

DESCRIPTION

VELJAN model V3D06 is a direct or pilot operated Directional Control valves controlled by solenoids, lever, hydraulic operated. Subplate or manifold mounting is standard. The 3D06 is used for directing fluid flow in hydraulic systems. The necessary pilot pressure for pilot operated versions can be obtained from system pressure or from a separate pilot pressure source. Operational life is improved by the use of wet pin solenoids which are immersed in the system fluid and assist heat dissipation. the solenoids are available with a built in manual override device, and they are continuously rated for standard AC-or-DC supply.

Valves with manual override on the pilot control can also be operated mechanically in case of power failure. Electrical connection is by a standard plug in connector.

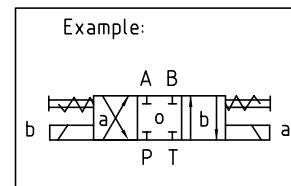
Manual and stem operated valves are available with detents to hold the spool in the selected position. Hydraulically operated valves may be remotely controlled by separate pilot valves.

A light weight modular design, with a short spool travel , results in a fast response. When used in rapid cycling duties the 3D06 valve offers outstanding performance. Streamlined internal passages ensure minimum pressure drop at maximum flows. All bodies are manufactured from quality controlled cast iron, with spools of high quality steel. Every valve is subjected to a closely monitored functional test before despatch.

Economical manufacture to close tolerance ensures interchangeability or circuit modification without the necessary for selective assembly. This is also true for spare parts, which can be ordered independently from manufacturing sources through the world wide service network.

For special applications, for instance fire resistant fluids or sea water protection special seal kits and solenoids are available.

Main Characteristics	
size	3/4"
Flow	upto 132 gpm (500l/min)
Pressure	5000psi (350 bar)
Weight	15 Kg (33lbs)



FEATURES

- Direct or pilot operated directional control valve with solenoid, lever, stem or hydraulic operation.
- Wide range of A.C. and D.C. coil voltages are available both with or without manual override.
- Mounting configuration according to CETOP, ISO and DIN.
- 12 standard spools.
- Spring centering, pressure centering or spring offset for spool return to neutral position, or detent version for mechanical operation.
- Wet pin solenoids for direct or alternating current.
- Leak proof construction up to 140 bars.
- Full interchangeability of spools with close tolerances.
- Electrical connection is by a standard plug-in connector according to DIN 43650.
- Solenoid coil can be positioned at 90° intervals with respect to body .
- Shifting time adjustment.
- Main Valve with adjustable spool stop.
- Orifice to reduce the pilot oil flow.

- End position control by proximity switch.
- Normal position control by inductive detector.
- High shifting performance.
- Smooth shifting -resulting in extended life.
- Easy Assembly- no dynamic seals.
- Each valve tested before despatch.

Operation

The solenoid operated 4-way valve 3D06 consists of a main body with spool and a solenoid operated pilot control valve. The solenoid when energised shifts the pilot control spool, thus directing fluid to one end of the main spool, and moving it into the desired position. So fluid can pass from the main port P to the system ports A or B while the opposite port (B or A) is free to the tank port. De- energising the solenoid allows both the pilot control and the main spool to return to their original positions.

The main spool of the direct operated valves can be moved mechanically by means of a lever or stem, or hydraulically from a remote pilot source.

Integral Check

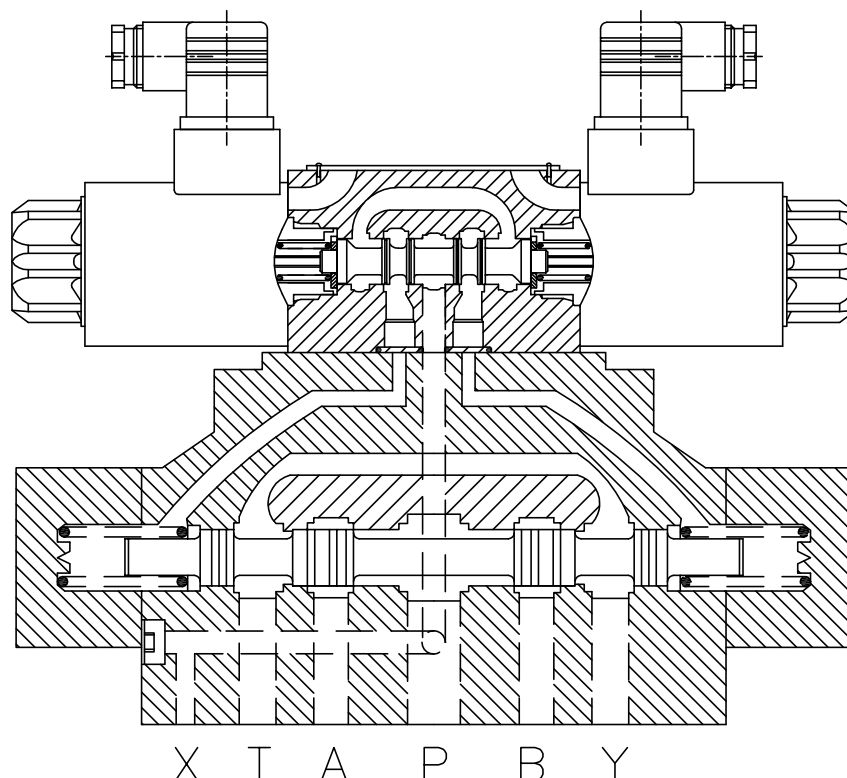
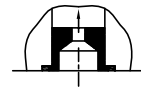
For valves with no-load flow (spools 01,44,45,07) and internal PP an integral check is necessary in P-port of the main valve to obtain the minimum pilot pressure. The integral check should not be used for load holding.

