OSHA Standard Compliant Pressure Relief 3-Port Valve with Locking Holes

New RoHS

5 - - - ×

SUP

VHS40-04-D MAX.PRESS.

THESE-EE-D LONG

Improved flow rate characteristics

6% increase Max. *1 VHS40-04-D

Energy saving

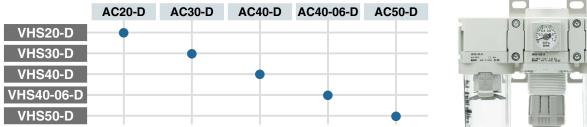
Zero blow-by of the air during switching of the handle

Safety measure

OSHA (Occupational Safety and Health Administration) standard compliant



Modular design with uniform body style to F.R.L units.



Variations

Single action		VHS20-D	VHS30-D	VHS40-D	VHS40-06-D	VHS50-D	
Double action		VHS20W-D	VHS30W-D	VHS40W-D	VHS40W-06-D	VHS50W-D	
	1/8	•					
	1/4	•	•	•			
Port size	3/8		•	•			
(Rc, NPT, G)	1/2			•			
	3/4				•	•	
	1					•	

Single Action

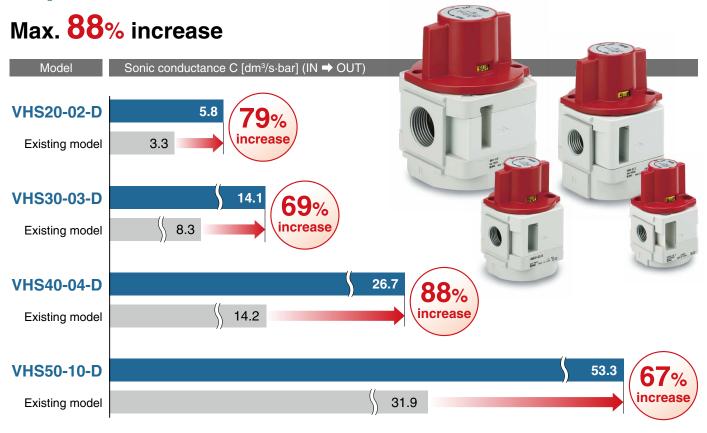
VHS20/30/40/50-D Series Double Action VHS20W/30W/40W/50W-D Series



AL30-03-0 ML-9613 1.0 MV

0

Improved flow rate characteristics



Safety measure

Can prevent accidents caused by inadvertent air supply problems

With the indicator window



The supply/exhaust status of the air flow can be verified at a glance in the indicator window.

SUP : Supply EXH : Exhaust

Double action

Push the handle and then turn, 2-step action prevents malfunction.



OSHA (Occupational Safety and Health Administration) standard compliant

For safety control, OSHA rule requires energy sources for certain equipment be turned off or disconnected and that the device either be locked or labelled with a warning tag.

With locking holes

When in the exhaust position, the valve may be padlock secured. Prevents accidental start-ups while personnel are cleaning or servicing equipment.



SMC

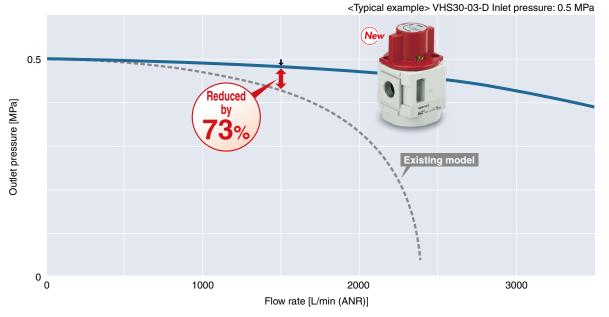
* Recommended lock shackle diameter size: ø5 or more



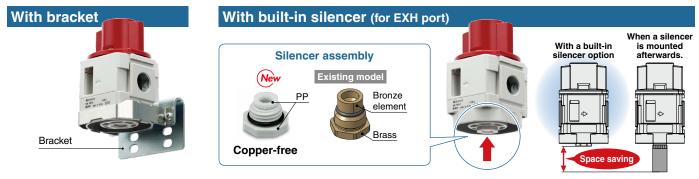
Lower pressure drop contributing to energy saving

Pressure drop: reduced by up to 73%

(* for flow rate up to 1500 L/min.)



