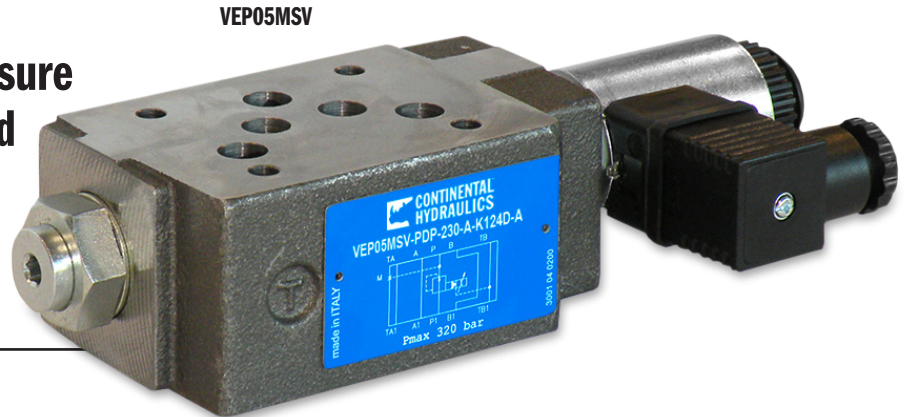


VEP05MSV-PDP

Proportional Three-Port Pressure Reducing Valve Pilot Operated

MODULAR VERSION
ISO 4401-05

P max 4600 PSI 320 bar
Q max SEE PERFORMANCE TABLE



DESCRIPTION

The VEP05MSV-PDP are a D05 modular three-way proportional pressure reducing valve which conforms to NFPA and ISO 4401 mounting standards.

These valves are designed to provide remote variable pressure control in the pressure port of a secondary circuit. The controlled pressure is proportional to the amount of current supplied to the solenoid.

As flow demands change, the valve opening will modulate to maintain the circuit pressure. In event of a loss in electrical power, the valve spool will return to the low-pressure condition.

The proportional solenoids can be driven by a variable current power supply or by use of external Power Amplifier Cards designed to maximize the valve's performance.

Key Features:

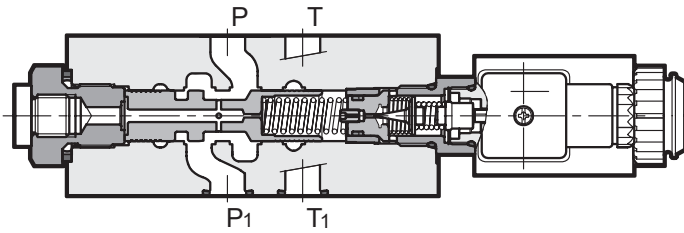
- Three Controlled Pressure Ranges up to 3300 PSI outlet.
- D05 Modular stack design for ease of installation
- Rated for flows to 26 GPM

PERFORMANCE

| | | VEP05 MSV |
|---|---|-----------------------------------|
| Max operating pressure: P - A - B ports T port | PSI (bar) | 4600 (320) 30 (2) |
| Minimum controlled pressure | see Δp-Q diagram page 3 | |
| Maximum flow in P line Maximum flow on free flow paths Drain flow | GPM (l/mi) | 26 (100) 26 (100) 0.1 (0.4) |
| Step response | see page 2 | |
| Hysteresis (with PWM 200 Hz) | % of p nom | < 3% |
| Repeatability | % of p nom | < ±1,5% |
| Electrical characteristics | see page 2 | |
| Ambient temperature range | °F (°C) | -4 / 140 (-20 / +60) |
| Fluid temperature range | °F (°C) | -4 / 176 (-20 / +80) |
| Fluid viscosity range | cSt | 10 - 400 |
| Fluid contamination degree | according to ISO 4406:1999 class 18/16/13 | |
| Recommended viscosity | cSt | 25 |
| Mass | lbs (kg) | 3.3 (1.5) |