Pilot Valve Orifice

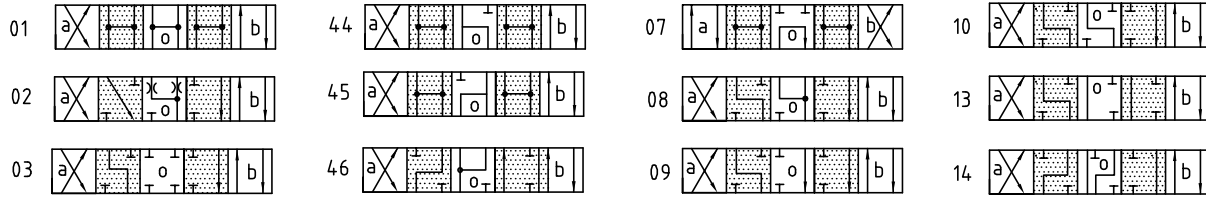
In certain operating conditions a higher flow volume can take place than the functional limit of the valve permits.

In this case it is necessary to fit an orifice plug in the P-port of the valve .

For order detail refer to page xxx.



Item	Characteristics	Symbol of Quantity	Symbol of SI Unit	Technical Data		
1.	General					
1.1	Type of unit	-	-	Directional Control Valve		
1.2	Model Number	-	-	Refer to model code page 4		
1.3	Design	-	-	Sliding spool valve		
1.4	Type of mounting	-	-	Subplate		
1.5	Type of port connections	-	-	Threads in subplate		
1.6	Port sizes	-	-	3/4" nominal		
1.7	Mounting position	-	-	Optional but horizontal recommended.		
1.8	Direction of flow	-	-	Refer to page 5.		
1.9	Ambient temperature range	θ	$^{\circ}\text{C}$	-20 ° min +50° max		
2.	Hydraulic characteristics					
2.1	Operating pressure range Inlet (P,A,B,X) Outlet(T,Y)	p_i max p_o max	bar	350 350 for external drain, 140 for internal drain		
2.2	Fluid temperature range	θ	$^{\circ}\text{C}$	-18 ° min +80° max		
2.3	Viscosity range	ν	cSt	10 - 650		
2.3.1	Recommended operating viscosity	ν_n	cSt	30		
2.4	Max flow	q_v	l/min	500		
2.5	Δp -Q characteristics	$\Delta p=f(q_v)$	-	Refer to page 5		
2.6	Permissible drain pressure	p_i	bar	140 (solenoid operation)		
2.6.1	Leakage max.	-	ml/min	320..870 (depends on spool type)		
2.7	Overlap, underlap	-	-	Refer to page 5		
3.	Type of Actuator					
3.1	Manual (Lever)	-	-	-		
3.1.2	Operating Force	F	N	40 at lever		
3.1.5	Position of actuators	-	-	"B" end		
3.2	Mechanical	-	-	Stem		
3.2.1	Total linear movement	l	mm	23.4		
3.2.2	Operating force	F_{max}	N	400		
3.3	Electrical	-	-	by solenoids		
3.3.1	Nominal voltage	U_n	V	refer to model code page 4.		
	Permissible voltage difference	-	%	+5 --- -10		
3.3.2	Type of current	-	-	Alternating current (AC) or direct current (DC)		
				Alternating current		Direct current
				115V/60CY 115V/50CY	230V/60CY 230V/50CY	12V/24V/48V
3.3.3	Input power	P20	W	31W		30W
3.3.4	Relative Operating period	OP rel	%	100		
3.3.5	Type of protection	-	-	IP 65		
3.4	Hydraulically	-	-	-		
3.4.1	Operating Pressure range	P_p min	bar	7.3 for spools with open centre position 15 for spools with closed centre position.		
		P_p max	bar	350		
3.4.2	Spool displacement	V	ml	17.2		
3.4.3	Connections	-	-	X,Y		
3.4.4	Port sizes X,Y,L (subplate)	-	-	1/4" NPTF; G1/4"		
4.	Response times (solenoid)			AC	DC	DC- quick energizingx
4.1	Energizing	t_e	ms	20	46	30
4.2	De-energizing	t_a	ms	18	27	30



