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CONTINENTAL HYDRAULICS

# VED \* M

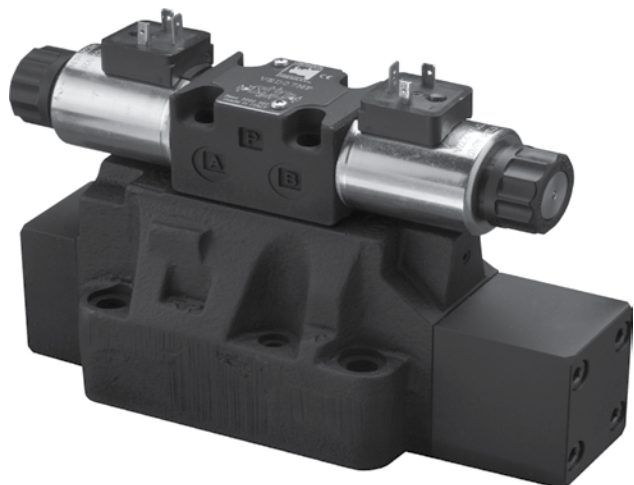
PROPORTIONAL PILOT OPERATED DIRECTIONAL CONTROL VALVES



VED \* M - PROPORTIONAL PILOT OPERATED DIRECTIONAL CONTROL VALVES

# VED\*M

## PROPORTIONAL PILOT OPERATED DIRECTIONAL CONTROL VALVES



### DESCRIPTION

Continental Hydraulics VED\*M pilot operated 4-way proportional valves conform to NFPA and ISO 4401 mounting standard.

### OPERATIONS

These valves are designed to control the direction and oil flow rate based on the amount of current supplied to the solenoid. In event of a loss in electrical power, the centering springs will return the valve spool to the center position.

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

A variety of manual overrides and a version with a pressure reducing valve are also available.

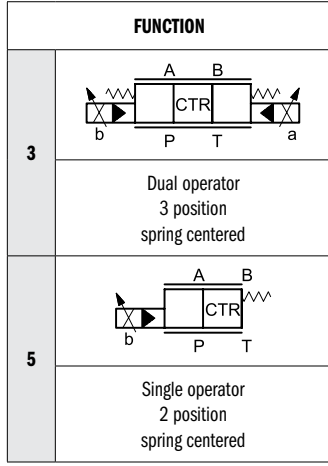
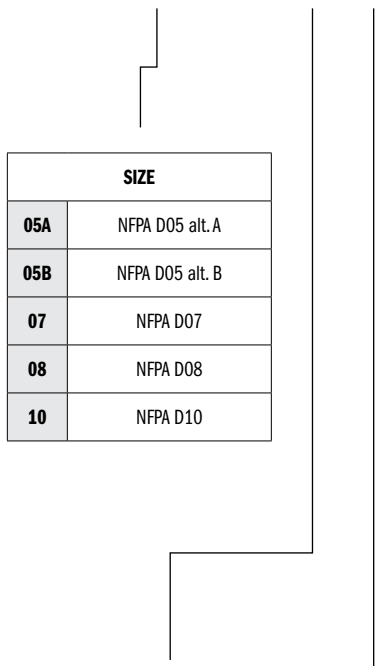
### TYPICAL PERFORMANCE SPECIFICATIONS

|                                    |                     |                 |             |
|------------------------------------|---------------------|-----------------|-------------|
| <b>MAXIMUM OPERATING PRESSURE:</b> | P - A - B Ports     | 5000 psi        | 350 bar     |
|                                    | T Port (int. drain) | 145 psi         | 10 bar      |
|                                    | T Port (ext. drain) | 3600 psi        | 250 bar     |
| <b>HYSTERESIS</b>                  | % of Q max          | < 4%            |             |
| <b>REPEATABILITY</b>               | % of Q max          | < ± 2%          |             |
| <b>POWER SUPPLY</b>                |                     | 12V DC / 24V DC |             |
| <b>CONNECTION</b>                  |                     | DIN 43560       | DT042P male |
| <b>PROTECTION</b>                  | IEC 60529           | IP 65           | IP 69K      |

|   |                 | VED05*M  |                         | VED07M                          |  | VED08M                          |   | VED10M                          |   |
|---|-----------------|--|-------------------------|---------------------------------|--|---------------------------------|---|---------------------------------|---|
| <b>FLOW CAPACITY WITH ΔP 145 PSI (10 BAR)</b> |                 | 21 gpm<br>21/10.5 gpm                          | 80 l/min<br>80/40 l/min | 26.5 gpm<br>40 gpm<br>40/20 gpm | 100 l/min<br>150 l/min<br>150/75 l/min | 53 gpm<br>80 gpm<br>80/40 gpm   | 200 l/min<br>300 l/min<br>300/150 l/min | 93 gpm<br>132 gpm<br>132/66 gpm | 350 l/min<br>500 l/min<br>500/250 l/min |
| <b>MAX FLOW</b>                               |                 | 48 gpm   | 180 l/min               | 120 gpm                         | 450 l/min                              | 210 gpm                         | 800 l/min                               | 420 gpm                         | 1600 l/min                              |
| <b>MOUNTING SURFACE</b>                       |                 | NFPA D05 alt. A /alt. B<br>ISO 4401-05-05-0-05 |                         | NFPA D07<br>ISO 4401-07-07-0-05 |  | NFPA D08<br>ISO 4401-08-08-0-05 |   | NFPA D10<br>ISO 4401-10-09-0-05 |   |
| <b>WEIGHT</b>                                 | Single Solenoid | 18.7 lbs                                       | 8.5 Kg                  | 23.2 lbs                        | 10.5 Kg                                | 37.5 lbs                        | 17.0 Kg                                 | 116.0 lbs                       | 54.5 Kg                                 |
|   | Dual Solenoid   | 19.8 lbs                                       | 9.0 Kg                  | 24.3 lbs                        | 11.0 Kg                                | 38.4 lbs                        | 17.4 Kg                                 | 117.0 lbs                       | 53.0 Kg                                 |

# IDENTIFICATION CODE

**VED** [ ] **M-** [ ] [ ] - [ ] - [ ] [ ] [ ] - [ ] - [ ] **D-** [ ] \_\_\_\_\_ DESIGN LETTER



| SIZE       |                 |
|------------|-----------------|
| <b>05A</b> | NFPA D05 alt. A |
| <b>05B</b> | NFPA D05 alt. B |
| <b>07</b>  | NFPA D07        |
| <b>08</b>  | NFPA D08        |
| <b>10</b>  | NFPA D10        |

| SEAL     |            |
|----------|------------|
| <b>A</b> | Buna (STD) |
| <b>G</b> | Viton      |

| CONNECTION |                   |
|------------|-------------------|
| <b>K1</b>  | DIN 43650 (STD)   |
| <b>K7</b>  | DT04-2P 'Deutsch' |

| VOLTAGE   |                      |
|-----------|----------------------|
| <b>12</b> | Voltage 12V DC       |
| <b>24</b> | Current 24V DC (STD) |

| NOMINAL FLOW<br>(with $\Delta p$ P-T 143 psi) |                |  |
|---|----------------|--|
| <b>05</b>                                     | <b>80</b>      | 80 l/min (21 gpm)  |
|   | <b>80/40</b>   | Asymmetrical spool:<br>80 l/min (21 gpm) on P-A<br>40 l/min (10.5 gpm) on B-T  |
| <b>07</b>                                     | <b>100</b>     | 100 l/min (26.5 gpm)   |
|   | <b>150</b>     | 150 l/min (40 gpm)   |
|   | <b>150/75</b>  | Asymmetrical spool:<br>150 l/min (40 gpm) on P-A<br>75 l/min (20 gpm) on B-T   |
| <b>08</b>                                     | <b>200</b>     | 200 l/min (53 gpm)   |
|   | <b>300</b>     | 300 l/min (80 gpm)   |
|   | <b>300/150</b> | Asymmetrical spool:<br>300 l/min (80 gpm) on P-A<br>150 l/min (40 gpm) on B-T  |
| <b>10</b>                                     | <b>350</b>     | 350 l/min (93 gpm)   |
|   | <b>500</b>     | 500 l/min (132 gpm)  |
|   | <b>500/250</b> | Asymmetrical spool:<br>500 l/min (132 gpm) on P-A<br>250 l/min (66 gpm) on B-T |

| PILOT/DRAIN |                                  |
|-------------|----------------------------------|
| <b>1</b>    | Internal pilot<br>External drain |
| <b>2</b>    | External pilot<br>External drain |
| <b>3</b>    | Internal pilot<br>Internal drain |
| <b>4</b>    | External pilot<br>Internal drain |

| MECHANICAL<br>(Omit if not required) |   |
|--------------------------------------|---|
| <b>R</b>                             | Reverse operator<br>2 position<br>spring centered<br>solenoid A supplied  |
| <b>Z</b>                             | Pilot pressure<br>reducer.<br>Mandatory with pilot<br>drain 1 and 3 when<br>pressure is higher than<br>3000 psi (210 bar) |

