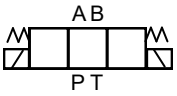
FluidHaus

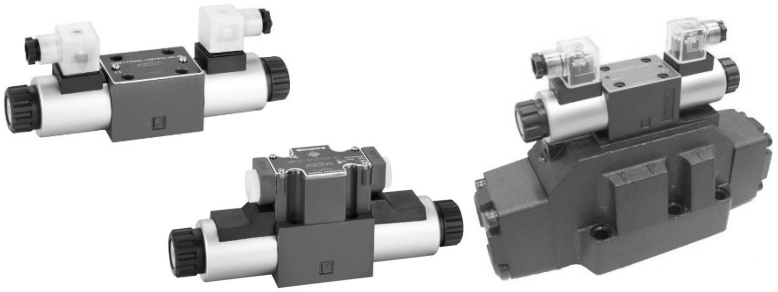
Directional Valve, NG4-32 (D02-10), ISO
Series: VSD…I

0-350 Bar (0-5075 PSI) 0-1100 lpm (0-290 gpm)



Features

- Solenoid Operated Directional Control Valves
- Multiple Spool Configurations
- Multiple voltages and connector styles
- Soft shift and Low leakage spool options (NG6/D03)
- Standard with CE Stamp
- NBR Buna Seals standard



Ordering Details

V Valve

S Sub-plate mount

D Directional Control

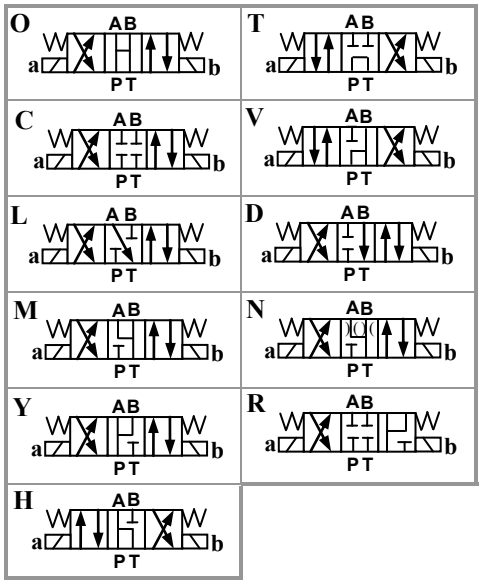
6- Size (mounting pattern, page 8):

Code	Size
4	NG4 (D02)
6	NG6 (D03)
10	NG10 (D05)

Code	Size
10H	NG10 (D08), 2 Stage
16	NG16 (D08)
25	NG25 (D08)
32	NG32 (D10)

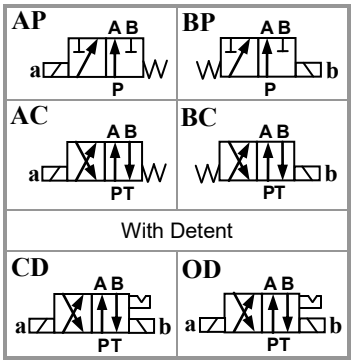
C- Spool Configuration:

3 Position



2 Position Solenoid on "a" Side

2 Position Solenoid on "b" Side



24 Solenoid Voltage:

Code	Voltage
12	12VDC
24	24VDC
110	110VAC (50 and 60 hz)
220	220VAC 50 and 60 hz)

DL- Electrical Connector Style: (reference page 7)

Code	Type
DL	Din 46350 Form A, includes connector w/lights, IP65
DU	Deutsch DT04-2P, IP69
CL	Conduit Wiring Box w/lights
FL	Flying leads

- Options: Blank = none

Size 6 and 10 Single Stage Valves	
Code	Option
L	Low Leakage spool (Max flow is ~50% of standard valve, Leakage < 3 ml/min)
SA	Water and Salt Spray Resistant
SR	Soft Shift with Rectifier coil (4-5 times increased shift time)
S1	Soft Shift (with 1mm orifice, slower shift time than SR)
ML	With manual safety locking device

Size 10, 16, 25, 32 Two Stage Valves Pilot Valve Supply	
Code	Supply
II	Internal pilot, Internal drain, (Standard)
EI	External pilot, Internal drain
IE	Internal pilot, External drain
EE	External pilot, External drain

Size 10, 16, 25, 32 Two Stage Valves Pilot Control Options	
Code	Option
T	Shifting time adjustment
P	With pilot pre-pressure valve (4.5 bar) , if internal piloted and system pressure can fall below 4.5 bar. Recommended with "T" spools.
PR	Pilot Pressure Reducing Module, if internal piloted and system pressure is above 250 bar

I Type: International Standard ("a" coil closest to A port)

Example Part Number: VSD6-C-24DL-I

Technical Specifications:

Mounting Size		ISO (Cetop)	NG4 (D02)	NG6 (D03)	NG10 (D05)	NG10 (D05) (2– Stage)	NG16 (D07) (2– Stage)	NG25 (D08) (2– Stage)	NG32 (D10) (2– Stage)
Maximum Flow Rate		LPM (GPM)	20 (5.3)	80 (21) -DC 60 (15.8) - AC	120 (31)	160 (42)	300 (80)	500 (130)	1100 (290)

Pressure and pilot flow::

Maximum Working Pressure A, B & P port		Bar (PSI)	315 (4560)	315 (4560)	315 (4560)	315 (4560)	350(5075)	350(5075)	350(5075)
Maximum Working Pressure T Port		Bar (PSI)	180 (2610)	210 (3045)-DC 160 (2320) -AC	210 (3045)-DC 160 (2320) -AC	-	-	-	-
	*With external Y drain	Bar (PSI)	-	-	-	315 (4560)	250 (3625)	250 (3625)	250 (3625)
	*With internal Y drain	Bar (PSI)	-	-	-	210 (3045)-DC 160 (2320) -AC	210 (3045)-DC 160 (2320) -AC	210 (3045)-DC 160 (2320) -AC	210 (3045)-DC 160 (2320) -AC
*Maximum Pressure Y pilot return port		Bar (PSI)	-	-	-	210 (3045)-DC 160 (2320) -AC	210 (3045)-DC 160 (2320) -AC	210 (3045)-DC 160 (2320) -AC	210 (3045)-DC 160 (2320) -AC
*Maximum Pressure X pilot pressure port		Bar (PSI)	-	-	-	250 (3625)	250 (3625)	250 (3625)	250 (3625)
Recommended Pilot Flow (for external piloting)		Lpm (gpm)	-	-	-	35 (9.2)	35 (9.2)	35 (9.2)	45.(11.9)
Minimum Pilot Pressure, Internal Supply		Bar (PSI)				7.5 (109)	4.5 (65)	4.5 (65)	4.5 (65)
Minimum Pilot Pressure, External Supply		Bar (PSI)				12 (174)	14 (203)	13 (188)	8.5(123)

General:

Fluid Operating Temperature Range	°C (°F)	-30 to +80 (-22 to +176)
Oil Cleanliness		NAS 1638 class 9, β10≥ 75
Viscosity Range	mm^2/s (SUS)	2.8-500 (35-2320)

