

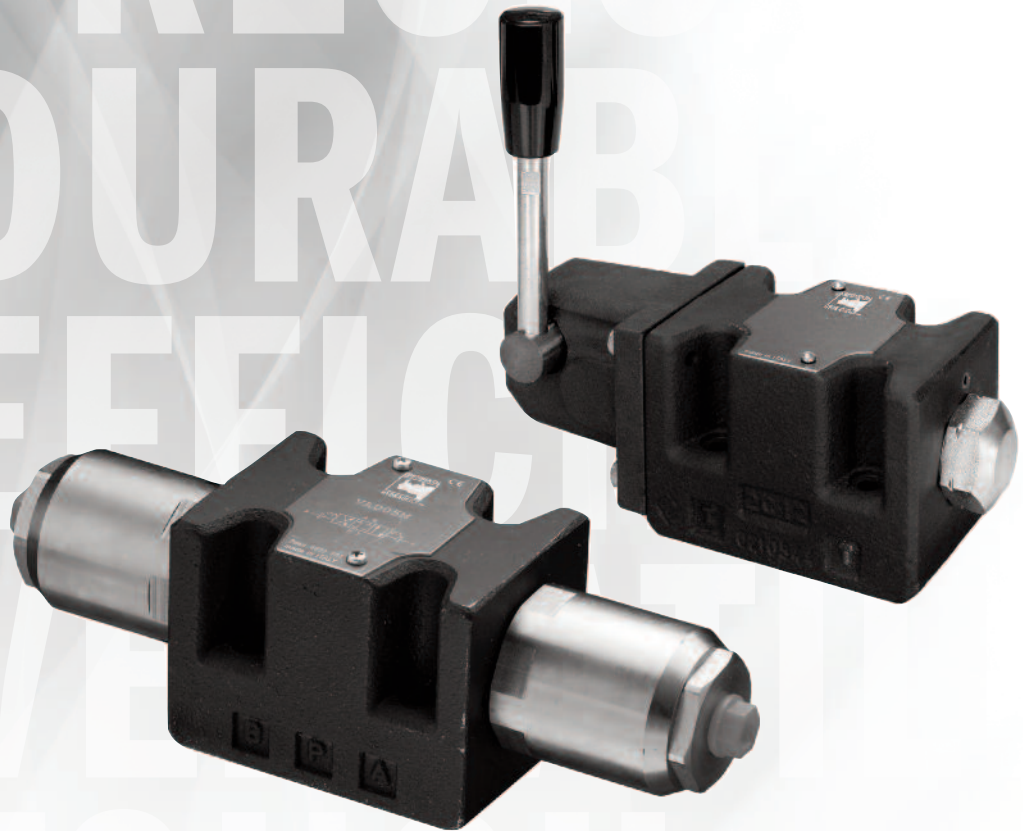


**CONTINENTAL
HYDRAULICS**
engineering in motion

CONTINENTAL HYDRAULICS

VAD05M-VMD05M

AIR & LEVER OPERATED DIRECTIONAL VALVES



VAD05M-VMD05M - AIR & LEVER OPERATED DIRECTIONAL VALVES

VAD05M-VMD05M

AIR & LEVER OPERATED DIRECTIONAL VALVES



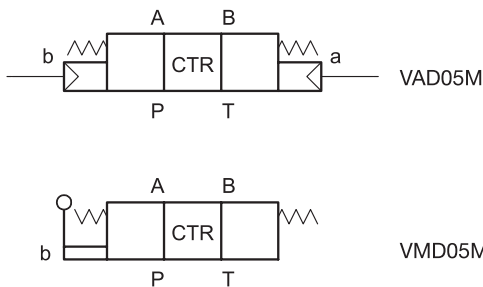
DESCRIPTION

The directional control valve with air pilot actuation conforms to valve NFPA D05 alt A mounting standard. The hand lever actuation conforms to NFPA D05.

They are available in both 3 way and 4 way styles.

