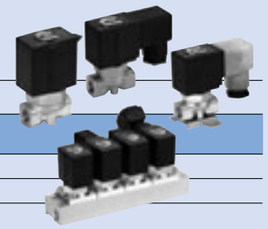
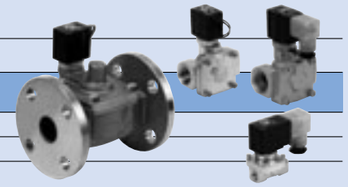
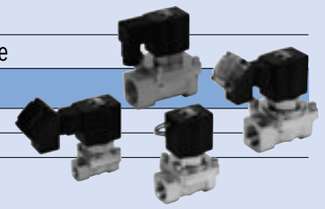
Direct Operated 2 Port Solenoid Valve
Series VX21/22/23
N.C., N.O./Single Unit, Manifold
For Air, Water, Oil, Steam
P.29



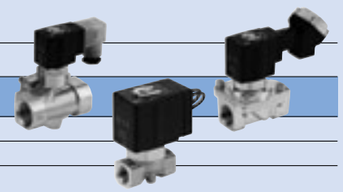
Pilot Operated 2 Port Solenoid Valve
Series VXD21/22/23
N.C., N.O./Single Unit
For Air, Water, Oil
P.59



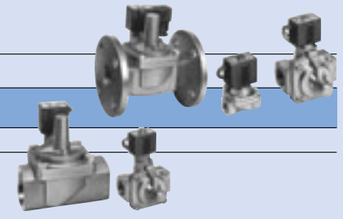
Zero Differential Pressure Type Pilot Operated 2 Port Solenoid Valve
Series VXZ22/23
N.C., N.O./Single Unit
For Air, Water, Oil
P.77



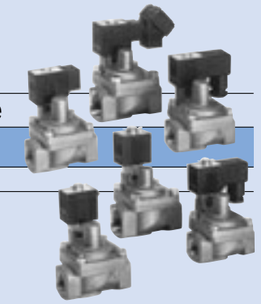
Energy Saving Type 2 Port Solenoid Valve
Series VXE
N.C.
For Air, Water, Oil
P.93



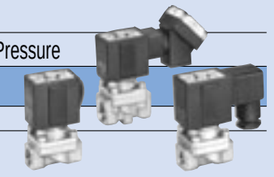
Pilot Operated 2 Port Solenoid Valve
Series VXP21/22/23
For Air, Gas, Steam, Water, and Oil
P.145



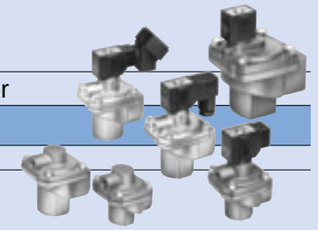
Water Hammer Relief/Pilot Operated 2 Port Solenoid Valve
Series VXR21/22/23
For Water and Oil
P.157



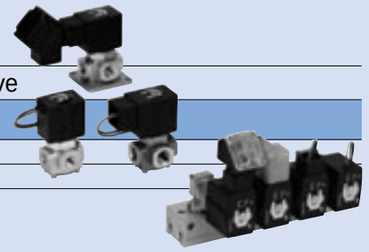
Diaphragm Type Pilot Operated 2 Port Solenoid Valve for High Pressure
Series VXH
Max. operating pressure: 2.0 MPa
P.167



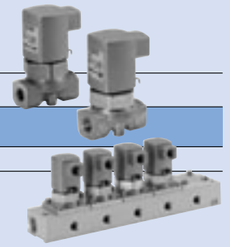
2 Port Solenoid Valve for Dust Collector
Series VXF
For Dust Collector
P.169



Direct Operated 3 Port Solenoid Valve
Series VX31/32/33
N.C., N.O., COM./Single Unit, Manifold
For Air, Water, Oil, Steam
P.179



Direct Air Operated 2 Port Valve
Series VXA21/22
For Air, Water, Oil
P.205



Selection Procedure for 2/3 Port Valves for Fluid Control

1. Selection of the series
Select series by referring to the number of ports, valve type (N.C., N.O., C.O.), port size and applied fluid.

2. Check by the applicable fluids check list
Use the tables for each series to check the compatibility of the applicable fluid with the solenoid valve.