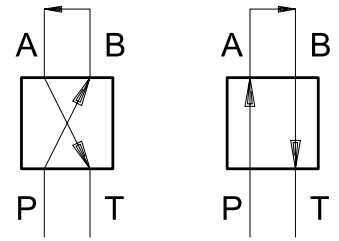
TYPICAL ORDERING CODE:  
**VED07M-3AC-100-A1-K1-24D-C**

| SPOOLS    |         |                              |                |                |                   |
|-----------|---------|------------------------------|----------------|----------------|-------------------|
| NAME      | SYMBOLS | DESCRIPTION                  | APPLICATION    | SIZE           | FUNCTION MATCHING |
| <b>AC</b> |         | METER IN / METER OUT         | MOTION CONTROL | 05, 07, 08, 10 | 3, 5              |
| <b>FC</b> |         | METER IN / METER OUT         |                | 05, 07, 08, 10 | 3, 5              |
| <b>RL</b> |         | METER IN / METER OUT (REGEN) |                | 07, 08, 10     | 3                 |
| <b>RA</b> |         | METER IN / METER OUT (REGEN) |                | 07, 08, 10     | 3                 |

VED \* M - PROPORTIONAL PILOT OPERATED DIRECTIONAL CONTROL VALVES

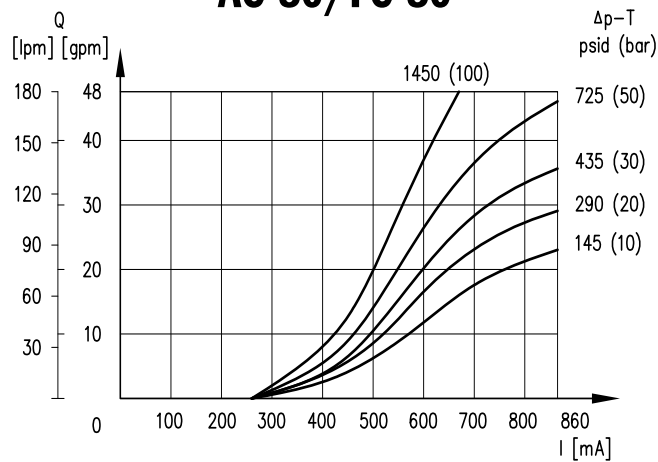
# PERFORMANCE CURVES - FLOW GAIN

1. Curves obtained with mineral oil with viscosity of 170 sus (36 cSt) at 122°F (50°C) and VED\*M at 24V with external amplifier.
2. The  $\Delta p$  values are measured between P and T (full loop) valve ports.
3. Typical flow rate curves at constant  $\Delta p$  related to the reference signal and measured for the available spools.



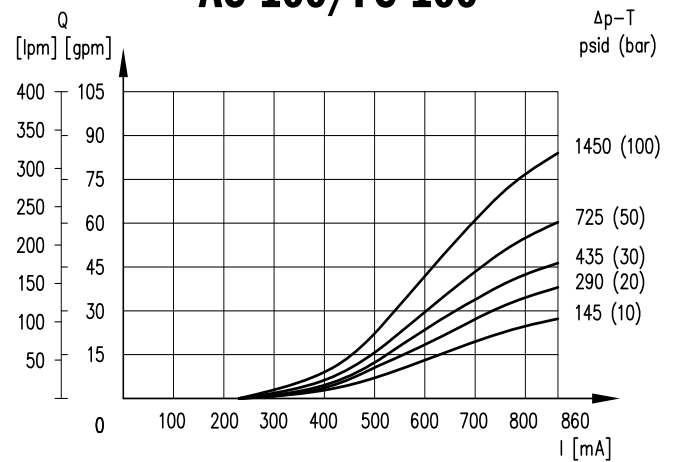
## VED05\*M

### AC-80/FC-80

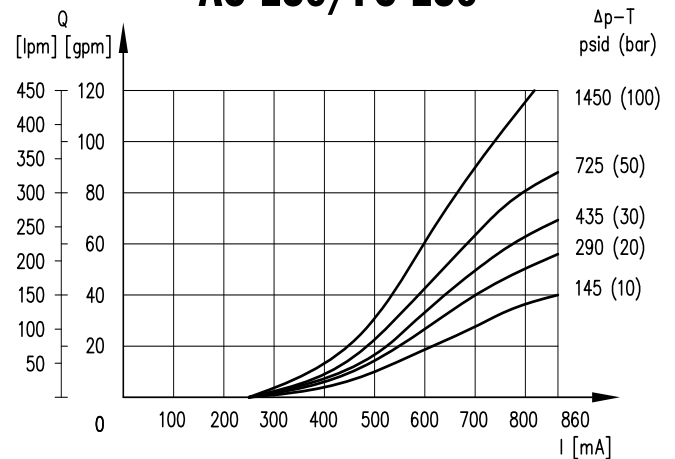


## VED07M

### AC-100/FC-100



### AC-150/FC-150



#### RESPONSE TIME

| VED05*M    | ENERGIZING | DE-ENERGIZING |
|------------|------------|---------------|
|            | 0 ▶ 100%   | 100% ▶ 0      |
| TIMES [ms] | 50         | 40            |

#### RESPONSE TIME

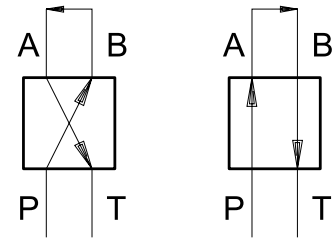
| VED07M     | ENERGIZING | DE-ENERGIZING |
|------------|------------|---------------|
|            | 0 ▶ 100%   | 100% ▶ 0      |
| TIMES [ms] | 80         | 50            |

# PERFORMANCE CURVES - FLOW GAIN

1. Curves obtained with mineral oil with viscosity of 170 sus (36 cSt) at 122°F (50°C) and VED\*M at 24V with external amplifier.

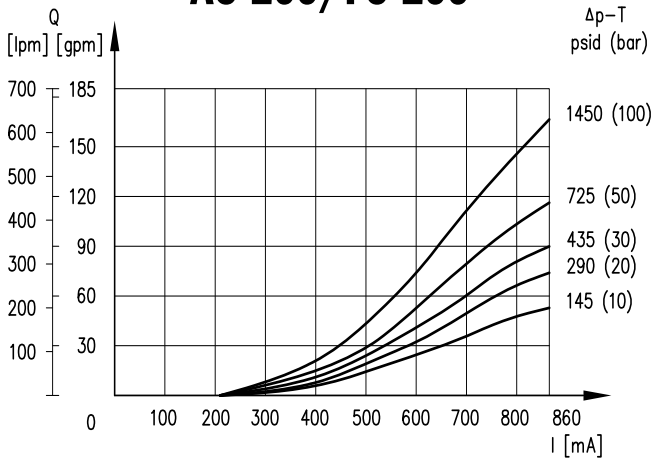
2. The  $\Delta p$  values are measured between P and T (full loop) valve ports.

3. Typical flow rate curves at constant  $\Delta p$  related to the reference signal and measured for the available spools.



