



Operation Manual

ISO Standard Solenoid Valve

PRODUCT NAME

VQ7-6/VQ7-8(-X23) Series

MODEL / Series / Product Number

*PIN assignment of -x23 is different from standard product

SMC Corporation

Contents

Safety Instructions	2
5 Port Solenoid Valve Precautions	4
VQ7-6/VQ7-8 Series Specific Product Precautions	7
Series VQ7-6	
Single Unit	
How to order/Specification	9
Construction	11
Manifold VV71 Series	
How to order	12
Manifold option	13
Control Unit	17
Series VQ7-8	
Single Unit	
How to order/Specification	18
Construction	20
Manifold VV72 Series	
How to order	21
Manifold option	22
Manifold option Parts/Mounting Bolt Part No.	25
Exploded view of Manifold	26
Failures and Countermeasures	28



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.

*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: Manipulating industrial robots -Safety.

etc.



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.

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. 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.

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.



Safety Instructions

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.*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) 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 regulation 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.



Series VQ7-6/7-8

5 Port Solenoid Valve Precautions 1

Be sure to read before handling.

Precautions on Design

⚠ Warning

1. Actuator drive

When an actuator, such as a cylinder, is to be driven using a valve, take appropriate measures to prevent potential danger caused by actuator operation.

2. Intermediate stopping

When a 3 position closed center valve is used to stop a cylinder at an intermediate position, accurate stopping of the piston in a predetermined position is not possible due to the compressibility of air. Furthermore, since valves and cylinders are not guaranteed for zero air leakage, it may not be possible to hold a stopped position for an extended length of time. Contact SMC if it is necessary to hold a stopped position for an extended time.

3. Effect of back pressure when using a manifold

Use caution when valves are used on a manifold, as actuator malfunction due to back pressure may occur. Special caution is necessary when using a 3 position exhaust center valve, or when driving a single acting cylinder, etc. When there is a danger of this kind of malfunction, implement countermeasures such as the use of an individual exhaust spacer assembly or exhaust blocking plate.

4. Disposition of pilot exhaust

Operate the pilot exhaust port (PE) with silencers mounted on both the D and U sides, or with release to atmosphere. If merged with the main exhaust, the main valve may malfunction due to back pressure.

5. Holding of pressure (including vacuum)

Since valves are subject to air leakage, they cannot be used for applications such as holding pressure (including vacuum) in a pressure vessel.

6. Cannot be used as an emergency shutoff valve, etc.

The valves presented in this catalog are not designed for safety applications such as an emergency shutoff valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

7. Maintenance space

The installation should allow sufficient space for maintenance activities.

8. Release of residual pressure

Provide a residual pressure release function for maintenance purposes. Special consideration should be given to the release of residual pressure between the valve and cylinder in the case of a 3 position closed center type valve.

9. Vacuum applications

When a valve is used for vacuum switching, etc., take measures against the suction of external dust or other contaminants from vacuum pads and exhaust ports, etc. Moreover, an external pilot type valve should be used in this case. Contact SMC in case of an internal pilot type or air operated valve, etc.

Selection

⚠ Warning

1. Confirm the specifications.

The products presented in this catalog are designed only for use in compressed air systems (including vacuum). Do not operate at pressures or temperatures, etc. beyond the range of specifications, as this can cause damage or malfunction. (Refer to specifications.) Contact SMC when using a fluid other than compressed air (including vacuum).

2. Extended periods of continuous energization

Contact SMC if valves will be continuously energized for extended periods of time.

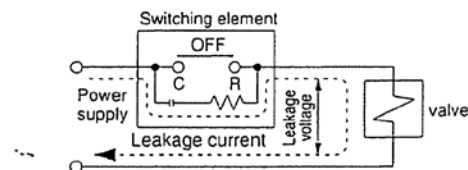
⚠ Caution

1. Momentary energization

If a double solenoid valve will be operated with momentary energization, it should be energized for at least 0.1 second.

2. Leakage voltage

Particularly when using a C-R element (surge voltage suppressor) for protection of the switching element, take note that leakage voltage will increase due to leakage current flowing through the C-R element, etc.



Limit the amount of residual leakage voltage to the following values:

With DC coil 2% or less of rated voltage

With AC coil 12.5% or less of rated voltage

3. Low temperature operation

Avoid ambient temperatures outside the range of -10 to 60°C (-5°C minimum for rubber seals). At low temperatures, appropriate measures should be taken to avoid solidification or freezing of drainage and moisture, etc.

4. Operation for air blowing

When using solenoid valves for air blowing, an external pilot type or direct solenoid operated type should be used.

Also, supply to the external pilot port compressed air within the pressure range prescribed in the specifications.

5. Mounting orientation

In the case of a single solenoid, the mounting orientation is unrestricted. In the case of double solenoid or 3 position valves, mount so that the spool valve is horizontal.

Also, when mounting in a location with vibration or impact, mount so that the spool valve is at a right angle to the direction of vibration.

Do not use in locations where vibration or impact exceeds the product's specifications.



Series VQ7-6/7-8 5 Port Solenoid Valve Precautions 2

Be sure to read before handling.

Mounting

⚠ Warning

1. If air leakage increases or equipment does not operate properly, stop operation.

After mounting or maintenance, etc., connect the compressed air and power supplies, and perform appropriate function and leakage inspections to confirm that the unit is mounted properly.

2. Instruction manual

Mount and operate the product after reading the manual carefully and understanding its contents. Also keep the manual where it can be referred to as necessary.

3. Painting and coating

Warnings or specifications printed or pasted on the product should not be erased, removed or covered up.

Piping

⚠ Caution

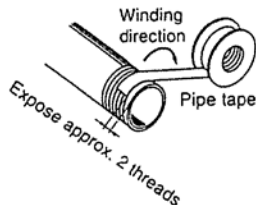
1. Preparation before piping

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

2. Wrapping of pipe tape

When connecting pipes and fittings, etc., be sure that chips from the pipe threads and sealing material do not get inside the valve.

Further, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the pipe/fitting.



3. When using closed center valves

When using closed center type valves, check carefully to be sure there are no air leaks from the piping between the valves and cylinders.

4. Tighten threads with the proper tightening torque.

When screwing fittings into valves, tighten with the torques given below.

Tightening torque for piping

Connection threads	Proper tightening torque N·m
Rc1/8	7 to 9
Rc1/4	12 to 14
Rc3/8	22 to 24
Rc1/2	28 to 30
Rc3/4	28 to 30

5. Connection of piping to products

When connecting piping to a product, refer to its instruction manual to avoid mistakes regarding the supply port, etc.

Wiring

⚠ Caution

1. Polarity

None of the series have polarity. (non-polar type)

2. Applied voltage

When electric power is connected to the solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

3. Confirm the connections.

After completing the wiring, confirm that the connections are correct.

Lubrication

⚠ Caution

1. Lubrication

1) The valve has been lubricated for life at the factory, and does not require any further lubrication.

2) In the event that it is lubricated, use Class 1 turbine oil (without additives), ISO VG32.

However, once lubrication is applied it must be continued, as the original lubricant may be eliminated leading to malfunction.



Series VQ7-6/7-8 5 Port Solenoid Valve Precautions 3

Be sure to read before handling.

Air Supply

Warning

1. Use clean air.

Do not use compressed air which contains chemicals, synthetic oils containing organic solvents, salts or corrosive gases, etc., as this can cause damage or malfunction.

Caution

1. Install air filters.

Install air filters close to valves at their upstream side. A filtration degree of 5µm or less should be selected.

2. Install an air dryer or after cooler, etc.

Air that includes excessive drainage may cause malfunction of valves and other pneumatic equipment. To prevent this, install an air dryer or after cooler, etc.

3. If excessive carbon powder is generated, eliminate it by installing mist separators at the upstream side of valves.

If excessive carbon powder is generated by the compressor, it may adhere to the inside of valves and cause malfunction.

Refer to SMC's "Air Cleaning Equipment" catalog for further details on compressed air quality.

Operating Environment

Warning

1. Do not use valves in atmospheres of corrosive gases, chemicals, salt water, water or steam, or where there is direct contact with same.

2. Do not use in an explosive atmosphere.

3. Do not use in locations subject to vibration or impact. Confirm the specifications for each series.

4. A protective cover, etc., should be used to shield valves from direct sunlight.

5. Shield valves from radiated heat generated by nearby heat sources.

6. Employ suitable protective measures in locations where there is contact with water droplets, oil or welding spatter, etc.

7. When solenoid valves are mounted in a control panel or are energized for extended periods of time, employ measures to radiate excess heat so that temperatures remain within the valve specification range.

Maintenance

Warning

1. Perform maintenance procedures as shown in the instruction manual.

If handled improperly, malfunction or damage of machinery or equipment may occur.

2. Equipment removal and supply/exhaust of compressed air

When equipment is removed, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc. Then cut the supply pressure and 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, etc., and then confirm that the equipment is operating normally.

3. Low frequency operation

Valves should be switched at least once every 30 days to prevent malfunction. (Use caution regarding the air supply.)

4. Manual override operation

When the manual override is operated, connected equipment will be actuated. Confirm safety before operating.

Caution

1. Drainage removal

Remove drainage from air filters regularly. (Refer to specifications.)

2. Lubrication

In the case of rubber seals, once lubrication has been started, it must be continued.

Use Class 1 turbine oil (without additives) VG32. Other lubricating oils will cause malfunction or other trouble.

Contact SMC regarding Class 2 turbine oil (with additives) VG32.

How to Find the Flow Rate (at air temperature of 20°C)

Subsonic flow when $P_1 + 0.1013 < 1.89 (P_2 + 0.1013)$

$$Q = 226S \sqrt{\Delta P (P_2 + 0.1013)}$$

Sonic flow when $P_1 + 0.1013 \geq 1.89 (P_2 + 0.1013)$

$$Q = 113S (P_1 + 0.1013)$$

Q: Air flow rate [l/min (ANR)]

S: Effective area (mm²)

ΔP: Differential pressure (P1-P2) [MPa]

P1: Upstream pressure [MPa]

P2: Downstream pressure [MPa]

* Correction for different air temperatures

Multiply the flow rate calculated with the above formulas by a coefficient from the table below.

Air temperature (°C)	-20	-10	0	10	30	40	50	60
Correction coefficient	1.08	1.06	1.04	1.02	0.98	0.97	0.95	0.94



VQ7-6/VQ7-8 Series Specific Product Precautions 1

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.

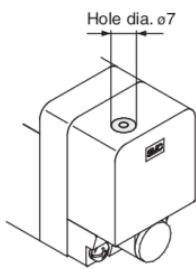
Warning

Manual Override Operation

Since connected equipment will be actuated when the manual override is operated, first confirm that conditions are safe.

Push type is standard. (Tool required)

Push type (Tool required)



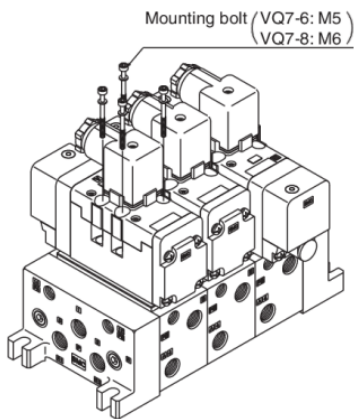
Push down on the manual override button with a small screwdriver until it stops. (Approx. 1.5 mm)
Release the screwdriver and the manual override will return.

Caution

Mounting of Valves

After confirming the gasket is correctly placed under the valve, securely tighten the bolts with the proper torque shown in the table below.

Series	Proper tightening torque (N-m)
VQ7-6	2.3 to 3.7
VQ7-8	4.0 to 6.0



Caution

Installation and Removal of Pilot Valve Cover

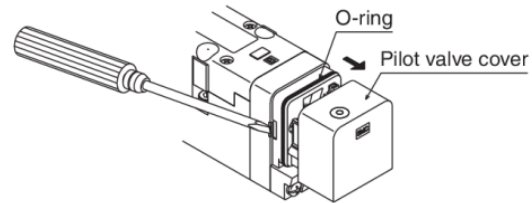
Installation and Removal of Pilot Valve cover

● Removal

To remove the pilot valve cover, spread the cover's hook outward about 1 mm with a flat head screw driver, and pull the cover straight off. If it is pulled off at an angle, the pilot valve may be damaged or the protective O-ring may be scratched.

● Installation

Put the cover back on straight without touching the pilot valve, and push it all the way until the cover's hook locks, without twisting the protective O-ring. (When pushed in, the hook opens and locks automatically.)