Options



Semi-standard/Made to Order



			Sing VF Dou	Standard Compliant Pressure le Action HS20/30/40/3 ble Action HS20W/30W/4	50-D	Ser	ies	R	OHS			
Symbo		2										
	M	3 1		How to Order					A A A A A A A A A A A A A A A A A A A			
VH	S	30 - [• Ø	6	3 D - 5 6 Made to Order (For details, refer to page 8.)	Option/Semi-stand Option/Semi-stand When more than alphanumeric ord Example) VHS30-N	dard symbo one specific er.	ol: cation is requ		ite in			
							0					
	Symbol Description					20	Body 30	size 40	50			
			Nil	Single action	•	•	•	•				
2	Handle operation W Double action					•		•	•			
			+ Nil	Rc*1		•		•	•			
6	Pij	pe thread type	Ν	NPT		•		•	•			
			<u> </u>	G		•		•	•			
			+ 01	1/8		•	_	_				
			02	1/4		•		•				
4		Port size	03	3/8				•				
		1 011 3126	04	1/2			—	•				
			06 10	3/4				•	•			
			+	I								
		Mounting	Nil	Without mounting option								
G	а	Mounting	В	With bracket		•		●	•			
Option			+	Without silencer]			•				
	b	Silencer	Nil S	With built-in silencer (for EXH port)		•	•	•				
			+					-				
	c	Handle color	Nil	Red				●	●			
			K	Black • • •								
ą			+ Nil	Resin]			•	-			
Idar	d Handle material Nil Resin M Metal + e Flow direction R Flow direction: Left to right R Flow direction: Right to left						•	•	•			
+												
-ing	e Flow direction Nil Flow direction: Left to right						•	•	•			
Image: Book of the control of the								•	•			
			Nil	Product label in SI units: MPa				•				
	f	Pressure unit	Z *2	Product label in imperial units: psi				 *3	 *3			
1 The	nine t	hread type for the E	XH port is	· · ·								

*1 The pipe thread type for the EXH port is G.

*2 For the pipe thread type: NPT only. This product is for overseas use only according to the New Measurement Act. (The SI unit type is provided for use in Japan.) *3 O: For the pipe thread type: NPT only

Simple Specials System A system designed to respond quickly and easily to your special ordering needs



For modular connection units (shipped assembled), the simple specials system can be used.

Short lead times

This system enables us to respond to your special needs (additional machining, accessory assembly, or the designing of a modular unit) and deliver your personalized products as quickly as standard products.

Repeat orders

Once we receive a simple special part number from one of your previous orders, we will process the order, manufacture the product, and deliver it to you as quickly as possible.

Please contact your local sales representative for more details.





..... OSHA standard (Occupational Safety and Health Administration, U.S. Department of Labor) For safety control, OSHA rule requires energy sources for certain equipment

be turned off or disconnected and that

the device either be locked or labelled

with a warning tag.

Specifications

Standard Specifications

Standard Specifications										
Model	VHS20-D	VHS30-D	VHS40-D	VHS40-06-D	VHS50-D					
Applicable AC size	AC20-D	AC30-D	AC40-D	AC40-06-D	AC50-D AC60-D*1					
Fluid	Air									
Ambient and fluid temperatures	-5 to 60°C (No freezing)									
Proof pressure	1.5 MPa									
Max. operating pressure			1.0 MPa							
Handle switching angle			90°							
Paint color	Handle: Red Body: White Body cover: White									
Weight 0.10 kg 0.18 kg 0.40 kg 0.43 kg				0.82 kg						

*1 The VHS50 can be connected to the AC60.