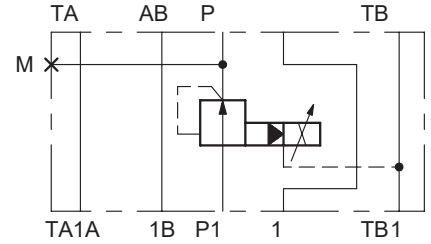
(Obtained with mineral oil with viscosity of 36 cSt at 50°C and electronic control card)

VEP05MSV



HYDRAULIC SYMBOLS

VEP03MSV-PDRP



OPERATING PRINCIPLE

- VEP05MSV valves are three-port pressure reducing valves, pilot operated, with proportional control. They are designed in modular version with mounting interface in compliance with ISO 4401 standards.
- These valves reduce pressure in the secondary branches of the circuit thus ensuring stability of controlled pressure in the event of variations in the flow rate through the valve.
- The valve can be controlled directly by a current control supply unit or by an electronic control card, to maximize the valve performance.

MAX PRESSURE VALVES

This valve incorporates a mechanical limit of the maximum pressure, that operates independently of the applied current. This kind of design ensures that the pressure cannot rise over even if the solenoid current exceeds the maximum current ($I > I_{max}$).

Values obtained with oil viscosity of 36 cSt at 50 °C and working lines closed (without flow).

| VEP05MSV | | -070 | -150 | -230 |
|---------------------------------------|-----------|-----------|------------|------------|
| Pressure value at 780 mA | PSI (bar) | 1160 (80) | 2390 (165) | 3300 (230) |
| Max pressure value when $I > I_{max}$ | PSI (bar) | 1375 (95) | 2600 (180) | 3600 (250) |

HYDRAULIC FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, according to ISO 6743-4. For these fluids, use NBR seals.

For fluids HFDR type (phosphate esters) use FPM seals (code G).

For the use of other fluid types such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C causes a faster degradation of the fluid and of the seals characteristics.

The fluid must be preserved in its physical and chemical characteristics.

ELECTRICAL CHARACTERISTICS

Proportional solenoid comprises two parts: tube and coil.

The tube, screwed to the valve body, contains the armature which is designed to maintain friction to a minimum thereby reducing hysteresis.

The coil is mounted on the tube and is secured by means of a lock nut. It can be rotated through 360° depending on installation clearances.

| | | | |
|--|-------------------------|------|------|
| NOMINAL VOLTAGE | V DC | 12 | 24 |
| RESISTANCE (at 20 °C) | Ω | 4.98 | 21 |
| NOMINAL CURRENT | A | 1.53 | 0.78 |
| DUTY CYCLE | | 100% | |
| ELECTROMAGNETIC COMPATIBILITY (EMC) | According to 2014/30/EU | | |
| CLASS OF PROTECTION | Class H Class F | | |
| Coil insulation (VDE 0580) Impregnation | | | |

Protection from atmospheric agents IEC 60529

The IP protection degree is guaranteed only with both valve and connectors of an equivalent IP degree correctly connected and installed.

| Electric Connection | Electric Connection Protection | Whole Valve Protection |
|---------------------|--------------------------------|------------------------|
| K1 | IP65 | IP65 |
| K7 | ID65/67 | IP65 |

STEP RESPONSE

(Obtained with mineral oil with viscosity of 36 cSt at 50 °C and electronic control card)

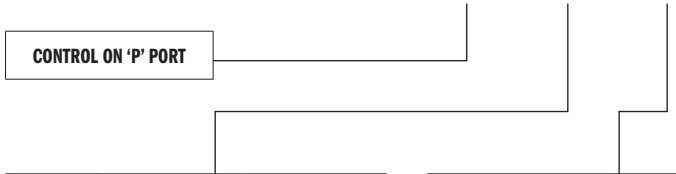
Step response is the time taken for the valve to reach 90% of the set pressure value following a step change of reference signal. 0 → 100%

