Electro-pneumatic Proportional Valve
Series VEF/VEP

Electro-pneumatic proportional valve: Flow type (VEF)

Controls the flow rate steplessly according to current. (It is a 2/3 port valve that has an electrical throttle valve function.) A model that is suitable for operating conditions, such as the number of ports or maximum effective area, can be selected.

Electro-pneumatic proportional valve: Pressure type (VEP)

Controls the pressure steplessly according to current. Also, because the effective fully opened area of the exhaust side is identical due to its construction, this valve provides a large exhaust capacity and can be used as a relief valve. (It is a 3 port valve that has an electrical pressure reducing valve function.)

Specifications

Item \ Model	Flow type			Pressure type	
	VEF2121 VEF3121	VEF2121	VEF2141 VEF3141	VEP3121	VEP3141
Port size Rc	1/4, 3/8	1/4, 3/8, 1/2	3/8, 1/2, 3/4	1/4, 3/8	3/8, 1/2, 3/4
Fluid	Air (Inert gas)				
Proof pressure	1.5 MPa				
Maximum operating pressure	1.0 MPa				
Ambient and fluid temperature	0 to 50°C (With no condensation)				
Response time	0.03 s or less		0.05 s or less	0.03 s or less	0.05 s or less
Hysteresis	3% F.S.				
Repeatability	3% F.S.				
Sensitivity	0.5% F.S.				
Linearity	—			3% F.S. or less	
Lubrication	Not required (Use turbine oil Class 1, ISO VG32, if lubricated.)				
Weight (kg)	0.9	1.0	1.4	0.9	1.4

Proportional Solenoid Specifications

Proportional solenoid recognition symbol	1 (Applicable power amplifier: VEA25□)
Applicable power amplifier	VEA25□
Max. current	1 A
Coil resistance	13 Ω (20°C)
Rated power consumption	13 W (20°C, with maximum current)
Coil insulation type	Class H or equivalent (180°C)
Max. temperature	140°C (With maximum current)
Electrical entry	DIN terminal

How to Order

<Flow type>

VEF 3 1 4 1 – 1 – 03 □

- **Port** (3)
- **Body size** (4)
- **Applicable power amplifier** (1)
- **Standard characteristics** (1)
- **Port size** (03)
- **Thread type** (□)

Applicable power amplifier

Symbol	Power amplifier
1	VEA25□

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

Port Symbol	Body size Symbol	Standard characteristics Symbol	Max. effective area (mm²)	Symbol	Port size
2	2	1	13	Nil	Without sub-plate
		2	9	02	Rc 1/4
		3	5	03	Rc 3/8
	3	1	30	02 03 04	Rc 1/4 Rc 3/8 Rc 1/2
	4	1	45	03 04 06	Rc 3/8 Rc 1/2 Rc 3/4
3	2	1	12	Nil	Without sub-plate
		2	8	02	Rc 1/4
		3	4.5	03	Rc 3/8
		4	2.5		
	4	1	25	03 04 06	Rc 3/8 Rc 1/2 Rc 3/4

<Pressure type>

VEP31 4 1 – 1 – 03 □

- **Body size** (4)
- **Applicable power amplifier** (1)
- **Standard characteristics** (1)
- **Port size** (03)
- **Thread type** (□)

Applicable power amplifier

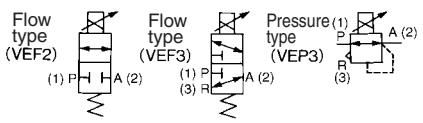
Symbol	Power amplifier
1	VEA25□

Thread type

Nil	Rc
F	G
N	NPT
T	NPTF

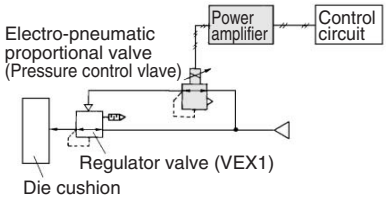
Body size Symbol	Standard characteristics Symbol	Set pressure range (MPa)	Symbol	Port size
2	1	0.05 to 0.65 MPa	Nil	Without sub-plate
			02	Rc 1/4
	2	0.1 to 0.9 MPa	03	Rc 3/8
4	1	0.005 to 0.15 MPa	03 04 06	Rc 3/8 Rc 1/2 Rc 3/4