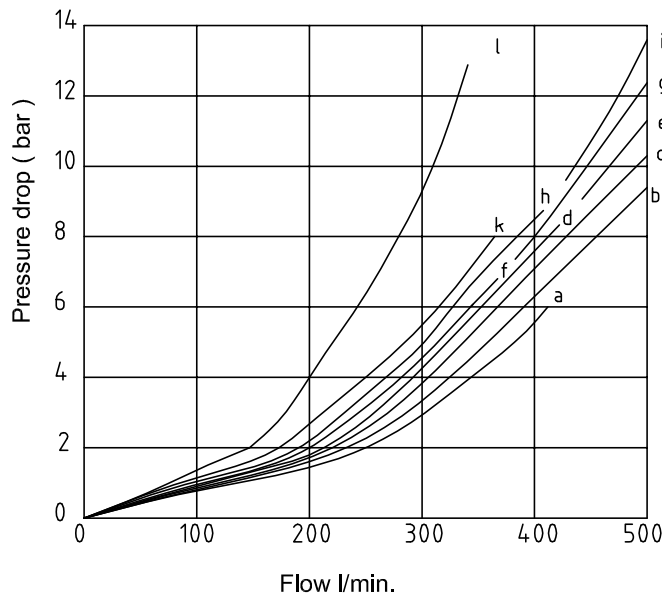
FUNCTIONAL LIMITS

The functional limits have been obtained with warm solenoid condition and at 10% under voltage.

Spool type	Flow (l/min) at a pressure (bar) of				
	70	140	210	280	350
01	500	500	450	400	360
02, 46, 08	500	500	500	450	420
03, 09, 10, 13, 14	500	500	500	500	500
44, 45	420	360	360	330	300
07	360	360	360	360	360

All flow data given is considered at a minimum pilot pressure of 13 bar and for 2 flow directions (e.g. from P--- A and simultaneous from B---T.

PRESSURE DROP

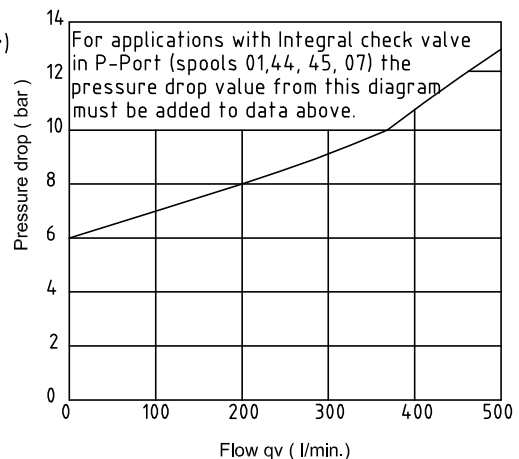


Spool type	Direction of Flow				
	P--A	P--B	P--T	A--T	B--T
01	c	c	c	c	i
02, 08	e	e		c	i
03,	e	g		b	g
44, 45	a	d	h	d	d
46	e	c		c	g
07	k	k	l	f	k
09	e	e		b	i
10	e	e		c	g
13	c	e		b	i
14	g	e		b	g

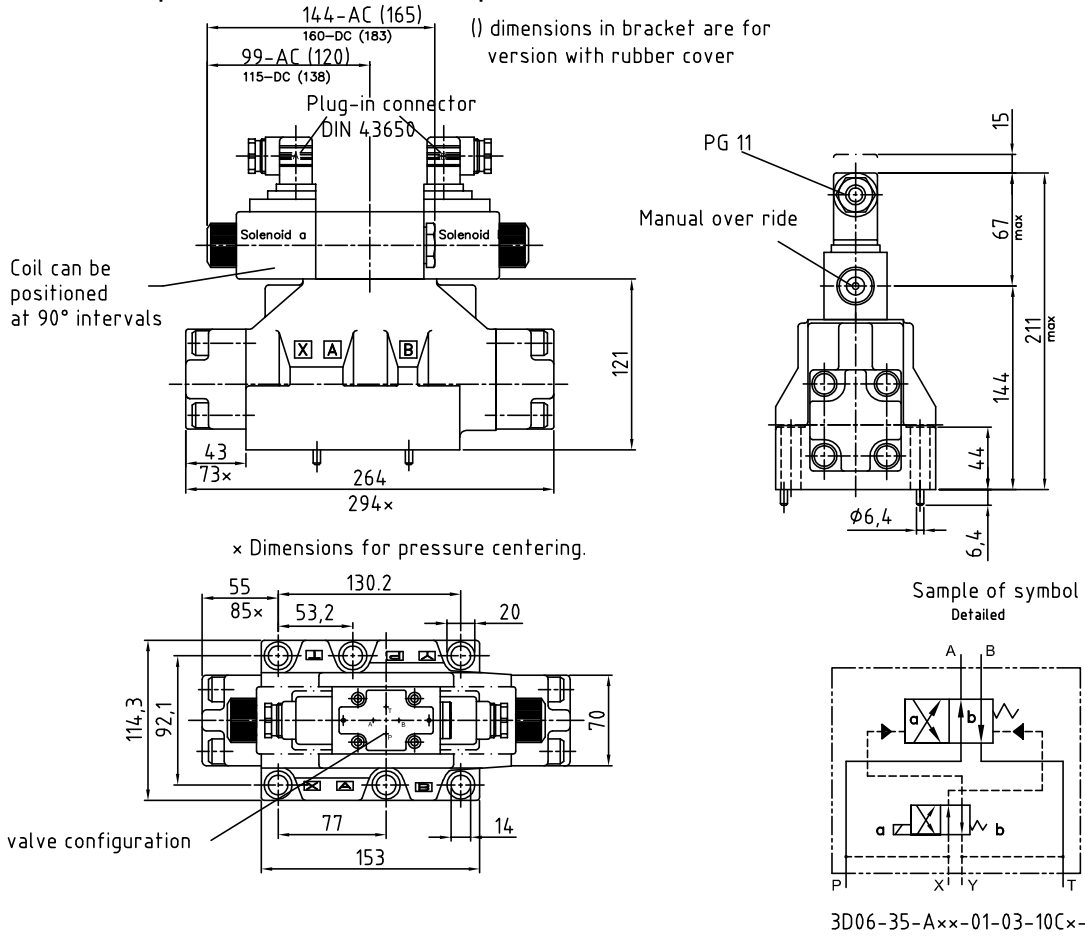
INTEGRAL CHECK VALVE (opening pressure approx. 6 bar)

All performance data given is typical and can be influenced by application.