Flow Rate Characteristics

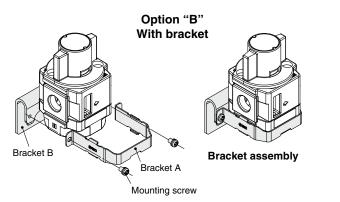
	Port	size	Flow rate characteristics							
Model	IN, OUT	EXH	IN -	→ OUT		OUT	\rightarrow EXH			
	111, 001		C (dm ³ /s·bar)	b	Cv	C (dm³/s·bar)	b	Cv		
VHS20-D	1/8	1/8	4.0	0.41	1.1	3.7	0.42	1.1		
VH320-D	1/4	1/0	5.8	0.31	1.4	3.8	0.42	1.1		
VHS30-D	1/4	1/4	8.8	0.44	2.4	8.0	0.46	2.3		
VH330-D	3/8		14.1	0.28	3.5	7.8	0.46	2.2		
	1/4		9.5	0.49	2.8	13.3	0.47	3.6		
VHS40-D	3/8	3/8	17.2	0.47	4.8	13.6	0.47	3.7		
	1/2		26.7	0.29	6.3	13.4	0.43	3.7		
VHS40-06-D	3/4	1/2	34.0	0.22	7.6	16.1	0.41	4.4		
VHS50-D	3/4	1/2	45.0	0.26	10.6	23.0	0.49	6.4		
VH350-D	1	1/2	53.3	0.36	13.5	22.8	0.49	6.3		

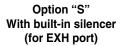
Option/Part Nos.

Optional	Model									
specifications	VHS20-D	VHS30-D	VHS40-D	VHS40-06-D	VHS50-D					
Bracket assembly ^{*1}	VHS24P-180AS	VHS34P-180AS	VHS44P-180AS	VHS44P-180AS	VHS54P-180AS					
Silencer assembly ^{*2}	VHS24P-190AS	VHS34P-190AS	VHS44P-190AS	VHS54P-190AS	VHS54P-190AS					

*1 The assembly consists of a bracket A/B and 2 mounting screws.

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



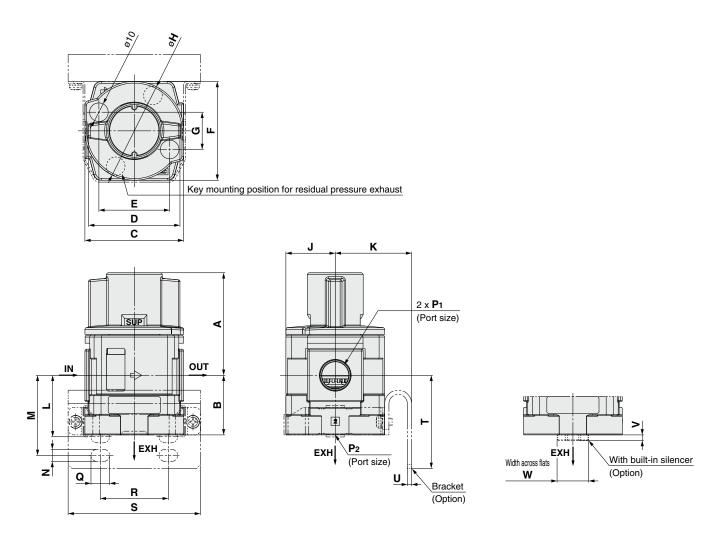


O-ring

Element assembly Cross section of EXH port with built-in silencer assembly

VHS20/30/40/50-D Series

Dimensions



Dimensions

	Standard specifications											
Model	P 1	P2		Α		с	D	Е	F	G	н	
	F1	F2	Single	Double	В	Ŭ				G	п	J
VHS20-D	1/8, 1/4	1/8	48.5	51.7	23	40	37	28	42	17.5	40	21
VHS30-D	1/4, 3/8	1/4	55	58.2	32	53	49	38	53	20	53	26.5
VHS40-D	1/4, 3/8, 1/2	3/8	69.7	73.9	41.3	70	63	52	71	29	70	35.5
VHS40-06-D	3/4	1/2	71.7	75.9	43.3	75	63	52	71	29	70	35.5
VHS50-D	3/4, 1	1/2	86.5	90.7	44.5	90	80	72	90	33	90	45

	Options specifications											
Model	With bracket										With silencer	
	К	L	М	Ν	Q	R	S	Т	U	V	W	
VHS20-D	30	25.3	34	5.4	8.4	27	60	40	2.3	3	13	
VHS30-D	41	33	43	6.5	10	36.5	71	50	2.3	3	17	
VHS40-D	50	44	57	8.5	19	43.5	88	66	2.3	3	21	
VHS40-06-D	50	46	59	8.5	19	43.5	88	68	2.3	4	27	
VHS50-D	70	60	_	11	27.5	49.5	113	71	3.2	4	27	

[mm]

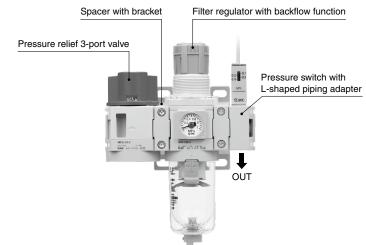
VHS20/30/40/50-D Series Modular Connection Example

Please note that products do not come assembled. They should be ordered separately and assembled by the customer.