All versions are available in 2 position spring offset, 2 position detent, 2 position spring centered and 3 position spring centered versions. The lever valve also is available in a 3 position detent model.

A wide range of spools for different requirements are available.



TYPICAL PERFORMANCE SPECIFICATIONS

MAXIMUM OPERATING PRESSURE	P, A, B PORTS	VA, VM	4600 psi	320 bar
	T PORT	VM VA internal drain VA external drain	2300 psi 360 psi 4600 psi	160 bar 25 bar 320 bar

NOTE VAD05M:

The Y external drain is available (STD) for the ISO 4401-05 size (CETOP R05 - D05 type A) and it must be connected when there is a backpressure higher than 25 bar (360 psi) on the T port. An adapter may be required to block off Y port on STD bar manifolds. See page 11.

MAXIMUM PILOT PRESSURE	VA	175 psi	12 bar
MINIMUM PILOT PRESSURE	VA	65 psi	4.5 bar
FLOW RATE	VA	32 gpm	120 l/min
	VM	33 gpm	125 l/min
MAXIMUM WEIGHT	VA Single Op.	7.0 lbs	3.2 kg
	VA Dual Op.	8.8 lbs	4.0 kg
	VM - Lever	9.3 lbs	4.2 kg

RANGE TEMPERATURES	Ambient	-4 to +130 °F	-20 to +54 °C
	Fluid	-4 to +180 °F	-20 to +82 °C
FLUID VISCOSITY	Range	60 -1900 SUS	10 - 400 cSt
	Recommended	120 SUS	25 cSt
FLUID CONTAMINATION		ISO 4406:1999 Class 20/18/15	

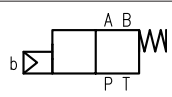
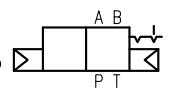
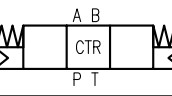
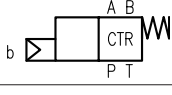
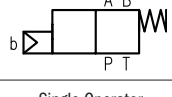
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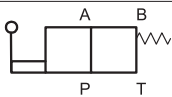
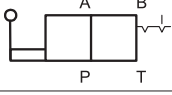
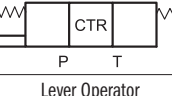
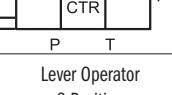
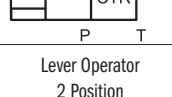
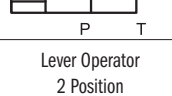
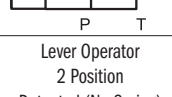
V **D05M** - - - **10** -

DESIGN LETTER

Operator

OPERATOR	
A	Air
M	Lever

FUNCTION FOR AIR OPERATOR	
1	 <p>Single Operator 2 Position Spring Offset</p>
2	 <p>Dual Operator 2 Position Detented (No Spring)</p>
3	 <p>Dual Operator 3 Position Spring Centered</p>
5	 <p>Single Operator 2 Position Spring Centered</p>
9	 <p>Single Operator 2 Position - 3 Way Spring Offset</p>

FUNCTION FOR LEVER OPERATOR	
1	 <p>Lever Operator 2 Position Spring Offset</p>
2	 <p>Lever Operator 2 Offset Position Detented (No Spring)</p>
3	 <p>Lever Operator 3 Position Spring Centered</p>
4	 <p>Lever Operator 3 Position Detented (No Spring)</p>
5	 <p>Lever Operator 2 Position Spring Centered</p>
9	 <p>Lever Operator 2 Position 3 Way Spring Offset</p>
25	 <p>Lever Operator 2 Position Detented (No Spring)</p>

SEAL	
A	Buna (STD)
G	Viton

MECHANICAL OMIT IF NOT REQUIRED	
R	Operator at "B" port end. Available only with functions 1, 5 and 9. Not available on lever valve

SPOOL TYPE
See page 4 & 5

NOTE:
Spool code 9X must have the T port connected to tank.