The table illustrates typical step response times measured with input flow rate of $Q = 25$ l/min.

| REFERENCE SIGNAL STEP | 0 → 100% | 100 → 0% |
|-----------------------|----------|----------|
| Step response [ms] | 60 | 60 |

IDENTIFICATION CODE:

VEP05MSV - PDP - [] - [] - K[] [] D - [] ————— DESIGN LETTER



| PRESSURE RANGE | | |
|----------------|-------------|-----------|
| CODE | PSI | BAR |
| 70 | 100 to 1060 | 7 to 70 |
| 150 | 100 to 2450 | 7 to 150 |
| 230 | 250 to 3300 | 17 to 230 |

| SEAL MATERIAL | |
|---------------|-------------|
| CODE | DESCRIPTION |
| A | BUNA (STD) |
| G | VITON |

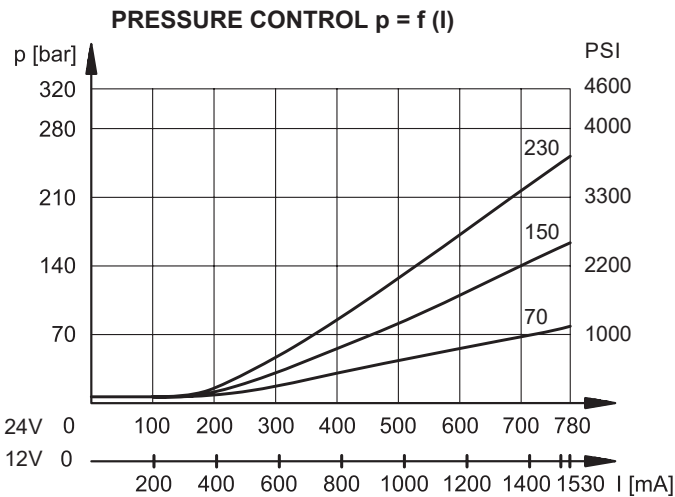
| CONNECTION | |
|------------|-------------|
| CODE | DESCRIPTION |
| K1 | DIN 43650 |
| K7 | DEUTSCH |

| VOLTAGE | |
|---------|-------------|
| CODE | DESCRIPTION |
| 12 | 12V DC |
| 24 | 24V DC |

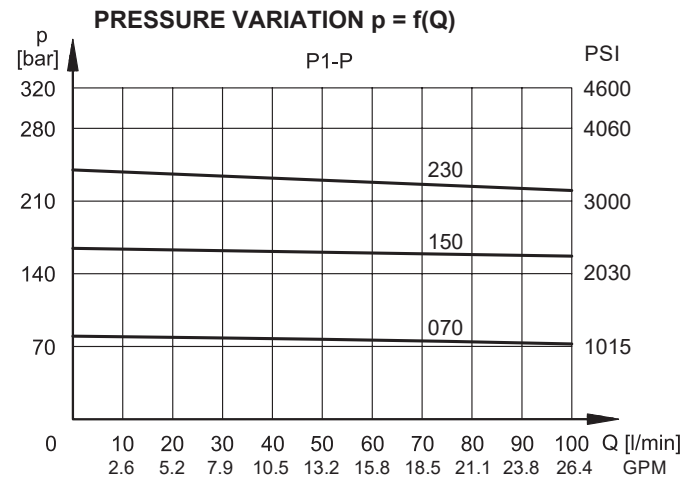
Please see Connectors Catalog
Form #1027453

TYPICAL ORDERING CODE:
VEP05MSV-PDP-230-A-K124D-A

CHARACTERISTIC CURVES (Measured with viscosity 36 cSt at 50 °C)

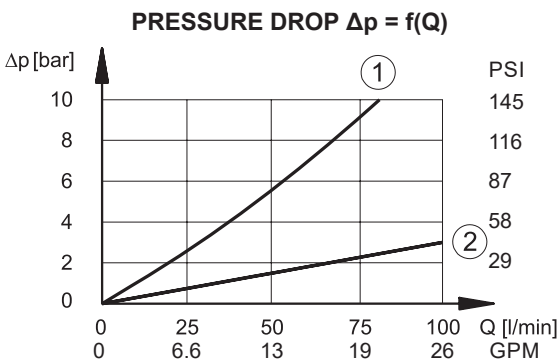


The curves have been obtained with working lines closed (without flow).