JIS Symbol



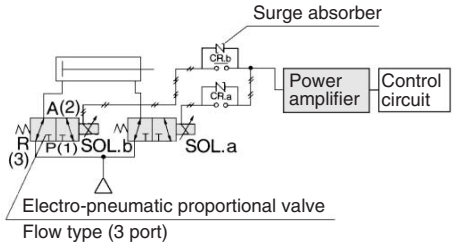
Application Example

Controlling pressure for die press cushion

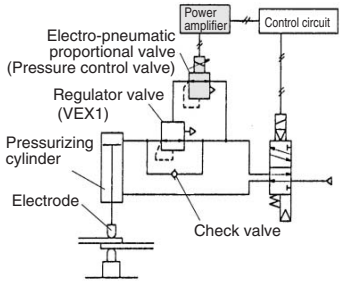


(Imagine air type shock absorber)

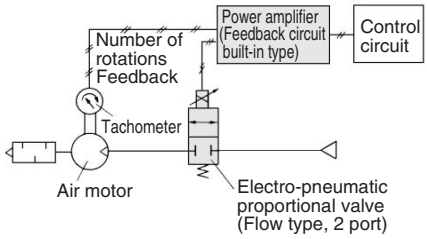
Controlling multispeed of cylinder



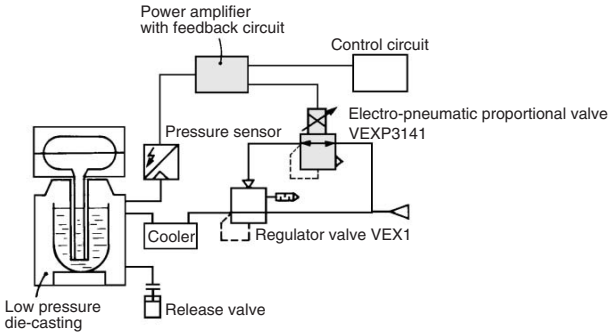
Controlling welding pressure of welding machine electrode



Controlling rotation of air motor



Controlling pressure of low pressure die-casting



Previous Type VE^{P}_{F}□□□0, VEA1□□

⚠ Caution

VE^{P}_{E}□□□0 must be used in conjunction with the power amplifier VEA1□□.
An old VEA1□□ cannot be used in combination with the current VE^{P}_{E}□□□1.

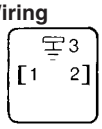
How to Use DIN Terminal

⚠ Caution

Wiring procedure

1. Loosen the retaining screw and pull the connector from the pin plug.
2. Make sure to remove the retaining screw, insert the tip of a flat head screwdriver into the groove below the terminal block and pry it up to separate the terminal cover from the terminal block.
3. Securely connect the wires to the specified terminals in accordance with the wiring procedure.

Wiring



Pin plug shape

Terminal block
Connection 3 is not used for terminal 1 and 2.
∗ Coil has no polarity.

Applicable cable (Heavy-duty cable)

0.75 mm², 1.25 mm²/2 core, 3 core (O.D. ø6.8 to ø11.5) based on JIS C 3312 and C 3322

Outlet changing procedure

To change the wire outlet, first separate the terminal cover from the terminal block.
Then, reinstall the terminal cover in the desired direction (in 90° increments).

⚠ Precautions

Be sure to read before handling. Refer to pages 14-21-3 to 14-21-4 for Safety Instructions and Common Precautions.

⚠ Caution

1. Air supply

Poor quality air could increase the spool's sliding resistance, while preventing it from attaining its specified characteristics. Use compressor oil with a minimal generation of oxidants and install a mist separator (SMC's AM series). Refer to page 14-14-2.

2. Mounting

- Vibrations are transmitted to the valve by the proportional solenoid's dither. If it is necessary to prevent the transmission of vibrations, insert vibration isolating rubber material.
- Thoroughly flush the pipe to completely eliminate any dust or scales from the pipe inside.
- Install a silencer (AN series) on the exhaust port.
- Be careful with the molded coil because it generates heat while current is applied to it.

3. Lubrication

This product can be used without lubrication. But if lubricated, use turbin oil Class 1, ISO VG32 (with no additive). It is impossible to use spindle oil, machine oil, or grease.

4. Manual operation

To check the operation of the valve without applying a current, remove the lock nut and use a screwdriver or the like to press the tip of the core. After checking the operation, reinstall the rubber cap in its original position.