3 Port Air Operated Valve
VPA3145/3165/3185 Series

How to Order

VPA3 1 4 5 □ – 04 – □

VPA
Air operated valve

Number of pilot

1	Single

Body size

4	1/2
6	1
8	1 1/2

Body type

5	Body ported

Valve option

—	For ordinary pressure
V	For vacuum and low pressure

Port size (IN, OUT port)

Symbol	Port size Rc size	VPA3145	VPA3165	VPA3185
03	3/8 (10A)	●	—	—
04	1/2 (15A)	●	—	—
06	3/4 (20A)	●	●	—
10	1 (25A)	—	●	—
12	1 1/4 (32A)	—	●	●
14	1 1/2 (40A)	—	—	●
20	2 (50A)	—	—	●

Thread type

—	Rc
F	G
N	NPT
T	NPTF



VPA3165-06



VPA3145-03

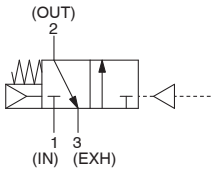
Specifications

Fluid	Air	
Type of actuation	N.C. only (N.O. only for vacuum)	
Operating pressure range	For vacuum and low pressure	For ordinary pressure
	–101.2 kPa to 0.2 MPa	0.2 to 0.8 MPa
Pilot pressure range	Refer to the graph of pilot pressure.	
Ambient and fluid temperature (°C)	0 (No freezing) to 60	
Lubrication	Required (Turbine oil, Class 1 ISO VG32 equivalent)	
Mounting orientation	Free	
Impact/Vibration resistance (m/s²) Note)	150/50	

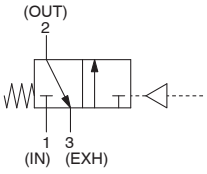
Note) Impact resistance: No malfunction from test using drop impact tester, to axis and right angle directions of main valve, each one time when pilot signal ON and OFF. (Value in the initial stage)
Vibration resistance: No malfunction from test with 45 to 1000 Hz one sweep, to axis and right angle direction of main valve, each one time when pilot signal ON and OFF. (Value in the initial stage)

Symbol

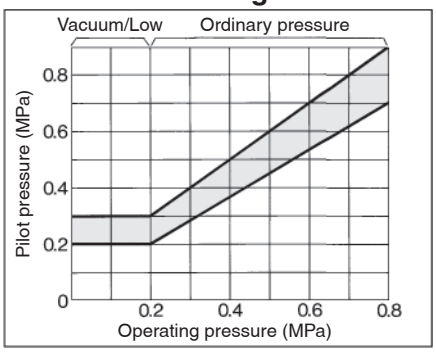
<Positive pressure>



<Vacuum pressure>



Pilot Pressure Range



⚠ Precautions

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 3 to 9 for 3/4/5 Port Solenoid Valve Precautions.

⚠ Caution

1. Lubrication
   Since this valve needs lubrication, use turbine oil Class 1 (ISO VG32).
2. Refer to pages 1309 and 1316 for information about the pressure applied to piping and ports, quality of air and piping for vacuum applications.

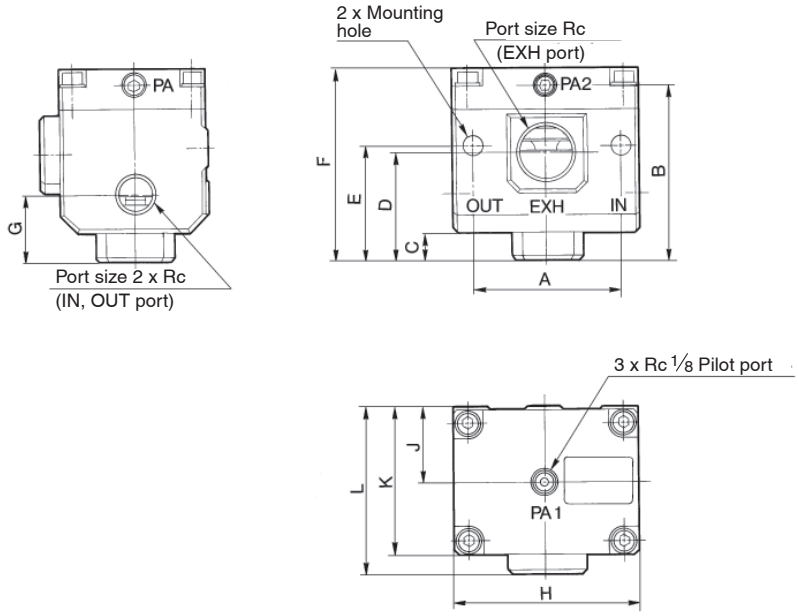
SMC

Flow Rate Characteristics/Weight

Valve model	Port size		Flow rate characteristics								Weight (kg)
			1→2(IN→OUT)				2→3(OUT→EXH)				
	1(IN), 2(OUT)	3(EXH)	C[dm³/(s·bar)]	b	Cv	Q [l/min (ANR)*1]	C[dm³/(s·bar)]	b	Cv	Q [l/min (ANR)*1]	
VPA3145	3/8	3/4	19	0.43	5.5	5284	18	0.47	5.4	5163	1.0
	1/2		23	0.32	6.2	5924	21	0.39	5.8	5672	
	3/4		28	0.36	7.6	7406	26	0.35	7.0	6831	

Valve model	Port size		Effective area (mm²)		Weight (kg)
	1(IN), 2(OUT)	3(EXH)	1→2(IN→OUT)	2→3(OUT→EXH)	
VPA3165	3/4	1 1/4	230	280	1.5
	1		280	310	
	1 1/4		310	330	
VPA3185	1 1/4	2	570	650	2.3
	1 1/2		650	670	
	2		650	670	

Dimensions



Model	Port size Rc		A	B	C	D	E	F	G	H	J	K	L	Mounting hole
	IN, OUT	EXH												
VPA3145	3/8	3/4	71	85	14	52	55	93	32	87.4	36	71	80	Ø 8.5
	1/2													
	3/4													
VPA3165	3/4	1 1/4	82.6	110	17	68	75	118	45	113	36	71	95	Ø 8.5
	1													
	1 1/4													
VPA3185	1 1/4	2	118	132	14	80	95	140	52	140	41	81	105	Ø 13
	1 1/2													
	2													

⚠ 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 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. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
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, fuel 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 catalogues 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

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
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 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.

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