Electrical

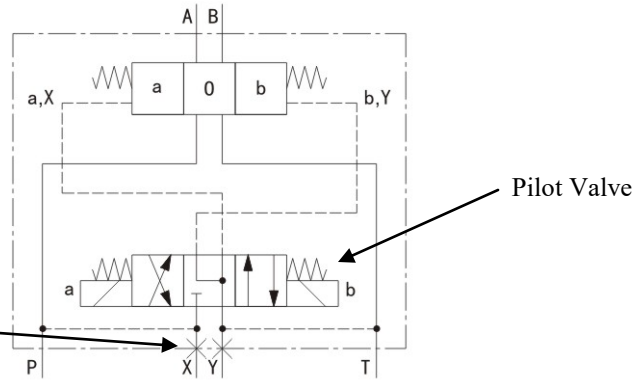
Solenoid Power, DC		Watts	26	30	35	30	30	30	30
Solenoid Power, AC, Holding (Inrush)		VA	29 (-)	50 (220)	90 (550)	50 (220)	50 (220)	50 (220)	50 (220)
Energize Shift Time, AC (DC)		ms	(50-90)	10-20 (25-45)	15-25 (45-60)	15-35 (50-80)	30-45 (50-65)	30-120 (65-160)	35-100 (80-130)
De-Energize Shift Time, AC (DC)		ms	(40-80)	15-40 (10-25)	20-30 (20-30)	20-40 (20-40)	30-45 (30-45)	30-125 (30-125)	30-115 (30-115)

Weight

Single Solenoid	w/ DL, DU or FL Connector	Kg (lbs)	0.72 (1.6)	1.45 (3.2)	4.3 (9.5)-DC 3.5 (7.7)-AC	6.4 (14)	8.6 (18.9)	18.0 (39.6)	40.5 (89)
	w/ CL Wiring Box	Kg (lbs)	-	1.8 (4.0)	4.7 (10.3)-DC 3.9 (8.6)-AC	6.8 (15)	8.9 (19.6)	18.3 (40.3)	40.8 (90)
Double Solenoid	w/ DL, DU or FL Connector	Kg (lbs)	0.89 (2.0)	1.95 (4.3)	6.1 (13.4)-DC 4.9 (10.8)-AC	6.8 (15)	9.5 (20.9)	18.7 (41.1)	41 (90)
	w/ CL Wiring Box	Kg (lbs)	-	2.3 (5.1)	6.5 (14.3)-DC 5.3 (11.7)-AC	7.2(16)	9.8 (21.6)	19.0 (41.8)	41.3 (90.9)

*2 Stage Pilot Valve Supply Options:

All 2 Stage valves come standard with pilot plugs for internal pilot pressure and return. Pilot Plugs can be removed for external supply . External pilot supply and return may be desirable for consistent pilot control (system pressure too low, too high, fluctuates) or higher pressure than the system for quicker response times.



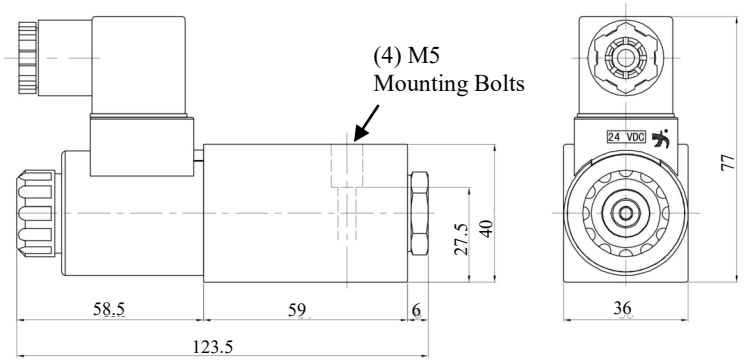
Pilot Plugs can be removed for external "X" pressure supply or external "Y" tank return

Installation Drawings (mm):

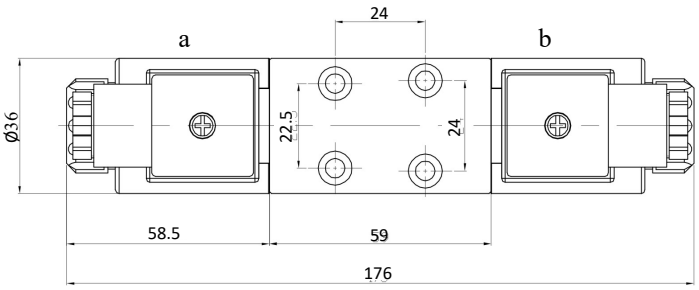
NG4 (D02)

DL –DC Coil/Din Connector

Single Solenoid

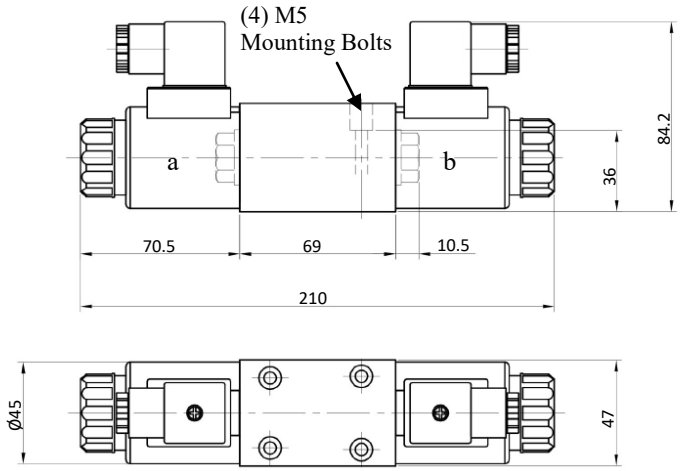


Double Solenoid

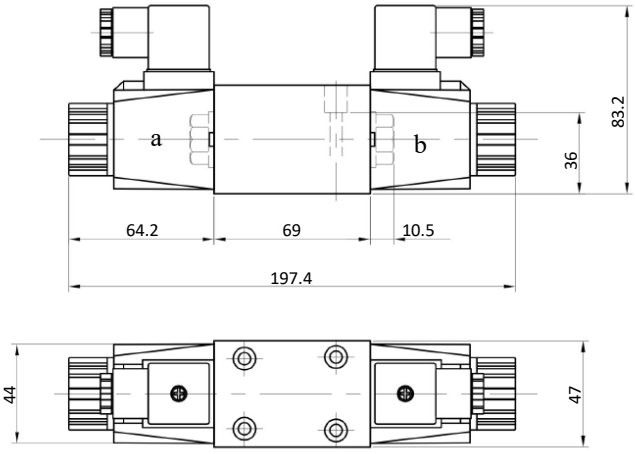


NG6 (D03)