Oil temperature 50°C; Oil viscosity 36 cSt.



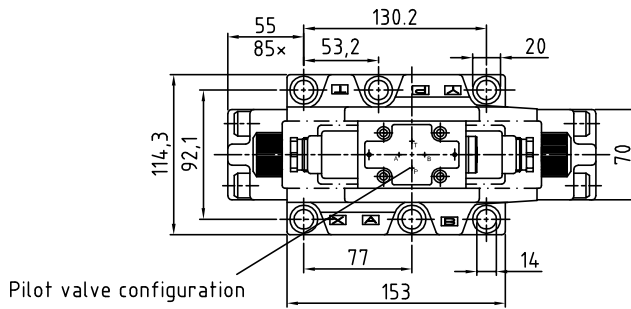
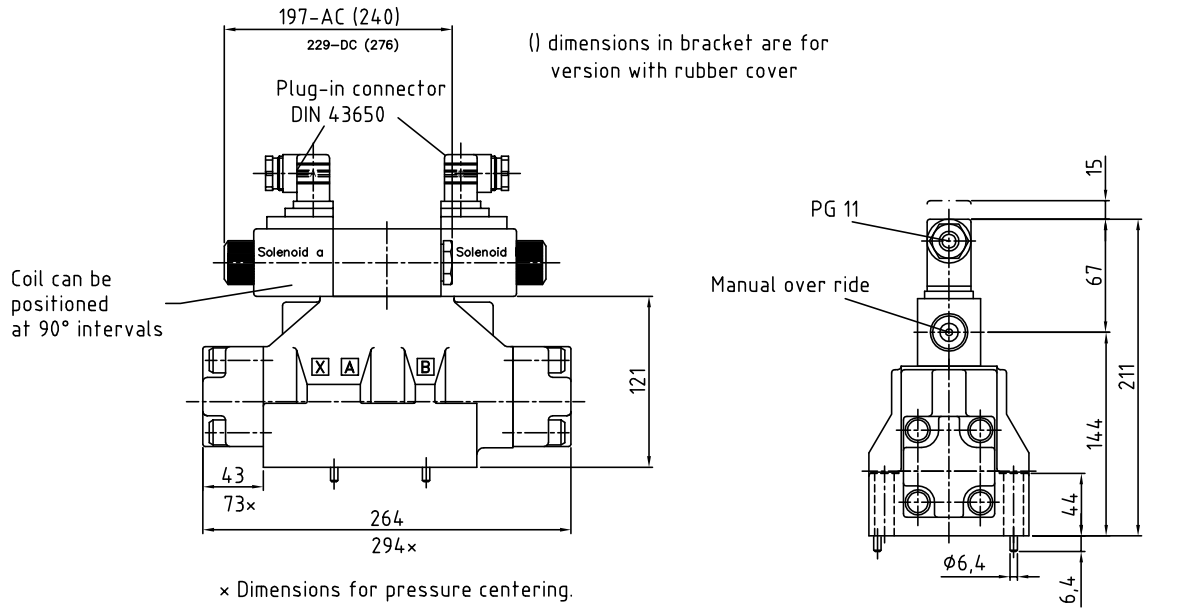
1 Solenoid -- 2 Spool Positions - Pilot Operated



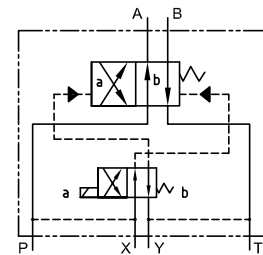
Symbol	Model-No	Spool type xx (also refer to page 5)	Symbol	Model-No	Spool type xx (also refer to page 5)
	3D06-35-Axx-01-03	01, 03		3D06-35-Axx-06-06	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14
	3D06-35-Axx-02-03	01, 03		3D06-35-Axx-06-03	07
	3D06-35-Axx-05-03	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14		3D06-35-Axx-06-06	07
	3D06-35-Axx-05-06	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14		3D06-35-Axx-11-03	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14
	3D06-35-Axx-05-03	07		3D06-35-Axx-11-03	07
	3D06-35-Axx-05-06	07		3D06-35-Axx-12-03	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14
	3D06-35-Axx-06-03	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14		3D06-35-Axx-12-03	07