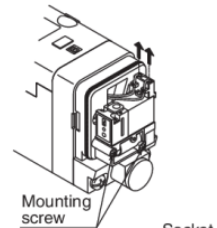


Caution

Replacement of Pilot Valves

● Removal

1. Remove the sockets which are installed on the pilot valve pins by pulling them straight upward.
2. Remove the pilot valve mounting screws with a small screwdriver.

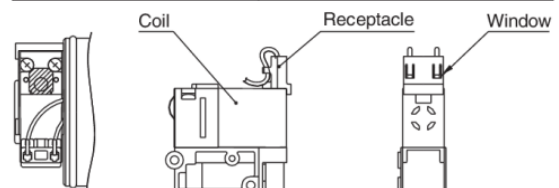


● Installation

1. After confirming installation of the gasket, securely tighten the mounting screws with the proper torque shown in the table below.
2. Put the sockets on straight and install them securely so that the receptacle housings touch the coil surface as shown in the drawing below.

If they are pushed in with excessive force, there is a danger of the sockets coming off of the receptacle housings. Confirm that the sockets do not protrude from the windows on the side of the receptacle housings.

Mounting screw	Proper tightening torque (N-m)
M1.7 x 12	0.12 to 0.13





VQ7-6/VQ7-8 Series Specific Product Precautions 2

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.

Warning

How to Wire DIN Terminal

ISO#: DIN 43650 A compatible

Connection

1. Loosen the top screw and remove the connector housing from the terminal spades on the solenoid.
2. Remove the housing screw and insert a screwdriver into the slot area on the underside of the DIN cap and carefully separate block and housing.
3. Loosen the terminal screws (slotted screws) on the terminal block, insert the core of the lead wire into the terminal in accordance with the prescribed connection method, and attach securely with the terminal screws.
4. Tighten the ground nut to secure the wire.

Change of electrical entry (Orientation)

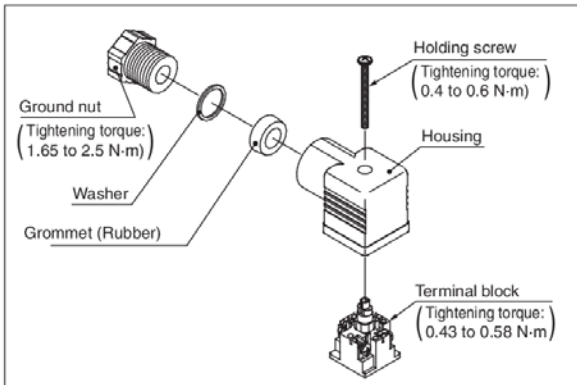
After separating terminal block and housing, the cord entry direction can be changed by attaching the housing in the desired direction (4 directions in 90° increments).

Precautions

Pull a connector out vertically, never at an angle.

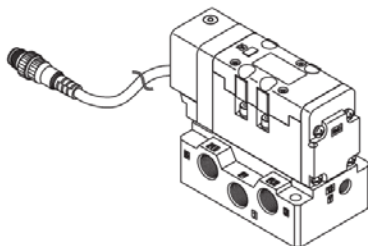
Applicable cable

O.D.: ø8 to ø12 (When you use the cord longer than ø9, cut the inside of grommet along the cutout and then insert the code.)



Using a Pre-wired Connector

4 core wire round type connector (M12) conforming to NECA (Nippon Electric Control Equipment Industries Association) standard 4202

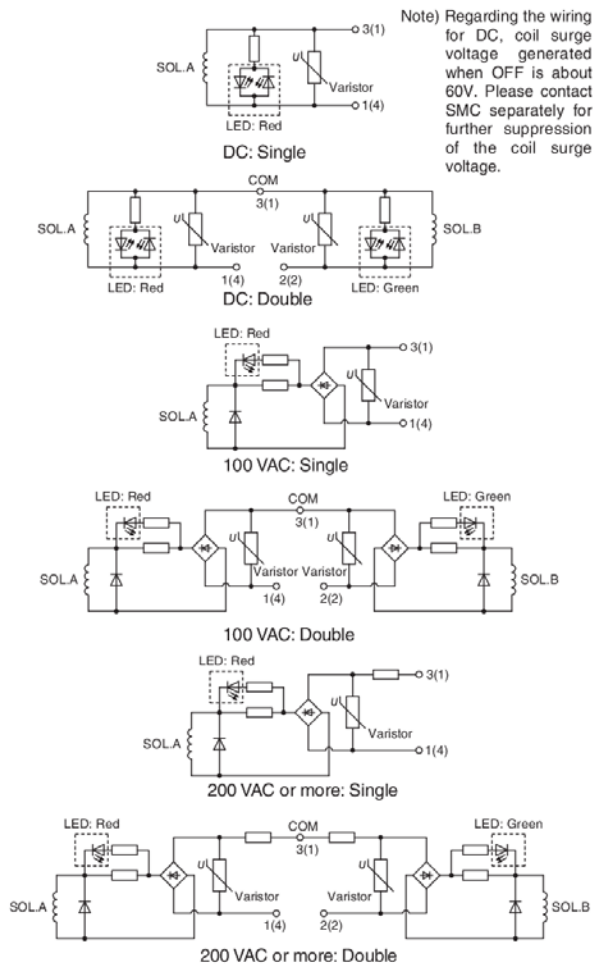


How to Calculate the Flow Rate

Refer to front matters 42 to 45 for How to Calculate the Flow Rate.

Caution

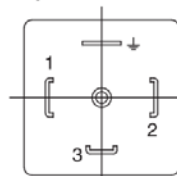
Internal Wiring Specifications



Note) Regarding the wiring for DC, coil surge voltage generated when OFF is about 60V. Please contact SMC separately for further suppression of the coil surge voltage.

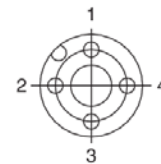
* Terminal numbers in the circuits are for a DIN connector. Numbers inside () are pre-wired connector pin numbers.

DIN terminal wiring specifications



Terminal no.
1: A side SOL.
2: B side SOL.
3: COM terminal

Pre-wired connector wiring specifications



Pin no. (Standard) Pin no. (X23)
1: COM. (+) 1: COM. (+)
2: B side SOL. 2: B side SOL.
3: Not in use 3: COM. (-)
4: A side SOL. 4: A side SOL.

Note) For standard, There is no polarity. It can also be used as -COM.

ISO Standard Solenoid Valve

VQ7-6 Series

Size 1/Single Unit



How to Order Valves

VQ7-6 - **FG** - **S** - **3** [] [] [] [] [] [] [] [] (-X23)

Passage symbol

FG	
YZ*	
FHG	
FJG	
FPG	
FIG	

* Semi-standard

Number of solenoids

S	Single
D	Double

CE-compliant

Nil	—
Q	CE-compliant

Connector

Nil	DIN terminal block (With connector)
O	DIN terminal block (Without connector)
SC	Pre-wired connector

※Only SC type is available with the -X23

Sub-plate port size

Nil	Without sub-plate
A02	Side ported 1/4 *
A03	Side ported 3/8
B02	Bottom ported 1/4 *
B03	Bottom ported 3/8

* Port R is 3/8

Thread type

Nil	Rc
F	G
T	NPTF

Seal

Nil	Metal seal
R	Rubber seal

Pilot exhaust

Nil	Common exhaust
V	Individual exhaust

Option

Nil	None
Z	Light/Surge voltage suppressor
N	With indicator light

Coil rated

1	100 VAC, 50/60Hz
2	200 VAC, 50/60Hz
3	24 VDC
4	12 VDC
5	110 VAC, 50/60Hz
6	220 VAC, 50/60Hz

For other rated voltages, please consult with SMC.

How to Order Sub-plate

VS7-1 - **A02** []

Port size

A02	Side ported 1/4*
A03	Side ported 3/8
B02	Bottom ported 1/4*
B03	Bottom ported 3/8

* Port 3(R2) and 5(R1) are 3/8

Thread type

Nil	Rc
F	G
T	NPTF

Specifications

Model	Piping location	Porting specifications		Weight (kg)
		1(P), 2(B), 4(A) port size	3(R2), 5(R1) port size	
VS7-1-A02□	Side	1/4	3/8	0.37
VS7-1-A03□		3/8		
VS7-1-B02□	Bottom	1/4	3/8	
VS7-1-B03□		3/8		

Model

Series	Number of positions	Model		Port size	Flow rate characteristics						(1) Response time (ms)	(2) Weight (kg)		
					1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → EA/EB)						
					$\frac{C}{[dm^3/(s \cdot bar)]}$	b	Cv	$\frac{C}{[dm^3/(s \cdot bar)]}$	b	Cv				
VQ7-6	2 position	Single	Metal seal	VQ7-6-FG-S-□	1/4	4.1	0.10	0.9	5.2	0.10	1.1	20 or less	0.40	
			Rubber seal	VQ7-6-FG-S-□R		5.0	0.13	1.1	6.0	0.11	1.4	25 or less		
		Double	Metal seal	VQ7-6-FG-D-□		4.1	0.10	0.9	5.2	0.10	1.1	12 or less		0.45
			Rubber seal	VQ7-6-FG-D-□R		5.0	0.13	1.1	6.0	0.11	1.4	15 or less		
	3 position	Closed center	Metal seal	VQ7-6-FHG-D-□		4.1	0.10	0.9	5.2	0.10	1.1	40 or less	0.48	
			Rubber seal	VQ7-6-FHG-D-□R		5.0	0.13	1.1	5.6	0.20	1.3	45 or less		
		Exhaust center	Metal seal	VQ7-6-FJG-D-□		4.1	0.10	0.9	5.2	0.10	1.1	40 or less	0.48	
			Rubber seal	VQ7-6-FJG-D-□R		4.8	0.16	1.1	6.0	0.17	1.4	45 or less		
		Double check	Metal seal	VQ7-6-FPG-D-□		1.4	-	-	3.1	-	-	50 or less	0.84	
			Rubber seal	VQ7-6-FPG-D-□R		1.4	-	-	3.1	-	-	50 or less		
		Pressure center	Metal seal	VQ7-6-FIG-D-□		4.1	0.10	0.9	5.2	0.08	1.1	40 or less	0.48	
			Rubber seal	VQ7-6-FIG-D-□R		5.6	0.15	1.2	5.9	0.08	1.3	45 or less		

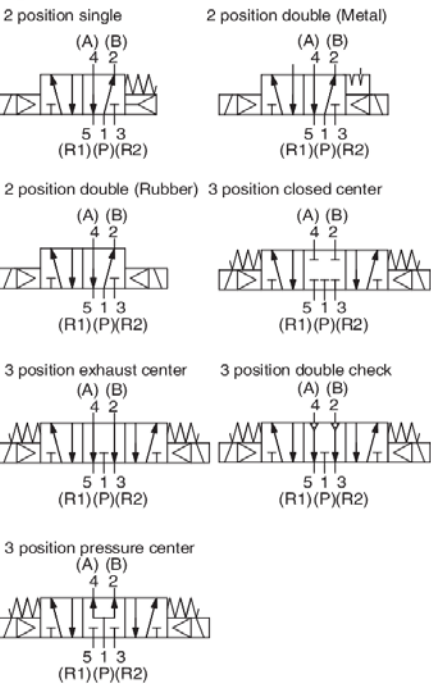
Note 1) Based on JIS B 8419: 2010 (Value for supply pressure of 0.5 MPa, with light/surge voltage suppressor, when using clean air.)
 Response time values will change depending on pressure and air quality.
 Value when ON for double type.

Note 2) Weight without sub-plate. (Sub-plate: 0.37 kg)



Standard Specifications

Symbol



Valve specifications	Valve construction	Metal seal	Rubber seal	
	Fluid	Air		
	Maximum operating pressure	1.0 MPa		
	Min. operating pressure	Single	0.15 MPa	0.20 MPa
		Double	0.15 MPa	0.15 MPa
		3 position	0.15 MPa	0.20 MPa
	Ambient and fluid temperature	-10 to 60°C (1)	-5 to 60°C (1)	
	Lubrication	Not required		
	Manual override	Push type (Tool required)		
	Impact/Vibration resistance	150/30 m/s ² (2)		
Enclosure	IP65 (Dusttight, Low jetproof)			
Solenoid specifications	Coil rated voltage	12 VDC, 24 VDC, 100 VAC, 110 VAC, 200 VAC, 220 VAC, 240 VAC (50/60Hz)		
	Allowable voltage fluctuation	±10% of rated voltage		
	Coil insulation type	Class B or equivalent		
	Power consumption (Current)	24 VDC	1W DC (42 mA)	
		12 VDC	1W DC (83 mA)	
		100 VAC (3)	1.2 VA (12 mA)	
		110 VAC (3)	1.3 VA (11.5 mA)	
		120 VAC (3)	1.5 VA (12 mA)	
		200 VAC (3)	2.5 VA (12.5 mA)	
		220 VAC (3)	2.6 VA (13 mA)	
230 VAC (3)	2.8 VA (12.5 mA)			
240 VAC (3)	3 VA (13 mA)			

Note 1) Use dry air to prevent condensation when operating at low temperatures.

Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

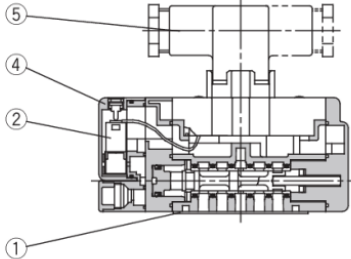
Note 3) The valve with an AC coil comes with a rectifying device; therefore, there is no difference in the consumption current when it is in the inrush and holding states.

VQ7-6 Series Construction

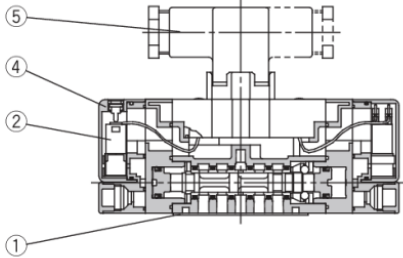
DIN Terminal Type

Metal seal type

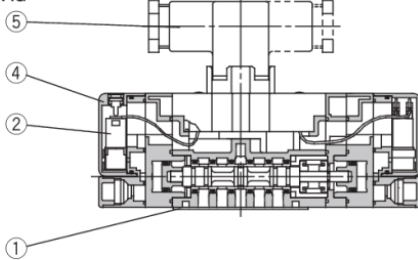
VQ7-6-FG-S-□



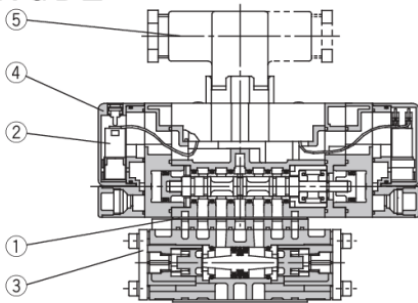
VQ7-6-FG-D-□



VQ7-6-^{FHG}_{FJG}-D-□

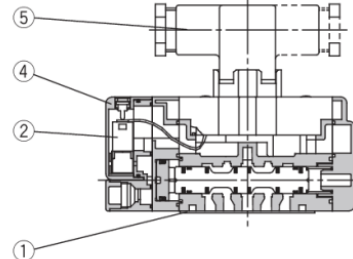


VQ7-6-FPG-D-□

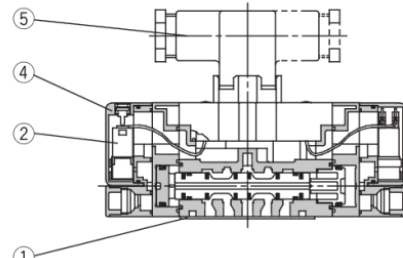


Rubber seal type

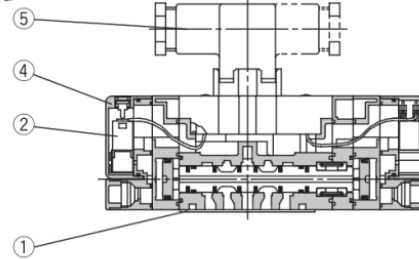
VQ7-6-FG-S-□R□



VQ7-6-FG-D-□R□



VQ7-6-^{FHG}_{FJG}-D-□R□



Replacement Parts (For valve)

No.	Description	VQ7-6-FG-S-□	VQ7-6-FG-D-□	VQ7-6- ^{FHG} _{FJG} -D-□	VQ7-6-FPG-D-□	VQ7-6-FG-S-□R□	VQ7-6-FG-D-□R□	VQ7-6- ^{FHG} _{FJG} -D-□R□
1	Gasket				VQ7060-13-4-1			
2	Pilot valve assembly ^{(1) (2)}			VQZ110Q-□ (5: 24 VDC, 6: 12 VDC, 1: For AC ⁽³⁾)				
3	Double check spacer		—		VV71-FPG		—	
4	Pilot valve cover				VQ7060-9A-1			
5	DIN terminal				UKL-S1			

Note 1) When the voltage is the same, the replacement of pilot valve assembly is possible.

Note 2) Since the substrate circuit in the valve is different, voltage cannot be changed with the pilot valve assembly.

Note 3) The pilot valve for 100 to 240 VAC is common.

Manifold VV71 Series VQ7-6 Series



How to Order Manifold

VV71 6 - 02R - - 02D - - -

Stations

1	1 station
:	:
10	10 stations

Note) When equipped with control unit, 1 or 2 stations are used for mounting.

2 (B), 4 (A) port connection

02R	1/4 (R side)
03R	3/8 (R side)
02L	1/4 (L side)
03L	3/8 (L side)
02Y	1/4 (Bottom side)
03Y	3/8 (Bottom side)
C6R	One-touch fitting ø6 (R side)
C8R	One-touch fitting ø8 (R side)
C10R	One-touch fitting ø10 (R side)
C6L	One-touch fitting ø6 (L side)
C8L	One-touch fitting ø8 (L side)
C10L	One-touch fitting ø10 (L side)
*	Mixed

Note) When ports are mixed, indicate piping specifications by means of the manifold specification sheet.

Thread type

Nil	Rc
F	G
T	NPTF

Note) With One-touch fittings: Nil

CE-compliant

Nil	—
Q	CE-compliant

Silencer box

Nil	None
SB	With

Note) The silencer box is mounted on the end plate located on the side (D, U, B) that is selected in "1(P), 3(R2), 5(R1) port connection".

Air release valve coil rating

Nil	None
1	100 VAC, 50/60 Hz
2	200 VAC, 50/60 Hz
3	24 VDC
4	12 VDC
5	110 VAC, 50/60 Hz
6	220 VAC, 50/60 Hz

For other rated voltages, please consult with SMC.

1(P), 3(R2), 5(R1) port connection

02D	1/4 (D side)
02U	1/4 (U side)
02B	1/4 (Both sides)
03D	3/8 (D side)
03U	3/8 (U side)
03B	3/8 (Both sides)
C12D	One-touch fitting ø12 (D side)
C12U	One-touch fitting ø12 (U side)
C12B	One-touch fitting ø12 (Both sides)
*	Mixed

Note) When ports are mixed, indicate piping specifications by means of the manifold specification sheet.

Thread type

Nil	Rc
F	G
T	NPTF

Note) With One-touch fittings: Nil

Control unit type (See pages 1130 and 1131 for details.)

Control equipment	Symbol								
	Nil	A	AP	M	MP	F	G	C	E
Air filter with auto-drain		○	○			○			
Air filter with manual drain				○	○		○		
Regulator		○	○	○	○	○	○		
Air release valve		○	○	○	○			○	○
Pressure switch			○		○				
Blanking plate (Air release valve)						○	○		
Blanking plate (Filter, Regulator)								○	
Blanking plate (Pressure switch)		○		○		○	○	○	
Number of manifold blocks required for mounting (stations)	2	2	2	2	2	2	2	2	1

Manifold Specifications

Manifold block size	Applicable solenoid valve	Porting specifications			Stations	Weight (kg)
		2(B), 4(A) port		1(P), 3(R2) 5(R1) port size		
		Port location	Port size			
ISO size 1	VQ7-6 Series ISO size 1	Right, Left	1/4 3/8 C6 (ø6) C8 (ø8) C10 (ø10)	1/4 3/8 C12 (ø12)	Note) Max. 10 stations	0.43n + 0.49 (n: Stations)
		Bottom	1/4 3/8			

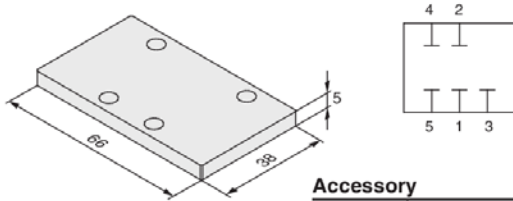
Note) When equipped with control unit, 1 or 2 stations are used for mounting.

VQ7-6 Series

Manifold Option Parts

Blanking plate assembly AXT502-9A

It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.



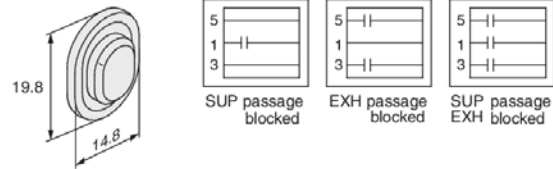
Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-2	4

Block plate (For SUP/EXH passages) AXT502-14

When two or more different high pressures are supplied to one manifold, block plates are installed between stations having different pressures.

Also, in cases such as when valve exhaust effects other stations in a circuit, block plates are used for exhaust at stations where the exhaust is to be separated.



Individual SUP spacer VV71-P-02 03 C10

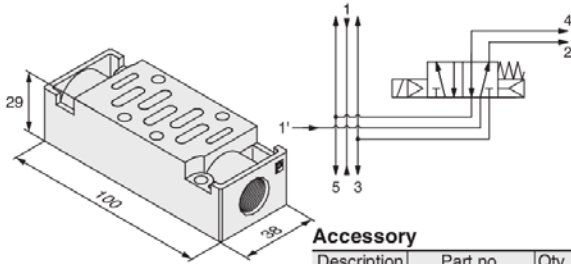


Thread type

Nil	Rc
F	G
T	NPTF

Note) It is not applicable to One-touch fittings.

By mounting individual SUP spacers on a manifold block, it is possible to provide individual supply ports for each valve.

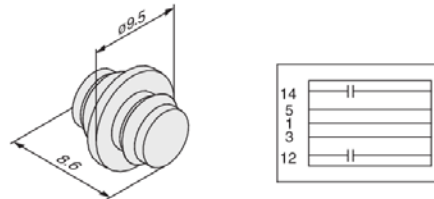


Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-6	4

Block plate (For pilot EXH passage) AZ503-53A

When a valve's pilot valve exhaust effects other valves in a circuit, block plates are used between stations where the pilot exhaust passages are to be separated.



Individual EXH spacer VV71-R-02 03 C12

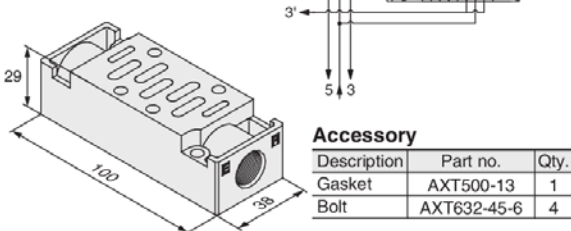


Thread type

Nil	Rc
F	G
T	NPTF

Note) It is not applicable to One-touch fittings.

By mounting individual EXH spacers on a manifold block, exhaust ports can be provided individually for each valve. (3, 5 common EXH type)

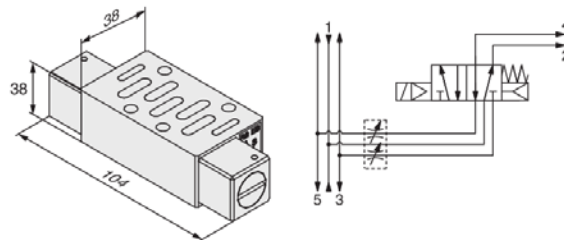


Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-6	4

Throttle valve spacer AXT503-23A

A throttle valve spacer is mounted on a manifold block to control cylinder speed by throttling exhaust air flow.



Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-5	4

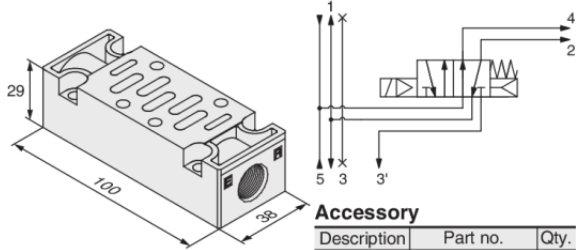
Reverse pressure spacer

AXT502-21A-1

Thread type

Nil	Rc
F	G
T	NPTF

With reverse pressure control manifold specifications, when pressure is changed individually on one side (ex. high speed cylinder return), pressure can be supplied individually to the R2 side by mounting a reverse pressure spacer. {Port 3 (R2) is individual and 5 (R1) is common.}

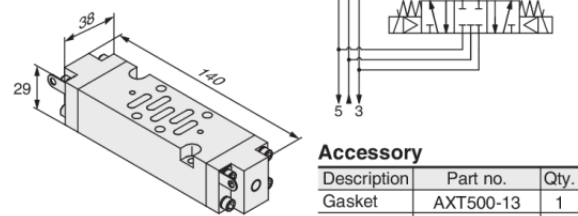


Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-6	4

Residual pressure release valve spacer
VV71-R-AB

This is used by mounting on a manifold block in order to exhaust the residual pressure trapped inside of a cylinder, etc., during an intermediate stop with a 3 position closed center or perfect type valve. Residual pressure at ports A and B is exhausted individually to the outside by manual operation.



Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-6	4

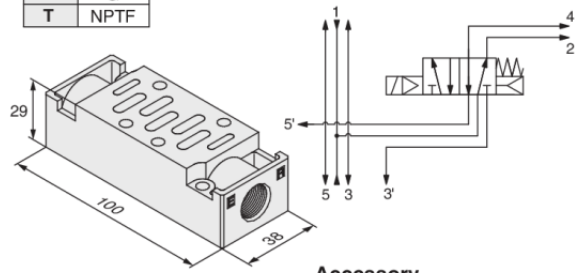
R1, R2 individual EXH spacer

VV71-R2-03

Thread type

Nil	Rc
F	G
T	NPTF

By mounting an individual EXH spacer on a manifold block, individual exhaust is possible from both R1 and R2. {3 (R2) and 5 (R1) are individual ports.}



Accessory

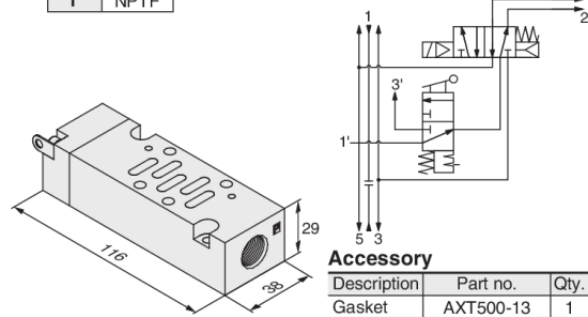
Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-6	4

Individual SUP spacer with residual pressure release valve
VV71-PR-02/03

Thread type

Nil	Rc
F	G
T	NPTF

This is used by mounting on a manifold block in order to stop the inlet side supply pressure in an individual supply spacer, while at the same time exhausting the residual pressure are performed by pressing the manual override, which can be locked by turning it.



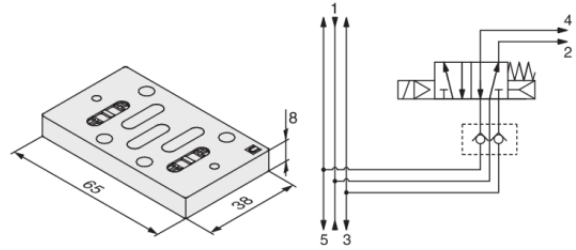
Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-6	4

Main EXH back pressure check plate

AXT503-37A

In cases where back pressure effects actuator operation due to simultaneous operation of manifold valves, etc., this effect can be eliminated by installing a plate between the manifold block and the valve from which back pressure is to be prevented.



Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-4	4

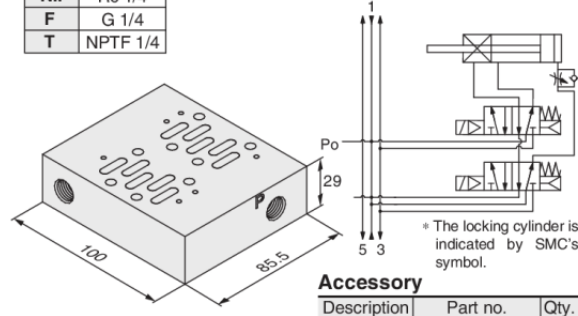
Adapter plate for locked-up cylinder

AXT502-26A

Thread type

Nil	Rc 1/4
F	G 1/4
T	NPTF 1/4

When using a locked-up cylinder with 2 valves for control, this spacer can be used by mounting on a manifold block. It consists of a circuit equipped with a function to prevent lurching during release.



Accessory

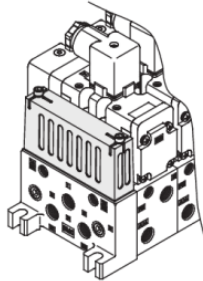
Description	Part no.	Qty.
Gasket	AXT500-13	2
Bolt	AXT632-45-6	8

VQ7-6 Series

Manifold Option Parts

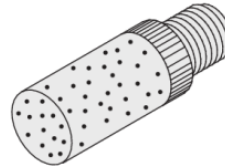
Silencer box VV71-□□□-□□-SB

This can be provided as a unit on the end plate to reduce manifold exhaust noise and piping labor.



Pilot EXH silencer AN110-01

This is used by mounting on the pilot exhaust port in order to reduce manifold and single type pilot exhaust noise, and to prevent the entry of dust.

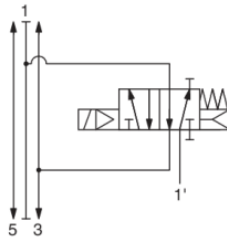
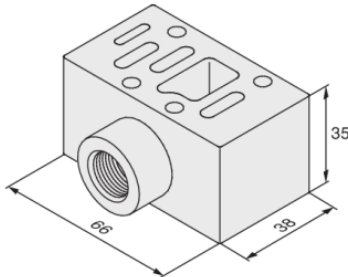


Release valve spacer AXT502-17A □

Combination of VQ7-6-FG-S (Single) and release valve spacer can be used as air release valve.
(Note) Mounting on 2 position double and 3 position valves is not possible.

Thread type

Nil	Rc 3/8
F	G 3/8
T	NPTF 3/8



Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT643-45-7	4

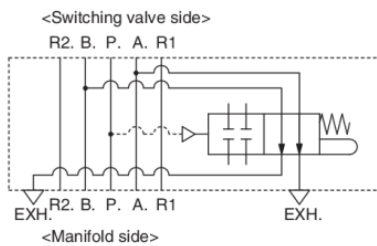
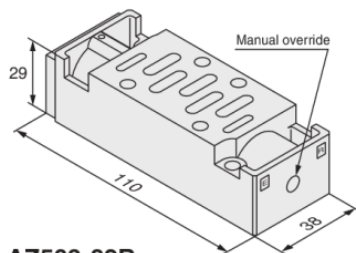
Residual pressure release valve spacer AZ503-82 □

At the same time as pilot pressure is released, residual pressure between the cylinder and valve is released.
There are two pilot types: internal pilot and external pilot types.

Pilot type

A	Internal pilot
B	External pilot

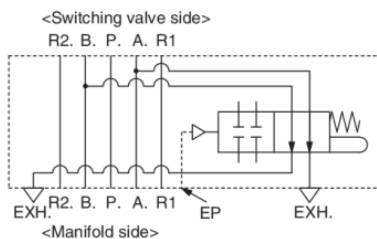
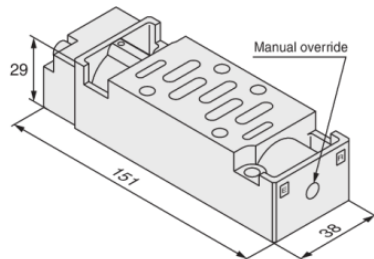
AZ503-82A



Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-6	4

AZ503-82B

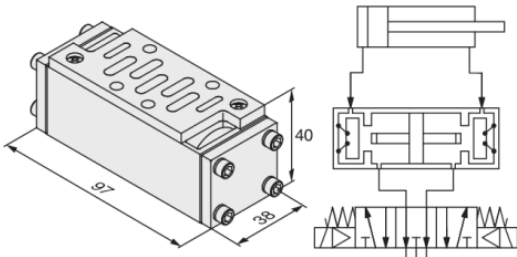


Specifications

Model	AZ503-82A	AZ503-82B
Switching signal type (Pilot type)	Internal pilot	External pilot
Applicable solenoid valve	VQ7-6	
Applicable sub-plate	ISO standard size 1	
Max. operating pressure	1.0 MPa	
Min. operating pressure	0.15 MPa (Pressure generated when the valve element is switched to the stopping side.)	
Ambient and fluid temperature	5 to 60°C	
Lubrication	Non-lube (Use turbine oil Class 1 (ISO VG32), if lubricated.)	

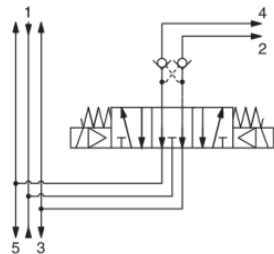
**Double check spacer
VV71-FPG**

By combining a 3 position exhaust center valve with a double check spacer, an intermediate stopping position of a cylinder can be held for an extended period. It can also be used for drop prevention at the cylinder stroke end when releasing residual supply pressure, by combining it with a 2 position single or double valve.



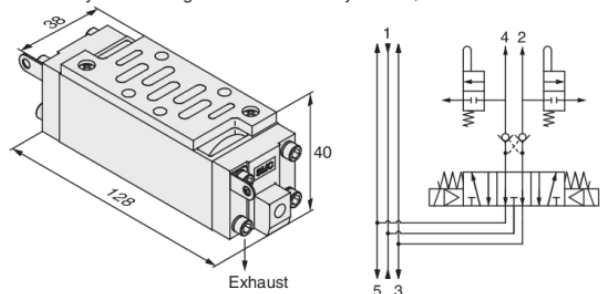
Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-8	4



**Double check spacer with residual pressure release valve
VV71-FPGR**

This is a double check spacer equipped with a residual pressure release function, to release residual pressure inside a cylinder during maintenance or adjustment, etc.



Accessory

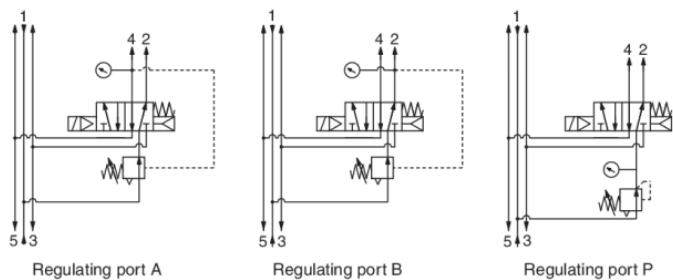
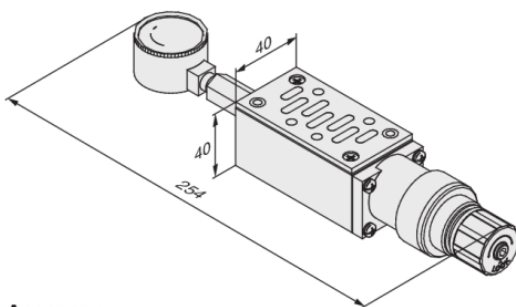
Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-8	4

Caution

- Since extended cylinder stops are not possible if there are leaks from piping between the valve and cylinder or from fittings, etc., check for leakage using a neutral liquid detergent.
- Since One-touch fittings allow slight air leakage, screw piping is recommended when stopping the cylinder in the middle for a long time.
- Combination of 3 position, closed center and pressure center valves is not possible.
- Set the load weight so that the cylinder side pressure is less than two times the supply side pressure.
- When using the residual pressure release function, confirm the action of actuators, etc., and operate after providing for safety measures.
- Be aware that if the exhaust side of perfect spacer is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.
- To combat the effects of back pressure, when required, we recommend installing an individual EXH spacer between the double check spacer and the manifold.

**Interface regulator
ARB250-00-^P/_A/_B**

Spacer Interface regulators can be placed on top of the manifold block to reduce the pressure of each of the valves.



Accessory

Description	Part no.	Qty.
Gasket	AXT500-13	1
Bolt	AXT632-45-8	4

Part No.

P reduced pressure	ARB250-00-P
A reduced pressure	ARB250-00-A
B reduced pressure	ARB250-00-B

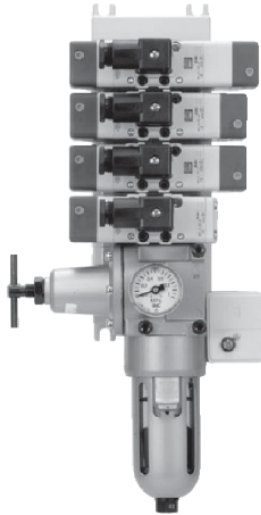
Caution

- When combining a pressure center valve and interface regulator with reduced pressure at ports A and B, use model ARB210-^A/_B.
- When combining a reverse pressure valve and interface regulator, use model ARB210-^A/_B. Further, it cannot be used with reduced pressure at port P.
- When combining a double check valve and an interface regulator, use a manifold or sub-plate as a basis, and stack them in the following order; the perfect spacer → the interface regulator → the valve.
- When a closed center valve is combined with the interface regulator's A, B port regulation, note that it cannot be used for intermediate stops of a cylinder because there is leakage from relief port on the regulator.