TYPICAL ORDERING CODE:
VAD05M-3A-A-10-A
VMD05M-3A-A-10-B

VAD05M SPOOLS						
NAME	SYMBOL	FUNCTION	CENTER POSITION	CROSSOVER	FUNCTION MATCHING	
A			All ports blocked	P→B or P→A T blocked	1, 2, 3, 5	
A1			All ports blocked	P→B and A→T restricted or P→A and B→T restricted	3, 5	
B			All ports open	All ports open	1, 2, 3, 5	
E			P and A blocked and B→T	All ports blocked or P and A blocked and B→T	3, 5	
F			P blocked, A→T and B→T	P blocked and A→T or B→T		
F1			P blocked, A and B restricted to T	P blocked, A or B restricted to T		
G			P to A and B T blocked	P→B or P→A T blocked		
H			P and A to T B blocked	All ports open, restricted		
K			P and B blocked, and A→T	P and B blocked and A→T or all ports blocked		
L			P→T, A and B blocked	All ports open, restricted		
Q			P and B to T, A blocked	All ports open, restricted		
X			-	All ports blocked		9

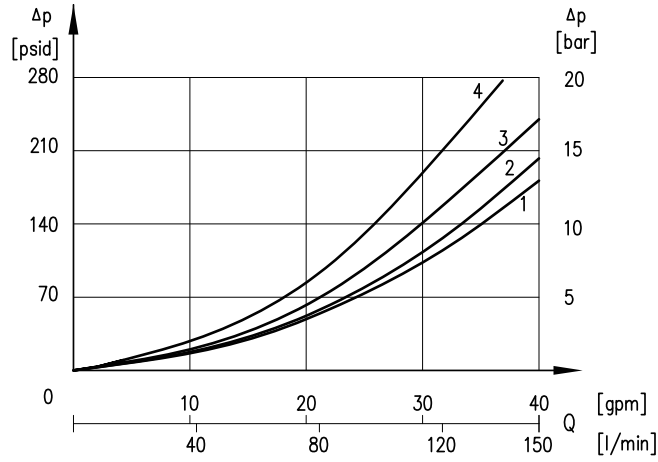
These are the standard configurations. Contact Continental Hydraulics for special versions.

VMD05M SPOOLS					
NAME	SYMBOL	FUNCTION	CENTER POSITION	CROSSOVER	FUNCTION MATCHING
A			All ports blocked	P→B or P→A T blocked	1, 3, 4, 5, 25
B			All ports open	All ports open	
F			P blocked, A→T and B→T	P blocked and A→T or B→T	3, 4, 5, 25
L			P→T, A and B blocked	All ports open, restricted	
X			-	All ports blocked	2, 9

These are the standard configurations. Contact Continental Hydraulics for special versions.

PRESSURE DROPS ΔP -Q SHIFTED VALVE

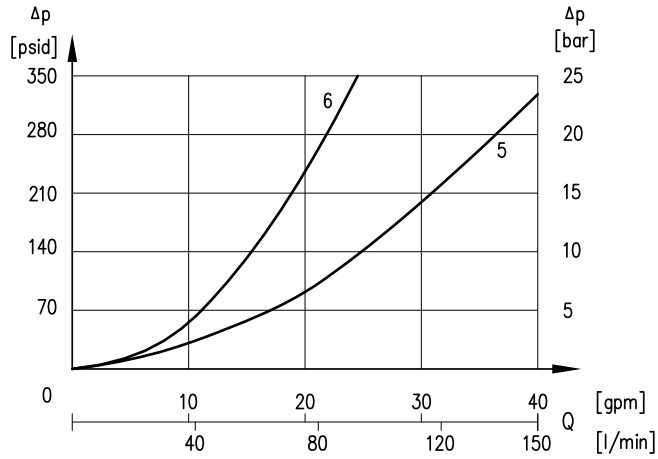
(OBTAINED WITH VISCOSITY OF 170 SUS - 36 CST AT 70°F - 50°C)