0 Symbol for neutral position depends on spool type, refer to page 5.

2 Solenoids -- 2 or 3 Spool Positions - Pilot Operated



Sample of symbol Detailed

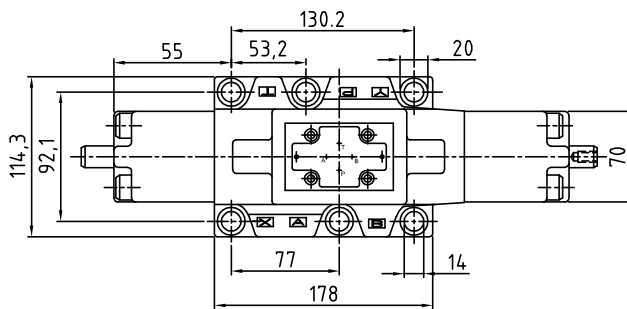
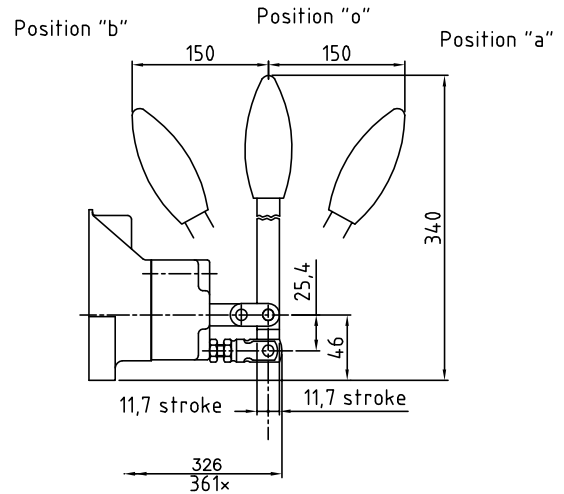
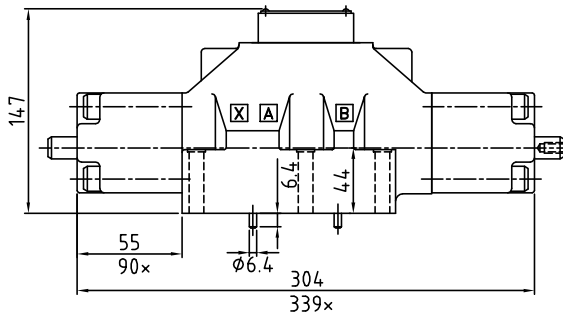


3D06-35-Axx-01-03-10Cx-

Symbol	Model-No	Spool type ** (also refer to page 5)	Symbol	Model-No	Spool type ** (also refer to page 5)
	3D06-35-Bxx-03-03	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14		3D06-35-Bxx-03-06	07
	3D06-35-Bxx-03-06	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14		3D06-35-Cxx-04-03	01, 03
	3D06-35-Bxx-03-03	07		3D06-35-cxx-04-03	07

0 Symbol for neutral position depends on spool type, refer to page 5.

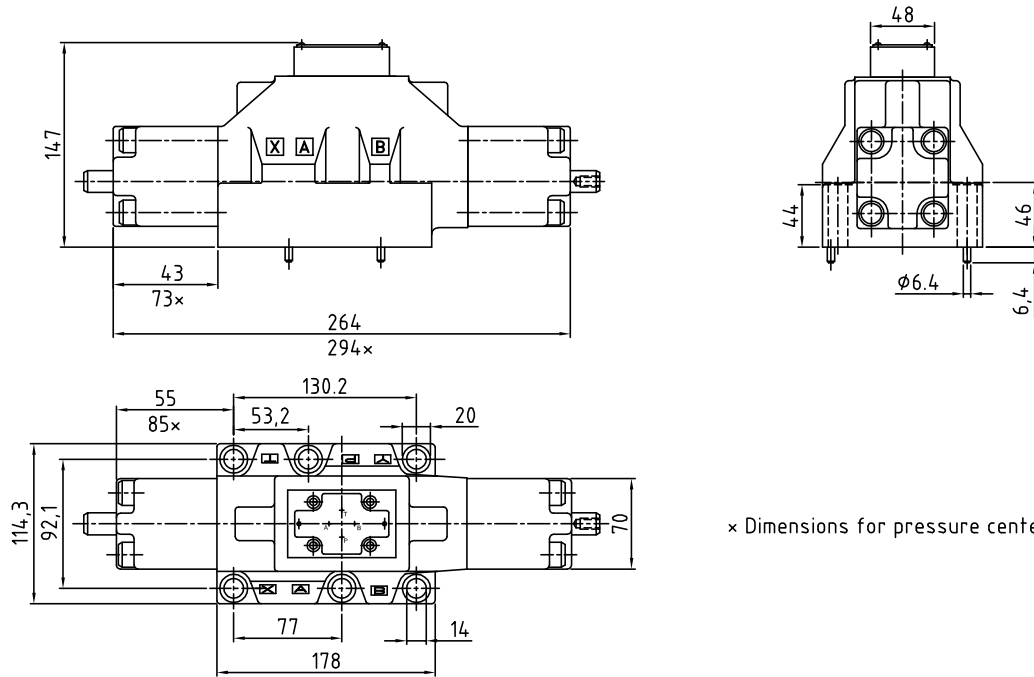
Stem and Lever Operation -- 2 or 3 Spool Positions