VQ7-6 Series

Control Unit

Control equipment (filters, regulators, pressure switches, air release valves) has been made into standardized units which can be mounted on manifolds without any modifications.



Control Unit Specifications

Air filter (With auto-drain/With manual drain)	
Filtration degree	5 μm
Regulator	
Set pressure (Outlet pressure)	0.05 to 0.85 MPa
Pressure switch	
Pressure adjustment range	0.1 to 0.7 MPa
Contact	1 ab
Rated current	(Induction load) 125 VAC 15 A, 250 VAC 15 A
Air release valve (Single only)	
Operating pressure range	0.15 to 1.0 MPa

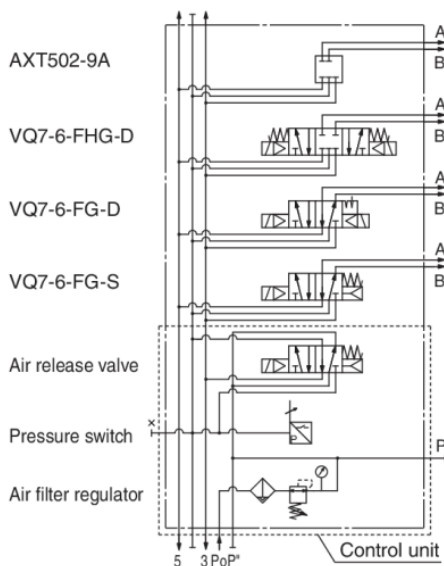
Options

Blanking plate	AXT502-9A (For manifold)
	AXT502-18A (For release valve adapter plate)
	MP2 (For control equipment/filter regulator)
	MP3-1 (For pressure switch)
Release valve adapter plate	AXT502-17A
Pressure switch	IS3100-X230

Control Unit Type

Ordering symbol	Nii	A	AP	M	MP	F	G	C	E
Control equipment									
Air filter with auto-drain		○	○			○			
Air filter with manual drain				○	○		○		
Regulator		○	○	○	○	○	○		
Air release valve		○	○	○	○			○	○
Pressure switch			○		○				
Blanking plate (Air release valve)						○	○		
Blanking plate (Filter, Regulator)								○	
Blanking plate (Pressure switch)		○		○		○	○	○	
Number of manifold blocks required for mounting (stations)		2 stations	2 stations	2 stations	2 stations	2 stations	2 stations	2 stations	1 station

Manifold specifications example



Use of Control Unit

<Construction and piping >

1. The supply pressure (Po) passes through the regulator with filter ① and is adjusted to the prescribed pressure. Next, it goes through the release valve ② (downstream residual pressure switching function used as normally ON) and is supplied to the manifold base side (P).
2. When the release valve ② is OFF, the supply pressure from port Po is blocked, and the air which was being supplied to the manifold side port P passes through the release valve ② and is discharged from port R1.
3. The pressure switch is piped into the outlet side of the release valve ②. (It operates when the release valve ② is energized.) Also, since there is an internal voltage drop of 4V, it may not be possible to confirm the OFF and ON states with a tester, etc.

⚠ Caution

- In the case of air filters with auto-drain or manual drain, mount so that the air filter is at the bottom.

ISO Standard Solenoid Valve

VQ7-8 Series

Size 2/Single Unit



How to Order Valves

VQ7-8-FG-S-3- - - - - (-X23)

Passage symbol

FG	
YZ*	
FHG	
FJG	
FPG	
FIG	

* Semi-standard

Number of solenoids

S	Single
D	Double

CE-compliant

Nil	-
Q	CE-compliant

Connector

Nil	DIN terminal block (With connector)
O	DIN terminal block (Without connector)
SC	Pre-wired connector

※ Only SC type is available with the -X23

Sub-plate port size

Nil	Without sub-plate
A03	Side ported 3/8
A04	Side ported 1/2
A06D	Side ported 3/4
B03	Bottom ported 3/8
B04	Bottom ported 1/2
B06	Bottom ported 3/4

Thread type

Nil	Rc
F	G
T	NPTF

Seal

Nil	Metal seal
R	Rubber seal

Pilot exhaust

Nil	Common exhaust
V	Individual exhaust

Option

Nil	None
Z	Light/ Surge voltage suppressor
N	With indicator light

Coil rated

1	100 VAC, 50/60Hz
2	200 VAC, 50/60Hz
3	24 VDC
4	12 VDC
5	110 VAC, 50/60Hz
6	220 VAC, 50/60Hz

For other rated voltages, please consult with SMC.

How to Order Sub-plate

VS7-2-A03- -

Port size

A03	Side ported 3/8
A04	Side ported 1/2
A06D	Side ported 3/4
B03	Bottom ported 3/8
B04	Bottom ported 1/2
B06	Bottom ported 3/4

Thread type

Nil	Rc
F	G
T	NPTF

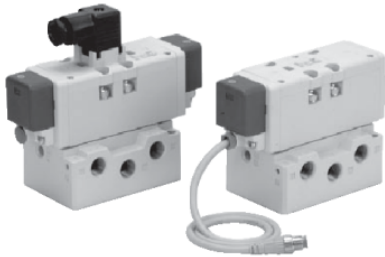
Specifications

Model	Porting specifications		Weight (kg)
	Piping location	Port size	
VS7-2-A03□	Side	3/8	0.68
VS7-2-A04□		1/2	
VS7-2-A06□		3/4	
VS7-2-B03□	Bottom	3/8	0.68
VS7-2-B04□		1/2	
VS7-2-B06□		3/4	

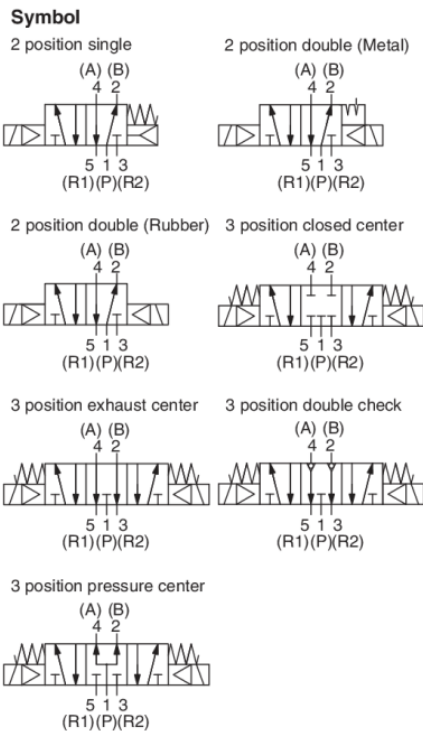
Model

Series	Number of positions	Model		Port size	Flow rate characteristics						(1) Response time (ms)	(2) Weight (kg)	
					1 → 4/2 (P → A/B)			4/2 → 5/3 (A/B → EA/EB)					
					C (dm ³ /(s·bar))	b	Cv	C (dm ³ /(s·bar))	b	Cv			
VQ7-8	2 position	Single	Metal seal	VQ7-8-FG-S-□	3/8	10	0.18	2.4	12	0.24	3.0	40 or less	0.64
			Rubber seal	VQ7-8-FG-S-□R		12	0.24	3.0	13	0.27	3.3	45 or less	
		Double	Metal seal	VQ7-8-FG-D-□		10	0.18	2.4	12	0.24	3.0	15 or less	
			Rubber seal	VQ7-8-FG-D-□R		12	0.24	3.0	13	0.27	3.3	20 or less	
	3 position	Closed center	Metal seal	VQ7-8-FHG-D-□		10	0.28	2.4	10	0.24	2.4	45 or less	0.75
			Rubber seal	VQ7-8-FHG-D-□R		11	0.25	2.8	11	0.27	2.8	50 or less	
		Exhaust center	Metal seal	VQ7-8-FJG-D-□		10	0.16	2.4	10	0.20	2.4	45 or less	0.75
			Rubber seal	VQ7-8-FJG-D-□R		11	0.26	2.8	13	0.27	3.3	50 or less	
		Double check	Metal seal	VQ7-8-FPG-D-□		7.2	-	-	7.0	-	-	60 or less	1.98
			Rubber seal	VQ7-8-FPG-D-□R		7.2	-	-	7.0	-	-	60 or less	
		Pressure center	Metal seal	VQ7-8-FIG-D-□		10	0.26	2.4	11	0.25	2.8	45 or less	0.75
			Rubber seal	VQ7-8-FIG-D-□R		13	0.27	3.3	12	0.29	3.0	50 or less	

Note 1) Based on JIS B 8419: 2010 (Value for supply pressure of 0.5 MPa, with light/surge voltage suppressor, when using clean air.) Response time values will change depending on pressure and air quality. Value when ON for double type.
 Note 2) Weight without sub-plate. (Sub-plate: 3/8, 1/2: 0.68 kg, 3/4: 1.29 kg)



Standard Specifications



Valve specifications	Valve construction	Metal seal	Rubber seal	
	Fluid	Air		
	Maximum operating pressure	1.0 MPa		
	Min. operating pressure	Single	0.15 MPa	0.20 MPa
		Double	0.15 MPa	0.15 MPa
		3 position	0.15 MPa	0.20 MPa
	Ambient and fluid temperature	-10 to 60°C ⁽¹⁾	-5 to 60°C ⁽¹⁾	
	Lubrication	Not required		
	Manual override	Push type (Tool required)		
	Impact/Vibration resistance	150/30 m/s ² ⁽²⁾		
Enclosure	IP65 (Dusttight, Low jetproof)			
Solenoid specifications	Coil rated voltage	12 VDC, 24 VDC, 100 VAC, 110 VAC, 200 VAC, 220 VAC, 240 VAC (50/60Hz)		
	Allowable voltage fluctuation	±10% of rated voltage		
	Coil insulation type	Class B or equivalent		
	Power consumption (Current)	24 VDC	1 WDC (42 mA)	
		12 VDC	1 WDC (83 mA)	
		100 VAC ⁽³⁾	1.2 VA (12 mA)	
		110 VAC ⁽³⁾	1.3 VA (11.5 mA)	
		120 VAC ⁽³⁾	1.5 VA (12 mA)	
200 VAC ⁽³⁾		2.5 VA (12.5 mA)		
220 VAC ⁽³⁾	2.6 VA (13 mA)			
230 VAC ⁽³⁾	2.8 VA (12.5 mA)			
240 VAC ⁽³⁾	3 VA (13 mA)			

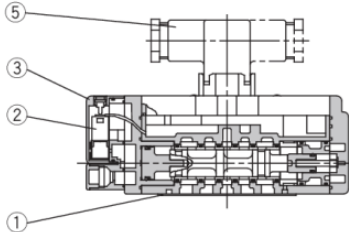
Note 1) Use dry air to prevent condensation when operating at low temperatures.
 Note 2) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized states every once for each condition. (Values at the initial period)
 Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)
 Note 3) Since AC coil specifications include a rectifying device, there is no difference in power consumption between inrush and holding.