SPOOL	FLOW CURVE NUMBER			
	SHIFTED			
	P→A	P→B	A→T	B→T
A, A1	2	2	1	1
B	3	3	1	1
E, F, F1, K	3	3	2	2
H, L, Q	1	1	2	2
1A	3	3	2	2
G	1	1	1	1
X	4	4	-	-

PRESSURE DROPS ΔP -Q CENTRAL POSITION

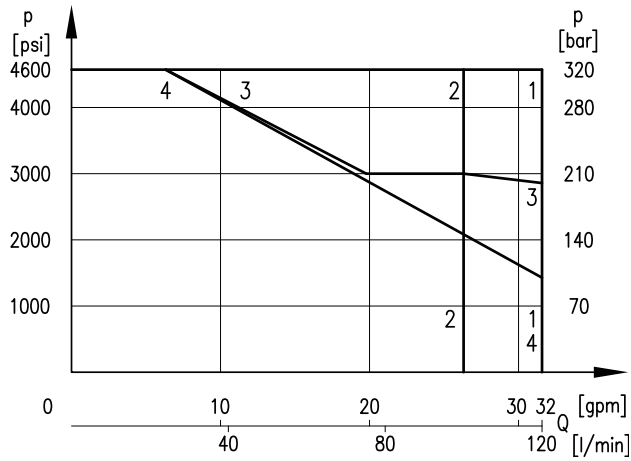
(OBTAINED WITH VISCOSITY OF 170 SUS - 36 CST AT 70°F - 50°C)



SPOOL	FLOW CURVE NUMBER				
	SHIFTED				
	P→A	P→B	A→T	B→T	P→T
B	-	-	-	-	5
F	-	-	6	6	-
H, L, Q	-	-	-	-	5
E	-	-	-	6	-
G	3	3	-	-	-
K	-	-	6	-	-

PERFORMANCE CURVE

VAD05M

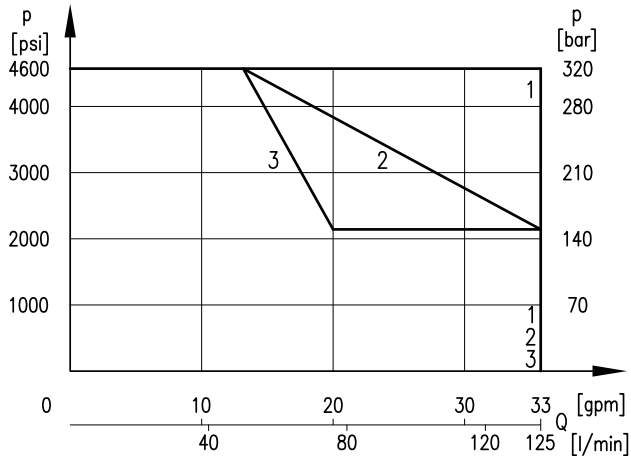


CURVE	SPOOL
1	A, B
2	1A, 1B
3	F
4	L

NOTES:

For spool F and 1A, the curve has been obtained with a minimum piloting pressure of 4.5 bar (65 psi). If the minimum piloting pressure used is 5.5 bar (80 psi), refer to curve 1.

VMD05M



CURVE	SPOOL
1	A, B, F
2	L
3	4L

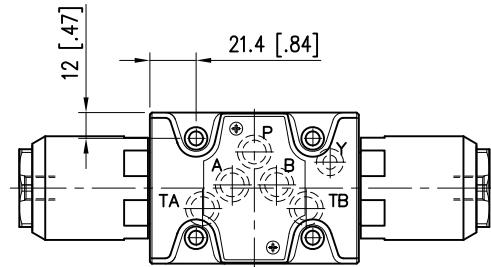
NOTES:

- Valve performance was tested in a four way circuit (full loop). Performances may be reduced from that shown when used in a three-way circuit (half circuit), i.e. A or B port plugged.
- The values have been obtained according to ISO 6403 norm with filtration according to ISO 4406:1999 class 18/16/13.