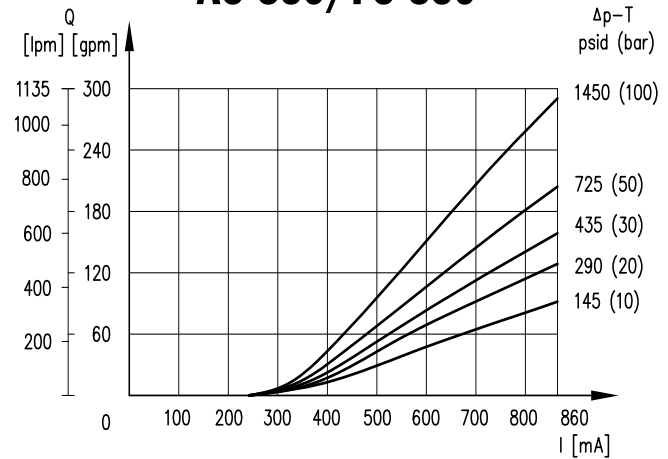
## VED08M

### AC-200/FC-200

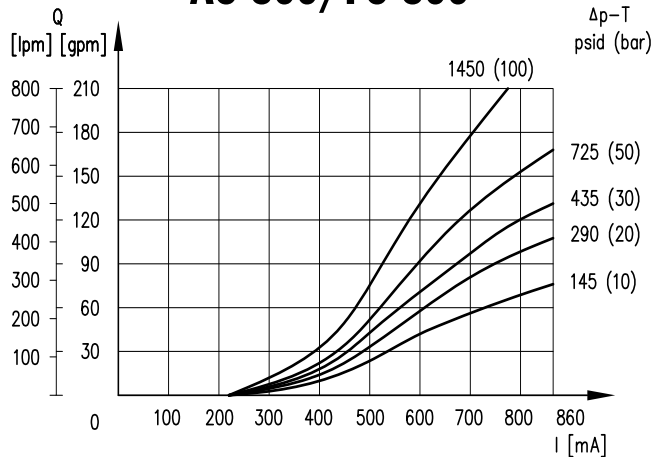


## VED10M

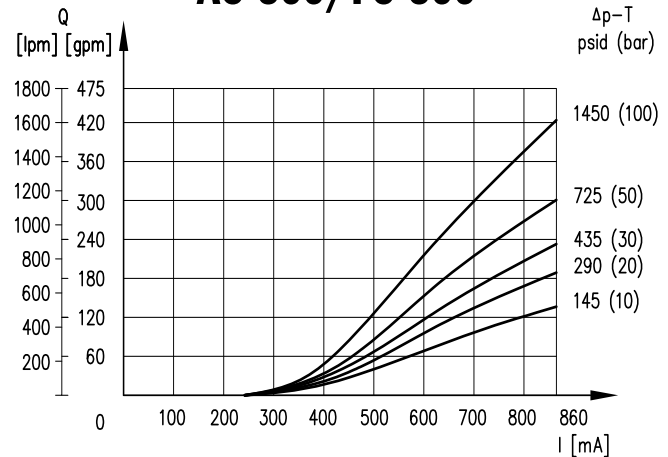
### AC-350/FC-350



### AC-300/FC-300



### AC-500/FC-500



## RESPONSE TIME

| VED08M     | ENERGIZING | DE-ENERGIZING |
|------------|------------|---------------|
|            | 0 ▶ 100%   | 100% ▶ 0      |
| TIMES [ms] | 100        | 70            |

## RESPONSE TIME

| VED10M     | ENERGIZING | DE-ENERGIZING |
|------------|------------|---------------|
|            | 0 ▶ 100%   | 100% ▶ 0      |
| TIMES [ms] | 200        | 120           |

VED \* M - PROPORTIONAL PILOT OPERATED DIRECTIONAL CONTROL VALVES

# PILOTING AND DRAINAGE

The VED\*M valves are available with piloting and drainage, both internal and/or external.

**The version with internal pilot without pressure reducer is suitable only on systems where the pressure is not higher than 3000 psi (210 bar).**

When the system pressure exceeds 3000 psi (210 bar) use of the version with external pilot is mandatory, or alternatively, the version with internal pilot and pressure reducer. The pressure reducer has fixed adjustment of 430 psi (30 bar).

The version with external drainage allows a higher back pressure on the unloading.

| CODE | PILOT    | X PLUG | DRAIN    | Y PLUG |
|------|----------|--------|----------|--------|
| 1    | Internal | □      | External | ■      |
| 2    | External | ■      | External | ■      |
| 3    | Internal | □      | Internal | □      |
| 4    | External | ■      | Internal | □      |

■ Plugged □ Unplugged

## PILOTING REQUIREMENTS

Minimum value of piloting pressure on port X: 430 psi (30 bar).

| PILOTING FLOW REQUIRED WITH OPERATION 0 > 100% |          |        |
|--|----------|--------|
| VED05*M  | 0.79 gpm | 3 lpm  |
| VED07M   | 1.32 gpm | 5 lpm  |
| VED08M   | 2.38 gpm | 9 lpm  |
| VED10M   | 3.43 gpm | 13 lpm |

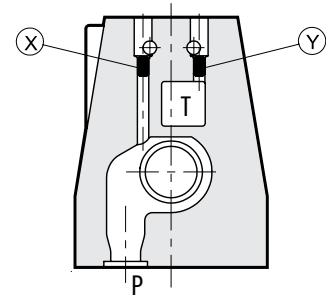
| PILOTING VOLUME REQUIRED WITH OPERATION 0 > 100% |                      |                      |
|--|----------------------|----------------------|
| VED05*M  | 0.10 in <sup>3</sup> | 1.7 cm <sup>3</sup>  |
| VED07M   | 0.19 in <sup>3</sup> | 3.2 cm <sup>3</sup>  |
| VED08M   | 0.55 in <sup>3</sup> | 9.1 cm <sup>3</sup>  |
| VED10M   | 1.32 in <sup>3</sup> | 21.6 cm <sup>3</sup> |

## PLUG SIZE:

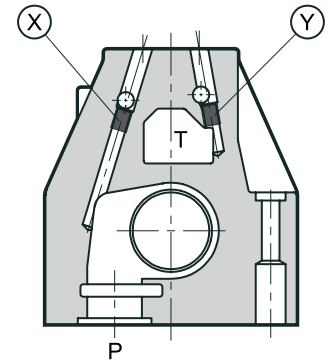
|         |         |
|---------|---------|
| VED05*M | M5x6 mm |
| VED07M  | M6x8 mm |
| VED08M  | M6x8 mm |
| VED10M  | M6x8 mm |