For modular connection units (shipped assembled), the simple specials system can be used. For details, refer to page 3.

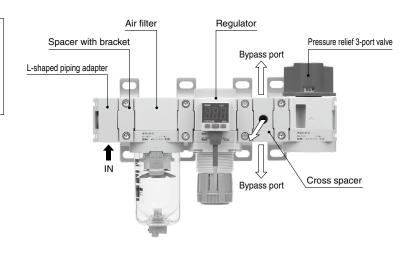
Combination example 1





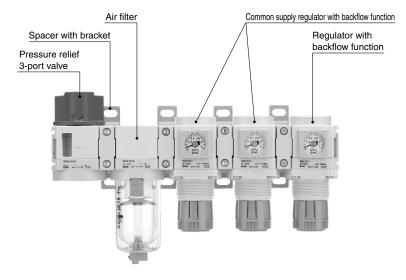
Combination example 2

L-shaped piping adapter E300L-03-D ———	— 1 pc.
Spacer with bracket Y300T-D —————	— 4 pcs.
Air filter AF30-03-D	— 1 pc.
Regulator AR30-03E1-D	— 1 pc.
Cross spacer Y34-03-D	— 1 pc.
Pressure relief 3-port valve VHS30-03-D	— 1 pc.



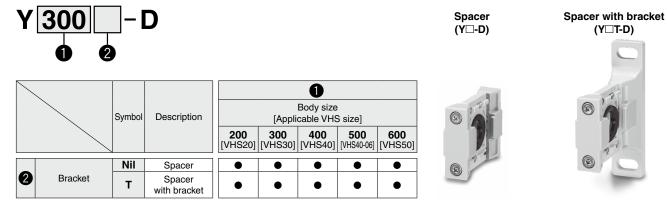
Combination example 3

Pressure relief 3-port valve VHS30-03-D	— 1 рс.
Spacer with bracket Y300T-D	— 4 pcs.
Air filter AF30-03-D	— 1 рс.
Common supply regulator with backflow function	
AR30MK-0302E-D	— 2 pcs.
Regulator with backflow function AR30K-03E-D —	— 1 рс.



VHS20/30/40/50-D Series Accessories Sold Separately (for Individual Parts)

Spacer/Spacer with Bracket



Standard Specifications

Fluid	Air
Ambient and fluid temperatures	−5 to 60°C (No freezing)
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa

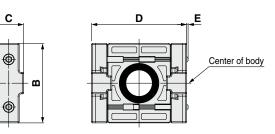
Replacement Parts

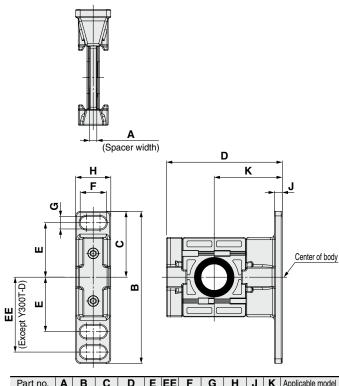
				Part number			
Description	Material	Y200-D	Y300-D	Y400-D	Y500-D	Y600-D	
		Y200T-D	Y300T-D	Y400T-D	Y500T-D	Y600T-D	
Seal	HNBR	Y220P-050S	Y320P-050S	Y420P-050S	Y520P-050S	Y620P-050S	

Dimensions

Spacer







Part no.	Α	В	С	D	E	Applicable model
Y200-D	3.2	35	13.2	42	0.6	VHS20-D
Y300-D	4.2	43	16.2	53	—	VHS30-D
Y400-D	5.2	51	19.2	71	_	VHS40-D
Y500-D	5.2	54	21.2	71	—	VHS40-06-D
Y600-D	6.2	64	27.2	90	_	VHS50-D
	-				_	