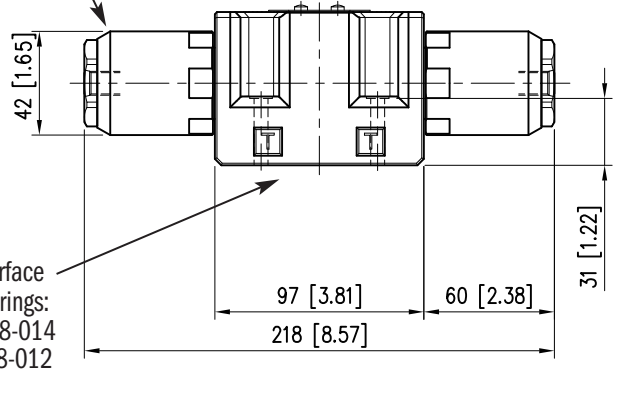
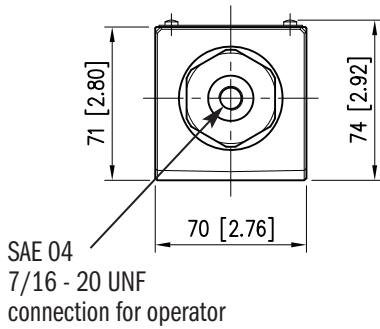
OVERALL AND MOUNTING DIMENSIONS FOR AIR OPERATED VALVE

VAD05M-2*, 3*

Dimensions in mm [IN]

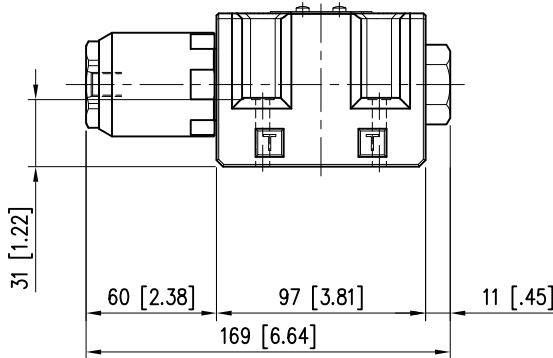


Hexagon:
38 mm [1 1/2"] wrench
Tightening torque:
25-30 lb.ft (35-40 Nm)

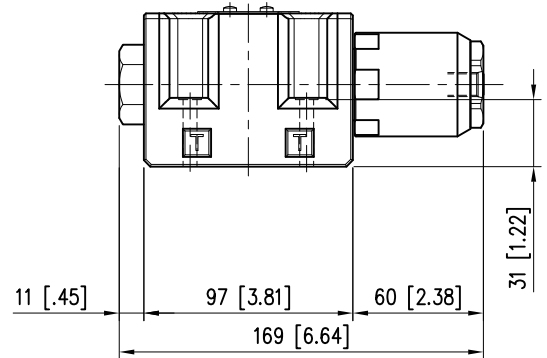


Mounting surface
with sealing rings:
5 pcs. AS568-014
1 pcs. AS568-012
90 Shore A