### PLUG MOUNTING

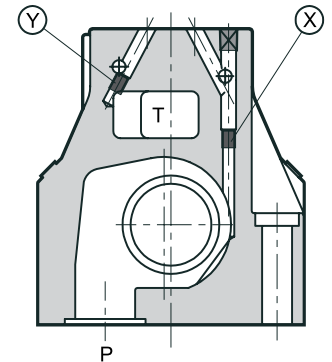
VED05\*M



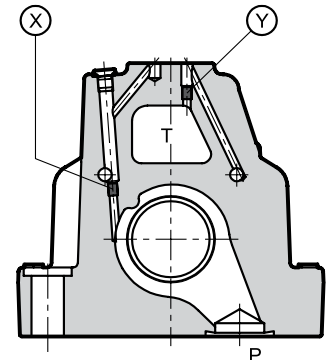
VED07M



VED08M



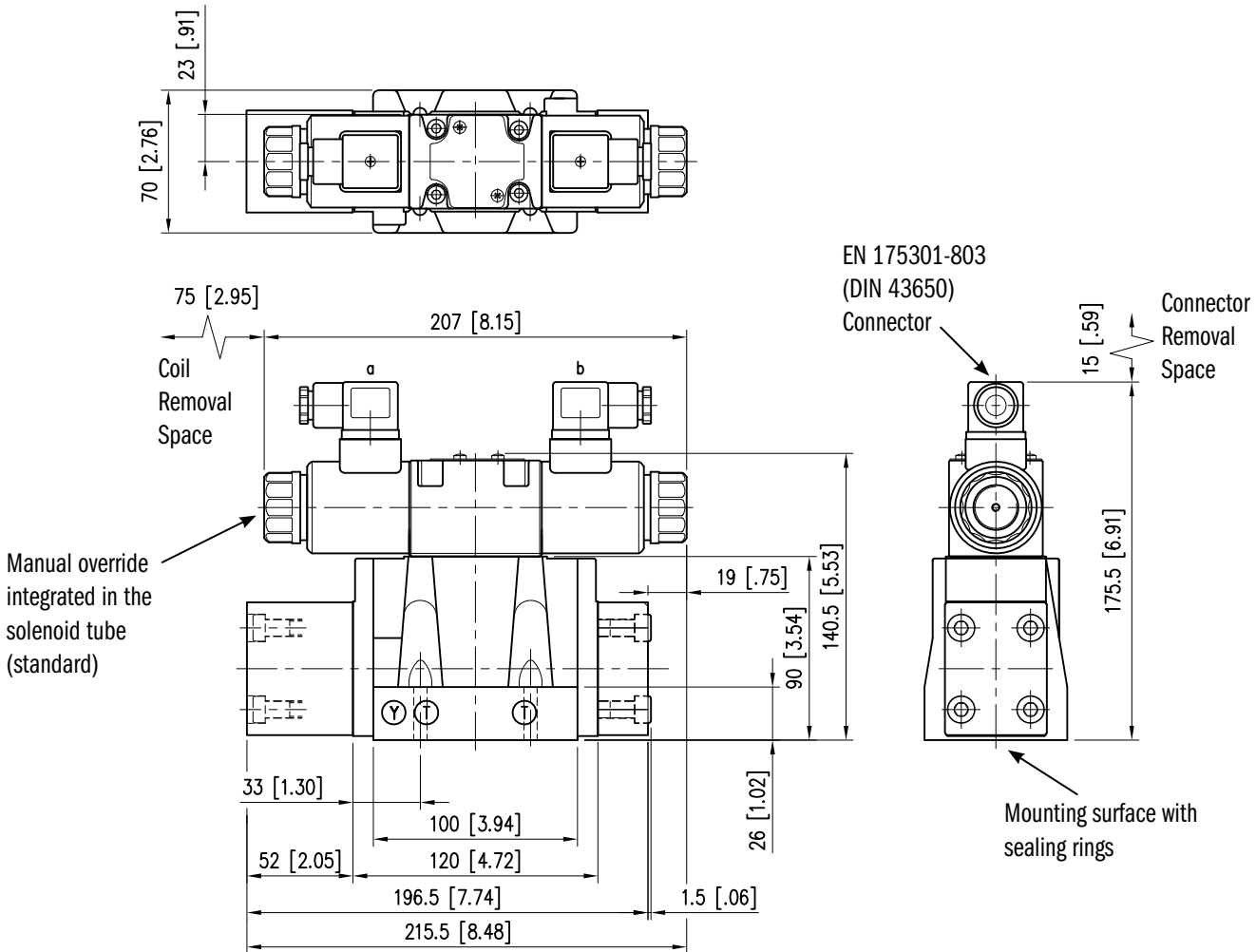
VED10M



# OVERALL AND MOUNTING DIMENSIONS FOR VED05\*M

VED05\*M-3

Dimensions in mm [IN]



**NOTES:**

For single solenoid overall dimensions see related drawing. See page 11.

**THREAD OF MOUNTING HOLES**

1/4 - 20 UNC -2B x 0.60

**FASTENING**

4 bolts 1/4-20 UNC-2B x 1 1/2

**TIGHTENING TORQUE**

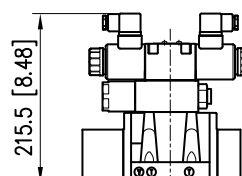
6 lb.ft (8.13 Nm)

**SEALING RINGS**

Qty. 5 O-ring AS568-014 90 shore A

Qty. 2 O-ring AS568-012 90 shore A

**VED05\*M\*Z**

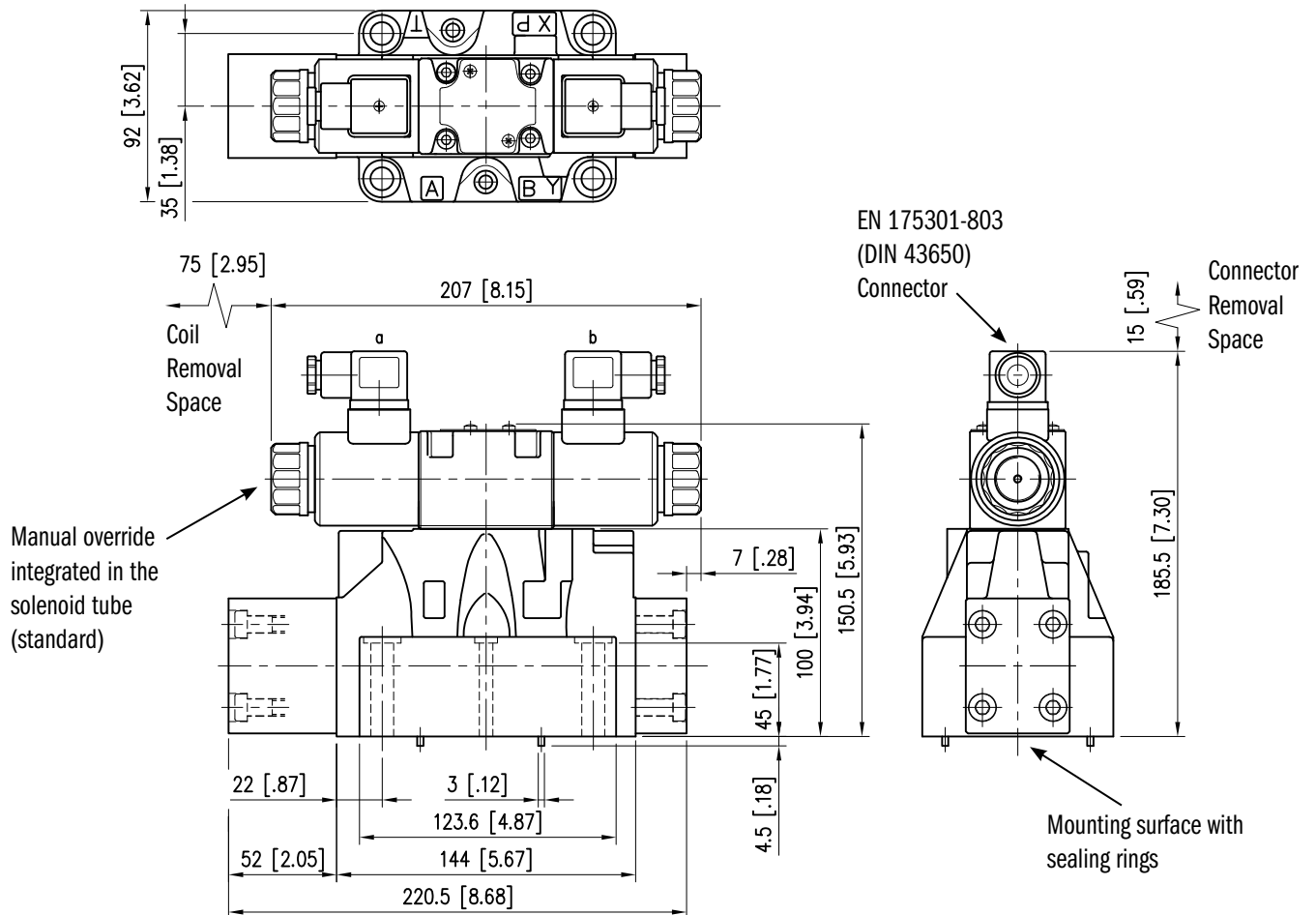


VED \*M - PROPORTIONAL PILOT OPERATED DIRECTIONAL CONTROL VALVES

# OVERALL AND MOUNTING DIMENSIONS FOR VED07M

VED07M-3

Dimensions in mm [IN]



**NOTES:**

For single solenoid overall dimensions see related drawing. See page 11.