3. Confirmation of the working pressure differential
There are two types of pressure differentials. The high pressure differential is the highest pressure difference allowable between the inlet side and the outlet side in an open and closed state. The minimum pressure differential is the lowest pressure required to hold the main valve fully open. Refer to the following pages for each series as the pressure differential varies with the orifice size, power supply, pressure and fluid.

4. Reference to the flow characteristic table
To obtain the flow rate of fluid, refer to the flow characteristic table.

5. Choice of the power supply voltage and electrical entry
Select the AC/DC power source and choose the electrical entry.

Solenoid Valves List/Air Operated Valves List

Solenoid Valves List

Number of ports	2 port																				3 port			
Action	Direct operated				Pilot operated, Diaphragm type		Zero pressure differential operation, Pilot operated, Diaphragm type		Direct operated <Energy saving type>		Pilot operated, Diaphragm type <Energy saving type>		Zero pressure differential operation, Pilot operated, Diaphragm type <Energy saving type>	Pilot operated, Disk type		Pilot operated, <Water hammer relief type>		Pilot operated, Diaphragm type	Pilot operated <Quick response, Instantaneous large flow>	Direct operated			
Series	VX21/22/23				VXD21/22/23		VXZ22/23		VXE21/22/23		VXED21/22/23		VXEZ22/23	VXP21/22/23		VXR21/22/23		VXH22	VXF21/22	VX31/32/33			
Body type	Single unit		Manifold		Single unit		Single unit		Single unit	Manifold	Single unit		Single unit	Single unit		Single unit		Single unit	Single unit	Single unit		Manifold	
Valve type	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.O.	N.C.	N.C.	N.C.		N.C.	N.C.	N.O.	N.C.	N.O.	N.C.	N.C.	N.C.	N.O.	N.C.	N.O.
Applicable fluids: Air	●		●		●		●		●	●	●		●							●		●	
Applicable fluids: Medium vacuum, non-leak, oil-free	●		●		—		—		●	●	—		—							●		●	
Applicable fluids: Water	●		●		●		●		●	●	●		●							●		—	
Applicable fluids: Heated water	●		●		●		●		—	—	—		—							●		—	
Applicable fluids: Oil	●		●		●		●		●	●	●		●							●		●	
Applicable fluids: Steam	●		●		—		—		—	—	—		—							● (Max. 183°C)		—	
Applicable fluids: High corrosion resistance, oil-free	●		●		●		●		●	●	●		●							—		—	
Applicable fluids: Copper-free, fluorine-free	●		—		●		●		●	—	●		●							●		—	
Applicable fluids: Non-leak, copper-free, oil-free	—		●		—		—		—	●	—		—							—		—	
Port size Rc: 1/8 (6A)	●		●		—		—		●	●	—		—	—	—	—	—	—	—	●		●	
Port size Rc: 1/4 (8A)	●		●		●		●		●	●	●		●	●	—	—	—	●	—	●		●	
Port size Rc: 3/8 (10A)	●		●		●		●		●	●	●		●	●	—	—	—	●	—	●		—	
Port size Rc: 1/2 (15A)	●		—		●		●		●	—	●		●	●	●	●	●	—	—	—		—	
Port size Rc: 3/4 (20A)	—		—		●		●		—	—	●		●	●	●	●	●	—	●	—		—	
Port size Rc: 1 (25A)	—		—		●		●		—	—	●		●	●	●	●	●	—	●	—		—	
Port size Flange, Rc: 11/4 (32A)	—		—		● Flange		—		—	—	● Flange		—	● Flange, Rc	● Flange, Rc	● Rc	● Rc	—	—	—		—	
Port size Flange, Rc: 11/2 (40A)	—		—		● Flange		—		—	—	● Flange		—	● Flange, Rc	● Flange, Rc	● Rc	● Rc	—	● Rc	—		—	
Port size Flange, Rc: 2 (50A)	—		—		● Flange		—		—	—	● Flange		—	● Flange, Rc	● Flange, Rc	● Rc	● Rc	—	—	—		—	
Page	P. 31				P. 61		P. 79		P. 97	P. 97	P. 119		P. 133	P. 145		P. 157		P. 167	P. 169	P. 181		P. 181	

