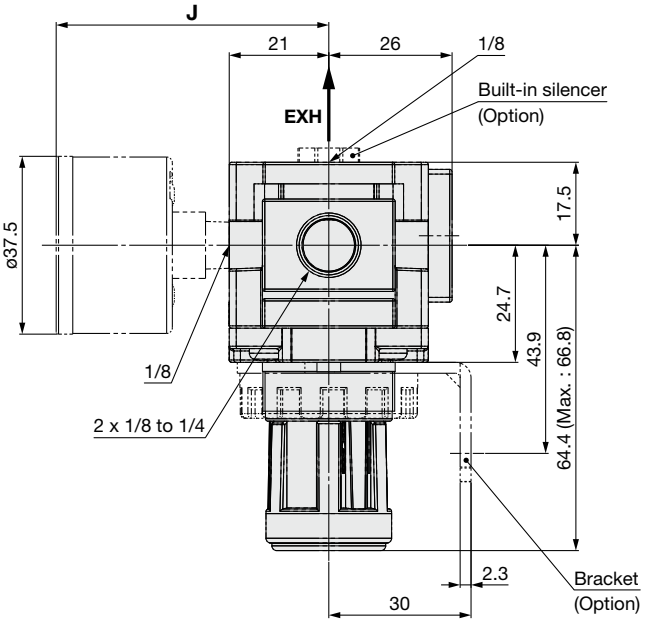


* The graph above shows the relief flow when the set pressure rises and falls from 0.1 MPa.

Dimensions

Round Type Pressure Gauge
AP20-D





Panel cutout dimensions

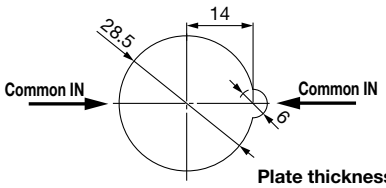
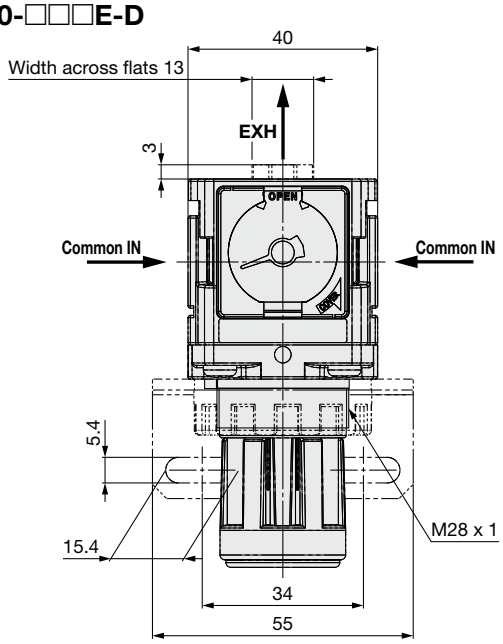


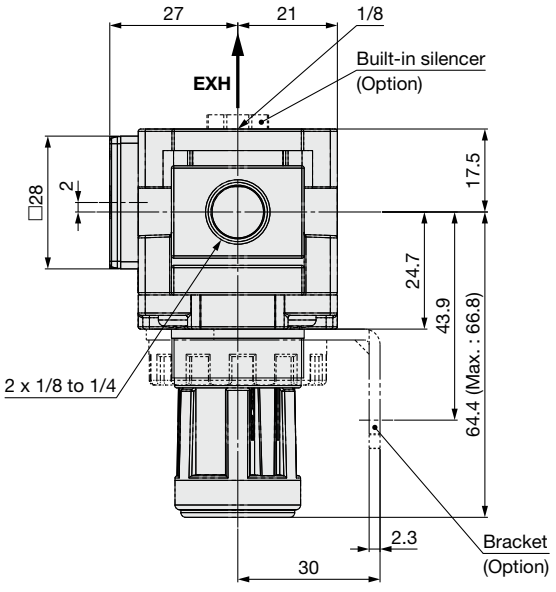
Plate thickness: Max. 3.5

Pressure Gauge Dimensions: J

Round type pressure gauge	Round type pressure gauge (with color zone)
57.5	58.5

Square Embedded Type Pressure Gauge
AP20-□□□E-D





Panel cutout dimensions

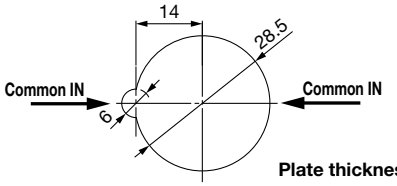


Plate thickness: Max. 3.5

AP20-D Series
Accessories (Optional Parts)