**THREAD OF MOUNTING HOLE**

1/4 - 20 UNC - 2B x 0.6

3/8 - 16 UNC - 2B x 0.9

**FASTENING**

2 bolts 1/4-20 UNC-2B x 2 (50 mm)

4 bolts 3/8-16 UNC-2B x 2 1/2 (60 mm)

**TIGHTENING TORQUE**

1/4 - 20 UNC -2B: 6 lb.ft (8.13 Nm)

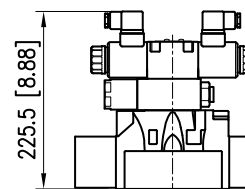
3/8 - 16 UNC -2B: 29.5 lb.ft (40 Nm)

**SEALING RINGS**

Qty. 4 O-ring 22.22mm ID x 2.62mm CS 90 shore A

Qty. 2 O-ring AS568-013 90 shore A

**VED07M\*Z**

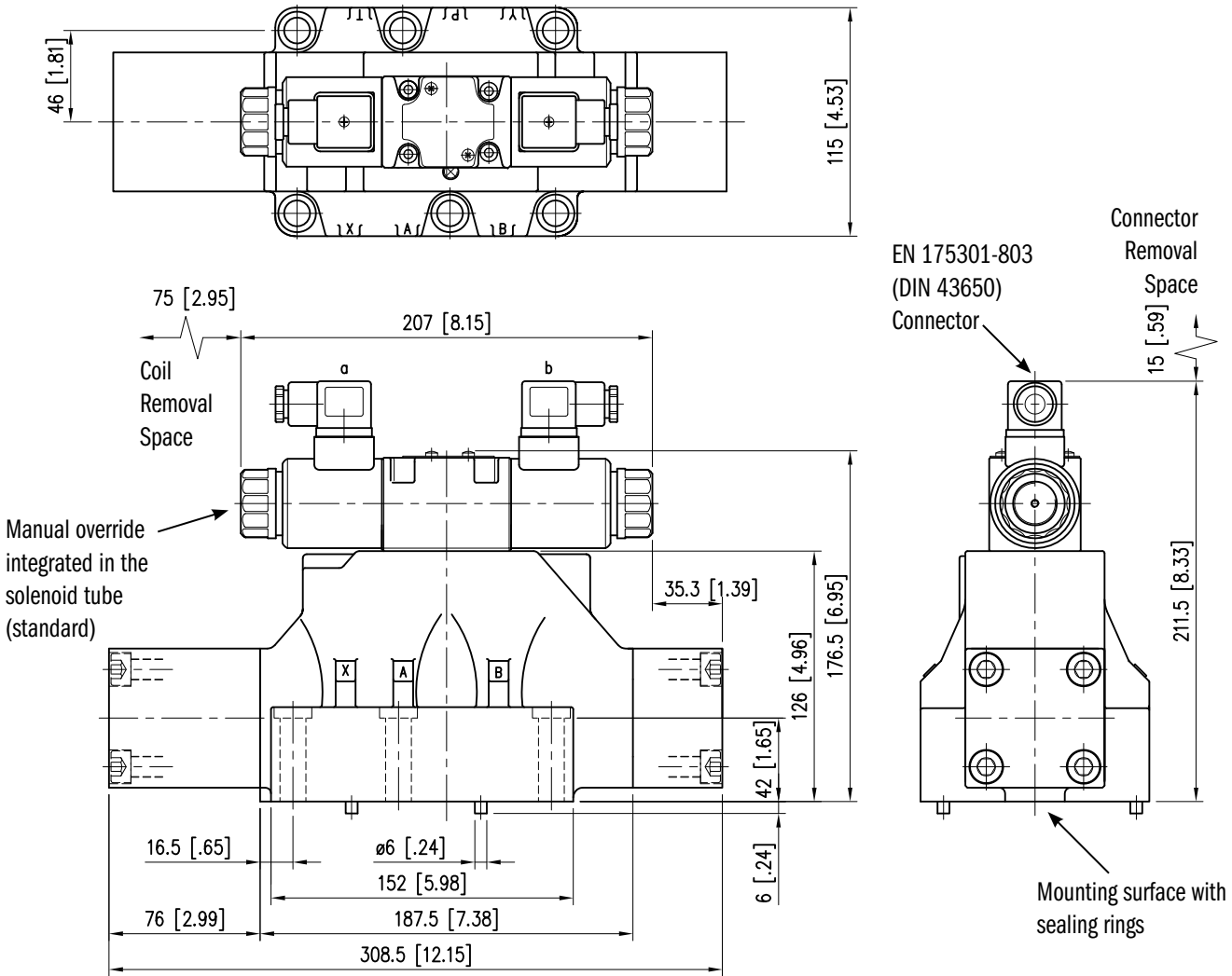




# OVERALL AND MOUNTING DIMENSIONS FOR VED08M-3

VED08M-3

Dimensions in mm [IN]



**NOTES:**

For single solenoid overall dimensions see the related drawing. See page 11.

**THREAD OF MOUNTING HOLES**

1/2 - 13 UNC x 0.9

**FASTENING**

6 bolts 1/2 - 13 UNC x 2 1/2 (60 mm)

**TIGHTENING TORQUE**

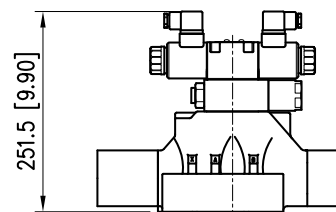
51 lb.ft (69 Nm)

**SEALING RINGS**

Qty. 4 O-ring AS568-123 90 shore A

Qty. 2 O-ring AS568-117 90 shore A

**VED08M\*Z**

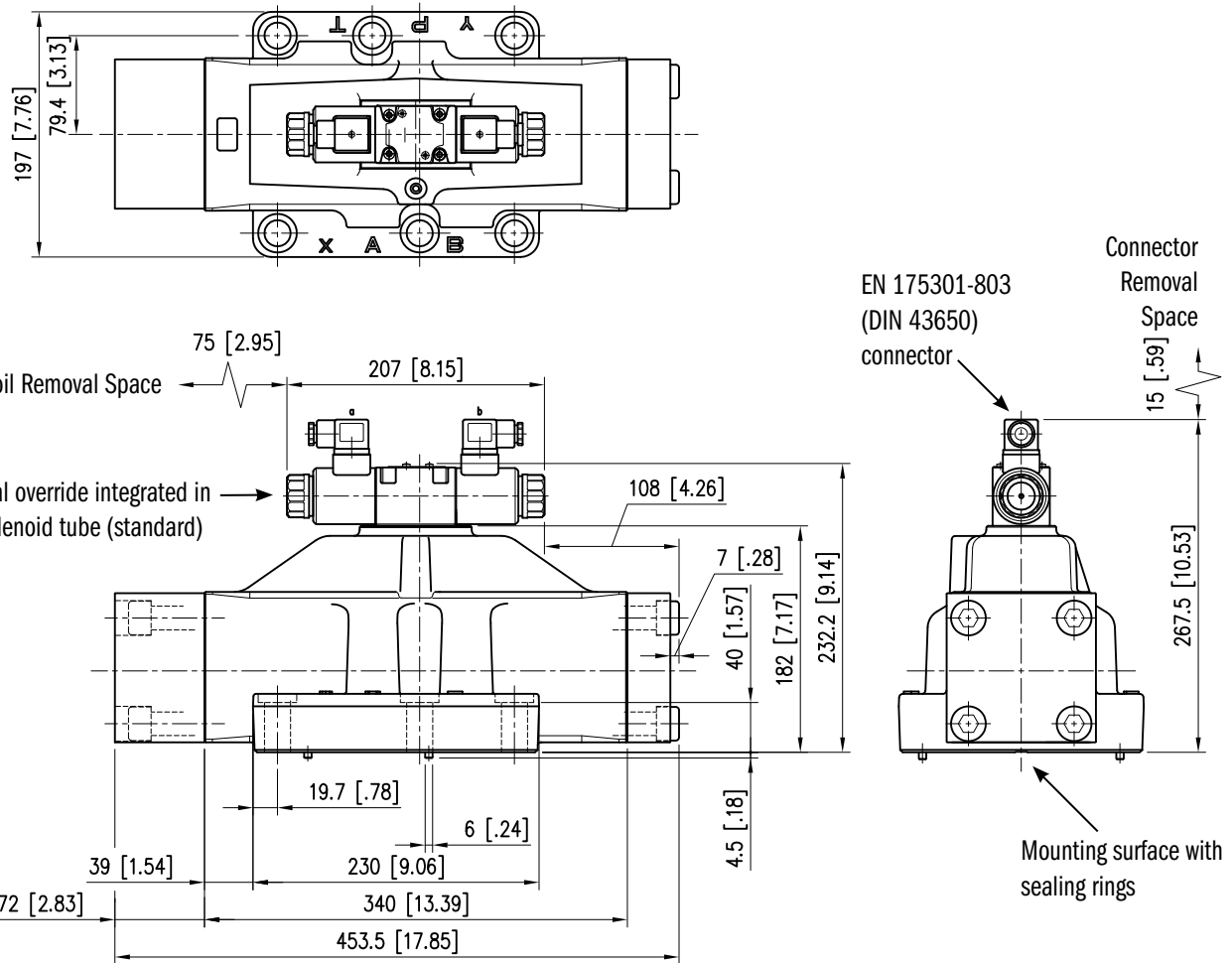


VED \*M - PROPORTIONAL PILOT OPERATED DIRECTIONAL CONTROL VALVES

# OVERALL AND MOUNTING DIMENSIONS FOR VED10M-3

VED10M-3

Dimensions in mm [IN]



**NOTES:**

For single solenoid overall dimensions see the related drawing. See page 11.