VAD05M-1*, 5*, 9*



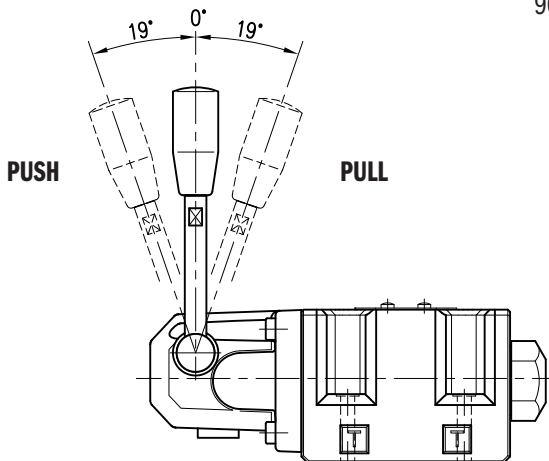
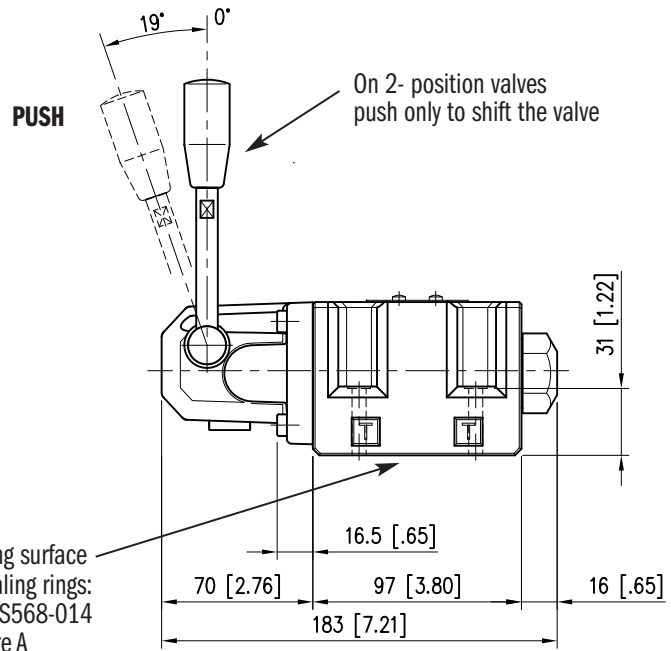
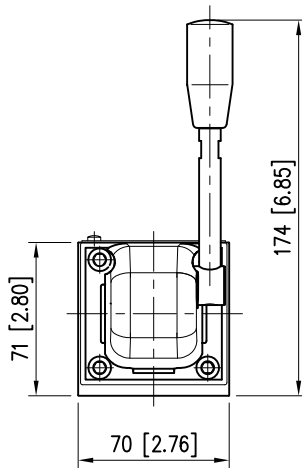
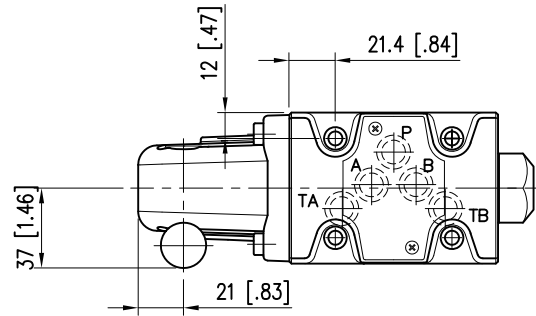
VAD05M-1*-R, 5*-R, 9*-R



OVERALL AND MOUNTING DIMENSIONS FOR LEVER OPERATED VALVE

VMD05M

Dimensions in mm [IN]



On 3- position valves, pulling the lever obtains the right position, pushing the lever obtains the left position

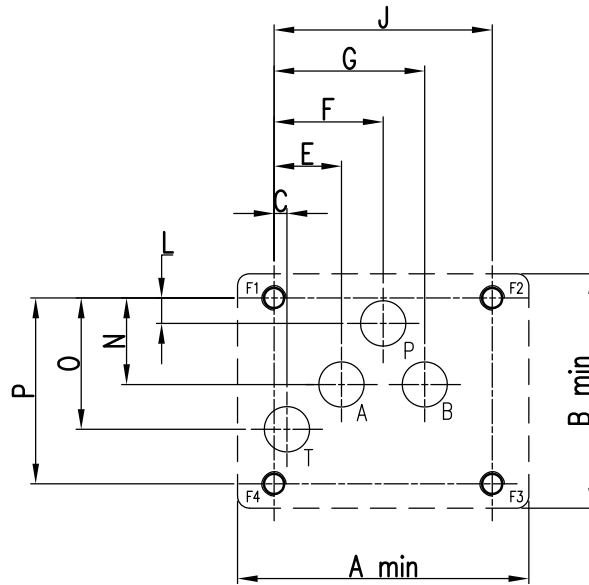
MOUNTING SURFACES

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

The mounting surface standards recommends 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.