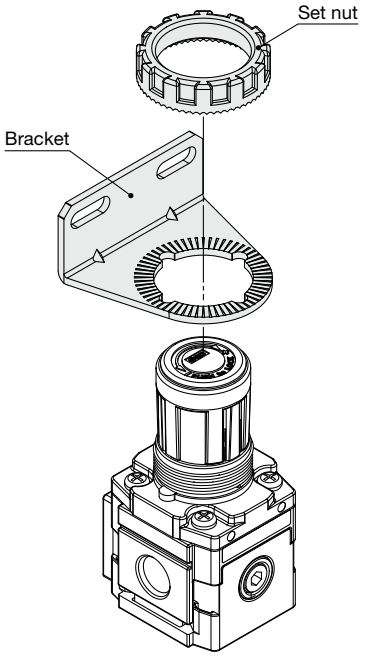
Bracket Assembly / Set Nut

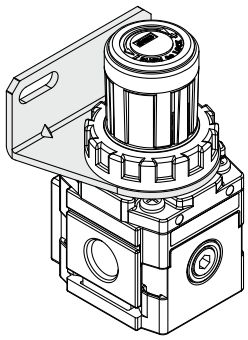
Bracket Assembly
AR23P-270AS

The assembly consists of a bracket and a set nut.

Set Nut
AR23P-260S

* Refer to the Dimensions on page 3 for panel cutout dimensions.





Bracket assembly

Silencer Assembly

The assembly consists of the element assembly and an O-ring.

VHS24P-190AS

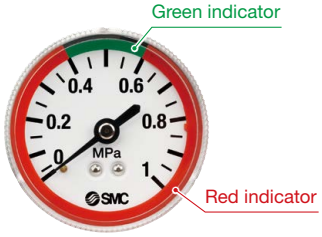
Pressure Gauge

Optional specifications			Model
			AP20-D
Pressure gauge∗1	**Round type**	**Standard**	G36-10-□01
		0.02 to 0.2 MPa setting	G36-4-□01
	Round type (with color zone)	**Standard**	G36-10-□01-L
		0.02 to 0.2 MPa setting	G36-4-□01-L
	Square embedded type∗2	**Standard**	GC3-10AS-D [GC3P-030AS (Pressure gauge cover only)]
		0.02 to 0.2 MPa setting	GC3-4AS-D [GC3P-030AS (Pressure gauge cover only)]

∗1 □ in part numbers for a round pressure gauge indicates a pipe thread type. No indication is necessary for R; however, indicate N for NPT. Please contact SMC regarding the pressure gauge supply for both MPa and psi unit specifications.
∗2 Including one O-ring and 2 mounting screws. [ ]: Pressure gauge cover only

Round type

Round type (with color zone)



Square embedded type

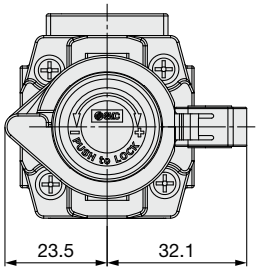
Knob Cover

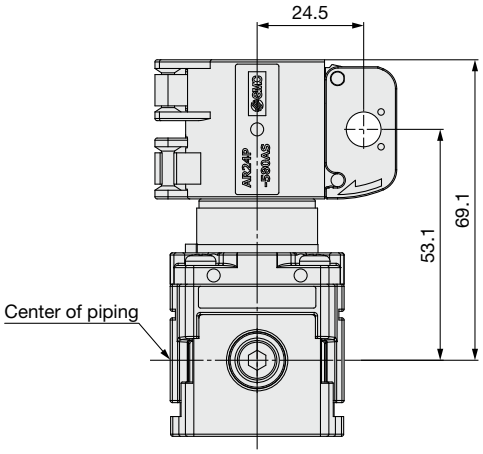
Can be mounted on the knob in order to prevent the accidental operation of the knob

AR24P-580AS

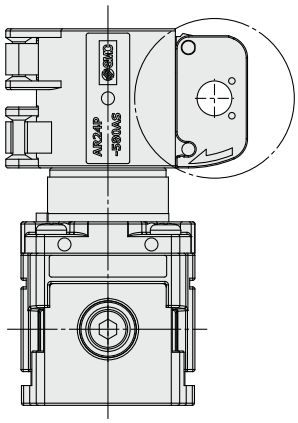
* The lock will be provided by the customer.