**THREAD OF MOUNTING HOLES**

3/4 - 10 UNC - 2B x 1.6

**FASTENING**

6 bolts 3/4 - 10 UNC - 2B x 2 3/4 (70 mm)

**TIGHTENING TORQUE**

245 lb.ft (332 Nm)

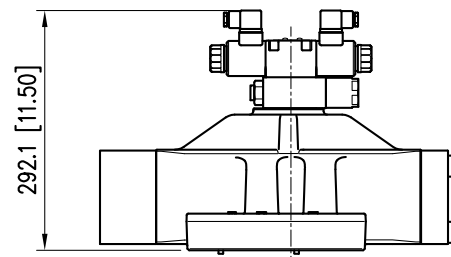
high strength: 415 lb.ft (562 Nm)

**SEALING RINGS**

Qty. 4 O-ring AS568-222 90 shore A

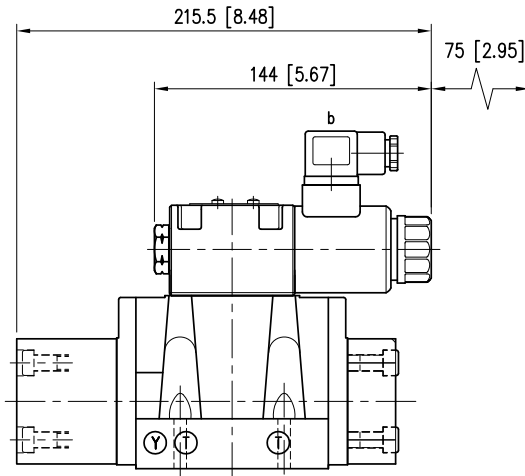
Qty. 2 O-ring AS568-117 90 shore A

**VED10M\*Z**

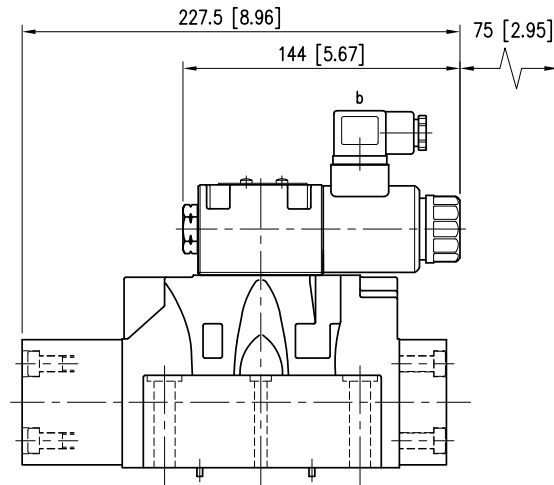


# OVERALL DIMENSIONS FOR SINGLE SOLENOID VERSIONS

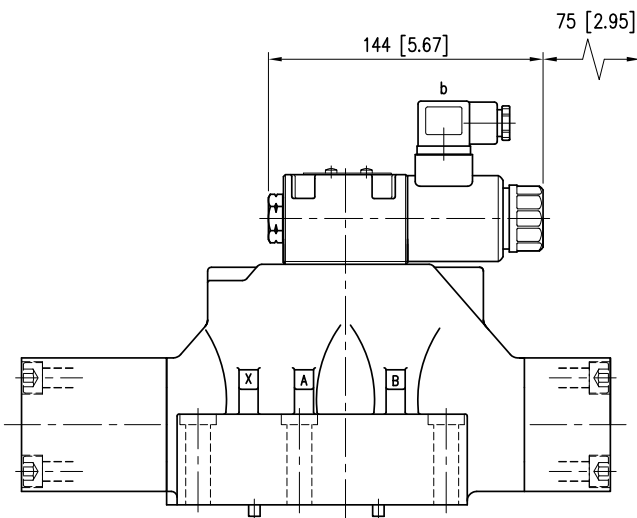
## VED05\*M-5



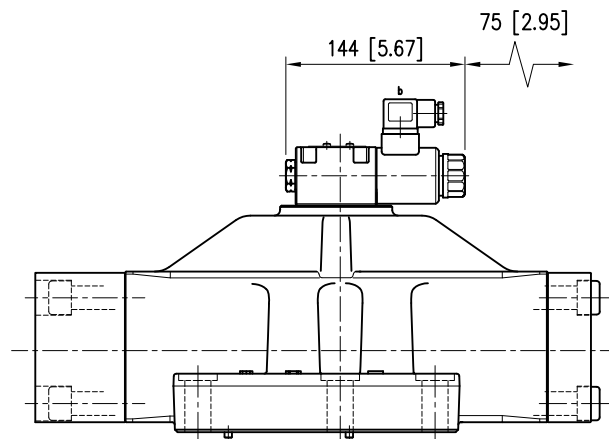
## VED07M-5



## VED08M-5R



## VED10M-5R



**NOTES:**

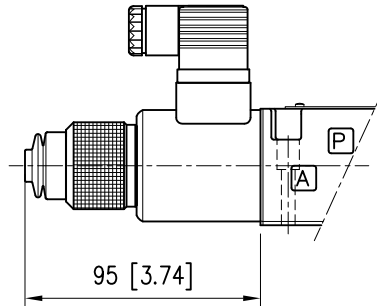
For missing dimensions refer to the previous drawings.

## MANUAL OVERRIDE

The standard valve has override pins integrated in the tube. The operation of this control must be executed with a suitable tool, being careful not to damage the sliding surface.

Three other manual overrides are available, using the proper letter in the ordering code.

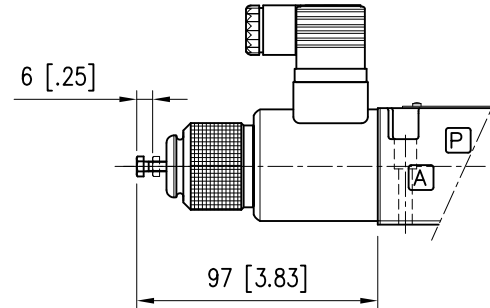
### MANUAL OVERRIDE BOOT PROTECTED (CODE U)



**NOTES:**

1. This device can be ordered separately with code **VMAP-03J-A**.

### SCREW MANUAL OVERRIDE (CODE S)



**NOTES:**

1. With metal ring nut provided with a M4 screw and a blocking locknut to allow continuous mechanical operation.
2. This device can be ordered separately with code **VMAP-03S-A**.



The manual override use doesn't allow any proportional regulation:

Using this kind of override, the main stage spool will open completely and the valve will behave as an on-off valve.

## ELECTRICAL DATA FOR VED \* M

The proportional solenoid consists of tube and coil. The coil is mounted on the tube and fastened to it by a ring retainer.

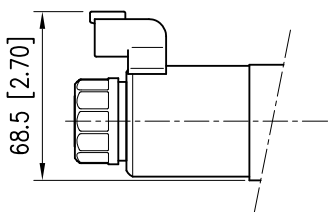
The coils can be indexed to any position allowing for convenient location of the connector.

### IP DEGREE

The declared IP degree is guaranteed for all valves only if the connector has been wired and mounted correctly on the coil.

The K7 connection meets DIN 40050-9 which extends the IEC 60529 rating system with an IP69K rating for high-pressure, high-temperature and wash-down applications.

### K7 CONNECTION



|  |                                |                  |           |
|--|--------------------------------|------------------|-----------|
| <b>NOMINAL VOLTAGE</b>                     | V DC                           | <b>12</b>        | <b>24</b> |
| <b>RESISTANCE AT 68° F</b>                 | K1                             | 3.66 Ω           | 17.6 Ω    |
|  | K7                             | 4.5 Ω            | 18.7 Ω    |
| <b>CURRENT AT 68° F</b>                    | K1                             | 1.88 A           | 0.86 A    |
|  | K7                             | 2.72 A           | 1.29 A    |
| <b>DUTY CYCLE</b>                          | 100%                           |                  |           |
| <b>ELECTROMAGNETIC COMPATIBILITY (EMC)</b> | European Directive 2004/108/EC |                  |           |
| <b>IP DEGREE ACCORDING IEC 60529</b>       | K1                             | IP 65            |           |
|  | K7                             | IP 69K           |           |
| <b>CLASS OF PROTECTION FOR INSULATION</b>  | Copper Wire                    | Class H (356° F) |           |
|  | Coil                           | Class F (311° F) |           |

## ACCESSORY ELECTRONICS

Some external digital amplifiers are available to be coupled to the valve for better control and to improve the valve performance.