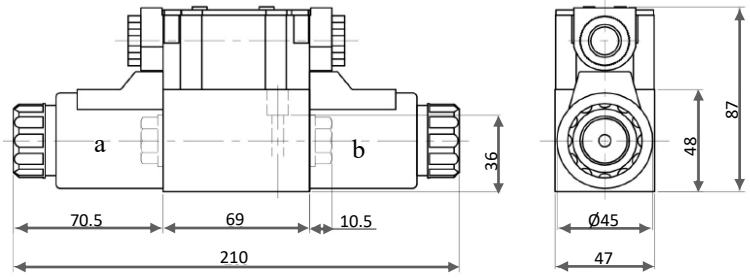
DL- DC Coil/DIN Connector



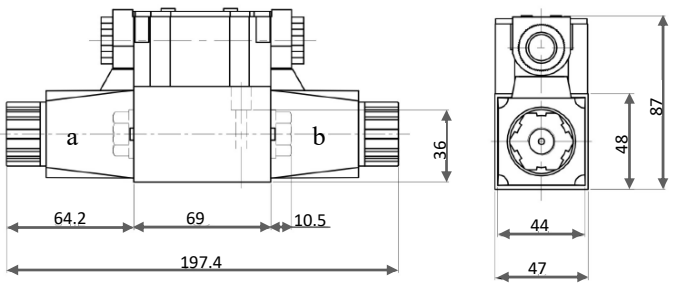
DL- AC Coil/DIN Connector



CL - DC Coil/Conduit Wiring Box



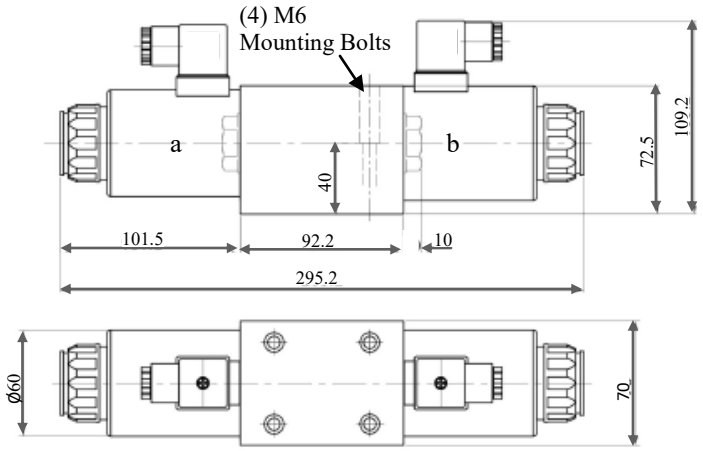
CL—AC Coil/Conduit Wiring Box



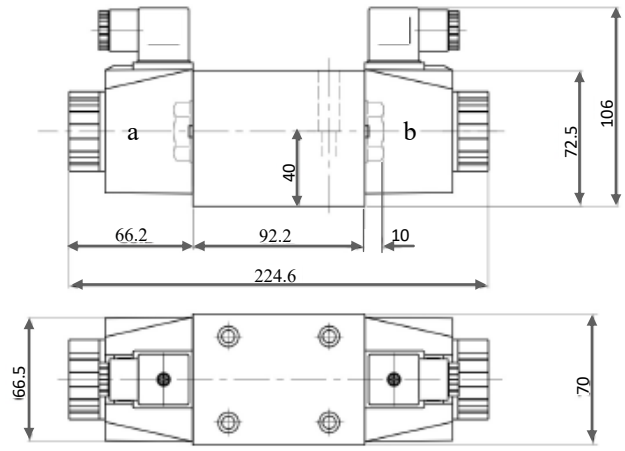
Installation Drawings (mm):

NG10 (D05)

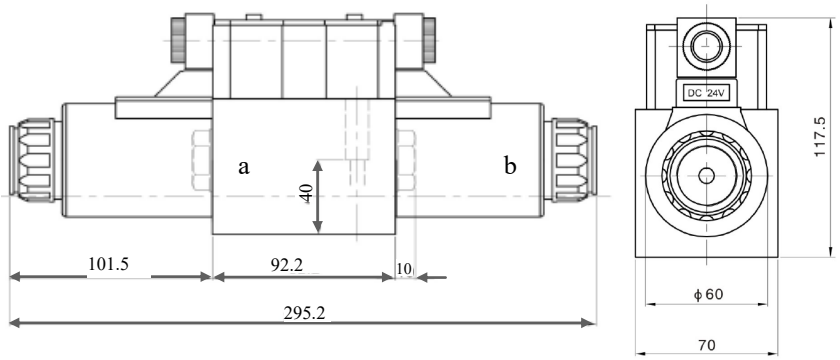
DL-DC Coil/DIN Connector



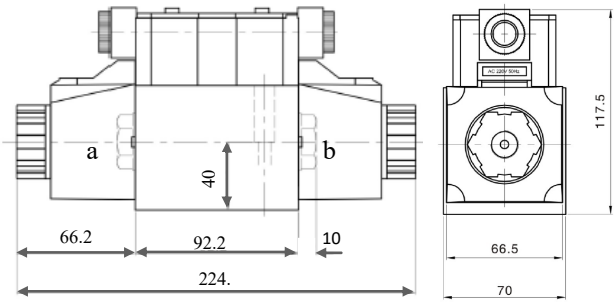
DL- AC Coil/DIN Connector



CL - DC Coil/Conduit Wiring Box



CL—AC Coil/Conduit Wiring Box



2 Stage Valve Options, NG10-NG32 (D05-D10)

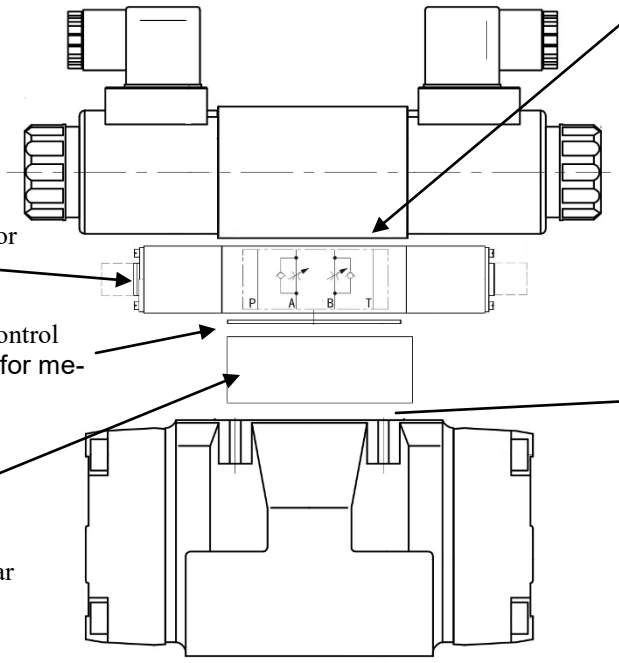
Flow restricting Orifice can be placed in P, T, A or B ports of NG6 (D03) pilot valve..

Orifice Size	Part Number
0 .8 mm	B08
1.0 mm	B10
1.2 mm	B12

Option "T" shifting time adjustment flow control valve. Meter out standard. Independent adjustment for both A and B ports.

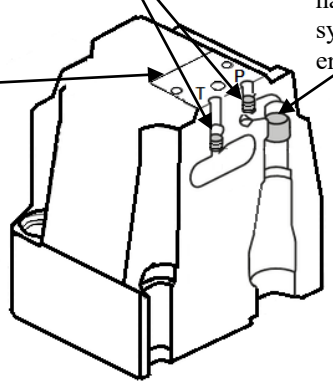
O-ring plate, flow control can be rotated 180° for meter in.

Option "PR" pilot pressure reducing valve if internal piloted system pressure exceeds 250 bar (3625 psi).