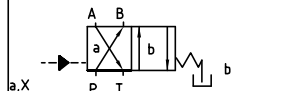
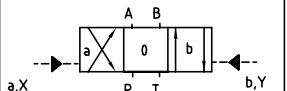
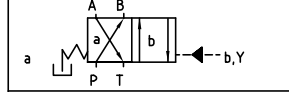
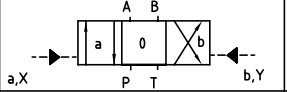
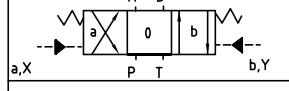
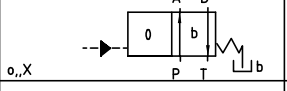
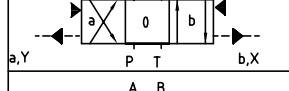
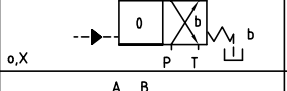
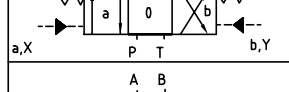

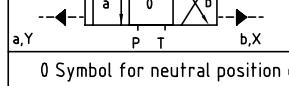

x Dimensions for detent version

Symbol	Model-No	Spool type ** (also refer to page 5)	Symbol	Model-No	Spool type ** (also refer to page 5)
	3D06-35- $\frac{3}{4}$ ^{xx} -02-04	01, 03		3D06-35- $\frac{3}{4}$ ^{xx} -07-05	07
	3D06-35- $\frac{3}{4}$ ^{xx} -03-04	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14		3D06-35- $\frac{3}{4}$ ^{xx} -12-04	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14
	3D06-35- $\frac{3}{4}$ ^{xx} -03-04	07		3D06-35- $\frac{3}{4}$ ^{xx} -12-04	07
	3D06-35- $\frac{3}{4}$ ^{xx} -07-05	01, 02, 03, 44, 45, 46, 08, 09, 10, 13, 14	<p>3 = Stem operation 4 = Lever operation</p>		
<p>0 Symbol for neutral position depends on spool type, refer to page 5.</p>					

Direct Hydraulically Operated Valve- 2 or 3 spool positions

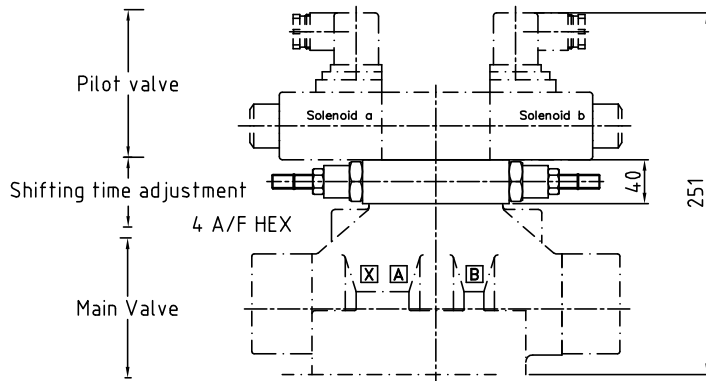


x Dimensions for pressure centering.

Symbol	Model-No.	Spool type ** (also refer to page 5)	Symbol	Model-No.	Spool type ** (also refer to page 5)
	3D06-35-0 ^{xx} -01-03	01,03		3D06-35-0 ^{xx} -04-03	01,02,03,44, 45,46,08,09 10,13,14
	3D06-35-0 ^{xx} -02-03	01,03		3D06-35-0 ^{xx} -04-03	07
	3D06-35-0 ^{xx} -03-03	01,02,03,44, 45,46,08,09 10,13,14		3D06-35-0 ^{xx} -11-03	01,02,03,44, 45,46,08,09 10,13,14
	3D06-35-0 ^{xx} -03-06	01,02,03,44, 45,46,08,09 10,13,14		3D06-35-0 ^{xx} -11-03	07
	3D06-35-0 ^{xx} -03-03	07		3D06-35-0 ^{xx} -12-03	01,02,03,44, 45,46,08,09 10,13,14
	3D06-35-0 ^{xx} -03-06	07		3D06-35-0 ^{xx} -12-03	07

0 Symbol for neutral position depends on spool type, refer tp page 5.

Shifting time Adjustment (1.2 kg)

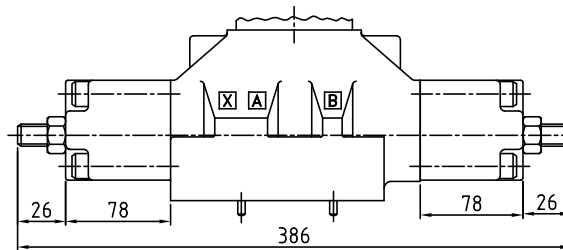


The shifting time adjustment is affected by a double throttle valve with check, which is mounted between main and pilot valve. The illustration depicts the "meter out" control. For "meter in" invert the control.