D05 (for VMD05M valve)



PORT FUNCTION:

P = PRESSURE PORT
T = TANK PORT

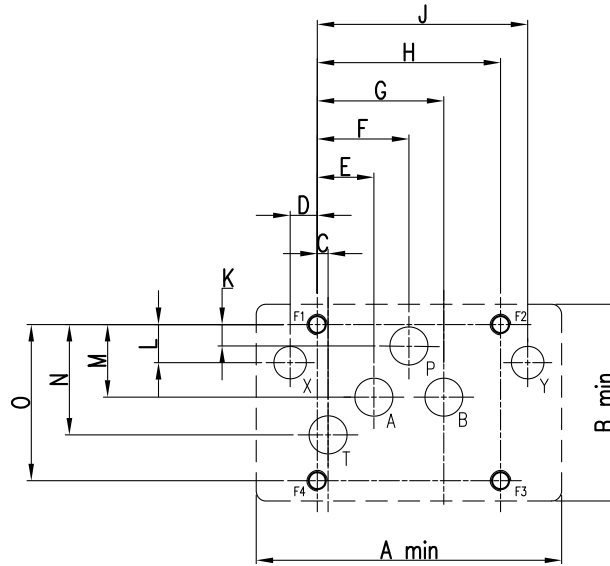
A = FIRST CYLINDER PORT
B = SECOND CYLINDER PORT

	MM	INCH
P, A, B, T MAX	Ø 11.2	Ø 0.44
MOUNTING BOLT THREAD SIZE	M6	1/4 - 20 UNC

	MM	INCH
A	90.0	3.54
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

	MM	INCH
J	54.0	2.125
L	6.30	0.25
M	11.2	0.44
N	21.4	0.84
O	32.5	1.28
P	46.0	1.82

D05 - ALTERNATIVE A (for VAD05M valve)



PORT FUNCTION:

P = PRESSURE PORT
T = TANK PORT

A = FIRST CYLINDER PORT
X = PILOT PORT

B = SECOND CYLINDER PORT
Y = DRAIN PORT

	MM	INCH
P, A, B, T MAX	∅ 11.2	∅ 0.44
X, Y ALT. A	∅ 6.30	∅ 0.25
MOUNTING BOLT THREAD SIZE	M6	1/4 - 20 UNC

	MM	INCH
A	90.0	3.54
B	58.0	2.28
C	3.20	0.126
D	8.00	0.31
E	16.7	0.66
F	27.0	1.06
G	37.3	1.47

	MM	INCH
J	54.0	2.125
K	62.0	2.44
L	6.30	0.25
M	11.2	0.44
N	21.4	0.84
O	32.5	1.28
P	46.0	1.82

NOTES:

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

NFPA: ∅ 9.6 max in D05 alt A

ISO: ∅ 6.3 max

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 (ΔP) will be approx. $\Delta P_1 = \Delta P (G1/G)$. See the chart for other viscosities.

FLUID VISCOSITIES	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
MULTIPLIER		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 G). 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 the degradation of the fluids physical and chemical properties.

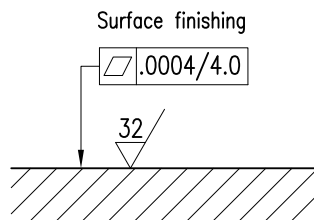
From a safety standpoint, temperatures above 130 degrees F are not recommended.

RANGE TEMPERATURES	Ambient	-4 to +130 °F	-20 to +54 °C
	Fluid	-4 to +180 °F	-20 to +82 °C
FLUID VISCOSITY	Range	60 -1900 SUS	10 -400 cSt
	Recommended	120 SUS	25 cSt
FLUID CONTAMINATION		ISO 4406:1999 Class 20/18/15	

INSTALLATION

The configurations with centering and return springs can be mounted in any position without impairing correct operation.