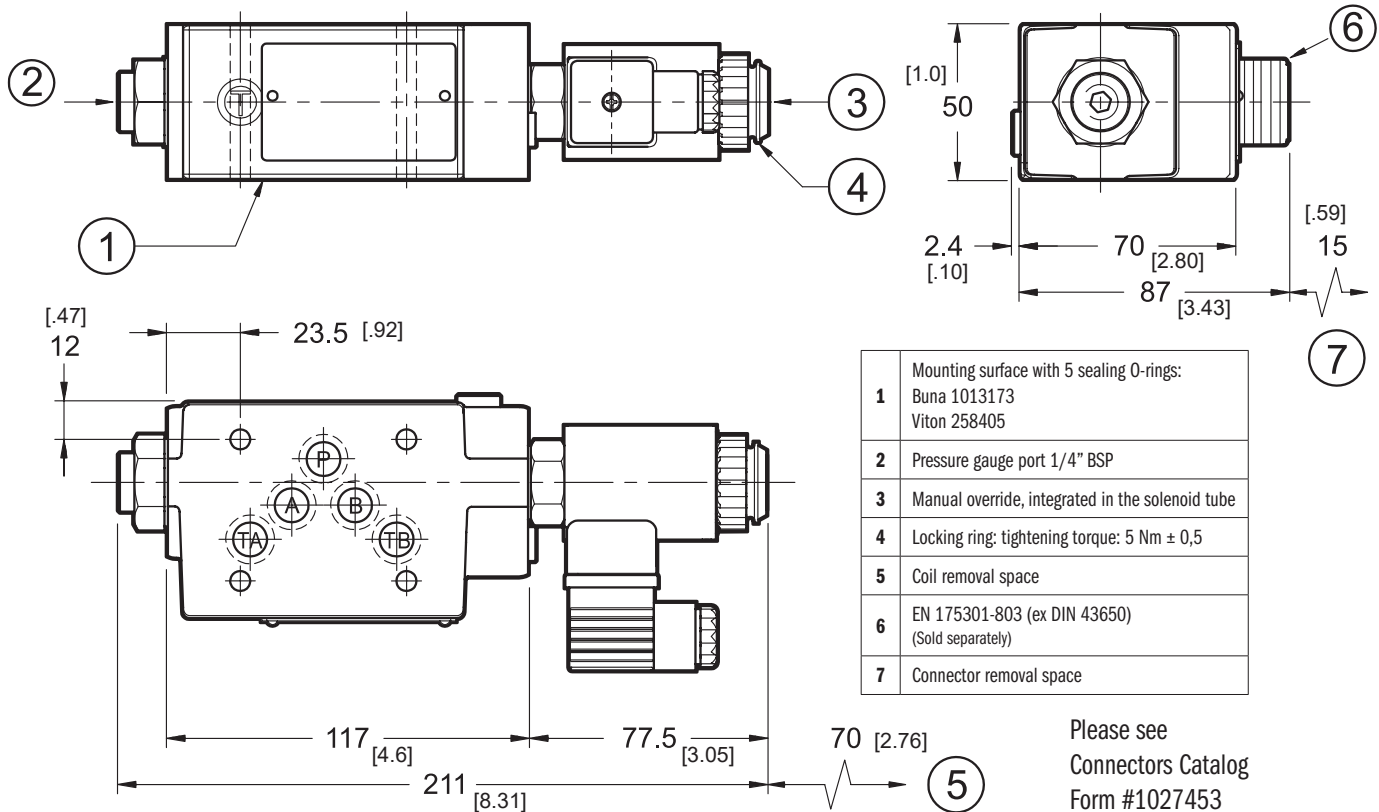


The curves have been obtained with inlet pressure 50 bar greater than nominal pressure.