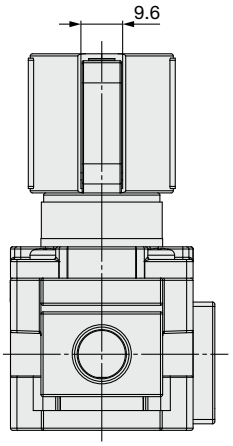
Dimensions

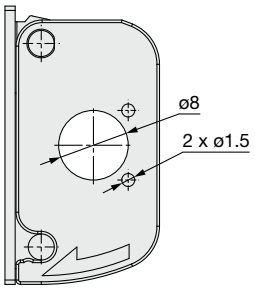


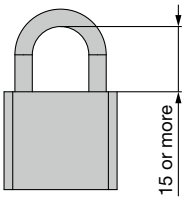


Detailed dimensions of the lock hole









* **Recommended lock dimensions**

Refer to the operation manual for how to mount the knob cover.

Scan or click here.

AP20-D Series
Specific Product Precautions

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For F.R.L. units precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smcworld.com

Design / Selection

⚠ Warning

1. **Do not supply air pressure from ports other than the IN(1) port. The valve will malfunction when air pressure is supplied from other ports.**
2. **Do not use this product as a safety valve.**
   * Definition of safety valves (JIS): Valves used for ensuring pressure capacity and piping safety.

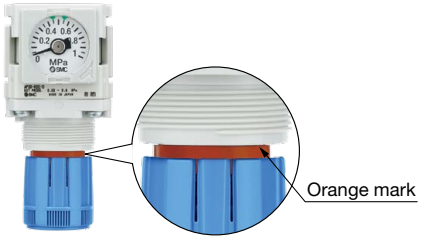
Mounting / Adjustment

⚠ Warning

1. **To set the exhaust pressure, with no pressure supplied, turn the knob to the right until it hits the stopper and stops. Then, start supplying pressure and adjusting the knob.**
2. **If pressure is supplied when the knob is loose, a large amount of air will be exhausted from the EXH port, which is dangerous.**
3. **Do not use tools on the pressure regulator knob as this may cause damage. It must be operated manually.**
4. **When the set pressure is exceeded, confirm that exhaust has begun before starting to use the device.**
5. **Before replacing or changing the mounting direction of the pressure gauge, or changing the direction of the scale plate, be sure to release the pressure completely.**
   It is dangerous to replace or change the mounting direction of the pressure gauge, or change the direction of the scale plate, while it is under pressure.

⚠ Caution

1. **Be sure to unlock the knob before adjusting the pressure and lock it after setting the pressure. Failure to follow this procedure can cause damage to the knob and the pressure may fluctuate.**
   - Pull the pressure regulator knob to unlock. (You can visually verify this with the "orange mark" that appears in the gap.)
   - Push the pressure regulator knob to lock. When the knob is not easily locked, turn it left and right a little and then push it (when the knob is locked, the "orange mark", i.e., the gap will disappear).



Piping

⚠ Warning

1. **To screw the pressure gauge and piping materials into the pressure gauge port on the product, tighten to the recommended torque (3 to 5 N·m) while securely holding the AP20-D in place.**
   Additionally, when mounting a One-touch fitting to the pressure gauge port, refer to the Fittings and Tubing Precautions.

⚠ 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.

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

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

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

*1) ISO 4414: Pneumatic fluid power - General rules and safety requirements for systems and their components
ISO 4413: Hydraulic fluid power - General rules and safety requirements for systems and their components
IEC 60204-1: Safety of machinery - Electrical equipment of machines - Part 1: General requirements
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1:Robots
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. SMC products cannot be used beyond their specifications. They are not developed, designed, and manufactured to be used under the following conditions or environments. Use under such conditions or environments is not allowed.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, combustion equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogs and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

SMC develops, designs, and manufactures products to be used for automatic control equipment, and provides them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not allowed.
Products SMC manufactures and sells cannot be used for the purpose of transactions or certification specified in the Measurement Act of each country.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

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) **Suction cups (Vacuum pads) are excluded from this 1 year warranty.**
A suction cup (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 suction cup (vacuum pad) or failure due to the deterioration of rubber material are not allowed 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.

⚠ Safety Instructions	Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.