VQ7-8 Series Construction

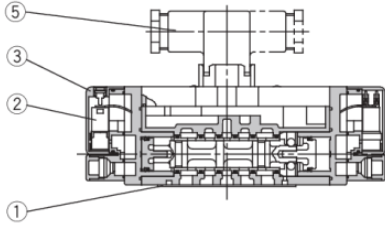
DIN Terminal Type

Metal seal

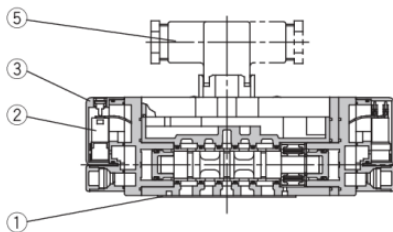
VQ7-8-FG-S-□



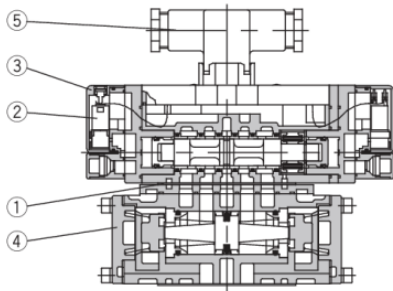
VQ7-8-FG-D-□



VQ7-8-^{FHG}
FJG -D-□
FIG

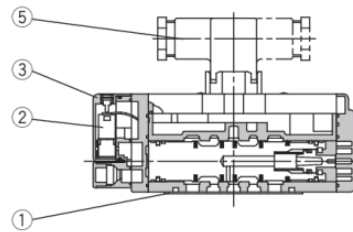


VQ7-8-FPG-D-□

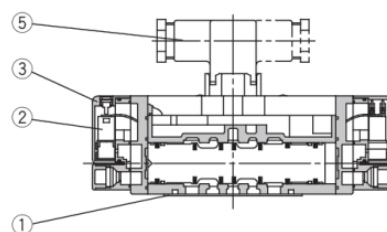


Rubber seal type

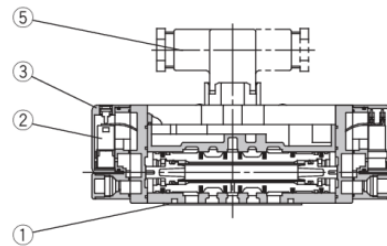
VQ7-8-FG-S-□R□



VQ7-8-FG-D-□R□



VQ7-8-^{FHG}
FJG -D-□R□
FIG



Replacement Parts (For valve)

Number	Description	VQ7-8-FG-S-□	VQ7-8-FG-D-□	VQ7-8- ^{FHG} FJG -D-□ FIG	VQ7-8-FPG-D-□	VQ7-8-FG-S-□R□	VQ7-8-FG-D-□R□	VQ7-8- ^{FHG} FJG -D-□R□ FIG
1	Gasket				VQ7080-13-4-1			
2	Pilot valve assembly ⁽¹⁾ ⁽²⁾			VQZ110Q-□	(5: 24 VDC, 6: 12 VDC, 1: For AC ⁽³⁾)			
3	Pilot valve cover				VQ7060-9A-1			
4	Double check spacer				VV72-FPG			
5	DIN terminal				UKL-S1			

Note 1) When the voltage is the same, the replacement of pilot valve assembly is possible.

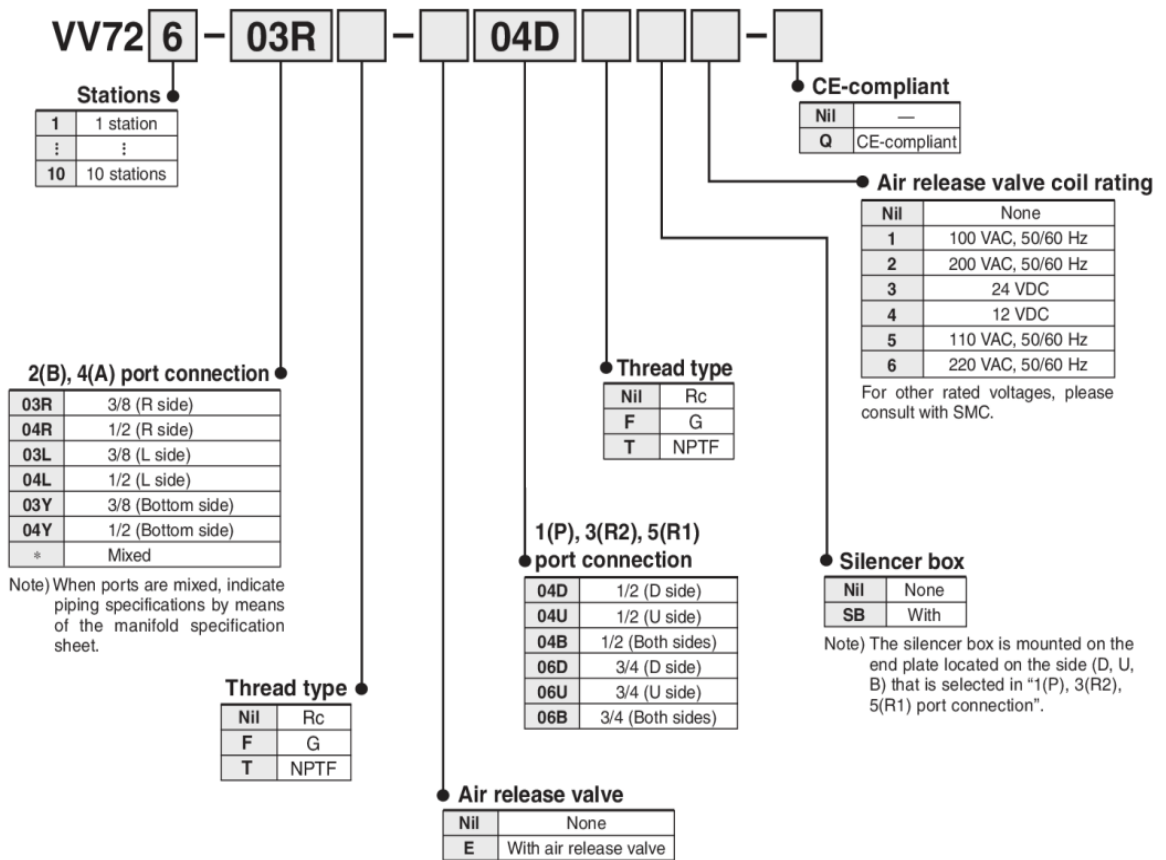
Note 2) Since the substrate circuit in the valve is different, voltage cannot be changed with the pilot valve assembly.

Note 3) The pilot valve for 100 to 240 VAC is common.

Manifold VV72 Series VQ7-8 Series



How to Order Manifold



Manifold Specifications

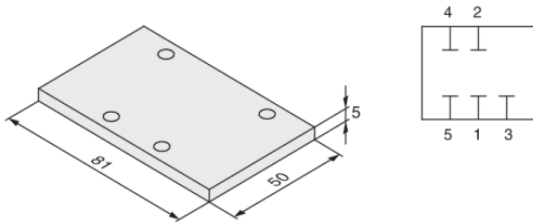
Manifold block size	Applicable solenoid valve	Porting specifications		Stations	Weight (kg)
		2(B), 4(A) port size	1(P), 3(R2) 5(R1) port size		
ISO size 2	VQ7-8 Series ISO size 2	3/8 1/2	1/2 3/4	Max. 10 stations	0.96n + 0.77 (n: Stations)

VQ7-8 Series

Manifold Option Parts

Blanking plate assembly AXT512-9A

It is used by attaching on the manifold block for being prepared for removing a valve for maintenance reasons or planning to mount a spare valve, etc.

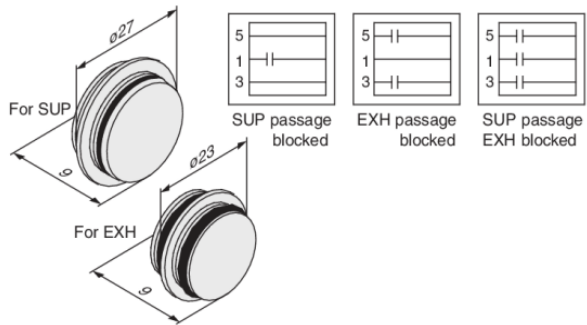


Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-2	4

Block plate (For SUP/EXH passages) AXT512-14-1A (For SUP) AXT512-14-2A (For EXH)

When two or more different high pressures are supplied to one manifold, block plates are installed between stations having different pressures. Also, in cases such as when valve exhaust effects other stations in a circuit, block plates are used for exhaust at stations where the exhaust is to be separated.

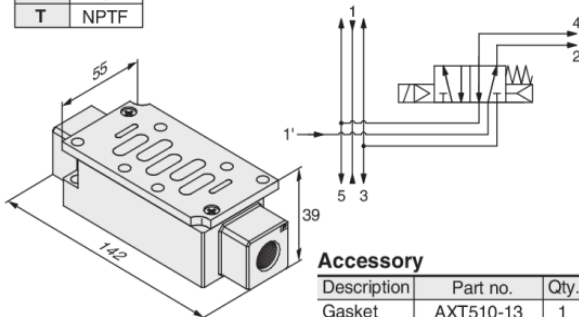


Individual SUP spacer VV72-P-03/04

By mounting individual SUP spacers on a manifold block, it is possible to provide individual supply ports for each valve.

Thread type

Nil	Rc
F	G
T	NPTF

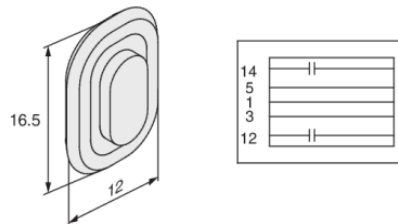


Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-5	4

Block plate (For pilot EXH passage) AZ512-49A

When a valve's pilot valve exhaust effects other valves in a circuit, block plates are used between stations where the pilot exhaust passages are to be separated.

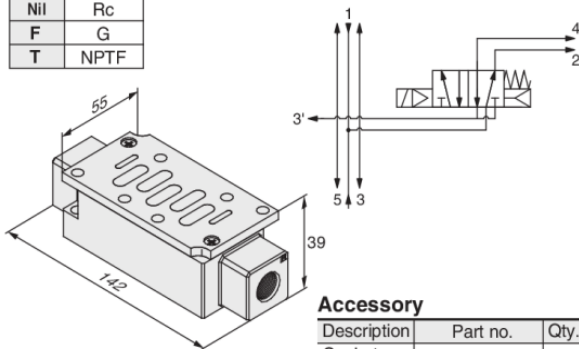


Individual EXH spacer VV72-R-03/04

By mounting individual EXH spacers on a manifold block, exhaust ports can be provided individually for each valve. (3, 5 common exhaust type)

Thread type

Nil	Rc
F	G
T	NPTF

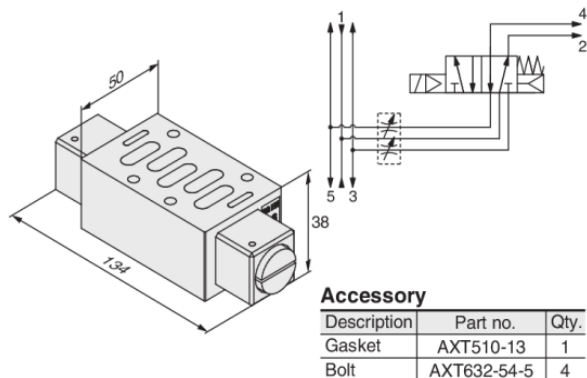


Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-5	4

Throttle valve spacer AXT510-32A

A throttle valve spacer is mounted on a manifold block to control cylinder speed by throttling exhaust air flow.



Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-5	4

Reverse pressure spacer
AXT512-19A-

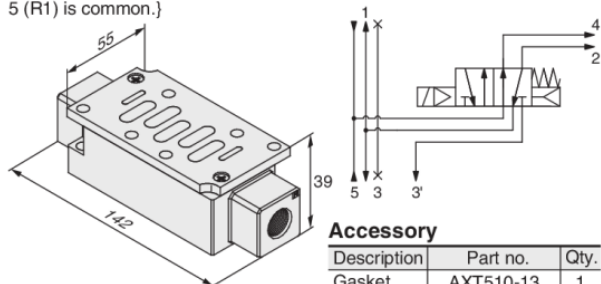
With reverse pressure control manifold specifications, when pressure is changed individually on one side (ex. high speed cylinder return), pressure can be supplied individually to the R2 side by mounting a reverse pressure spacer. (Port 3 (R2) is individual and 5 (R1) is common.)

● **Thread type**

Nil	Rc
F	G
T	NPTF

● **Port size**

1	3/8
2	1/2

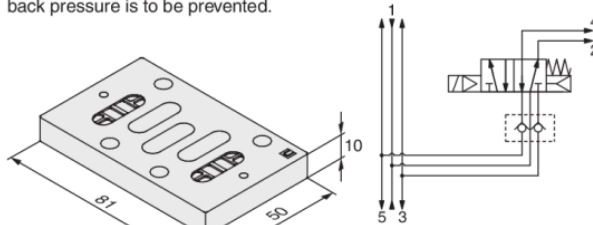


Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-5	4

Main EXH back pressure check plate
AXT512-25A

In cases where back pressure effects actuator operation due to simultaneous operation of manifold valves, etc., this effect can be eliminated by installing a plate between the manifold block and the valve from which back pressure is to be prevented.