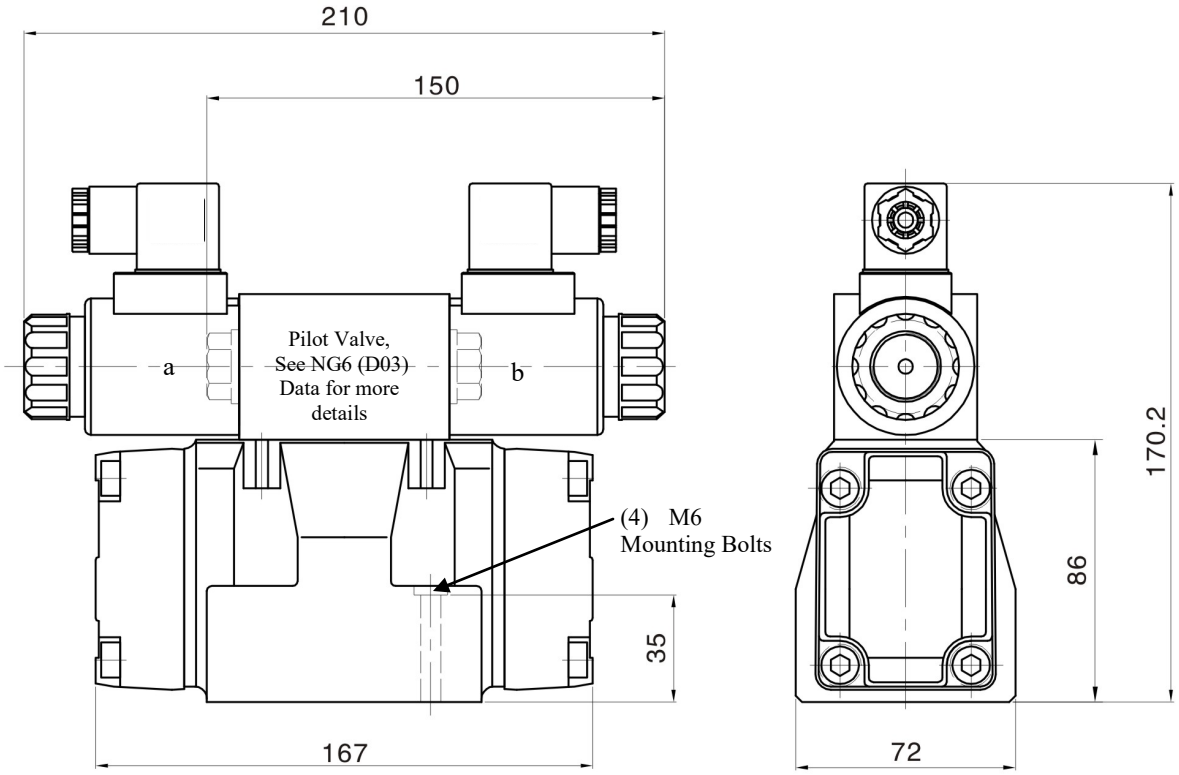
Internal Pilot Pressure Plugs. Remove for external.

Option "P" 4.5 bar (65 psi) pilot pressure valve. To insure sufficient pilot pressure during internally piloted low system pressure operation.

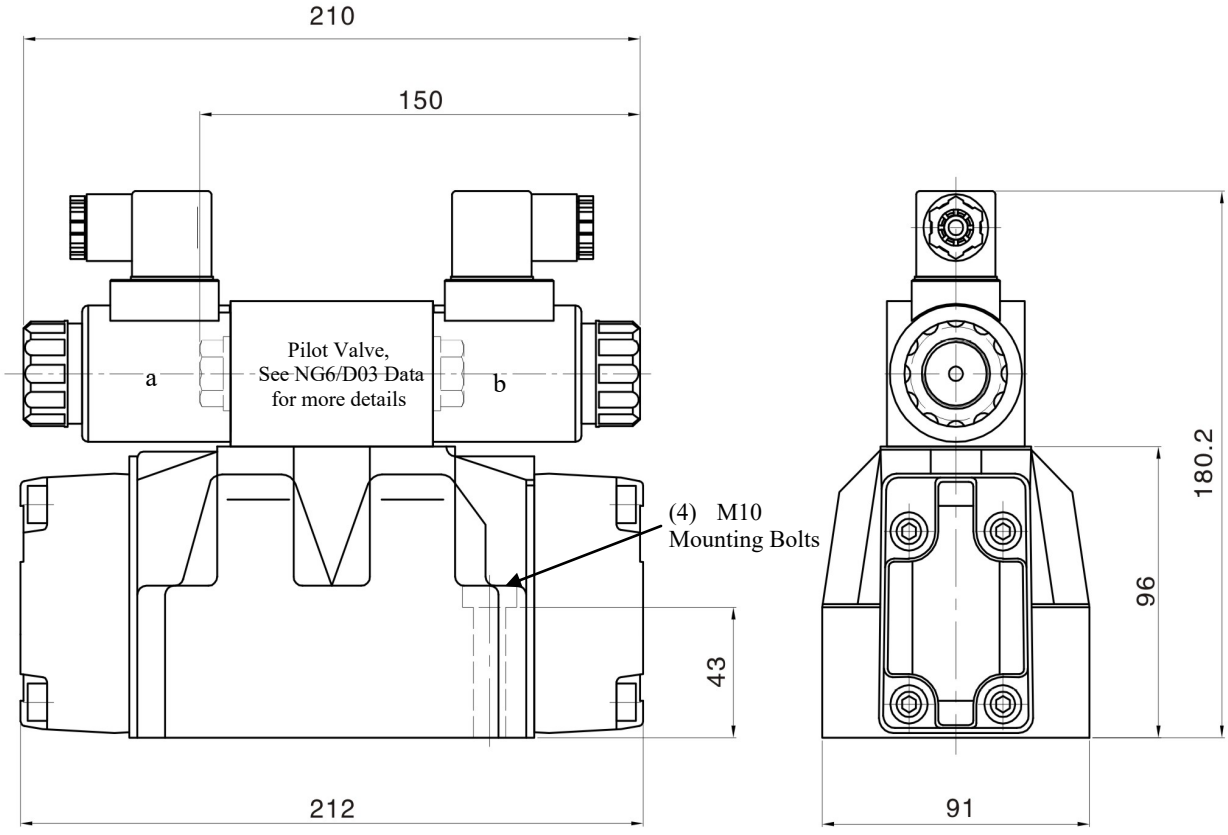


Installation Drawings (mm):