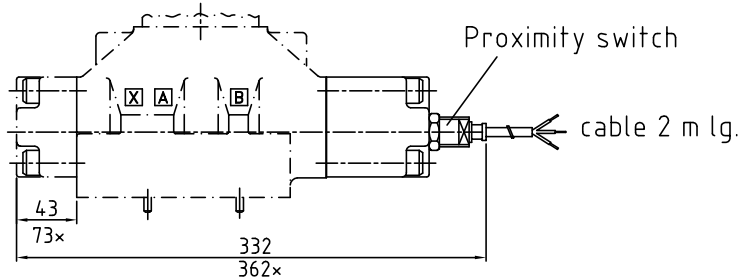
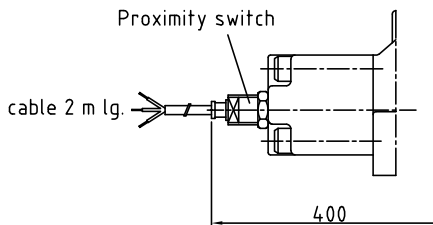
Main valve with adjustable spool stop

End cap :
09 = Spool stop on both sides

Applications :
For controls 0, A, B, C.
(refer to model code page 4)



End position control by proximity switch (incl.amplifier)



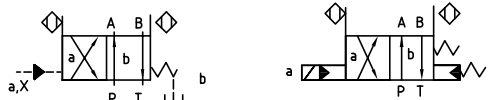
Technical Data (Proximity switch) :

- Function : PNP, Contact
- Supply voltage (V_{Nom}) : 10 ... 30 VDC
- Supply Voltage ripple : ≤ 10%
- Current consumption : max. 8 mA
- Residual voltage L-Signal : U_{Nom}- 2.2 v at I_{max}.
- Output current (I) : ≤ 200 mA
- Type of protection : IP 67
- Ambient temperature : - 25 ... + 70 °C
- Wire cross-sectional area : 3 x 0.5 mm²

Please note :

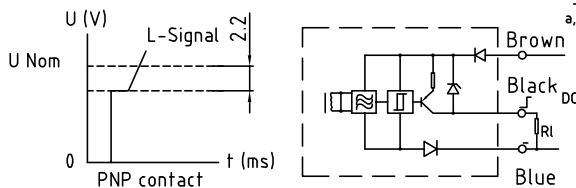
1. The proximity switch always controls the opposite spool position.
2. The proximity switch is not possible on mechanically operated valves and valves with adjustable spool stop on both sides. On valves with pressure centering centering it is only possible on B-side.

Sample of Symbols :

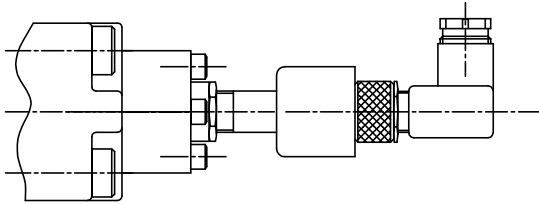


End Cap with Proximity Switch :

- OD = Proximity switch on A-side
- OE = Proximity switch on B-side
- OF = Proximity switch on both sides.

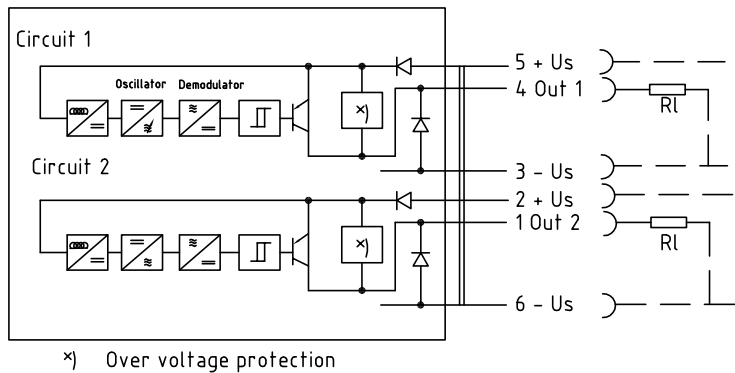


Normal position control by inductive detector



Characteristics for inductive detector

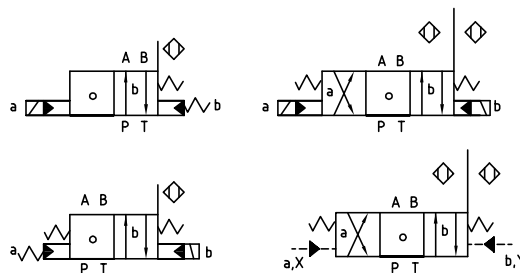
Supply voltage U_s via full bridge rectifier w/o filter for condenser (A.C. input voltage)	24 V \pm 20 % (arithmetic average value)
Current consumption I_s	approx. 20 mA (each circuit)
Residual voltage (switching outputs)	\leq 2.5 V
Outputs	NC contact positive no short circuit protection
Minimum resistive load	\geq 60 Ω
Operating temperature range	0 ... + 85 ° C
Type of protection (DIN 40050)	IP 65 at coupled connector
Permissible pressure p dyn. (Inside of the inductive detector ports T,Y)	315 bar



Please note:

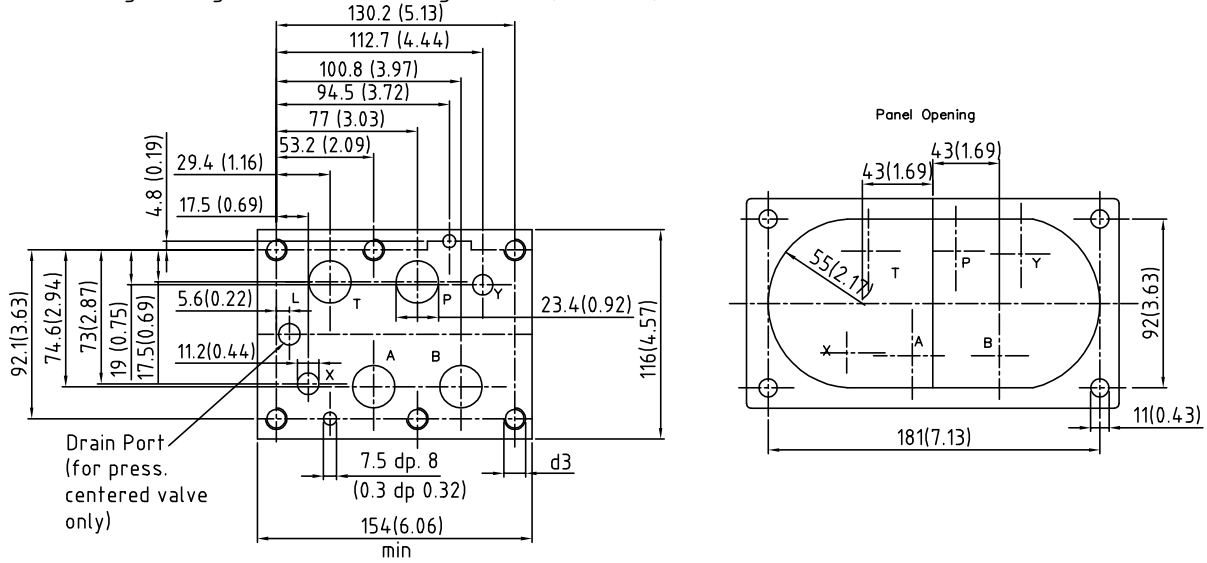
1. The inductive detector always controls the normal spool position.
2. The inductive detector is not possible on mechanically operated valves and valves with adjustable spool stop on both sides.
On valves with pressure centering it is only possible on B-side.

Sample of Symbols :





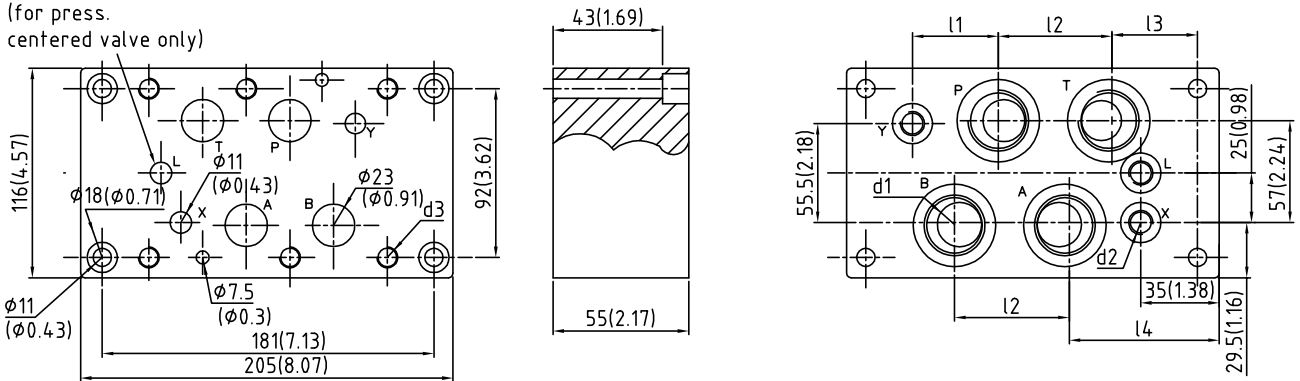
Mounting configuration according to NFA, CETOP, ISO and DIN



Block mounting face
Flatness .003/3.93 inches (0.01 mm /100 mm) length
Surface finish 0,8/

Subplates (mount. configuration accord. NFPA, CETOP, ISO and DIN) Weight: ≈ 17 lbs(8 kg)

Drain Port
(for press.
centered valve only)



Portings:

- P = Pressure Port
- A & B = Actuator Ports
- T = Tank Port
- X = Pilot Port (for hydr.operated and for pilot operated valves with external PP)
- Y = Drain Port (for external PD: pilot operated and mech. operated valves)
- L = Pilot port (for hydr.operated valves)
- L = Drain port (connect for pressure centered valves only)

Please note:

Fixing screws are included in subplate order.
For valves ordered without subplate fixing screws must be ordered separately.

Qty.	Fixing screws	Order-No.
6	M 12 x 65, DIN 912;10.9	361-12293-8
6	1/2"-13 UNC x 2 1/2" (SAE)	358-20280

Model-No.	Order-No.	d1 (A,B,P,T)	d2 (X,Y,L)	d3	l1	l2	l3	l4
SS-B-12-G 130-L	S26-34487	3/4" B.S.P.P	1/4" B.S.P.P	M12	55 (2.16)	49 (1.93)	66 (2.60)	90 (3.54)
SS-B-16-G 130-L	S26-34488	1" B.S.P.P	1/4" B.S.P.P	M12	48.5 (1.91)	59.5 (2.34)	62 (2.44)	82 (3.23)
SS-P-16-G 129-L	S26-34489	1" NPTF	1/4" NPTF	1/2" -13 UNC				