See Continental Hydraulics Control Amplifier Catalog for products to match your requirements.

**VEA-3E-A:** DIN Connector - Gray

**VEA-3F-A:** DIN Connector - Black

# MOUNTING SURFACES

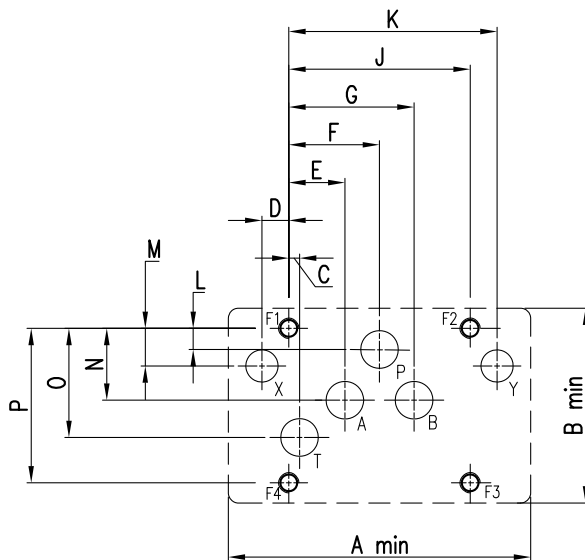
ALL THE MOUNTING SURFACES REFER TO NFPA T3.5.1 R2-2002 AND ISO 4401:2005 STANDARDS.

The mounting surface standards recommend metric coarse threads. However, subplates are commercially available with UNC threads. Select a bolt size that matches the threads in the mounting surface.

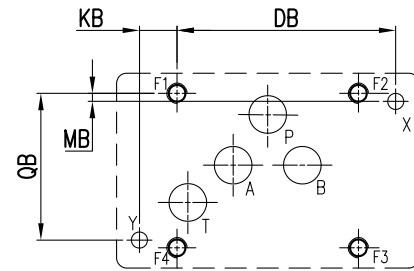
Dimensional tolerances are ± 0.1 mm (0.004") for bolt and pin location; ± 0.2 mm (0.008") for the other quotes.

The minimum depth of the blind hole G where required is 8 mm (0.31 in).

**D05 - ALTERNATIVE A**



**D05 - ALTERNATIVE B**



**PORT FUNCTION:**

P = PRESSURE PORT  
T = TANK PORT

A = FIRST CYLINDER PORT  
X = PILOT PORT

B = SECOND CYLINDER PORT  
Y = DRAIN PORT

|                                  | MM     | INCH       |
|----------------------------------|--------|------------|
| <b>P, A, B, T MAX</b>            | ∅ 11.2 | ∅ 0.44     |
| <b>X, Y ALT. A</b>               | ∅ 6.3  | ∅ 0.25     |
| <b>X, Y ALT. B</b>               | ∅ 4.8  | ∅ 0.19     |
| <b>MOUNTING BOLT THREAD SIZE</b> | M6     | 1/4-20 UNC |

|          | MM   | INCH  |
|----------|------|-------|
| <b>A</b> | 90   | 3.54  |
| <b>B</b> | 58   | 2.28  |
| <b>C</b> | 3.2  | 0.126 |
| <b>D</b> | 8    | 0.310 |
| <b>E</b> | 16.7 | 0.660 |
| <b>F</b> | 27   | 1.06  |
| <b>G</b> | 37.3 | 1.47  |

|          | MM   | INCH  |
|----------|------|-------|
| <b>J</b> | 54   | 2.125 |
| <b>K</b> | 62   | 2.44  |
| <b>L</b> | 6.3  | 0.25  |
| <b>M</b> | 11.2 | 0.44  |
| <b>N</b> | 21.4 | 0.84  |
| <b>O</b> | 32.5 | 1.28  |
| <b>P</b> | 46   | 1.82  |

|           | MM   | INCH  |
|-----------|------|-------|
| <b>DB</b> | 65.1 | 2.563 |
| <b>KB</b> | 11.2 | 0.44  |
| <b>MB</b> | 2.4  | 0.09  |
| <b>QB</b> | 43.7 | 1.72  |

**NOTES:**

NFPA D05 and ISO 4401-05 indicate different diameters for X and Y holes:

NFPA: ∅ 9.6 max in D05 alt. A  
∅ 4.8 max in D05 alt. B

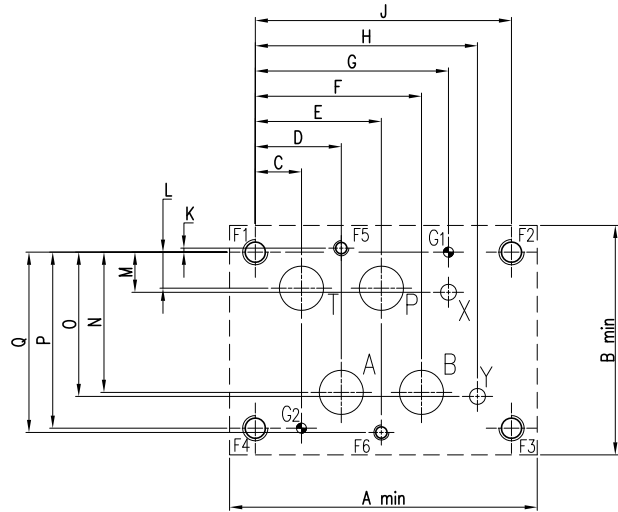
ISO: ∅ 6.3 max both

**D07**

|                                   | MM     | INCH       |
|-----------------------------------|--------|------------|
| P, A, B, T MAX                    | ∅ 17.5 | ∅ 0.69     |
| X, Y MAX                          | ∅ 6.3  | ∅ 0.25     |
| G MAX                             | ∅ 4    | ∅ 0.16     |
| MOUNTING BOLT THREAD SIZE F1 - F4 | M10    | 3/8-16 UNC |
| MOUNTING BOLT THREAD SIZE F5 - F6 | M6     | 1/4-20 UNC |

|   | MM   | INCH  |
|---|------|-------|
| A | 122  | 4.8   |
| B | 91   | 3.58  |
| C | 18.3 | 0.72  |
| D | 34.1 | 1.34  |
| E | 50   | 1.97  |
| F | 65.9 | 2.60  |
| G | 76.6 | 3.016 |
| H | 88.1 | 3.47  |

|   | MM    | INCH  |
|---|-------|-------|
| J | 101.6 | 4     |
| K | 1.6   | 0.063 |
| L | 14.3  | 0.56  |
| M | 15.9  | 0.626 |
| N | 55.6  | 2.19  |
| O | 57.2  | 2.25  |
| P | 69.9  | 2.75  |
| Q | 71.5  | 2.815 |

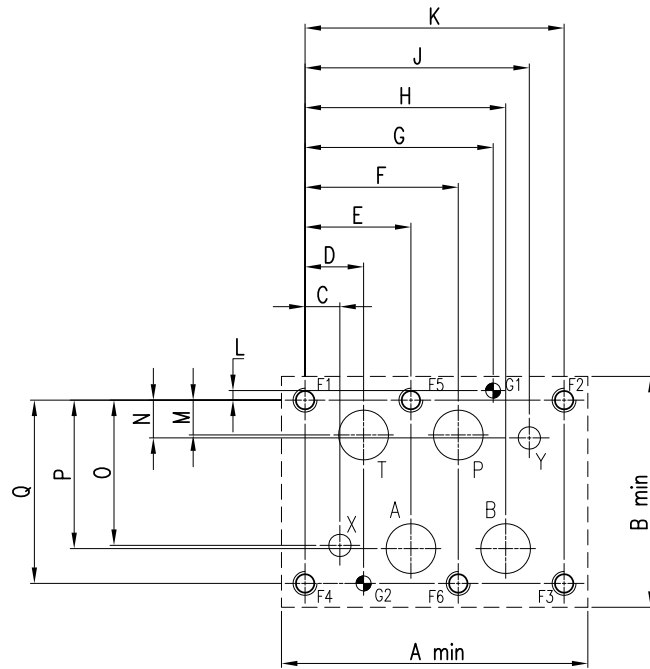


**D08**

|                           | MM     | INCH       |
|---------------------------|--------|------------|
| P, A, B, T MAX            | ∅ 25   | ∅ 0.98     |
| X, Y MAX                  | ∅ 11.2 | ∅ 0.44     |
| G MAX                     | ∅ 7.5  | ∅ 0.30     |
| MOUNTING BOLT THREAD SIZE | M12    | 1/2-13 UNC |

|   | MM    | INCH  |
|---|-------|-------|
| A | 154   | 6     |
| B | 116   | 4.57  |
| C | 17.5  | 0.69  |
| D | 29.4  | 1.157 |
| E | 53.2  | 2.09  |
| F | 77    | 3.03  |
| G | 94.5  | 3.719 |
| H | 100.8 | 3.97  |

|   | MM    | INCH  |
|---|-------|-------|
| J | 112.7 | 4.44  |
| K | 130.2 | 5.125 |
| L | 4.80  | 0.187 |
| M | 17.5  | 0.69  |
| N | 19    | 0.75  |
| O | 73    | 2.874 |
| P | 74.6  | 2.93  |
| Q | 92.1  | 3.625 |