Air Operated Valves List

Number of ports	2 port			
Action	Direct operated			
Series	VXA21/22			
Body type	Single unit		Manifold	
Valve type	N.C.	N.O.	N.C.	N.O.
Applicable fluids: Air	●		●	
Applicable fluids: Medium vacuum, non-leak, oil-free	●		●	
Applicable fluids: Water	●		●	
Applicable fluids: Heated water	●		●	
Applicable fluids: Oil	●		●	
Applicable fluids: Steam	●		●	
Applicable fluids: High corrosion resistance, oil-free	●		●	
Applicable fluids: Copper-free, fluorine-free	●		—	
Applicable fluids: Non-leak, copper-free, oil-free	—		●	
Port size Rc: 1/8 (6A)	●		●	
Port size Rc: 1/4 (8A)	●		●	
Port size Rc: 3/8 (10A)	●		●	
Port size Rc: 1/2 (15A)	●		—	
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⚠Caution

Be sure to read before handling. Refer to front matters 42 and 43 for Safety Instructions, and pages 17 to 19 for 2 Port Solenoid Valves for Fluid Control Precautions.

Series VX2/VX3/VXD/VXZ/VXE
Glossary of Terms

Pressure Terminology

1. Maximum operating pressure differential
The maximum pressure differential (the difference between the inlet and outlet pressure) which is allowed for operation. When the outlet pressure is 0 MPa, this becomes the maximum operating pressure.

2. Minimum operating pressure differential
The minimum pressure differential (the difference between the inlet pressure and outlet pressure) required to keep the main valve fully opened.

3. Maximum system pressure
The maximum pressure that can be applied inside the pipelines (line pressure).
(The pressure differential of the solenoid valve portion must be less than the maximum operating pressure differential.)

4. Proof pressure
The pressure in which the valve must be withstood without a drop in performance after holding for one minute under prescribed pressure and returning to the operating pressure range. (value under the prescribed conditions)

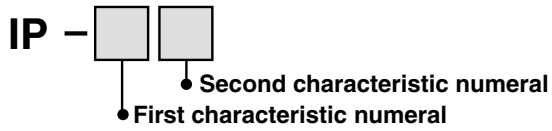
Electrical Terminology

1. Apparent power (VA)
Volt-ampere is the product of voltage (V) and current (A).
Power consumption (W): For AC, $W = V \cdot A \cdot \cos\theta$. For DC, $W = V \cdot A$.
Note) $\cos\theta$ shows power factor. $\cos\theta = 0.6$

2. Surge voltage
A high voltage which is momentarily generated by shutting off the power in the shut-off area.

3. Enclosure
A degree of protection defined in the "JIS C 0920: Waterproof test of electric machinery/appliance and the degree of protection against the intrusion of solid foreign objects".

Verify the degree of protection for each product.



● **First Characteristics: Degrees of protection against solid foreign objects**

0	Non-protected
1	Protected against solid foreign objects of 50 mm ø and greater
2	Protected against solid foreign objects of 12 mm ø and greater
3	Protected against solid foreign objects of 2.5 mm ø and greater
4	Protected against solid foreign objects of 1.0 mm ø and greater
5	Dust-protected
6	Dusttight

● **Second Characteristics: Degrees of protection against water**

0	Non-protected	—
1	Protected against vertically falling water drops	Dripproof type 1
2	Protected against vertically falling water drops when enclosure tilted up to 15°	Dripproof type 2
3	Protected against rainfall when enclosure tilted up to 60°	Rainproof type
4	Protected against splashing water	Splashproof type
5	Protected against water jets	Low jetproof type
6	Protected against powerful water jets	Strong jetproof type
7	Protected against the effects of temporary immersion in water	Immersible type
8	Protected against the effects of continuous immersion in water	Submersible type

Example) IP65: Dusttight, Low jetproof type
"Low jetproof type" means that no water intrudes inside an equipment that could hinder from operating normally by means of applying water for 3 minutes in the prescribed manner. Take appropriate protection measures, since a device is not usable in an environment where a droplet of water is splashed constantly.

Others

1. Material
NBR: Nitrile rubber
FKM: Fluoro rubber – Trade names: Viton®, Dai-el®, etc.
EPDM: Ethylene propylene rubber
PTFE: Polytetrafluoroethylene resin – Trade names: Teflon®, Polyflon®, etc.
FFKM: Perfluoroelastomer – Trade names: Kalrez®, Chemraz®, etc.

2. Oil-free treatment
The degreasing and washing of wetted parts.

3. Passage symbol
In the JIS symbol () IN and OUT are in a blocked condition (), but actually in the case of reverse pressure (OUT> IN), there is a limit to the blocking.
() is used to indicate that blocking of reverse pressure is not possible.