Pressure values in P1 greater than 50 bar reduce flow values considerably.



1. Pressure drops P1 → P
2. Pressure drop in passing lines (ex. A ↔ A1)
3. Pressure drops T 1 → T

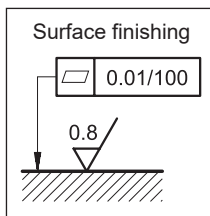
OVERALL AND MOUNTING DIMENSIONS Dimensions mm [in]

INSTALLATION

These valves can be installed in any position without impairing correct operation if it is ensured that there is no air in the hydraulic circuit. Otherwise, vertical mounting with solenoid downward is preferable. In this case you must consider possible variations of the minimum controlled pressure values reported in point 2. Connect the valve T port directly to the reservoir.

Add any return pressure value detected in the T line to the reduced pressure value.

NOTE: Occurring return pressures are to be added up to the value of pressure setting at T port.

Valves are fixed by means of screws or tie rods on a flat surface with planarity and roughness equal to or better than those indicated in the relative symbols. If minimum values are not observed fluid can easily leak between the valve and support surface.



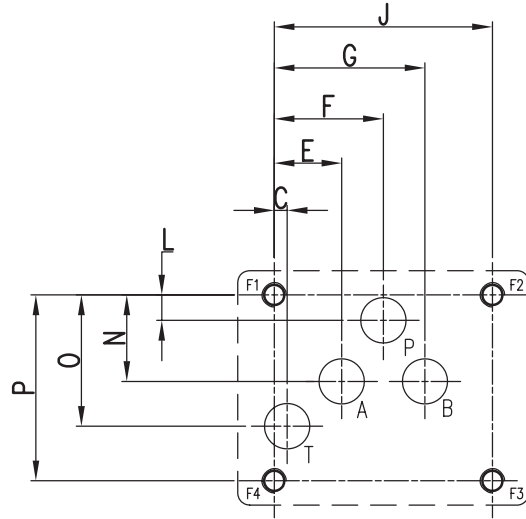
MOUNTING INTERFACE

Dimensions inch [mm]

| D05 | | |
|---------------------------|--------|--------------|
| CODE | MM | Inch |
| P, A, B, T Max | Ø 11.2 | Ø 0.44 |
| Mounting Bolt Thread size | M6 | 1/4 - 20 UNC |

| CODE | MM | Inch |
|------|------|-------|
| A | 72.0 | 2.84 |
| B | 58.0 | 2.28 |
| C | 3.20 | 0.126 |
| E | 16.7 | 0.66 |
| F | 27.0 | 1.06 |
| G | 37.3 | 1.47 |

| CODE | MM | Inch |
|------|------|-------|
| J | 54.0 | 2.125 |
| L | 6.30 | 0.25 |
| N | 21.4 | 0.84 |
| O | 32.5 | 1.28 |
| P | 46.0 | 1.812 |



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Connectors and Cable Sets

Connectors and Cable Sets

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- VEA-3C-A (Ø 19/6 1001848)
- VEA-3MH-A (Ø 19/6 1001849)
- VEA-3L4-A (M12 18 19/6 1001850)

Female Receptacles

- VEA-3M-A (Ø 19/6 264203)
- VEA-3D-A (Ø 19/6 304435)
- VEA-3L-A (M12 4 19/6 264204)
- VEA-DT06-CS-A (Ø 19/6 1021639DC)

DIN Connector 43650 Form A 1202 4400

- VEA-3E-A (Grey) 165639
- VEA-3E-A (Black) 165638
- PC11-S0 Strain Relief

Cable Glands VSD-HL-KD2

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Connectors and Cables Sets

Form #1027453