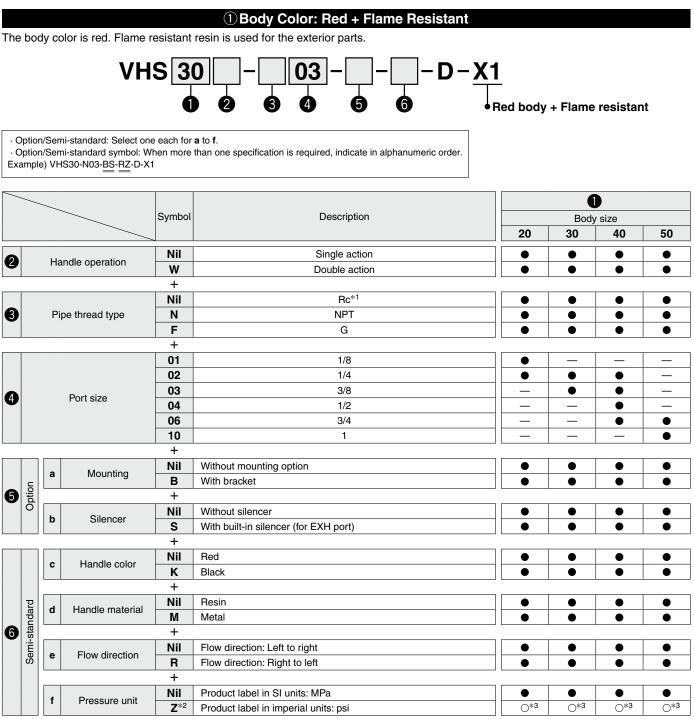
Part no.	Α	В	С	D	Ε	EE	F	G	Н	J	K	Applicable model
Y200T-D	3.2	67	29	51	24	33	11.5	5.5	15.5	3.5	30	VHS20-D
Y300T-D	4.2	85	42.5	67.5	35	-	14	7	20	6	41	VHS30-D
Y400T-D	5.2	115	50	85.5	40	55	18	9	26	7	50	VHS40-D
Y500T-D	5.2	115	50	85.5	40	55	18	9	26	7	50	VHS40-06-D
Y600T-D	6.2	140	60	115	50	70	20	11	31.2	8	70	VHS50-D

Spacer with bracket

VHS20/30/40/50-D Series Made to Order

Please contact SMC for detailed dimensions, specifications, and delivery times.





*1 The pipe thread type for the EXH port is G.

*2 For the pipe thread type: NPT only. This product is for overseas use only according to the New Measurement Act. (The SI unit type is provided for use in Japan.) *3 〇: For the pipe thread type: NPT only



VHS20/30/40/50-D Series **Specific Product Precautions 1**

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For 3/4/5-port solenoid valve precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smcworld.com

Precautions on Design

Marning

1. Do not supply air pressure from ports other than the 1 (P) port.

The valve will malfunction when air pressure is supplied from other ports.

2. We recommend using a lock with a shackle diameter of ø5 or more. If a lock with a shackle diameter of less than ø5 is to be used, please test it on the actual machine.

Installation and Adjustment

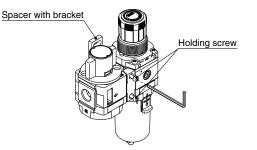
∧Caution

- 1. The valve must be switched to each position instantly and securely. Stopping the handle between the extreme positions may cause a malfunction.
- 2. Double action type requires two actions (push the handle and turn it). Confirm that the handle is pushed properly before turning it. If the handle is not pushed properly to the end, the internal parts will be broken by turning the handle.
- 3. Tighten the 2 holding screws on the spacer with bracket or spacer evenly.

Tighten them to the recommended tightening torque.

Insufficient tightening torque may result in loosening or sealing failure. Excessive tightening torque may damage the thread, etc.

Recommen	Unit: N·m				
Applicable model	VHS20 [AC20]	VHS30 [AC30]	VHS40 [AC40]	VHS40-06 [AC40-06]	
Spacer with bracket part number	Y200T-D	Y300T-D	Y400T-D	Y500T-D	Y600T-D
Spacer part number	Y200-D	Y300-D	Y400-D	Y500-D	Y600-D
Torque	0.36 ±0.036	1.2 ±0.05	1.2 ±0.05	1.4 ±0.05	2.0 ±0.1



Piping

MWarning

1. Piping load and moment

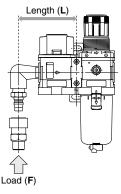
Avoid any torsional or bending moments other than those caused by the equipment's own weight as failure to do so may result in damage.