Accessory

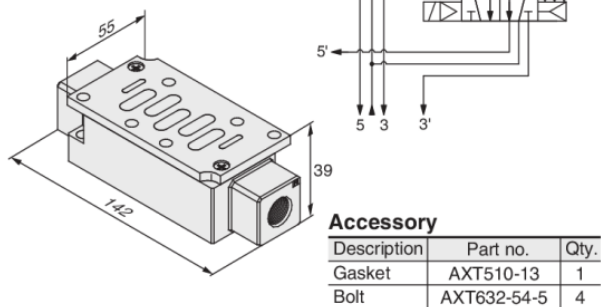
Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-3	4

R1/R2 individual EXH spacer
VV72-R2-04

By mounting an individual EXH spacer on a manifold block, individual exhaust is possible from both R1 and R2. (3 (R2) and 5 (R1) are individual ports.)

● **Thread type**

Nil	Rc
F	G
T	NPTF

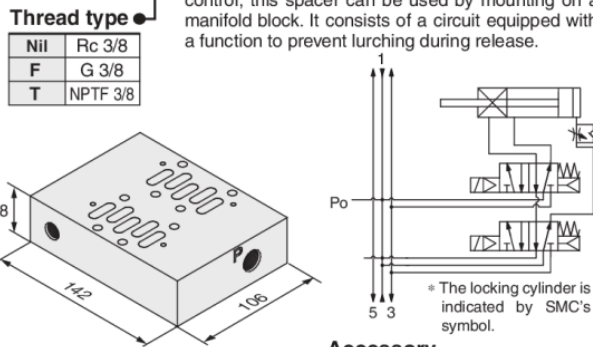


Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-5	4

Adapter plate for locked-up cylinder
AXT602-6A

When using a locked-up cylinder with 2 valves for control, this spacer can be used by mounting on a manifold block. It consists of a circuit equipped with a function to prevent lurching during release.

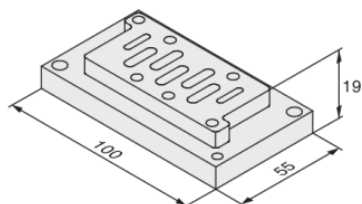


Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	2
Bolt	AXT632-54-5	8

Conversion adapter plate
VV72-V-1

This conversion adapter plate allows a VQ7-6 (size 1) valve to be mounted on a VQ7-8 manifold base. (V type)



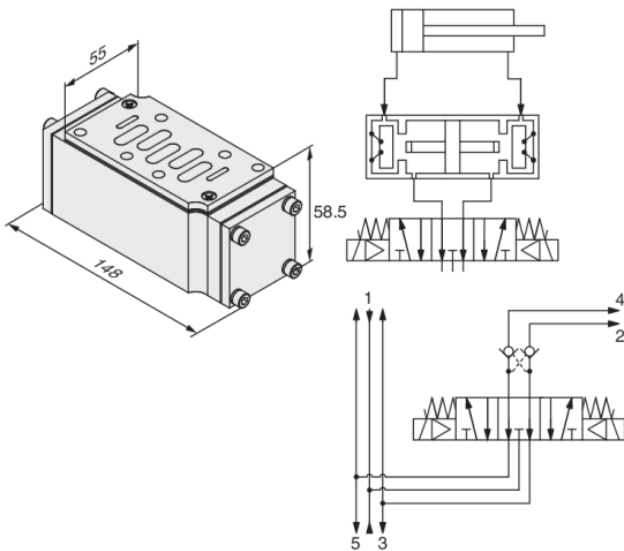
When a conversion adapter plate is mounted, remove the adapter plate on the manifold block and assemble in the order of gasket and conversion adapter plate.

Accessory

Description	Part no.	Qty.
Gasket	AXT512-11	1
Bolt	M6 x 20 (With switch)	2
	M4 x 20 (With switch)	2

**Double check spacer
VV72-FPG**

By combining a 3 position exhaust center valve with a double check spacer, an intermediate stopping position of a cylinder can be held for an extended period. It can also be used for drop prevention at the cylinder stroke end when releasing residual supply pressure, by combining it with a 2 position single or double valve.

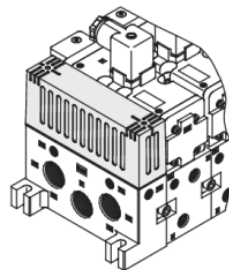


⚠ Caution

- Since extended cylinder stops are not possible if there are leaks from piping between the valve and cylinder or from fittings, etc., check for leakage using a neutral liquid detergent.
- Since One-touch fittings allow slight air leakage, screw piping is recommended when stopping the cylinder in the middle for a long time.
- Combination of 3 position, closed center and pressure center valves is not possible.
- Set the load weight so that the cylinder side pressure is less than two times the supply side pressure.
- When using the residual pressure release function, confirm the action of actuators, etc., and operate after providing for safety measures.
- Be aware that if the exhaust side of perfect spacer is restricted excessively, the intermediate stopping accuracy will decrease and will lead to improper intermediate stops.
- To combat the effects of back pressure, when required, we recommend installing an individual EXH spacer between the double check spacer and the manifold.

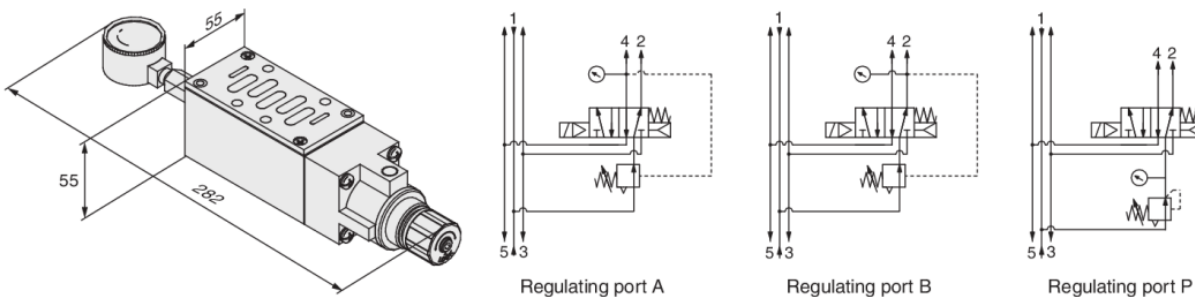
**Silencer box
VV72-□□□-□□-SB**

This can be provided as a unit on the end plate to reduce manifold exhaust noise and piping labor.



**Interface regulator
ARB350-00-^PA_B**

Spacer Interface regulators can be placed on top of the manifold block to reduce the pressure of each of the valves.



Accessory

Description	Part no.	Qty.
Gasket	AXT510-13	1
Bolt	AXT632-54-6	4

Part No.

P reduced pressure	ARB350-00-P
A reduced pressure	ARB350-00-A
B reduced pressure	ARB350-00-B

⚠ Caution

- When combining a pressure center valve and interface regulator with reduced pressure at ports A and B, use model ARB310-^A_B.
- When combining a reverse pressure valve and interface regulator, use model ARB310-^A_B. Further, it cannot be used with reduced pressure at port P.
- When combining a double check valve and an interface regulator, use a manifold or sub-plate as a basis, and stack them in the following order; the perfect spacer → the interface regulator → the valve.
- When a closed center valve is combined with the interface regulator's A, B port regulation, note that it cannot be used for intermediate stops of a cylinder because there is leakage from relief port on the regulator.

VQ7-6/VQ7-8 Series

Manifold Option Parts/Mounting Bolt Part No.

VQ7-6 Mounting Bolt Part No.

Number of options		0		Single stack						Double stack				
Mounting bolt	No.	AXT632-45-1	AXT632-45-2	AXT632-45-4	AXT632-45-5	AXT632-45-6	AXT632-45-7	AXT632-45-8	AXT632-45-9	AXT632-45-10	AXT632-45-11	AXT632-45-12	AXT632-45-13	
	Size	M5 x 35 with SW	M5 x 15 with SW	M5 x 45 with SW	M5 x 60 with SW	M5 x 65 with SW	M5 x 70 with SW	M5 x 75 with SW	M5 x 90 with SW	M5 x 95 with SW	M5 x 100 with SW	M5 x 105 with SW	M5 x 115 with SW	
Option mounting diagram														

Number of options		Triple stack				
Mounting bolt	No.	AXT632-45-14	AXT632-45-16	AXT632-45-17	AXT632-45-18	AXT632-45-19
	Size	M5 x 120 with SW	M5 x 130 with SW	M5 x 135 with SW	M5 x 140 with SW	M5 x 145 with SW
Option mounting diagram						

The installation position of spacer (1) in the option mounting diagrams is limited only by the precautions given below.

Spacers

- Main EXH back pressure check plate
- Throttle valve spacer
- Release valve spacer
- Spacer (1)
 - Individual SUP spacer
 - Individual EXH spacer
 - R1, R2 individual EXH spacer
 - Reverse pressure spacer
 - Residual pressure release valve spacer
 - Individual SUP spacer with residual pressure release valve
- Spacer (2)
 - Interface regulator (P port regulation)
 - Interface regulator (A port regulation)
 - Interface regulator (B port regulation)
 - Double check spacer
 - Double check spacer with residual pressure release valve

Note 1) A throttle valve spacer and double check spacer (including those with residual pressure release valve) cannot be combined.

Note 2) When a double check spacer (Top) (including those with residual pressure release valve) and individual EXH spacer (Bottom) are combined with a R1, R2 individual EXH spacer (Bottom), be careful regarding the installation position.

Note 3) When an interface regulator (Top) and double check spacer (Bottom) (including those with residual pressure release valve) (Bottom) are combined, be careful regarding the installation position.

VQ7-8 Mounting Bolt Part No.

Number of options		0		Single stack				Double stack			
Mounting bolt	No.	AXT632-54-1	AXT632-54-2	AXT632-54-3	AXT632-54-5	AXT632-54-6	AXT632-54-7	AXT632-54-8	AXT632-54-9	AXT632-54-11	
	Size	M6 x 45 with SW	M6 x 18 with SW	M6 x 55 with SW	M6 x 85 with SW	M6 x 100 with SW	M6 x 105 with SW	M6 x 125 with SW	M6 x 140 with SW	M6 x 145 with SW	M6 x 160 with SW
Option mounting diagram											

Number of options		Triple stack			
Mounting bolt	No.	AXT632-54-12	AXT632-54-13	AXT632-54-14	AXT632-54-15
	Size	M6 x 165 with SW	M6 x 180 with SW	M6 x 185 with SW	M6 x 200 with SW
Option mounting diagram					

Spacers

- Main EXH back pressure check plate
- Interface regulator (P port regulation)
- Interface regulator (A port regulation)
- Interface regulator (B port regulation)
- Double check spacer
- Spacer (1)
 - Individual SUP spacer
 - Individual EXH spacer
 - R1, R2 individual EXH spacer
 - Reverse pressure spacer
 - Residual pressure release valve spacer
- Throttle valve spacer
- Release valve spacer