NG10 (D05) 2 Stage

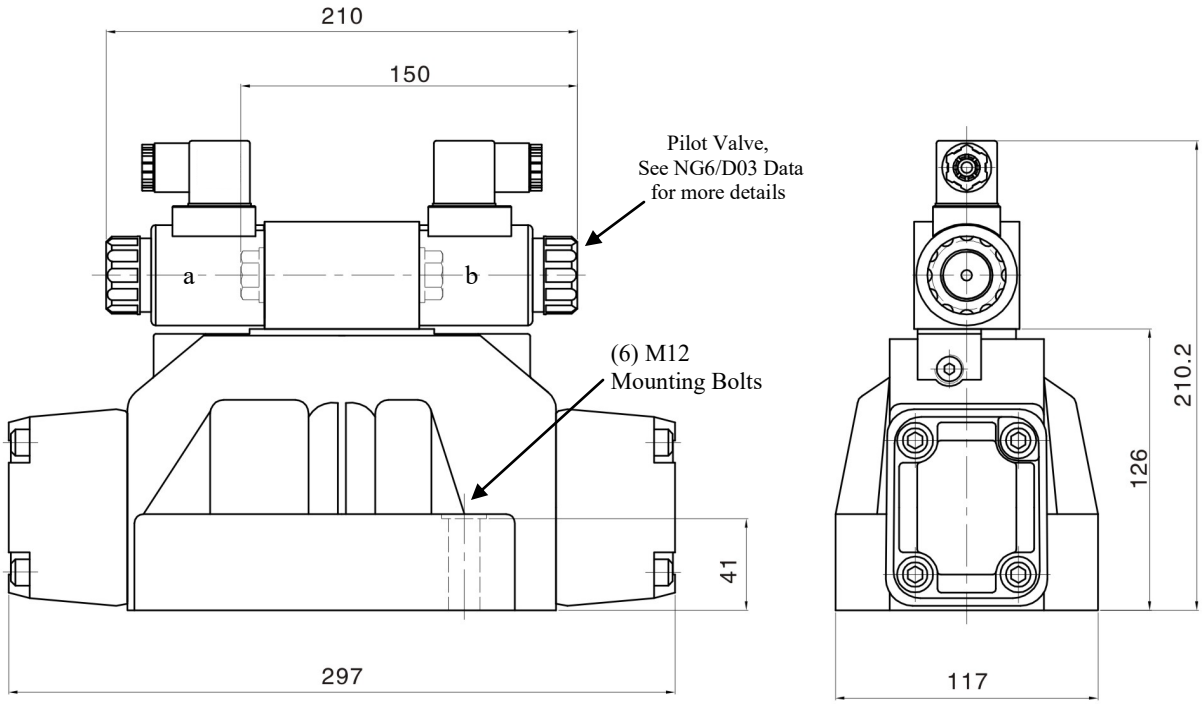


NG16 (D07)

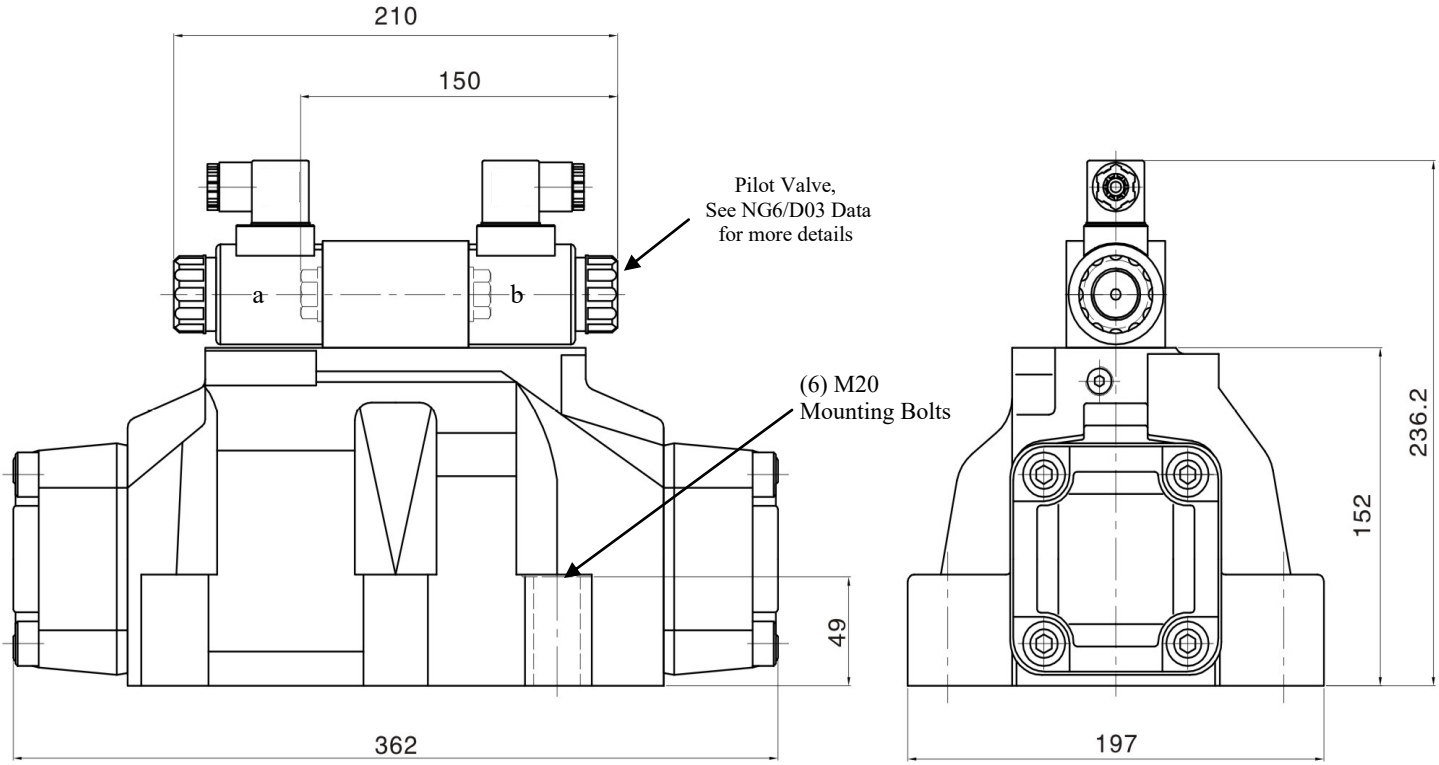


Installation Drawings (mm):

NG25 (D08)



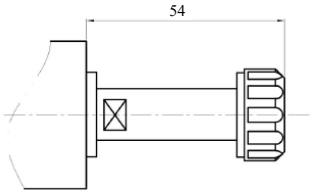
NG32 (D10)



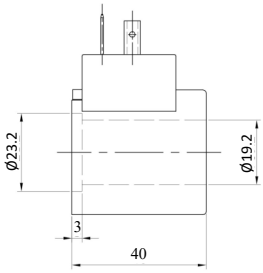
Coil Overview and Dimensions (mm):

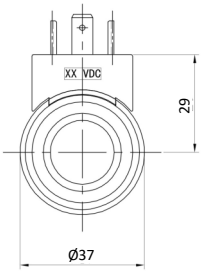
NG4 (D02)

Core Tube with fastening nut, without coil

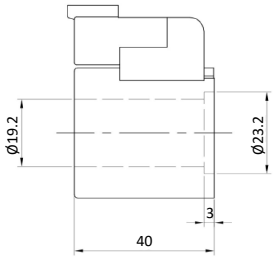


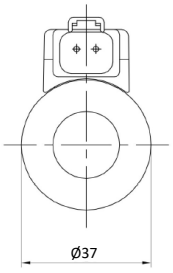
DL—DIN 46350 Form A connector



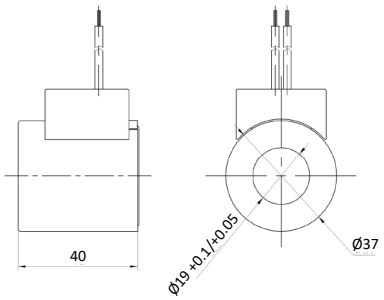


DU –Duetsch DT04-2P Connector



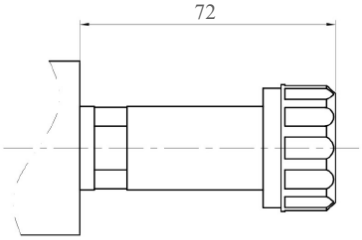


FL— Flying Leads



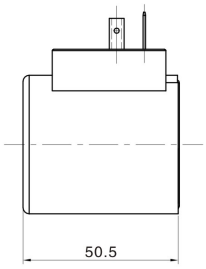
NG6 (D03)