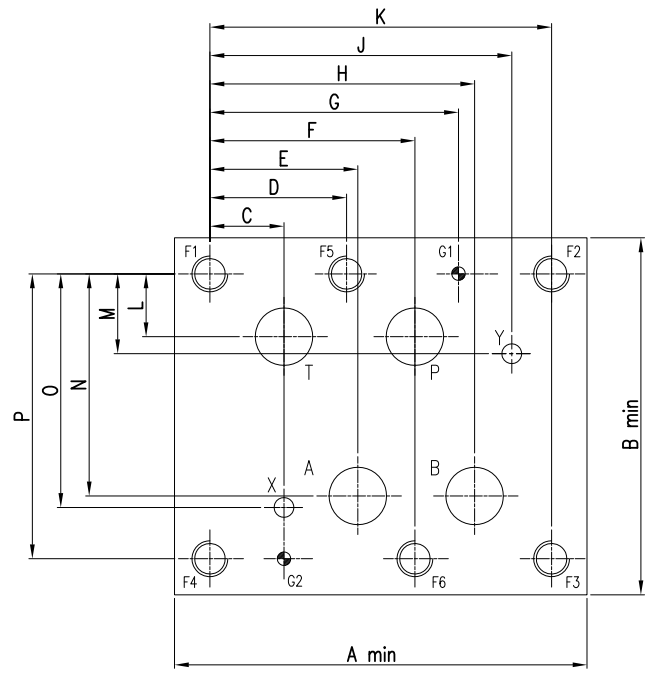


D10

|                           | MM     | INCH     |
|---------------------------|--------|----------|
| P, A, B, T MAX            | ∅ 32   | ∅ 1.25   |
| X, Y MAX                  | ∅ 11.2 | ∅ 0.44   |
| G MAX                     | ∅ 7.5  | ∅ 0.30   |
| MOUNTING BOLT THREAD SIZE | M20    | ¾-10 UNC |

|   | MM    | INCH  |
|---|-------|-------|
| A | 230   | 9.06  |
| B | 199   | 7.83  |
| C | 41.3  | 1.63  |
| D | 76.2  | 3     |
| E | 82.5  | 3.25  |
| F | 114.3 | 4.5   |
| G | 138.6 | 5.457 |
| H | 147.6 | 5.81  |

|   | MM    | INCH |
|---|-------|------|
| J | 168.3 | 6.63 |
| K | 190.5 | 7.5  |
| L | 35    | 1.38 |
| M | 44.5  | 1.75 |
| N | 123.8 | 4.87 |
| O | 130.2 | 5.13 |
| P | 158.8 | 6.25 |





# APPLICATION DATA

## FLUIDS

All pressure drops shown on these data pages are based on 170 SUS fluid viscosity and 0.87 specific gravity. For any other specific gravity (G1) the pressure drop ( $\Delta P$ ) will be approx.  $\Delta P_1 = \Delta P (G1/G)$ . See the chart for other viscosities.

|                          |     |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--------------------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>FLUID VISCOSITIES</b> | Cst | 10   | 14.5 | 32   | 36   | 43   | 54   | 65   | 76   | 86   | 108  | 216  | 324  | 400  |
|                          | SUS | 60   | 75   | 150  | 170  | 200  | 250  | 300  | 350  | 400  | 500  | 1000 | 1500 | 1900 |
| <b>MULTIPLIER</b>        |     | 0.77 | 0.81 | 0.97 | 1.00 | 1.04 | 1.10 | 1.15 | 1.20 | 1.24 | 1.31 | 1.56 | 1.72 | 1.83 |

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

Using fluids at temperatures higher than 180 degrees F causes the accelerated degradation of seals as well as degradation of the fluids physical and chemical properties.

From a safety standpoint, temperatures above 130 degrees F are not recommended.

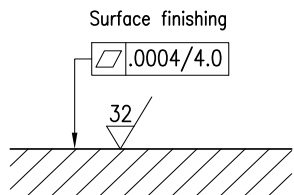
|                            |                              |               |               |
|----------------------------|------------------------------|---------------|---------------|
| <b>RANGE TEMPERATURES:</b> | Ambient                      | -4 to +130 °F | -20 to +54 °C |
|                            | Fluid                        | -4 to +180 °F | -20 to +82 °C |
| <b>FLUID VISCOSITY</b>     | Range                        | 60 -1900 SUS  | 10 - 400 cSt  |
|                            | Recommended                  | 120 SUS       | 25 cSt        |
| <b>FLUID CONTAMINATION</b> | ISO 4406:1999 Class 18/16/13 |               |               |

## INSTALLATION

The VED\*M valves can be installed in any position without impairing correct operation.

Ensure that there is no air in the hydraulic circuit.

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.



### BOLT KITS

|                 |                       |            |         |
|-----------------|-----------------------|------------|---------|
| <b>D05 SIZE</b> | <b>BD05H -150 - B</b> | Valve Only | 1009397 |
| <b>D07 SIZE</b> | <b>BD07 - 250</b>     | Valve Only | 1009400 |
| <b>D08 SIZE</b> | <b>BD08 - 250</b>     | Valve Only | 1009401 |
| <b>D10 SIZE</b> | <b>BD10 - 275</b>     | Valve Only | 1013038 |

### SEAL KIT

|                  |                       |         |
|------------------|-----------------------|---------|
| <b>D05* SIZE</b> | <b>Buna Seal Kit</b>  | 1013174 |
|                  | <b>Viton Seal Kit</b> | 1013175 |
| <b>D07 SIZE</b>  | <b>Buna Seal Kit</b>  | 1013176 |
|                  | <b>Viton Seal Kit</b> | 1013177 |
| <b>D08 SIZE</b>  | <b>Buna Seal Kit</b>  | 1013178 |
|                  | <b>Viton Seal Kit</b> | 1013179 |
| <b>D10 SIZE</b>  | <b>Buna Seal Kit</b>  | 1013180 |
|                  | <b>Viton Seal Kit</b> | 1013181 |

### SUBPLATES

|                        |                     |           |        |           |
|------------------------|---------------------|-----------|--------|-----------|
| <b>D05 alt. A SIZE</b> | <b>AD05JESPS16S</b> | Aluminium | SAE-16 | 351716AJ  |
|                        | <b>DD05JESPS16S</b> | Ductile   | SAE-16 | 351716AK  |
| <b>D07 SIZE</b>        | <b>AD07SPS016S</b>  | Aluminium | SAE-16 | 1013039AB |
|                        | <b>DD07SPS016S</b>  | Ductile   | SAE-16 | 1013039AC |
| <b>D08 SIZE</b>        | <b>AD08SPS020S</b>  | Aluminium | SAE-20 | 265803AP  |
|                        | <b>DD08SPS020S</b>  | Ductile   | SAE-20 | 265803AL  |
| <b>D10 SIZE</b>        | <b>AD10SPS032S</b>  | Aluminium | SAE-32 | 1013040AB |
|                        | <b>DD10SPS032S</b>  | Ductile   | SAE-32 | 1013040AC |

#### NOTES:

1. Max pressure for aluminum subplates: 3000 psi (210 bar)
2. Max pressure for ductile subplates: 5000 psi (350 bar)
3. Always verify subplate port size is proper for the application



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