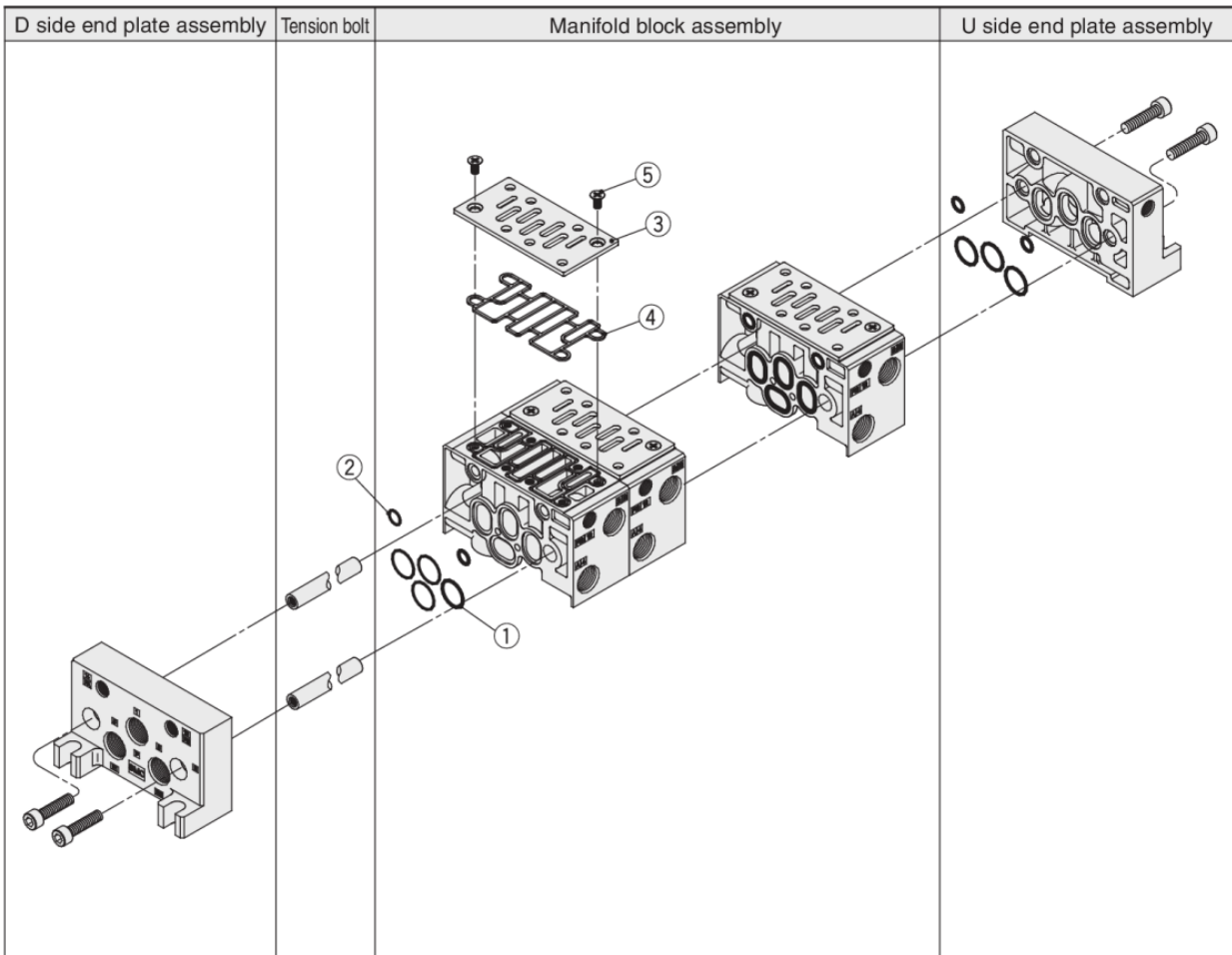
Note 1) A throttle valve spacer and double check spacer cannot be combined.

Note 2) There is no limitation on the mounting position for spacer (1).

Note 3) When a double check spacer (Top) (including those with residual pressure release valve) and individual EXH spacer (Bottom) are combined with a R1, R2 individual EXH spacer (Bottom), be careful regarding the installation position.

Note 4) When an interface regulator (Top) and double check spacer (Bottom) (including those with residual pressure release valve) (Bottom) are combined, be careful regarding the installation position.

Exploded View of Manifold/VQ7-6



<End Plate Assembly>

AXT502 - [] A - [] []

End plate position

L	U side
R	D side

P, R port size

02	1/4
03	3/8
C12	One-touch fitting for ø12

Thread type

Nil	Rc
F	G
T	NPTF

Note) It is not applicable to One-touch fittings.

<Tension Bolt Part No.>

AXT502 - 34 - []

Stations

2	For 2 stations
3	For 3 stations
⋮	⋮
10	For 10 stations

Note) These tie-rods are solid pieces for each number of stations.

<Manifold Block Assembly>

AXT502 - 1A - [] [] [] - []

Porting specifications

A	Side
B	Bottom

Cylinder port location

L	L side
R	R side

Cylinder port size

02	1/4
03	3/8
C6 (1)	One-touch fitting for ø6
C8 (1)	One-touch fitting for ø8
C10 (1)	One-touch fitting for ø10

Thread type

Nil	Rc
F	G
T	NPTF

Note) It is not applicable to One-touch fittings.

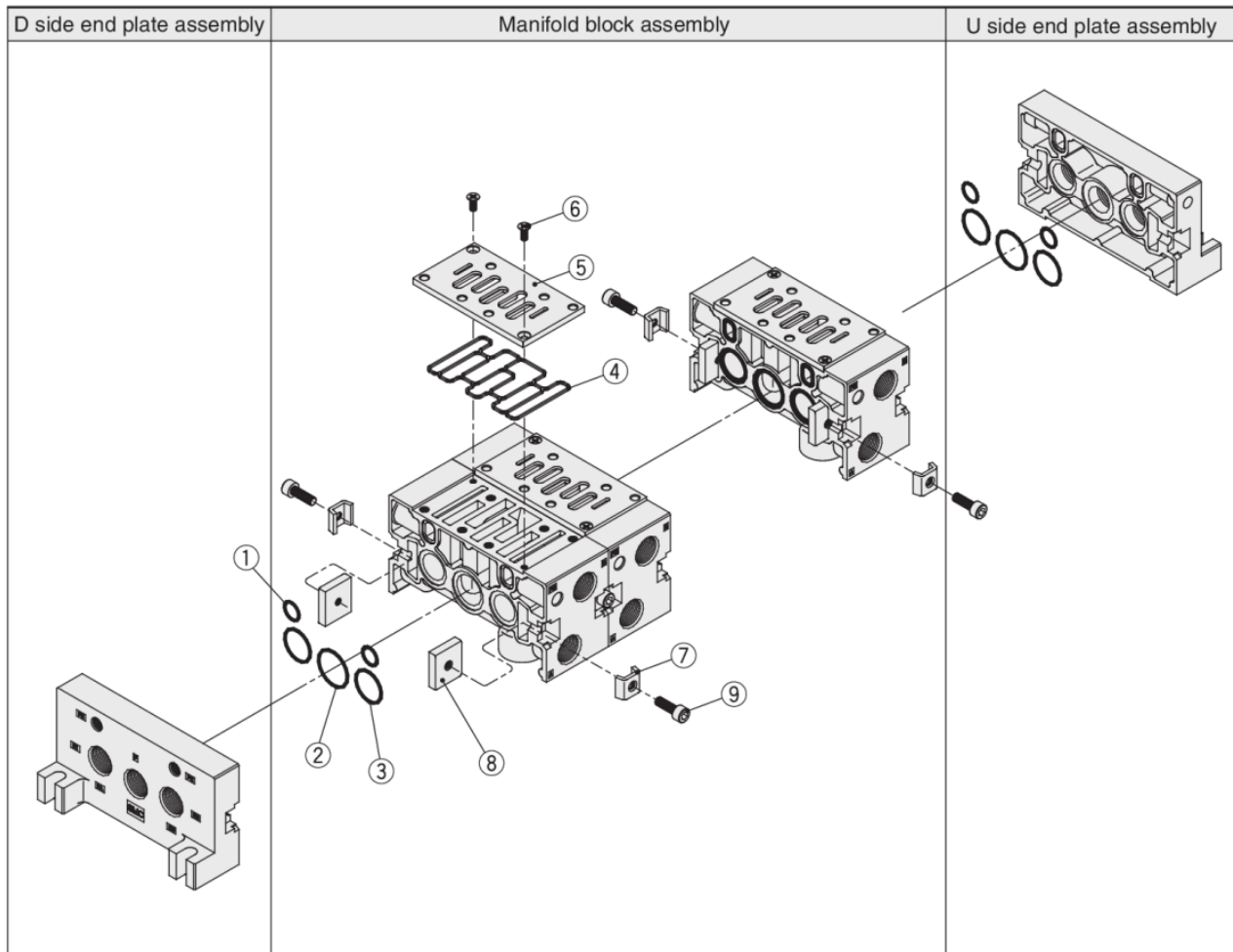
Note 1) Side piping only
 Note 2) In this manifold block assembly, the tension bolt for increasing station (1 station) is included.

Replacement Parts (For manifold block)

	Part no.	Description	Qty.	Material
1	AXT502-19	O-ring	4	NBR
2	AXT502-20	O-ring	2	NBR
3	AXT502-22-2	Plate	1	SPCC
4	AXT502-31	Gasket	1	NBR
5	M4 x 8	Oval countersunk head screw	2	SWRH

VQ7-6/VQ7-8 Series

Exploded View of Manifold/VQ7-8



<End Plate Assembly>

AXT512 - [] A - [] []

End plate position

L	U side
R	D side

P, R port size

04	1/2
06	3/4
C12	One-touch fitting for $\phi 12$

Thread type

Nil	Rc
F	G
T	NPTF

Note) It is not applicable to One-touch fittings.

<Manifold Block Assembly>

AXT512 - 1A - [] [] [] - []

Porting specifications

A	Side
B	Bottom

Cylinder port size

03	3/8
04	1/2

Cylinder port location

L	L side
R	R side

Thread type

Nil	Rc
F	G
T	NPTF

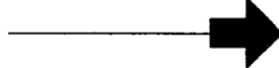
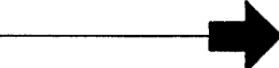
Replacement Parts (For manifold block)

	Part no.	Description	Qty.	Material
1	AXT512-13	O-ring	2	NBR
2	AS568-022	O-ring	1	NBR
3	AS568-020	O-ring	2	NBR
4	AXT512-5	Gasket	1	NBR
5	AXT512-4	Plate	1	SPCC
6	M4 x 10	Oval countersunk head screw	2	SWRH
7	AXT512-6-1	Connection fitting A	2	SPCC
8	AXT512-6-4	Connection fitting B	2	SS
9	AXT512-6-3	Hexagon socket head screw	2	SCM

Series VQ7-6/7-8

Failures and Countermeasures

Problem	If the valve has any problems, follow the instructions below.	Possible cause of problem	Solution
Malfunction (Valve is not shifting)	Does the valve shift when the manual override is pushed in?	NO → 1) The main valve is "sticking". VContamination in the supply air is adhering to the main valve, causing little or no movement.	VReplace the valve VClean the air supply (See P.4).
	YES →	2) Pressure drop VThe pressure of the air supply has dropped, failing to reach the minimum operating pressure, which has resulted in the valve not shifting.	VAdjust the pressure within the operating pressure of the valve.
	Does the indicator light come on when solenoid is energized?	NO → 1) Electrical problem VSequence failure VWrong wiring VDisconnection of the fuse and lead wire VVoltage drop	} Check each electrical system and deal with any problem.
	YES →	1) Voltage drop Even if the light is on, a valve sometimes does not shift due to the voltage drop.	Check the voltage, then if it is dropping, readjust.
	YES →	2) Leak Current The valve has not shift because there is residual voltage in the deenergized state (OFF position)	Check the residual voltage. Keep the residual voltage at the following values of the rated voltage: { DC coil: 2% or less { AC coil: 12.5% or less
	YES →	3) Pilot Valve Problem VContamination from the air supply entered into the pilot valve and caused the pilot valve to malfunction. VCoil is disconnected.	VReplace the pilot valve Ass'y. Pilot valve Ass'y Parts No. 1(100VAC) VQZ110Q - 2(200VAC) 5(24VDC) VClean the air supply (See P.4).
Slow response (The valve operates but response is very slow.)		1) Leak Current VSlow response was due to the pressing of residual voltage in the deenergized state (OFF position)	Check the residual voltage. Keep the residual voltage at the following values of the rated voltage: { DC coil: 2% or less { AC coil: 12.5% or less
		2) The Main Valve is "sticking" VContamination in the supply air is adhering to the main valve, causing little or no movement.	VReplace the valve. VClean the air supply (See P.2).

Problem	If the valve has any problems, follow the instructions below.	Possible cause of problem	Solution
Air leakage	<p style="text-align: center;">Check possible points where air leakage might occur such as:</p> <p>1. Between the valve and base. </p>	<p>1) The mounting bolts might be loose. (See P.6).</p>	<p>Tighten the mounting bolts. Proper tightening torque: VQ7-6: 2.3 to 3.7N·m VQ7-8: 4.0 to 6.0N·m</p> <p>If the gasket is damaged, replace it.</p>
	<p>2. From the R(exhaust) port. </p> <p>Note) In the case of the metal seal type valve, air leaks across the spool by; as follows, VQ7-6: about 230cm³/min per port. (at 0.5MPa) VQ7-8: about 320cm³/min per port. (at 0.5MPa) This is within specifications.</p>	<p>1) The mounting bolts might be loose. (See P.6).</p> <p>3-2) The inside leakage increased because dust particles from the air supply were caught in the main valve.</p>	<p>Tighten the mounting bolts. Proper tightening torque: VQ7-6: 2.3 to 3.7N·m VQ7-8: 4.0 to 6.0N·m</p> <p>If the gasket is damaged, replace it.</p> <p>V Replace the valve. VClean the air supply (See P.4).</p>

Revision

SMC Corporation

4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021 JAPAN

Tel: + 81 3 5207 8249 Fax: +81 3 5298 5362

URL <http://www.smcworld.com>

Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
© 2018 SMC Corporation All Rights Reserved

No.VQ7-6-OMW0001