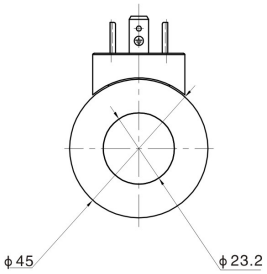
Core Tube with fastening



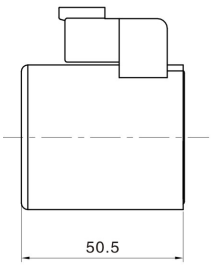
ML– Manual, Push and 1/4 turn safety lock

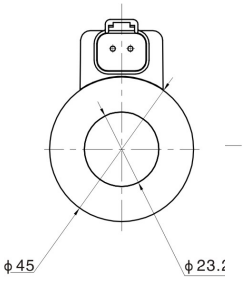
DL - DIN 46350 Form A connector



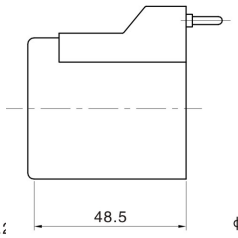


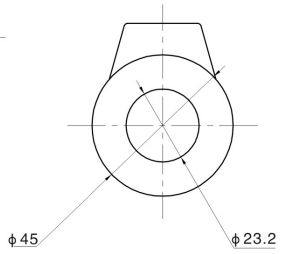
DU - Duetsch DT04-2P Connector





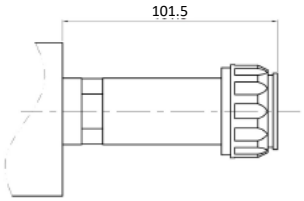
CL - Coil for Wiring Box



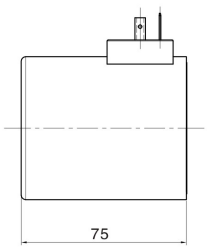


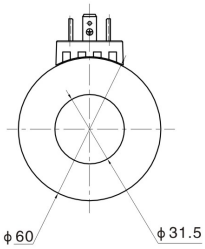
NG10 (D05)

Core Tube with fastening nut, without coil

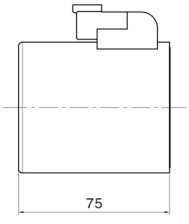


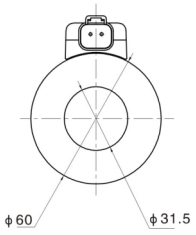
DL—DIN 46350 Form A connector



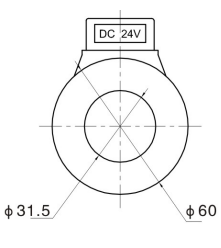


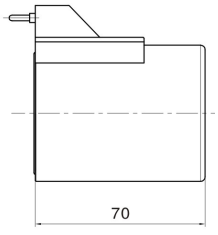
DU –Duetsch DT04-2P Connector





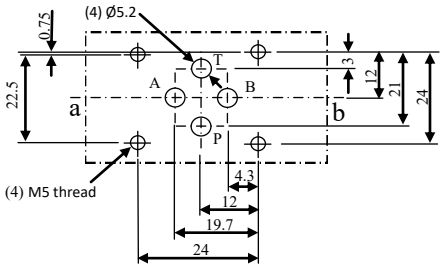
CL— Coil for Wiring Box



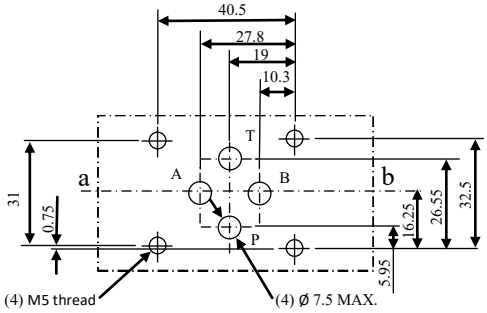


Mounting Pattern Dimensions (mm):

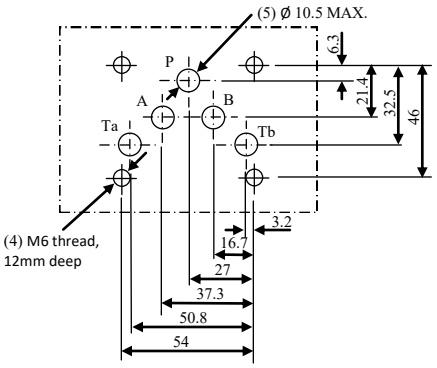
NG4 (D02)



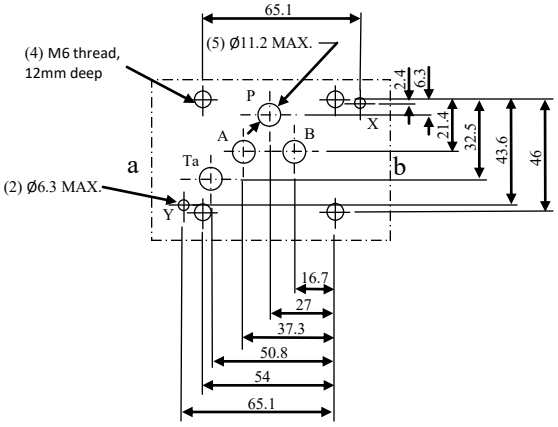
NG6 (D03)



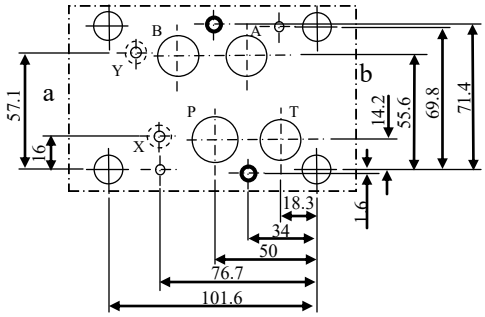
NG10 (D05)



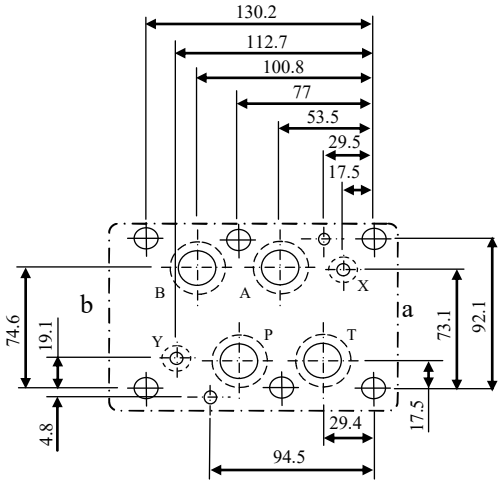
NG10 (D05) 2-Stage



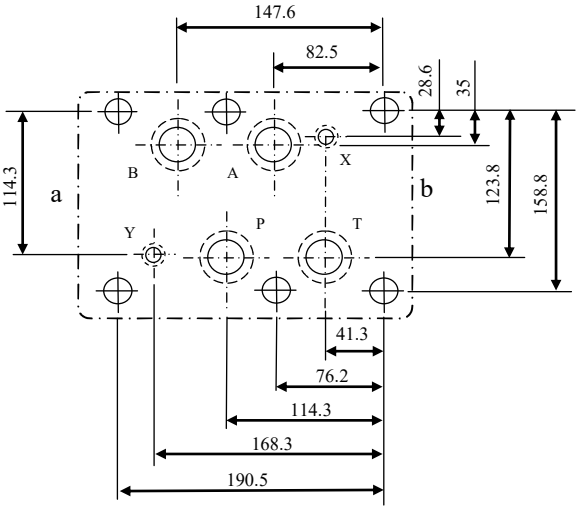
NG16 (D07)