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.



SEAL KIT

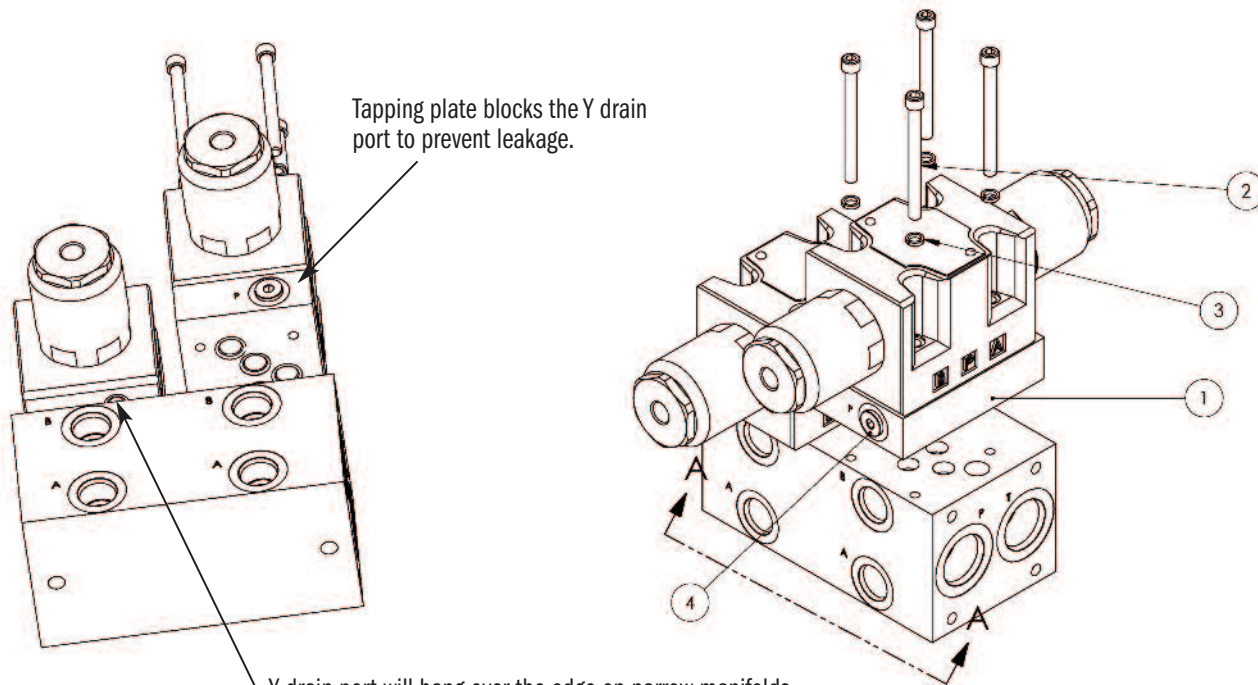
Buna Seal Kit for VAD05M	1015696
Viton Seal Kit for VAD05M	1015697
Buna Seal Kit for VMD05M	1015698
Viton Seal Kit for VMD05M	1015699

BOLT KIT

BD05-163	valve only	1013160
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TAPPING PLATE KIT FOR VAD05M DES A P/N 1016562

for use with standard D05 bar type manifold



Tapping plate blocks the Y drain port to prevent leakage.

Y drain port will hang over the edge on narrow manifolds. In this application, use a tapping plate kit under the directional control valve to block the port. Use a manifold with a D05 alt A mounting pattern for applications where the drain port is required.

ITEM	P/N	DESCRIPTION	Q.TY
1	351706AH	DD05TPPT4S	1
2	198250	Scr Soc Head Cap 1/4"-20 x 2.75"	4
3	003559	1/4" Hi collar lock washer	4
4	260118	SAE 04 hex soc head plug	2
5	1016563	kit literature	1

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