Support external piping separately.

If moment application is unavoidable during operation, the moment should be lower than the max. moment shown below. Piping materials without flexibility, such as steel tube piping, are prone to being affected by excess moment loads or vibrations from the piping side. Use flexible tubing in between to avoid such effects.

					Unit: N⋅m
Applicable model	VHS20 [AC20]	VHS30 [AC30]		VHS40-06 [AC40-06]	
Max. moment (M)	14.5	16	19.5	35	45

Max. moment (\mathbf{M}) = Length (\mathbf{L}) x Load (\mathbf{F})



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

Should they remain, they could cause a malfunction.

3. When connecting pipes and fittings, etc., be sure that neither chips from the pipe threads nor sealing material get inside the valve.

When using sealant tape, leave 1.5 to 2 thread ridges exposed at the end of the pipe/fitting.

4. Connect piping/fittings using the recommended torgue while holding the female thread side tightly.

Insufficient tightening torque can result in loose piping or sealing failure. Over tightening may break the thread. If the female side is not held while tightening, excessive force will be applied to the bracket directly, resulting in breakage.

Recommended Tightening Torque								
Connection thread	1/8	1/4	3/8	1/2	3/4	1		
Torque	7 to 9	12 to 14	22 to 24	28 to 30	28 to 30	36 to 38		



VHS20/30/40/50-D Series Specific Product Precautions 2

Be sure to read this before handling the products. Refer to the back cover for safety instructions. For 3/4/5-port solenoid valve precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: https://www.smcworld.com

Piping

AWarning

5. When an SMC One-touch fitting is used, refer to the operation manual for the One-touch fitting.

6. Silencer is recommended in the exhaust port.

When mounting a built-in resin silencer (VHS series/optional), tighten it by hand, and then use a tool on the width across flats of the octagonal part to tighten it additionally until it is attached firmly on the end. When mounting the resin silencers (AN series), use a tool on the width across flats of the hexagonal part to tighten it an additional 1/4 turn after tightening the silencer by hand.

When installing One-touch fittings (KQ2 series), add a 1/2 turn after tightening it by hand. Excess tightening torque may damage the resin silencers or the threads of the exhaust port.

Air Supply

AWarning

1. Air containing a large amount of drainage can cause a malfunction. Install an air dryer or aftercooler on the inlet side of the product.

ACaution

- 1. Use an air filter with 5 μm or less filtration rating on the inlet side to avoid any damage to the seat caused by dust.
- 2. Install a mist separator on the inlet side to remove carbon powder from the compressor or other equipment. An excessive amount of carbon dust ingress via the inlet may cause the valve to malfunction.

Refer to "SMC Air Preparation System" for further details on compressed air quality.

Operating Environment

A Warning

- 1. Do not use in an atmosphere containing corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.
- 2. Do not use in explosive atmospheres.
- 3. Do not use in locations subject to vibration or impact.
- 4. A protective cover should be used to shield the product from direct sunlight.
- 5. Remove any sources of excessive heat.
- 6. Employ suitable protective measures in locations where there is contact with water droplets, oil, welding spatter, etc.
- 7. Install a silencer into exhaust port to prevent the ingress of dust if there is a lot of dust in the atmosphere.

If dust enters the valve via exhaust port, it may cause air leakage.

If any ambient environments from 1 to 7 mentioned above are true for your operating conditions, select the metal handle type for your safety.

Maintenance

AWarning

1. When equipment is to be removed, first confirm that measures are in place to prevent dropping of driven objects and run-away of equipment, etc. Then cut the supply air pressure and electric power, and exhaust all compressed air from the system using its residual pressure release function.

When the equipment is to be started again after remounting or replacement, first confirm that measures are in place to prevent lurching of actuators and then confirm that equipment operates normally.

2. Do not disassemble the product.

It will cause damage to the product and result in operation failure.

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

AWarning

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.
 - 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.
- 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.

- *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.

 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

- 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.
- 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

- 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.

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.

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