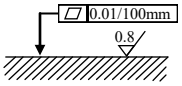
NG25 (D08)



NG32 (D10)



Mating surface recommendation:

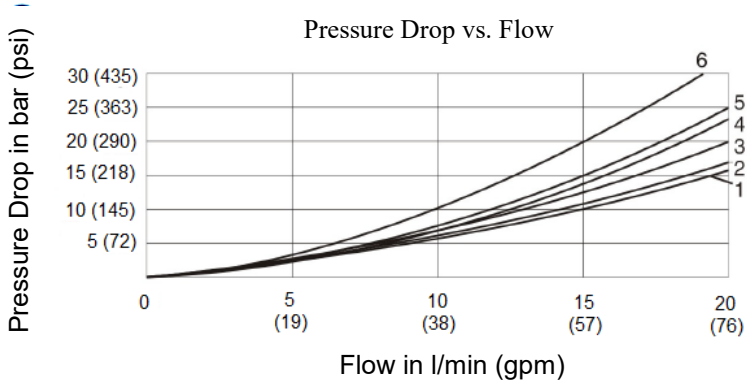


X = External Pilot Pressure
Y = External Pilot Drain

Flow versus Pressure Drop

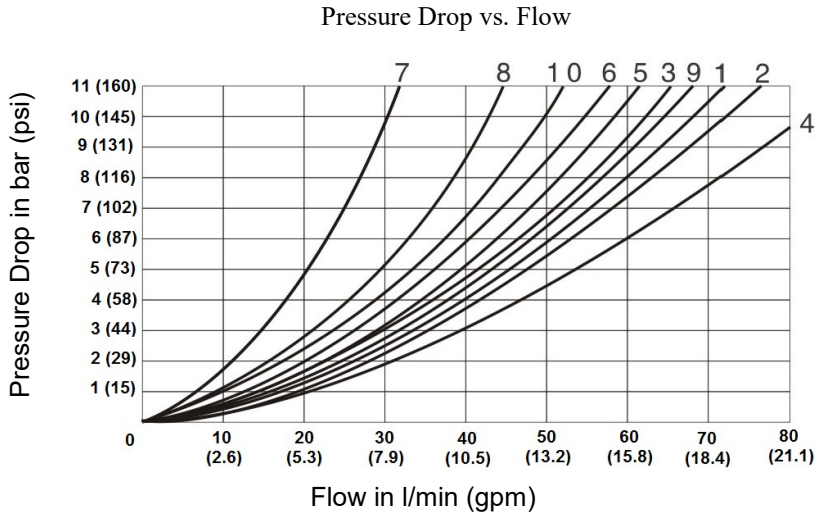
Tests based on Oil Viscosity of 41mm/s and temperature 50°C

NG4 (D02) Valves



Spool Symbol	Flow Direction				
	P-A	P-B	P-T	A-T	B-T
AC, BC	5	5	-	2	2
C	5	5	-	2	2
M	5	5	-	1	1
T	4	4	6	2	2
O	4	4	3	2	2
Y	4	4	-	2	2

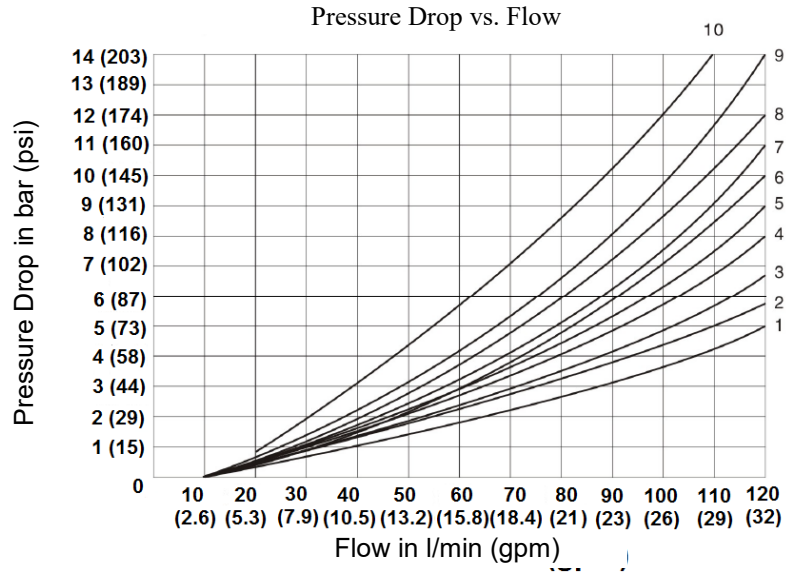
NG6 (D03) Valves



Spool Symbol	Flow Direction			
	P-A	P-B	A-T	B-T
AP,BP	3	3	-	-
AO	1	1	3	1
AC, BC	5	5	3	3
C	3	3	1	1
H	1	3	1	1
O	2	4	2	2
M, N	1	1	2	1
L	3	3	4	9
Y	2	4	3	3
V	3	1	1	1
R	5	5	4	-
N	1	1	2	2
D	3	3	9	4
T	6	6	9	9

7 = Spool Symbol R in spool Position B to A
8= Spool Symbol T in central position P to T
9 = Spool symbol O in central position P to T

NG10 (D05) Valves



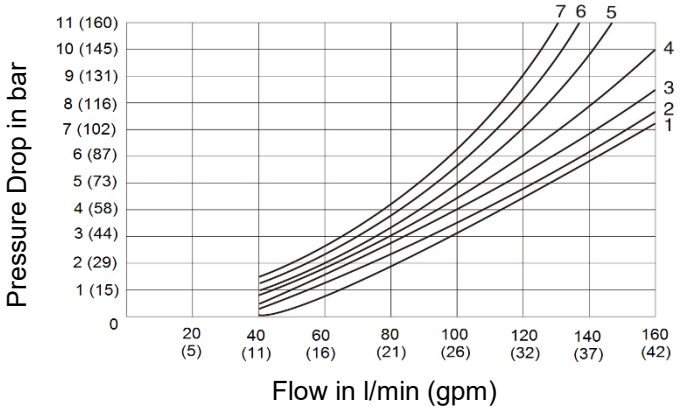
Spool Symbol	Flow Direction			
	P-A	P-B	A-T	B-T
AP,BP	3	3	-	-
AO	1	1	4	5
AC, BC	5	5	6	6
C	1	1	4	4
H	2	3	7	4
O	1	1	6	7
M	1	1	3	3
N	1	2	1	3
L	2	2	3	5
Y	1	1	4	5
V	4	2	5	7
R	3 (9 in Regen)	6	4	-
N	2	3	4	5
D	2	2	3	3
T	3	3	6	7

Spool Symbol	Flow Direction in Center Position				
	P-A	P-B	B-T	A-T	P-T
H	4	-	-	9	9
V	1	1	6		7
T	1	1	3		3
O	1	2	1		3

Flow versus Pressure Drop

Tests based on Oil Viscosity of 41mm/s and temperature 50°C

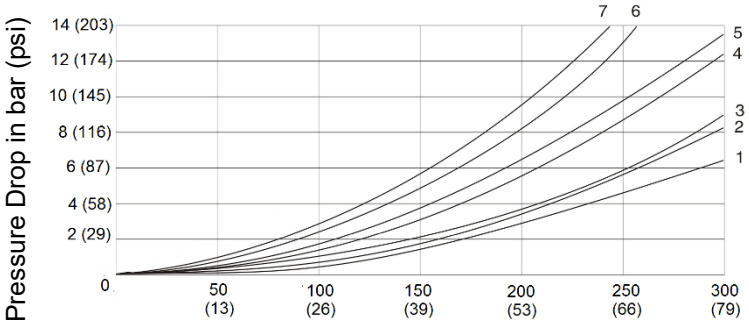
NG10 (D05) 2-Stage Valves



Spool Symbol	Flow Direction, Energized Position			
	P-A	P-B	A-T	B-T
C, BC, AC	2	2	4	5
H	1	4	1	4
T	4	2	2	6
O, AO	4	4	1	4
M	1	2	1	3
L	2	3	1	4
Y	4	4	3	4
V	4	1	3	4
N	2	2	3	5
R	2	2	3	-
D	3	3	3	4

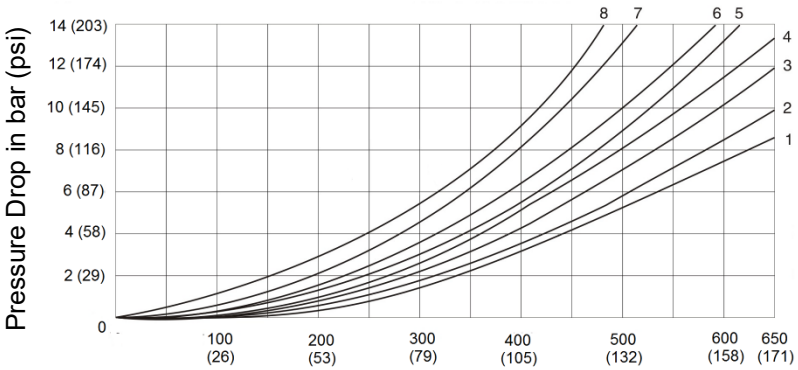
Spool Symbol	Flow Direction, Centered Position3		
	A-T	B-T	P-T
H	3	-	6
T	-	-	7
O	1	3	5
L	3	-	-
V	-	7	5
D	-	4	-

NG16 (D07) Valves



Spool Symbol	Flow Direction, Centered Position3				
	P-A	P-B	A-T	B-T	P-T
C, BC, AC	1	1	1	3	-
H	2	2	3	3	-
T	5	1	3	7	6
O, AO	2	2	3	3	-
M, L	1	1	3	3	-
Y, N	2	2	4	3	-
R	2	2	4	-	-
D	1	1	4	7	-

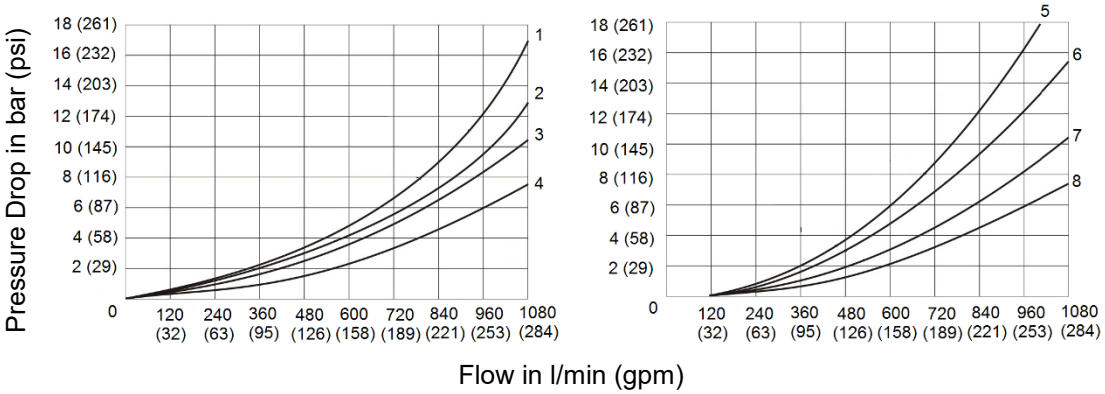
NG25 (D08) Valves



Spool Symbol	Flow Direction in Center Position			
	P-A	P-B	A-T	B-T
C	1	1	1	3
H	1	4	3	3
T	3	1	2	4
O	4	4	3	4
M	2	2	3	5
L	2	2	3	3
Y	4	4	1	4
V	4	1	1	5
R	2	1	1	-
N	1	1	1	3

7 - Spool symbol T, center position P-T
8—Spool Symbol R, B-A

NG32 (D10) Valves



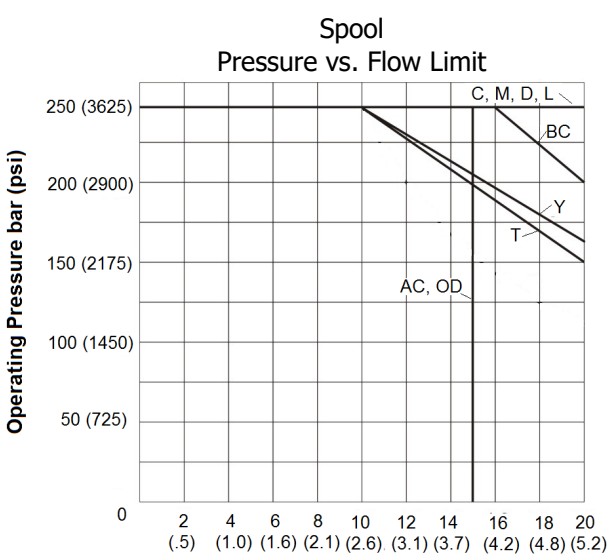
Spool Symbol	Flow Direction, Centered Position					
	P-A	P-B	A-T	B-T	P-T	B-A
C	4	4	3	2	6	-
R	4	4	3	-	-	1
N	4	4	3	2	-	-
T	7	8	7	5	6	-

Technical Specifications:

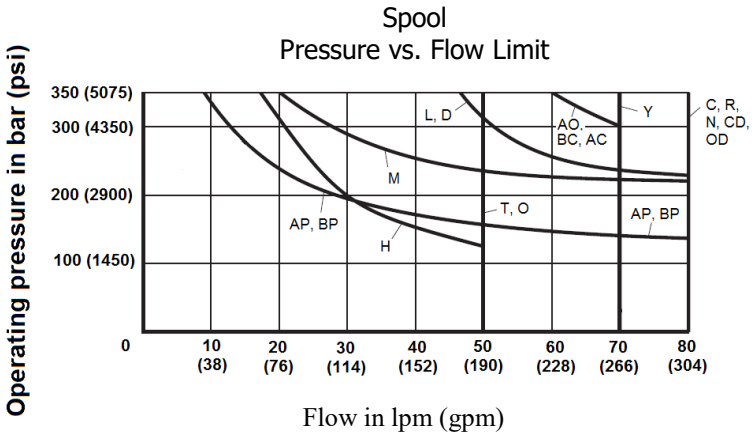
Solenoid Power Limits:

Test based on Oil Viscosity of 46mm/s (190SUS), temperature 40°C (107 °F), 10% under voltage, no back pressure in the tank line, 2 directions of flow i.e. P-A and B-T

NG4 (D02) Valves



NG6 (D03) Valves



NG10 (D05) Single Stage Valves